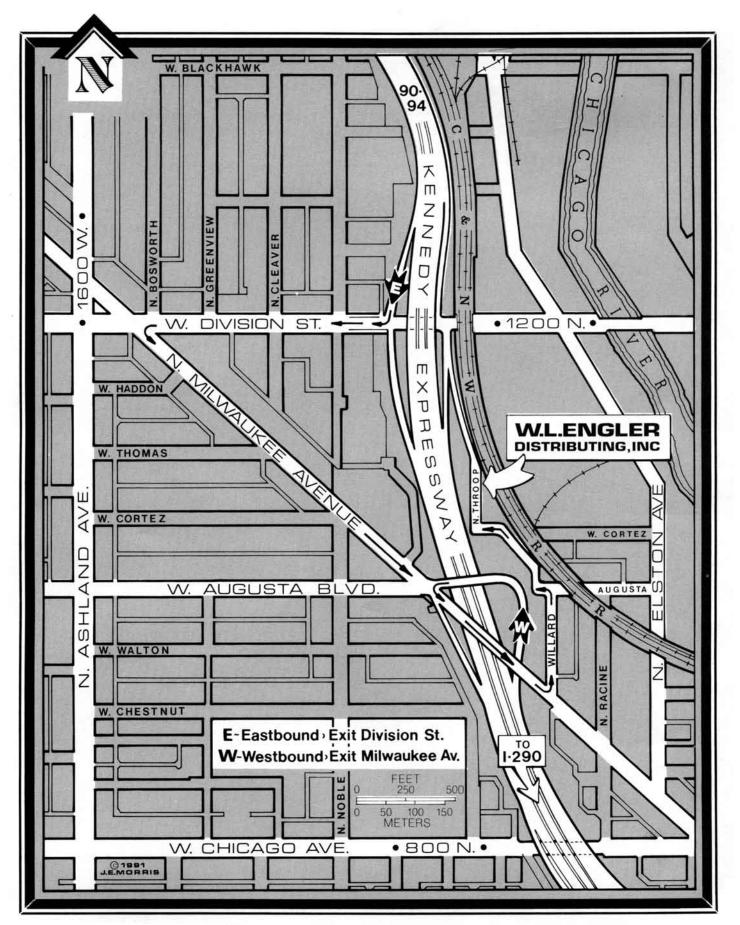


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Notes



J951X* SERIES

HIGH EFFICIENCY, SINGLE STAGE CONDENSING, UPFLOW/HORIZONTAL GAS FURNACES

95.0 AFUE 38,000 - 108,000 Btuh Input

















DESCRIPTION

The high efficiency upflow gas furnace may be installed free standing in a utility room, basement, or enclosed in an alcove or closet. Upflow/horizontal units come ready for upflow or horizontal application. The extended flush jacket provides a pleasing "appliance appearance." Design certified by CSA for application in Canada and the United States.

This furnace series is approved and certified by the SCAQM and the SJVAPC Districts in the state of California under each Districts' Mitigation Fee Plan for shipment into and sales in both districts.

For California installations in SCAQMD only: This furnace does not meet the SCAQMD Rule 1111 NOx emission limit (14 ng/J), and thus is subject to a mitigation fee of up to \$450. This furnace is not eligible for the Clean Air Furnace Rebate Program: www.CleanAirFurnaceRebate.com.

WARRANTY

Oxbox offers durability even under the most stressful heating and cooling conditions, and our innovative 1-5-10 no-registration warranty gives you maximum peace of mind.

Plus, every piece of equipment is warranted to the home, not the homeowner—providing an extra measure of coverage when it comes time to sell.

1 year: Complete replacement, no questions asked*

5 years: Standard parts warranty

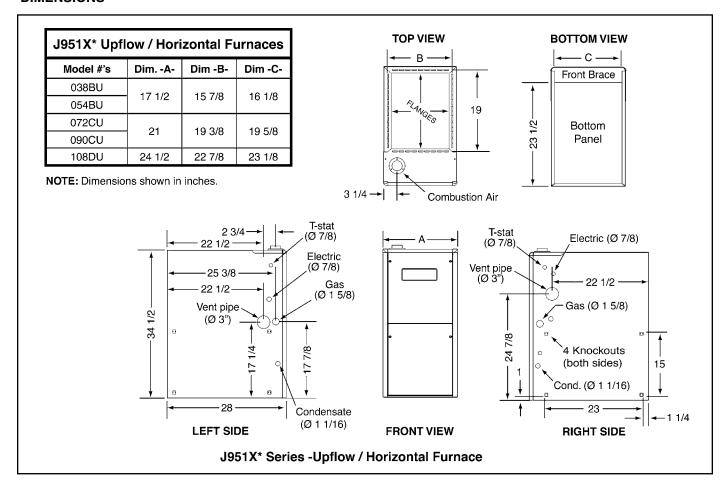
10 years: Compressor replacement**

In addition, Oxbox offers a 20-year warranty on heat exchangers for gas furnace and package gas electric units.

FEATURES

- 100% fired and tested: All units and each component are tested on the manufacturing line.
- 30 second blower delay at start-up assures a warm duct temperature at furnace start-up. Adjustable blower off settings (60, 90, 120 and 180 seconds).
- 30 second post purge increases life of heat exchanger.
- Hot surface igniter: Innovative application of a silicon nitride type igniter.
 Utilizes proven Smartlite® technology.
- Flexible category IV venting system: May be vertically or horizontally vented using either a one-pipe or two-pipe system for maximum flexibility in installation.
- High Static Blowers: All models equipped with high static blowers.
- Low Boy Height: Easy to apply in low ceiling applications, works well with taller high SEER coils, easier to handle and install.
- Tubular primary heat exchanger: Heavy gauge aluminized steel heat exchanger and stainless steel secondary heat exchanger assures a long life.
- 60 second fixed cooling cycle blower-off delay (TDR) increases cooling performance.
- High efficiency blower kits maximize efficiencies. On select units, a SEER improvement of up to 1 point is realized.
- Multi-speed direct drive blower: Designed to give a wide range of cooling capacities. Switches on PCB, provide ultra easy motor speed selection.
- LP convertible: Simple burner orifice and regulator spring change for ease of convertibility.
- Diagnostic lights for easy troubleshooting without counting flashes: Dedicated light for flame signal strength and 2 lights in combination to indicate all other fault codes with easy to recognize states without counting flashes.
- Incorporates integrated control board with connections for electronic air cleaner and humidifier.
- Two piece door design enhances furnace appearance and uses captured screws to prevent losing door screws.
- Blower Compartment: Sealed door to reduce air leakage and insulated for ultra quiet operation.
- Sealed Vestibule reduces burner and inducer sound levels.
- Furnace Air Leakage: These furnaces comply with Energy Star cabinet air leakage requirement of less than or equal to 2%. Keep the conditioned air flowing to where it's needed.
- PolyPro by DuraVent: These furnaces have been tested with and are approved to be installed with DuraVent's PolyPro venting system.

DIMENSIONS



VENT TABLE

		LENGTH (FT.) adius elbow*	DUEL PIPE L	VENT, ENGTH (FT.) lbow on each pipe*
	OUTLET	OUTLET	INLET/OUTLET	INLET/OUTLET
MODELS	2"	3"	2"	3"
038BU	50	70	50	70
054BU	70	90	70	90
072CU	50	90	50	90
090CU	60	90	60	90
108DU	N/A	90	N/A	90

*NOTE:

- 1. Subtract 2.5 ft. for each additional 2" elbow and 3.5 ft. for each additional 3" elbow.
- 2. Two 45 degree elbows are equivalent to one 90 degree elbow.
- 3. One short radius elbow is equivalent to two long radius elbows.
- 4. Do not include termination elbows in calculation of vent length.5. This table is applicable for elevations from sea level to 2000 ft.
- For higher elevations decrease vent pipe lengths by 8% per 1000 ft. of altitude.
- 6. Only the listed pipe materials are approved for use with J951x Condensing Furnaces.

SPECIFICATIONS

J951X*U MODEL NUMBERS	038BU	054BU	072CU	090CU	108DU
Input - BTUH	38,000	54,000	72,000	85,000	108,000
Heating Capacity - BTUH	36,000	51,000	68,000	81,000	103,000
AFUE	95.0/94.0*	95.0/90.0*	95.0/90.0*	95.0/94.0*	95.0/90.0*
Motor H.P Speed - Type	3/4 - 5 - ECM	3/4 - 5 - ECM	3/4 - 5 - ECM	1 - 5 - ECM	1 - 5 - ECM
Motor FLA	8.8	8.8	8.8	11.5	11.5
Rated Ext. SP - In. W.C.	0.5	0.5	0.5	0.5	0.5
Temperature Rise Range - F	25-55	30-60	35-65	35-65	35-65
Shipping Weights (lbs)	95	95	110	134	136

^{*}AFUE for Upflow/Horizontal application.



J801X* SERIES

HIGH EFFICIENCY UPFLOW/HORIZONTAL GAS FURNACES

Induced Draft - 80+% AFUE Input 45.000 - 126.000 BTUH

















DESCRIPTION

The high efficiency gas furnace may be installed free standing in a utility room, basement, or enclosed in an alcove or closet. The rounded corner jacket provides a pleasing "appliance appearance." Design certified by CSA for application in Canada and the United States.

This furnace series is approved and certified by the SCAQM and the SJVAPC Districts in the state of California under each Districts' Mitigation Fee Plan for shipment into and sales in both districts.

For California installations in SCAQMD only: This furnace does not meet the SCAQMD Rule 1111 NOx emission limit (14 ng/J), and thus is subject to a mitigation fee of up to \$450. This furnace is not eligible for the Clean Air Furnace Rebate Program: www.CleanAirFurnaceRebate.com.

WARRANTY

Oxbox offers durability even under the most stressful heating and cooling conditions, and our innovative 1-5-10 no-registration warranty gives you maximum peace of mind.

Plus, every piece of equipment is warranted to the home, not the homeowner—providing an extra measure of coverage when it comes time to sell.

1 year: Complete replacement, no questions asked*

5 years: Standard parts warranty

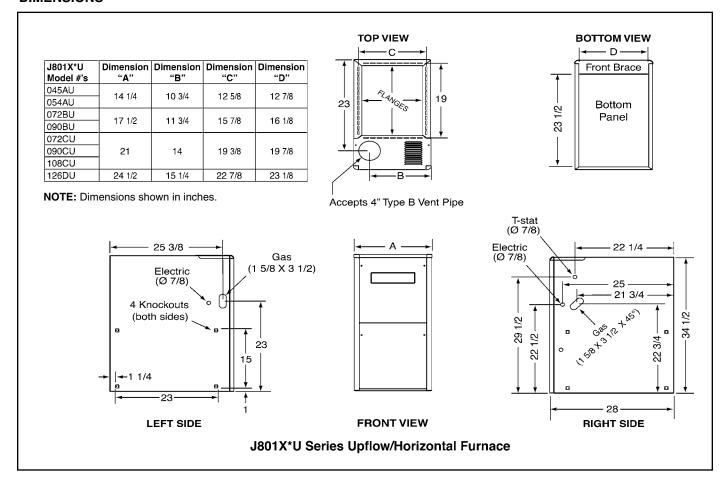
10 years: Compressor replacement**

In addition, Oxbox offers a 20-year warranty on heat exchangers for gas furnace and package gas electric units.

FEATURES

- 100% fired and tested: All units and each component are tested on the manufacturing line.
- Low Boy Height: Easy to apply in low ceiling applications, works well with taller high SEER coils, easier to handle and install.
- Tubular primary heat exchanger: Heavy gauge aluminized steel heat exchanger assures a long life.
- 30 second blower delay at start-up: Assures a warm duct temperature at furnace start-up. Adjustable blower off settings (60, 90, 120 and 180 seconds).
- 30 second post purge: Increases life of heat exchanger.
- Hot surface igniter: Innovative application of a silicon nitride igniter. Utilizes proven Smartlite® technology.
- High static blowers: All models equipped with high static blowers.
- 90 second cooling cycle blower-off delay (TDR): Increases cooling performance.
- Flexible category I venting system: May be vented with dedicated venting system or common vented with other category one appliances.
- High efficiency blower kits: Maximize efficiencies. On select units, a SEER improvement of up to 1 point is realized.
- Multi-speed direct drive blower: Designed to give a wide range of cooling capacities. Switches on PCB, provide ultra easy motor speed selection.
- LP convertible: Simple burner orifice and regulator spring change for ease of convertibility.
- Diagnostic lights for easy troubleshooting without counting flashes: Dedicated light for flame signal strength and 2 lights in combination to indicate all other fault codes with easy to recognize states without counting flashes.
- Integrated control board: Incorporates connections for electronic air cleaner and humidifier.
- Two piece door design: Enhances furnace appearance and uses captured screws to prevent loose door screws.
- Blower Compartment: Insulated for ultra quiet operation.
- Meets Title 24 Standards: Min. 350 CFM/Ton, .58 watts/CFM and ≤ 2% cabinet leakage.
- Meets SCAQMD and SJVAPCD rules 1111/4905: For low NOx limit of 40ng/J.

DIMENSIONS



SPECIFICATIONS

J801X*U MODEL NUMBERS	045AU	054AU	072BU	090CU	108CU	126CU
Input - BTUH	45,000	54,000	72,000	90,000	108,000	126,000
Heating Capacity - BTUH	36,000	43,200	57,600	72,000	86,400	100,800
AFUE	80.0	80.0	80.0	80.0	80.0	80.0
Motor H.P Speed - Type	1/2 - 5 - ECM	1/2 - 5 - ECM	3/4 - 5 - ECM	3/4 - 5 - ECM	1 - 5 - ECM	1 - 5 - ECM
Motor FLA	6.4	6.4	8.8	8.8	11.5	11.5
Rated Ext. SP - In. W.C.	0.5	0.5	0.5	0.5	0.5	0.5
Temperature Rise Range - F	30-60	30-60	30-60	35-65	35-65	40-70
Shipping Weights (lbs)	95	95	110	134	136	147

POWER HUMIDIFIERS





MODEL 1137

Flow-through humiditier that's ideal for most homes. No by-pass required. Installs on vertical warm air supply plenum.

Unit size: 16" wide x I4" high x 10" deep Plenum opening: 15" wide x 9-1/2" high Bypass duct: N/A

1137 Series - 21.3 GPD Capacity

Drain type humidifier with fan for installation on warm air plenum. Built-in isolation relay provides 24V. secondary voltage for control of fan motor and solenoid valve by a wall/ duct humidistat included. 120V power cord, 15' of drain hose, 10' of wire and saddle valve included. (Copper tubing not included.)

Model 1137

Model 1137R - Recirculating, no household drain required. Comes with 975 recirculating pump.

REPLA	CEMENT PARTS 1137	
PART #	DESCRIPTION	
1099-9	Thumb Nut	
990-13	Evaporator Pad	
1137-17	Solenoid Valve Assy.	
1137-9	Fan Blade	
GA4328	Relay Assembly	
1137-8	Fan Motor	
1137-3 Drain Pan		
1137-21	Pump (1137R Only)	



MODEL 1042LH

Flow-through humidifier that's ideal for most homes. Installs on vertical warm air supply or cold air return plenum.

Unit size: 15" wide x 11-1/2" high x 9" deep Plenum opening: 10-1/4" wide x 9-1/2" high Bypass duct: 6" diameter (collar supplied)

1042 Series - 19.2 GPD Capacity

Drain type, by-pass humidifier with new styling. New patented water distribution system. Humidity control selector/shutoff damper. 6" collar, 15 ft. of drain hose, saddle valve and brass fittings. (copper supply tubing and 6" by-pass pipe not included.) Replaces the Model 1040 fitting the same plenum opening and mounting holes as the original 1040.

Model #1042 - 120 volt Model #1042L - 24 volt Model 1042LH - Same as 1042L plus H-86 wall/duct humidistat.

REPLACEMENT	PARTS FOR 1042 SERIES
PART #	DESCRIPTION
990-13 975-33 975-45	Evaporator Pad Motor Pump, Motor & Lid Assy.
975-45 1137-3 975-10 990-52 990-53 975-1 727-58 990-37-75	Drain Pan Float Valve Assy. Solenoid 115v Solenoid 24v Seat Valve Transformer 24v Orifice with Strainer



POWER HUMIDIFIERS



MODEL 1099LH

Highest capacity flow-through humidifier for large homes. Installs on vertical warm air supply or cold air return plenum.

Unit size: 16" wide x 16" high x 11" deep Plenum opening: 13-1/4" wide x 9-1/4" high Bypass duct: 7" diameter (collar supplied)

1099 Series - 23.1 GPD Capacity

Drain type humidifier, fiber glass reinforced cabinet, complete with 115V solenoid valve, 7 in. stub collar, 15 ft. of drain hose, saddle valve and brass fittings. (Copper tubing and 7 in. pipe not included.)

Model 1099

Model 1099LH - Same as 1099 but with 24V solenoid valve and transformer allowing 24V control circuit plus H-86 wall/duct humidistat.

r	
REPLACEME	ENT PARTS SERIES 1099
PART #	DESCRIPTION
1099-20 1099-41	Evaporator Pad Solenoid 115v
1099-42	Solenoid 24v
975-1 975-10	Seat Valve Float Valve Assy.
975-33	Motor
975-45	Pump, Motor & Lid Assy.
727-58	Transformer, 24v



Model S1-BP5000MT

Model Elite 570 is a Bypass Design Humidifier incorporating an integral humidity control damper. The hot air from your furnace is bypassed through a Vapor Pad® where moisture is evaporated and absorbed into the airflow of your heating system. This economical design will provide comfort as it humidifies your home. The 570 is an option designed for smaller size homes.

MODEL S1-BP5000MT - 12.0 GPD Capacity

Unit size: 11-7/8" wide x 13-3/8" high x 9-1/2" deep Plenum opening: 8-3/4" wide x 9-1/2" high Bypass duct: 6" diameter

REPLACEMENT PARTS MODEL 65		
PART #	DESCRIPTION	
GA10 GA4040	Evaporator Pad Solenoid 24v	

POWER HUMIDIFIERS



Model 900M Elite Series Humidifier

FEATURES

- Manual Humidistat, a contemporary design and solid construction, the MHX3 gives you
 the ability to control your humdity comfort level.
- Bypass humidifier mounts easily on the warm or return plenum and delivers 17 GPD.
- Evaporator pad replacement number GA19.
- A portion of the heated air from the furnace passes through a water-soaked pad where it absorbs additional moisture and then returns for distribution throughout your home.
- Water is metered into a patented kinetic trough and dispersed uniformly across the pad.
 Unevaporated water drains from the bottom of the unit to eliminate mineral build-up.

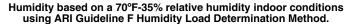
Humidity requirements in GPD based on house size and type of construction (from ARI Guideline F)

Type of	Size of house (sq. ft.)*					
Construction	500	1000	1500	2000	2500	3000
Tight	2.1	4.2	6.4	8.5	10.6	12.7
Average	3.3	6.5	9.8	13.1	16.3	19.6
Loose	4.6	9.2	13.8	18.4	23.0	27.6

^{*}Based on 8ft. ceiling height

SPECIFICATIONS

Unit Size: 12" wide x 16-1/2" high x 10" deep Plenum Opening: 8-3/4" wide x 12" high Bypass Duct: 6" diameter



Model No.	GPD*	Loose	Average	Tight	
900	17	1782	2523	3904	

^{*}NOTE: Figures are based on an 8ft. ceiling height. GPD shown is a 120° plenum temperature. Square footage may be adjusted for other plenum temperatures.

Model 1000M Elite Series Humidifier

FEATURES

- Manual Humidistat, a contemporary design and solid construction, the MHX3 gives you
 the ability to control your humdity comfort level.
- Fan-powered unit mounts easily on the warm air plenum and delivers 18 GPD.
- Evaporator pad replacement number GA19.
- A portion of the heated air from the furnace passes through a water-soaked pad where it absorbs additional moisture and then returns for distribution throughout your home.
- Water is metered into a patented kinetic trough and dispersed uniformly across the pad. Unevaporated water drains from the bottom of the unit to eliminate mineral build-up.

Humidity requirements in GPD based on house size and type of construction (from ARI Guideline F)

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Construction	500	1000	1500	2000	2500	3000	
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Average	3.3	6.5	9.8	13.1	16.3	19.6	
Loose	4.6	9.2	13.8	18.4	23.0	27.6	

^{*}Based on 8ft. ceiling height

Humidity based on a 70°F-35% relative humidity indoor conditions using ARI Guideline F Humidity Load Determination Method.

Model No.	GPD*	Loose	Average	Tight	
1000	18	1924	2723	4214	

*NOTE: Figures are based on an 8ft. ceiling height. GPD shown is a 120° plenum temperature. Square footage may be adjusted for other plenum temperatures.



SPECIFICATIONS

Unit Size: 16" wide x 16-1/2" high x 10" deep Plenum Opening: 14" wide x 12" high



AIR CLEANERS

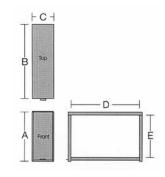
Progressive Media Air Cleaners

Straight-through Design

- The choice for optimizing Indoor Air Quality
- Top performing Ultravation® Progressive MERV 11 Media
- Superior dust spot ratings: 51 % initial / 56% average
- UltraStrand[™] media technology: MERV 11 efficiency—matches older technology MERV 8 initial resistance!
- 10-year cabinet warranty

Ultravation® Progressive Media Air Cleaners with UltraStrand™ media technology remove particu-lates as small as .3 microns! They have better capture capability yet match MERV 8 pressure drop characteristics.





Model	Finish	Cabinet Dimensions A x B x C	Duct Opening D x E	Filter size
90-006	Light beige, powder coat	16 3/4" x 25 1/4" x 7 3/8"	23 1/4" x 14 3/8"	16" x 25" x 5"
90-007	Light beige, powder coat	20 3/4" x 25 1/4" x 7 3/8"	23 1/4" x 18 3/8"	20" x 25" x 5"

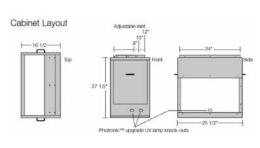
Right Angle Design

The versatile right angle design cabinet with adjustable inlet saves space and simplifies installation (see illustration). The cabinet opens on either end to fit any installation configuration.

Rugged and Efficient Right Angle Design

 Right angle cabinet simplifies installation requiring less duct metal and less labor.





Model	Finish	Cabinet Dimensions	Outlet size (furnace A/C side)	Inlet size	Filter size
90-064	Light beige, powder coat	27 1/2" x 16 1/2" x 25 1/2"	23 1/8" x 13 9/16"	Adjustable	20" x 25" x 5"

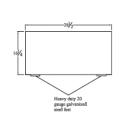
Support Box Design

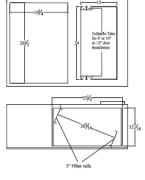
The support box design cabinet with adjustable inlet saves space and simplifies installation (see illustration). The cabinet is reversible to fit any installation configuration.

Rugged and Efficient Design

- Cabinet simplifies installation requiring less duct metal and less labor.
- Two Sizes—compliments most air handler / furnace designs
- Fully insulated (available without insulation)
- · Adjustable inlet and outlet
- Reversible for installation flexibility







Model	Finish	Cabinet Dimensions	Outlet size (furnace side)	Inlet size	Filter size
90-035	Light beige, powder coat	42" x 28 1/2" x 16 1/4"	26 1/2" x 19 1/4"	Adjustable	20" x 25" x 5"

UV AIR PURIFIERS



Ultramax[™] integrates UV lamps, power supply and microprocessor control into a single, balanced UV system that is designed for state of the art performance in HVAC mold treatment and airborne microorganism reduction.



- Ultramax" is the only microprocessor controlled UV air disinfection system.
- The ESP II™ integrated power supply monitors and controls the lamps, optimizing UV performance at all times. Taking cues from the microprocessor, it senses when to send more or less power to the lamps.
- ESP II auto-senses line voltage 120-277VAC 50/60Hz.
- The UVLampMonitor displays lamp status and reminds the homeowner when lamp changes are needed.
- TWO-YEAR lamp life.
- · Ultravation® proprietary easy-plug-in lamp system prevents accidental homeowner exposure to UV for added safety.
- Ultramax'" Remote UV lamp models use Ultravation's T3™ (patented) design that produces up to 40% more UV than competing models with safety interlock system.
- Ultramax™ integrated or fixed UV lamp models use Compact-Twin "U" shaped lamps that effectively double the lamp's length—for substantially more output than any competing lamp.
- All Ultramax" UV lamps use Philips Sterilamp® low mercury content UV lamp technology and are the most environmentally friendly UV lamp available. Philips lamps use less than 5mg of mercury.

17" FIXED LAMP

Features:

- Autosensing power supply Works on any voltage from 115-240VAC
- Single or dual lamp configurations
- Compact design
- · Electronic power supply
- T3 lamps deliver 50% more UV
- On/Off power switch
- No need to remove unit to change lamps
- 1 year UVC lamp warranty
- 10 year equipment warranty



17" REMOTE LAMP

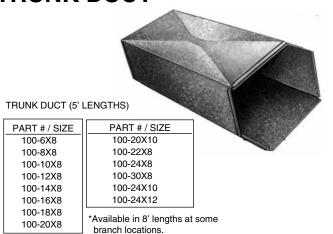
Features:

- Autosensing power supply Works on any voltage from 115-240VAC
- · Single or dual lamp configurations
- 6 Ft. lamp lead cords(s)
- Compact design
- Electronic power supply
- T3 lamps deliver 50% more UV
- On/Off power switch
- No need to remove unit to change lamps
- 1 year UVC lamp warranty
- 10 year equipment warranty



UMX 1902

TRUNK DUCT



PLENUM CHAMBERS

(Custom Made)

No. 12 Custom Made Plenum Chamber Shipped Knocked Down & Strapped



PLENUM CHAMBERS
CUSTOM MADE FOR LUXAIRE FURNACES

PART # / SIZE
20-1/8x13-1/2x36
20-1/8x13-1/2x60
20-1/8x16-1/2x36
20-1/8x16-1/2x60
20-1/8x20x36
20-1/8x20x60
20-1/8x21-1/2x36
20-1/8x21-1/2x60

PART # / SIZE 21x13-1/2x36 21x13-1/2x60 21x16-1/2x36 21x16-1/2x60 21x20x36 21x20x60

TRUNK REDUCERS



No.113 Reducer - Increaser

PART # / SIZE	
113-10X8-8X8	
113-12X8-8X8	
113-12X8-10X8	
113-14X8-10X8	
113-14X8-12X8	
113-16X8-12X8	
113-16X8-14X8	
113-18X8-10X8	
113-18X8-14X8	
113-18X8-16X8	
113-20X8-14X8	
113-20X8-16X8	
113-20X8-18X8	
113-24X8-18X8	
113-24X8-20X8	
113-24X10-18X8	
113-24X10-24X8	
113-24X12-24X8	



PART # / SIZE 114-2 114-4 114-6 114-8

WALL STACK

PART # / SIZE
200-2 x 3-1/4 x 10
200-2 x 3-1/4 x 12
200-2 x 3-1/4 x 14
200-5 x 3-1/4 x 10
200-5 x 3-1/4 x 12
200-5 x 3-1/4 x 14
200-8 x 3-1/4 x 10
200-8 x 3-1/4 x 12
200-8 x 3-1/4 x 14



Button Lick – 2 piece Wall Stack – 24" Wall Stack – 60" Wall Stack – 100"

ADJUSTABLE PLENUMS

*To Install Adjustable Plenum:

- 1 Cut raw edges of side panel to desired width and height sizes.
- 2 Trim top to 1/8" Less than Plenum width and depth dimensions.
- 3 Assemble 3 sides, slide top into side panel pockets, then position fourth side.

Parts No. 12AT and 12AS may be ordered separately.



PLENUM SIDE

PART # / SIZE 12AS-15X34 12AS-18X34 12AS-18X46 12AS-21X34 12AS-21X46 12AS-24X34 12AS-24X46 12AS-30X34 12AS-30X46

PLENUM TOP

PART # / SIZE 12AT-14X14 12AT-15X15 12AT-18X18 12AT-21X21 12AT-24X24 12AT-30X30

JOIST PANNING



NO. 90 - 29" LONG

PART #	SIZE
90XX	33" WIDE
90-1/2	16" WIDE

STACK ELBOWS

No. 290 Horizontal 90° Elbow (Longway)



PART# 290-3-1/4 x 10 290-3-1/4 x 12 290-3-1/4 x 14

STACK ANGLES

No. 209 Horizontal 45° Angle (Longway)

No. 206 Vertical

PART # 209-3-1/4 x 10 209-3-1/4 x 12 209-3-1/4 x 14



No. 216 Vertical 90° Elbow (Shortway)



PART # 216-3-1/4 x 10 216-3-1/4 x 12 216-3-1/4 x 14 45° Angle (Shortway)



112-6X8

112-8X8

112-10X8 112-12X8

112-14X8 112-16X8

112-18X8 112-20X8 112-20X10 112-22X8 112-24X8 112-24X10 112-25X10 112-24X12 112-30X8



COLD AIR DROPS



*CD100-16X20 DUCT SIZE IS 20X10. CD100-16X25 DUCT SIZE IS 25X10.

No. CD100

Cold Air Drop Package

- 1 Starting Collar
- 2 Joins Duct 32" Long
- 1 Elbow with Built-In Filter Rack

PART #	
CD100-14X20	
CD100-14X25	
CD100-16X20	
CD100-16X25	

ELBOW ONLY

FILTER RACK

PART #
FR16X20X1
FR16X25X1
FR20X25X1

END CAPS

PART # / SIZE No. 112 End Cap

PART# 212-3-1/4 x 10 212-3-1/4 x 12 212-3-1/4 x 14



STARTING COLLARS

No.111 Straight Takeoff Collar



PART # / SIZE
111-6X8
111-8X8
111-10X8
111-12X8
111-14X8
111-16X8
111-18X8
111-20X8
111-20X10
111-22X8
111-22X10
111-24X8
111-24X10
111-24X12
111-30X8

No. 211 Take-off Collar



PART # / SIZE 211- 3-1/4 x 10 211- 3-1/4 x 12 211- 3-1/4 x 14

No.110 Offset Takeoff Collar – 2" Rise – Plenum End is 2" greater in depth than trunk size



PART # / SIZE
110-8X8
110-10X8
110-12X8
110-14X8
110-16X8
110-18X8
110-20X8
110-22X8
110-24X8
110-24X10
110-24X12
110-30X8

No. 115C Transition Takeoff Collar - Center Line

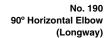


PART # / SIZE	INLET SIZE
115C-1/2-14x8	10 X 12
115C-1/2-16x8	10 X 13
115C-1/2-18x8	10 X 15
115C-1/2-20X8	10 X 16
115C-1/2-24X8	10 X 20

ELBOWS AND ANGLES

PART # / SIZE PART # / SIZE 190S-20X8 190S-6X8 190S-8X8 190S-22X8 190S-10X8 190S-24X8 190S-12X8 190S-30X8 1908-14X8 190S-20X10 190S-16X8 190S-24X10 190S-18X8 190S-24X12

"S" Designates Square Throat





PART # / SIZE 109-6X8 109-8X8 109-10X8 109-12X8 109-12X8 109-14X8 109-16X8 109-18X8

PART # / SIZE 109-20X8 109-22X8 109-24X8 109-30X8 109-24X10 109-24X12 No. 109 45° Horizontal Angle (Longway)



PART # / SIZE PART # / SIZE 116S-20X8 116S-6X8 116S-8X8 116S-22X8 116S-10X8 116S-24X8 116S-30X8 116S-12X8 116S-20X10 116S-14X8 116S-16x8 116S-24X10 116S-24X12 116S-18X8

"S" Designates Square Throat

No. 116 90° Vertical Elbow (Shortway)



PART # / SIZE	PART # / SIZE
106-6X8	106-20X8
106-8X8	106-22X8
106-10X8	106-24X8
106-12X8	106-30X8
106-14X8	106-20X10
106-16X8	106-24X10
106-18X8	106-24X12





HANDY LOCK FURNACE PIPE



Button Lock-120" Joint. Push Edges Together to Lock. Assembly is an Easy One-Man Job Lock ... No Tools. Without Use of Tools.

Handy Lock-60" Joint. Push Edges Together to

Handy Lock-24" Joint. Edges Lock Together Without Use of Tools.

GALVANIZED PIPE

PART #	SIZE	GAUGE
LE330-2	3"X2'	
LE430-2	4"X2'	30
LE530-2	5"X2'	
LE630-2	6"X2'	
LE730-2	7"X2'	
LE830-2	8"X2'	30
LE330-5	3"X5'	
LE430-5	4"X5'	
LE530-5	5"X5'	
LE730-5	7"X5'	
LE630-5	6"X5'	30
LE630-10	6"X10'	
LE830-5	8"X5'	
PART #	SIZE	GAUGE
LE328-2	3"X2'	
LE928-2	9"X2'	
LE1028-2	10"X2'	
LE1228-2	12"X2'	28
LE928-5	9"X5'	
LE1028-5	10"X5'	
LE1228-5	12"X5'	
PART #	SIZE	GAUGE
LE426-2	4"X2'	
LE526-2	5"X2'	
LE626-2	6"X2'	
LE726-2	7"X2'	
LE826-2	8"X2'	26
LE926-2	9"X2'	
LE1026-2	10'X2'	
LE1226-2	12"X2'	
LE1226-5	12"X5'	
LE1426-5	14"X5'	
PART #	SIZE	GAUGE
LE1224-2	12"X2'	
LE1424-2	14"X2'	
LE1624-2	16"X2'	24
LE2024-2	20"X2'	
LE2224-2	22"X2'	
LE2424-2	24"X2'	
LE2224-2	22"X2'	

SPIRAL DUCT 10' LENGTHS

PART #	GAUGE
6S	26
8S	26
10S	26
12S	26
14S	26
16S	24
18S	24
20S	24

SPIRAL DUCT **COUPLINGS**

PART #
6C
8C
10C
12C
14C
16C
18C
20C

ROUND ELBOWS

GALVANIZED PIPE 90º ELBOW



	PART #	SIZE	GAUGE
ŀ		4"	<u> </u>
	EL430		
	EL530	5" 6"	00
	EL630	7"	30
	EL730		
-	EL830	8"	
	PART #	SIZE	GAUGE
	EL328	3"	
	EL928	9"	28"
-	EL1028	10"	
	EL1228	12"	
	PART #	SIZE	GAUGE
	EL426	4"	
	EL526	5"	
	EL626	6"	
	EL726	7"	26
	EL826	8"	
	EL926	9"	
	PART #	SIZE	GAUGE
	EL1024	10"	
	EL1224	12"	
	EL1424	14"	
	EL1624	16"	
	EL1824	18"	24
- [EL2024	20"	
	EL2224	22"	
	EL2424	24"	

TAKEOFFS



PART #	SIZE
EP75-5	5"
EP75-6	6"
EP75-7	7"
EP75-8	8"



PART #	SIZE
EP5-6	6"
EP5-7	7"
EP5-8	8"

No. EP200 **Double Top** Takeoff



PART #	SIZE
EP200-6	6"

No. EP137 Adjustable Takeoff 1-1/2" Rise

PART #	SIZE
EP137-5	5"
EP137-6	6"
EP137-7	7"
EP137-8	8"

STACK BOOTS



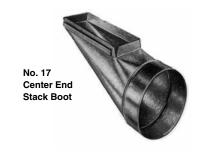
NO.13 90º ELBOW STACK

PART # / SIZE	
13 3-1/4 x 10 x 4	
13 3-1/4 x 10 x 6	
13 3-1/4 x 10 x 7	
13 3-1/4 x 12 x 6	
13 3-1/4 x 12 x 7	
13 3-1/4 x 14 x 6	
13 3-1/4 x 14 x 7	



NO. 5 STRAIGHT BACK

PART # / SIZE
5 3-1/4 x 10 x 6
5 3-1/4 x 10 x 7
5 3-1/4 x 12 x 6
5 3-1/4 x 12 x 7
5 3-1/4 x 14 x 6
5 3-1/4 x 14 x 7



NO. 17 CENTER END

PART # / SIZE
17 3-1/4 x 10 x 4
17 3-1/4 x 10 x 6
17 3-1/4 x 10 x 7
17 3-1/4 x 12 x 6
17 3-1/4 x 12 x 7
17 3-1/4 x 14 x 6
17 3-1/4 x 14 x 7

REGISTER BOOTS

No. P13 90° Register Boot



NO. P13 90º ELBOW

PART # / SIZE
P13 2-1/4 x 10 x 6
P13 2-1/4 x 12 x 6
P13 2-1/4 x 14 x 6
P13 4 x 10 x 5
P13 4 x 10 x 6
P13 4 x 10 x 7
P13 4 x 12 x 6
P13 4 x 12 x 7
P13 4 x 14 x 6
P13 4 x 14 x 7
P13 4 x 14 x 8
P13 6 x 10 x 5
P13 6 x 10 x 6
P13 6 x 10 x 7
P13 6 x 12 x 6
P13 6 x 12 x 7
P13 6 x 12 x 8
P13 6 x 14 x 6
P13 6 x 14 x 7
P13 6 x 14 x 8

No. P5 Straight Back Register Boot



NO. P5 STRAIGHT BACK

Р	ART # / SIZE
P5	2-1/4 x 10 x 6
P5	2-1/4 x 12 x 6
P5	2-1/4 x 14 x 6
P5	4 x 10 x 5
P5	4 x 10 x 6
P5	4 x 10 x 7
P5	4 x 12 x 6
P5	4 x 12 x 7
P5	4 x 12 x 8
P5	4 x 14 x 6
P5	4 x 14 x 7
P5	4 x 14 x 8
P5	6 x 10 x 6
P5	6 x 10 x 7
P5	6 x 12 x 6
P5	6 x 12 x 7
P5	6 x 12 x 8
P5	6 x 14 x 6
P5	6 x 14 x 7
P5	6 x 14 x 8





NO. P17 CENTER END

END CAPS

START COLLARS

REDUCERS



No. 65 — 30 GA

NO. 65

PART # / SIZE
65-3
65-4
65-5
65-6
65-7
65-8
65-9
65-10
65-12
65-14
65-16
65-18
65-20
65-22
65-24



No. 70 Starting Collar

NO. 70C*

110.700
PART #
70C-3
70C-4
70C-5
70C-6
70C-7
70C-9
70C-9
70C-10
70C-12
70C-14
*CRIMPED

W/ DAMPER

PART # / SIZE
72-6
72-7
72-8
72-10
72-12
72-14



NO. 70

PART#	
70-4	
70-5	
70-7	
70-8	
70-9	
70-10	
70-12	
70-14	
70-16	
70.40	

70-18 70-20 70-22 70-24



No. 61 Cap Reducer

NO. 61

=



No. 64 Taper Reducer

NO. 64

PART # /	PART # /
SIZE	SIZE
64-4X3	64-10X9
64-5X3	64-12X8
64-5X4	64-12X9
64-6X3	64-12X10
64-6X4	64-14X8
64-6X5	64-14X10
64-7X4	64-14x12
64-7X5	64-16X10
64-7X6	64-16X12
64-8X4	64-16X14
64-8X5	64-18X12
64-8X6	64-18X16
64-8X7	64-20X12
64-9X6	64-20X14
64-9X7	64-20X16
64-9X8	64-20X18
64-10X6	64-22X16
64-10X7	64-22X20
64-10X8	64-24X20

DRAW BANDS

No. 81 Draw Bands



F	PART # / SIZE
EX	81-5
EX	81-6
EX	81-7
EX	81-8
EX	81-9
EX	81-10
EX	81-12

REGISTER BOXES

No. 30 11" Deep Register Box



NO. 30 PART # / SIZE 30-6X10 30-6X12

STACKHEADS

No. 2 Short Throat (6") Stack dimension 3-1/4" deep

PART # / SIZE 2 10 x 6 2 12 x 6 2 14 x 6



VOLUME DAMPERS

PART # / SIZE 84-4 84-5 84-6 64-7 84-8 84-9 84-10 84-12



TEES WYES



PART #	DIAMETER
121-1/2-3	3"
121-1/2-3	4"
121-1/2-5	5"
121-1/2-6	6"
121-1/2-7	7"
121-8	8"
121-9	9"
121-10	10"
121-12	12"
121-14	14"
121-16	16"
121-18	18"
121-20	20"
121-24	24"

REDUCING TEES

SIZE
5X5X3
5X5X4
6X6X4



NO.162

PART # / SIZE
162-4X3X3
162-4X4X3
162-5X4X3
162-5X4X4
162-5X5X3
162-5X5X4
162-6X4X3
162-6X4X4
162-6X5X4
162-6X6X4
162-6X6X6
162-7X6X3
162-7X6X4



NO.163

PART # / SIZE 163-6X4X4 163-8X6X6 163-10X8X8



SPIN FITTINGS

No. 156D Spin Fitting with or without Damper

NO. 156D W/DAMPER

PART # / SIZE 156D-6 156D-8 156D-10 165D-12

NO. 156 W/O DAMPER

PART # / SIZE
156-6
156-8
156-10

SADDLES*

No. 88/406A 90º Saddle Branch





NO. 88

	_
PART # / SIZE	:
87-3	
88-4	
88-5	
88-6	
88-7	
88-8	
88-9	
88-10	
88-12	
88-14	
88-16	
	-

NO. 406A*

No. 86 45º Saddle Branch



NO. 86

PART # / SIZE
85-3
86-4
86-5
86-6
86-7
86-8
86-9
86-10
86-12

INSTALLATION ACCESSORIES



DRIVE CLEAT

PART #	SIZE
91-8	8"
91-10	10"
DC5	60"
DC10	120"

PLENUM CORNER

PART #	SIZE
92-5	60"
CS10	120"

HANGER STRAP

PART #	SIZE	
HS10	120"	

RIGID S-CLIPS

PART #	SIZE
1SS26	1" LEG

S-CLIP

PART #	SIZE
SC5	60"
SC10X	120"
97-8	8"
97-10	10"
97-12	12"
97-14	14"
97-16	16"
97-18	18"
97-20	20"
97-22	22"
97-24	24"
97-30	30"

OVAL STACKHEADS

No. 95 Standard Oval Stackhead



NO. 95
PART # / SIZE
95-10X4X5
95-10X4X6
95-10X6X5
95-10X6X6
95-10X6X7
95-12X4X6
95-12X6X6
95-12X6X7
95-14X6X7

OVAL PIPE No. 75 60" lengths No. 78 100" lengths

NOS.				
PAR	Т	#	/	S

PART # / SIZE
75-6
75-7
75-8
78-6
78-7
70 0



OVAL BOOTS

No. 96 Round to Oval 90° Boot



NO. 96 PART # / SIZE 96-6 96-7 96-8

No.102 Round to OvalStraight Boot



No. 102
PART # / SIZE
102-6
102-7
102-8



No. 107 PART # / SIZE 107-6 107-7 107-8

No 107 Round to Oval End Boot

OVAL ELBOWS, FLAT

No. 94 4-Piece Flat Oval Elbow 90°



No. 94 PART # / SIZE 94-6 94-7 94-8

OVAL ELBOWS, VERTICAL

No. 357 Vertical Oval Angle 45°

No. 357

PART # / SIZE
357-6
357-7
357-8



No.350 Vertical Oval Elbow 90°

No.98 3-Piece Flat Oval Angle 45°



No. 98 PART # / SIZE 98-6 98-7 98-8

No. 350 PART # / SIZE 350-6 350-7 350-8



Deflect-o®ALUMINUM VENTS AND KITS Bulk supurr-FLEX® Ducting



FLEX	DU	IC1
------	----	-----

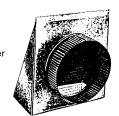
PART #	DIA./LENGTH
F0425	4"/25FT.

FRESH AIR VENT

No. 104
Vent with
Screen
No Damper

PART # / SIZE 104-4 104-6 104-8 104-10

NO. 104



PLASTIC LOUVERED VENT HOODS (NO PIPE)

LOUVERED SUPURR-VENT® HOODS



RVHA4B(W)



PART #	DIAMETER
HS3W	3" WHITE
HS3B	3" BROWN
HS4W	4" WHITE
HS4B	4" BROWN
HS5W	5" WHITE
HS5B	5" BROWN
HS6W	6" WHITE
HS6B	6" BROWN

ALUMINUM WIDE MOUTH BATHROOM/DRYER VENTS

PART #	DESCRIPTION
DAVHA3	3" WIDE MOUTH
DAVHA4	4" WIDE MOUTH
3000-5	5" WIDE MOUTH
3000-6	6" WIDE MOUTH



* WITH 11" THROAT AND DAMPER

ALUMINUM DRYER BOX

The Dryerbox is a simple innovative space saving metal receptacle that installs in the wall behind the clothes dryer in the laundry room. The 21 inch high molded box will house and collect the flex transition hose allowing the clothes dryer to be installed right against the wall. Eliminating the bends in the flex exhaust hose provides for better, less restrictive airflow, which in turn minimizes lint buildup, saves energy costs and reduces the serious fire hazard from lint buildup.





503-6

RETURN AIR FURNACE BOXES



Compact and fully assembled for quick installations. Heavy gauge galvanized construction. The support box raises the furnace 18" for easier servicing.

PART #	DESCRIPTION
FB143/4	14-3/4"Wx29"D
FB173/4	17-3/4"Wx29"D
FB213/4	21-3/4"Wx29"D
FB243/4	24-3/4"Wx29"D

New Items are constantly added to our inventory.

FLEXIBLE DUCT



UPC #030 is a UL 181, class I Air Duct, Constructed of Atco's tough, black, polyester core surrounded by high density fiberglass Insulation and metalized, polyester vapor barrier with spiral reinforcement.

RATED POSITIVE PRESSURE: 10" w.g. per UL 181

RECOMMENEDED OPERATING PRESSURES: 6" w.g. pos., 4"-12" dia., 4" w.g. pos.,

14"-18" dia., 3/4" w.g. neg.

VELOCITY: 5000 FPM, R Value: 6.0 (Calculated C Factor= .167)
FLAME SPREAD/SMOKE DEVELOPED: Less than 25/Less than 50

PART #	SIZE	LENGTH	PART #	SIZE	LENGTH
4MFS	4"		10MFS	10"	
5MFS	5"		12MFS	12"	
6MFS	6"	25'	14MFS	14"	25'
7MFS	7"		16MFS	16"	
8MFS	8"		18MFS	18"	
9MFS	9"		20MFS	20"	



UPC #020 is a low cost, general purpose, venting duct constructed of non-combustible, corugated aluminum with water tight seams. Comes in compressed lengths with one crimped end.

RECOMMENDED OPERATING PRESSURE: 6" w.g. pos/neg

VELOCITY: 5000 FPM

PART #	SIZE	LENGTH	PART #	SIZE	LENGTH
3AV 4AV 5AV	3" 4" 5"	8'	6AV 7AV 8AV	6" 7" 8"	8'

UPC #050 is a non-insulated, UL 181, Class I Connector, constructed of a triple lamination of metalized polyester, alumInum foil, and polyester film, encapsulating a steel wire helix.

RATED POSITIVE PRESSURE: 10" w.g. per UL 181

RECOMMENDED OPERATING PRESSURE: 6" w.g. pso., all dia., 3/4" w.g. neg. all dia.

VELOCITY: 5000 FPM

FLAME SPREAD/SMOKE DEVELOPED: Less than 25/Less than 50

PART #	SIZE	LENGTH	PART #	SIZE	LENGTH
	_	LLINGIII			LLIVAIII
3NI	3"		8NI	8"	
4NI	4"		10NI	10"	
5NI	5"	25'	12NI	12"	25'
6NI	6"		14NI	14"	
7NI	7"		16NI	16"	

UPC #011 is a vinyl sleeve insulation used to insulate non-insulated duct.

R VALUE: 4.35

FLAME SPREAD/SMOKE DEVELOPED: Less than 25/less than 50

PART #*	SIZE	LENGTH	PART #	SIZE	LENGTH
5VF 6VF (S) 7VF (S) 8VF (S) 9VF	5" 6" 7" 8" 9"	5'	10VF (S) 12VF (S) 14VF (S) 16VF	10" 12" 14" 16"	5'

^{*}R6 Silver & R8 silver also available









CODE COMPLIANCE*

^{*&}quot;S" Designates also available in silver-poly coating.

FLEXIBLE DUCT CONNECTOR

2-3/4" METAL 4" FABRIC 2-3/4" METAL/CANVAS



28 GA. GALV "S-LOC" SEAM

CANFLEX

PART #	LENGTH
EC100	100'

RESIDENTIAL

1-3/4" METAL 3" FABRIC 1-3/4" METAL/NEOPRENE



28 GA. GALV. "S-LOC" SEAM

NEOFLEX

PART #	LENGTH
RN100	100'

EXTRA WIDE COMMERCIAL

3" METAL 3" FABRIC 3" METAL/VINYL



24 GA. GALV. "FLEX-LOC" SEAM

VINYLON

PART #	LENGTH
V100	100'

Call MANUFACTURING COMPANY, INC.



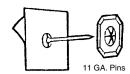
9 GA. APPROX .135" DIA

PART #	SIZE	QTY.	PART #	SIZE	QTY.
CMF50	1/2"	1000	CMF 100	1"	1000
CMF50B	1/2"	5000	CMF 100B	1"	5000



MAGNETIC HAMMER DUAL HEAD

FOR SETTING PINCHERS



INSULATION HANGERS

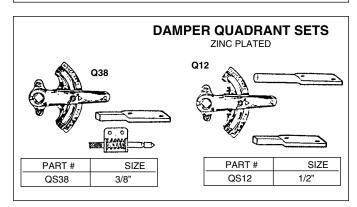
"STIK PIN"®

SELF ADHESIVE HANGER WASHERS SUPPLIED WITH HANGERS

PART #	SIZE	QTY.	PART #	SIZE	QTY.
SPO750	3/4"	100	SPO1250	1-1/4"	100
SPO750B	3/4"	1000	SPO1250B	1-1/4"	1000

DAMPER BLADE HARDWARE

DAMPER REGULATOR END BEARINGS, DIALS & QUADRANTS DAMPER REGULATOR SETS ZINC PLATED DS14 DS14 PART # SIZE DS14 DS38 3/8"



REGULATOR SETS CAIN KWIKI REGULATOR SETS PART# SIZE **HAMMER-ON TYPE** K69 5/16" K70 5/16" K-69 KWIKI-69 ₩**0** (\$ K-706 K-704 **CONSISTS OF** 1 K708 BEARING 1 K704 WASHER 1 K705 HANDLE K-708 1 K706 WING NUT KWIKI-70 K-70 K-704 **CONSISTS OF** 2 K708 BEARING 1 K704 WASHER K-705 1 K705 HANDLE 1 K706 WING NUT K-708

DUCT ACCESSORIES



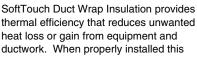
ToughGuard® Duct Liner

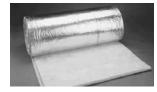


ToughGard R Duct Liner is used primarily as an acoustical liner in HVAC sheet metal ducts to absorb unwanted crosstalk, equipment and air rush noise. This product can be used in most types of heating and cooling duct systems, op er ating at velocities up to 6,000 fpm and temperatures to 250°F

	PART #	SIZE	"K" VALUE	TOLERANCE
1	1/2 DL	1/2"x47"x100'	.28	±0.3
1	1DL	1"x47"x100'	.28	±0.3

SoftTouch Duct Wrap Insulation





product virtually eliminates condensation problems on cold duct surfaces.

			DENSITY
PART #	SIZE	"R" VALUE	(LBS./CU.FT.)
FSK-W	1-1/2"x48"x100'	5.2	.75
FSK-W2	2-1/8"Xx48"x75'	6.9	.75
FSKK-W3	3"x48"x50'	9.6	.75
AF984	3" x 50 Yards	Foil Tape	Skrim Kraft

STAPLE GUN

PART #	DESCRPTION	
P6-6	Staple Gun	
STCR2619-3/8	Staples	

Shurtape

Shuretape AF100 *U.L.181A-P/B-FX*

2 mil aluminum foil with an acrylic adhesive used in the HVAC industry for joining and sealing fiberglass ductboard and Class 1 FlexDuct.Provides an air-tight seal.



DC181*B-FX*

Designed for use on Class 1 Flex Duct for connecting, joining, sealing and patching flexible air ductwork. UL 181B-FX Listed.



AF975

2 mil aluminum foil tape used to seal and join aluminum backed duct wrap, to create water and vapor barriers, and for temporary metal repair.



PC657(12mil) / PC609(10mil)

Industrial grade cloth duct tape used in the HVAC industry for sealing metal and flex duct work, and patching and mending thermal insulation. Tested in accordance with UL 723.



PC622/622B

12.5 mil Premium grade cloth duct tape used for protection of window and door frames and for heavy duty bundling, holding, and splicing. Tested in accordance with UL 723.



VP410

UV-resistant SPVC line set tape, Uased for general purpose in theH-VAC industry to wrap line sets, seam Rubatex and Armaflex, and insulate air ducts and underground pipes.a



DUCT LINER ADHESIVES

A non-cobwebbing, fast tacking spray or brush adhesive designed to attach fibrous glass and duct liner insulation to sheet metal. Flammable wet and self-extinguishing dry.

DESCRIPTION
17oz. Spray
1 Gallon Bucket
5 Gallon Bucket
12lb. Cylinder
40lb. Cylinder
12ft. Hose for 658 Cylinder
6ft. Hose for 658 Cylinder
Spray Gun

DUCT SEALANTS AND MASTICS

Indoor & Outdoor Water Based Sealants

PART #	DESCRIPTION
IG-601-25	Indoor Sealant, 11oz. Cartridge
321-25 Indoor/Outdoor 11oz. Cartridg	
1030	Indoor/Outdoor 1 Gallon Bucket

DUCT SEALANTS Indoor/Outdoor Foil Tape

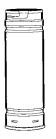
PART #	DESCRIPTION
AFG1402-3	3" x 100'
AFT701-3	3" x 50'



ROUND GAS VENT LENGTHS AND FITTINGS

STRAIGHT LENGTHS

DIA./LENGTH	5'	3'	2'	18"	12"
3"	1	10	385	20	30
4"	2XX	11	386	21	31
5"	3	12	387	22	32
6"	4	13	388	23	33
7"	5	14	389	24	34
8"	6	15X	390	25	35
10"		2516		2426	
12"		2517		2427	
14"		2500		2520	
16"		2501		2521	





DIA.	PART#		
3"	50		
4"	51X		
5"	52		
6"	53		
7"	54		
8"	55		
10"	2456		
12"	2457		

ADJUSTABLE LENGTH

45° ADJUSTABLE ELBOW

PART #	Α	В
70X	4-1/2"	4"
71	4-1/2"	4-1/2"
72	4-1/2"	4-1/2"
73	5"	5"
74	6-1/2"	6-1/4"
75	6-1/2"	6-1/2"
2476	5-3/4"	5-3/4"
2477	6-1/8"	6-1/4"
2550	6-1/2"	6-7/8"
2551	7-1/4"	7-1/4"
	70X 71 72 73 74 75 2476 2477 2550	70X 4-1/2" 71 4-1/2" 72 4-1/2" 73 5" 74 6-1/2" 75 6-1/2" 2476 5-3/4" 2477 6-1/8" 2550 6-1/2"



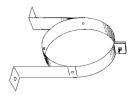
INCREASER

SIZE/IN.	PART #		
3" X 4"	100		
3" X 5"	101		
3" X 6"	102		
4" X 5"	103		
4" X 6"	104		
5" X 6"	105		
6" X 7"	106		
6" X 8"	107		
7" X 8"	108		
8" X 10"	2409		
10" X 12"	2511		



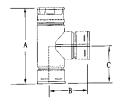
WALL STRAP

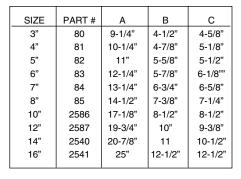
SIZE	PART #		
4"	1486		
5"	1487		
6"	1488		
7"	1489		
8"	1490		

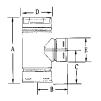


90° ADJUSTABLE ELBOW

SIZE	PART #	Α	В
3"	60	5-1/2"	5-1/2"
4"	61	6"	6"
5"	62	6-1/2"	6-1/2"
6"	63X	6-7/8"	6-7/8"
7"	64X	8-1/2"	8-7/8"
8"	65	8-7/8"	8-7/8"
10"	2466	9-5/8"	9-5/8"







REDUCTION TEE

STANDARD TEE

SIZE/IN.	PART #	Α	В	С	D	E
5" x 5" x 4"	82T4	10"	5-3/4"	5"	5-5/8"	4-5/8"
6" x 6" x 4"	83T4	9-7/8"	6-1/2"	5-1/2"	6-5/8"	4-5/8"



TEE Y WITH 45 BRANCH

SIZE/IN.	PART #	Α	В	С	D
5" x 3" x 4"	430	5-5/8"	3-5/8"	4-5/8"	12-1/4"
6" x 3" x 4"	440	6-5/8"	3-5/8"	4-5/8"	12-1/4"
6" x 3" x 5"	445	6-5/8"	3-5/8"	5-5/8"	13-1/4"
7" x 3" x 5"	450	7-5/8"	3-5/8"	5-5/8"	13-1/4"

ROUND GAS VENT LENGTHS AND FITTINGS



HIGH WIND VENT TOP

SIZE	PART #
3"	130
4"	131
5"	132
6"	133
7"	134
8"	135
10"	2536
12"	2537
14"	2560
16"	2561



STORM COLLAR

SIZE	PART #
3"	150
4"	151
5"	152
6"	153
7"	154
8"	155
10/12"	2656
14"	2570
16"	2571

ADJUSTABLE ROOF FLASHING

SIZE	PART #
3"	140
4"	141
5"	142
6"	143
7"	144
8"	145
10"	2646
12"	2647
14"	2 5 80
16"	2581

*Flat to6/12 roof pitches.

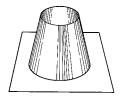


STEEP FLASHING

SIZE**	PART #
3"	140S
4"	141S
5"	142S
6"	143S
7"	144S
8"	145S

**7/12 to12/12 roof pitches.

TALL CONE ROOF FLASHING



SIZE	PART #
3"	140F
4"	141F
5"	142F
6"	143F
7"	144F
8"	145F
10"	2646F
12"	2647F
14"	2580F
16"	2581F

DRAFT HOOD CONNECTOR

SIZ	E	PART #	SIZE	PART #
3"		120	8"	125X
4"		121	10"	2626
5"		122	12"	2627
6"		123	14"	2590
7"		124	16"	2591



TEE CAP

SIZE	PART #	SIZE	PART #
3"	90	8"	95
4"	91	10"	2596
5"	92	12"	2597
6"	93	14"	2690
7"	94	16"	2691

GAS VENT SUPPORT

SIZE	PART #	SIZE	PART #
3"	1440	7"	1444
4"	1441	8"	1445
5"	1442	10"	1446
6"	1443	12"	1447



PIPE COLLAR



SIZE	PART #
3"	170
4"	171
5"	172
6"	173

FIRESTOPS

SIZE	PART #	SIZE	PART #
3"	1460	6"	1463
4"	1461	7"	1464
5"	1462	8"	1465



WALL THIMBLE



SIZE	PART #
3"	160
4"	161
5"	162
6"	163
7"	164
8"	165



OVAL GAS VENT LENGTHS AND FITTINGS

STRAIGHT LENGTHS

4" OVAL

SIZE	PART #	
5'	300	
2'	307	
18"	303	
12"	304	





OVAL VENT TOP

SIZE	PART #	
4"	316	

45° ELBOW

SIZE	PART #
4"	310



Al آ

ADJUSTABLE FLASHING

SIZE	PART #	
4"	317	

45° FLAT ELBOW

SIZE	PART #		
4"	311		



STORM COLLAR

SIZE	PART #	
4"	318	

ADAPTER ROUND TO OVAL

SIZE	PART #	
4"	315	



TEE CAP

SIZE	PART #	
4"	313	

ADAPTER - OVAL TO ROUND

SIZE	PART #	
4"	314	



STANDARD OVAL TEE

SIZE	PART #	
4"	312	

Hart&Cooley. install confidence

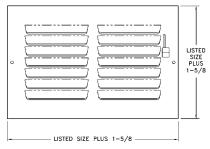
Ceiling/Sidewall Registers

304 Ceiling Register*

- All-steel one-piece stamped-face curved-blade construction
- · Four-way deflection
- Four-way air pattern
- For sidewall or ceiling application
- Multi-shutter valve
- Listed heights 10" and larger require double valves
- Bright White enamel finish

^{*}Some sizes special order



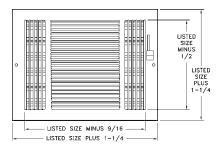


304 Available Sizes (in.)					
HT	WIDTH				
	6	8	10	12	14
6	Х				
8		Х			
10			Х		
12				Х	
14					Х

631 Register*

- All-steel construction
- Ideal for shallow duct installations
- Used for ceiling or sidewall installations
- For heating or cooling
- Three-way deflection
- 1/3" spaced fins set at 20 degrees
- Multi-shutter valve
- 1-5/8" depth when fully opened
- Interlocking valve louvers for positive shut-off
- Bright White finish





631 Available Sizes (in.)							
HT	WIDTH						
	8	8 10 12 14 16					
4	X	Χ	X	Χ			
6	Х	Х	X	Χ	Х		
8		Х	Х	Х			

650 Return Air Grille*

- All-steel construction
- 1/3" spaced fins set at 20 degrees
- Exceptional free area
- 5/16" Margin Turnback
- Bright White finish

^{*}Some sizes special order



	LISTED SIZE MINUS 1/2	LISTED SIZE PLUS 1-3/4								
1/2 LISTED SIZE MINUS 1/2 LISTED SIZE PLUS 1-3/4										

650 Available Sizes (in.)											
HT	WIDTH										
	6	8	10	12	14	16	18	20	24	30	36
4	Х	Χ	X	X	Χ	Χ		X	Χ	Χ	
6	Х	Х	Х	Х	Χ	Χ	Х	Х	Χ	Х	Х
8		Х	Х	Х	Χ	Χ	X	Х	Χ	Χ	Х
10	Х		X	X	Χ	Χ	X	X	Χ	Χ	Х
12			Х	Х	Χ	Χ	Х	Х	Х	Х	Х
14	Х	Х	Х	Х	Χ	Χ	X	Х	Χ	Χ	
16				X	Χ	Χ	X	X	Χ	Χ	
18				Х	Х		Х	Х	Х	Х	
20			Х	Х	Χ	Χ		Х	Χ	Χ	
24	Х		Х	Х	Х	Χ	X	Х	Χ	Χ	
25								Х			
30					Х			Х	Х	Х	

^{*}Some sizes special order

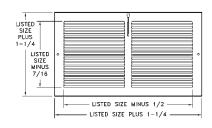


Sidewall Registers & Grilles

651 Register*

- All-steel construction
- 1/3" spaced fins set at 20 degrees
- · Positive volume-control damper
- Bright White finish
- *Some sizes special order



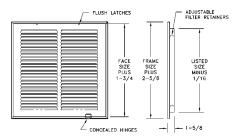


	651 Available Sizes (in.)						
HT		WID	TH				
	8	10	12	14			
4	Х	Х	Х				
6	Х	Х	Х	Х			

659 Return Air* Filter Grille

- All-steel construction
- 1/3" spaced fins set at 20 degrees
- Effectively conceals filter
- Use standard 1" thick disposable filters (not included)
- Removable face for easy installation and cleaning
- · Equipped with adjustable filter retainers
- Bright White finish



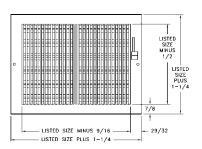


	659 Standard Sizes (in.)									
НТ				١	NIDTH	1				
	10	12	14	16	18	20	24	25	30	36
6		Х	Х				Х		Х	
8							Х		Х	
10	X					Χ	Х		Χ	
12		Χ			X	Χ	X		Х	
14			Х			Χ	Х	Х	Х	Χ
16				Χ		Χ	Х	Х	Χ	
18					Х		Х		Х	
20	Х	Χ	Х	Χ		Χ	Х	Х	Х	
24		Χ	X		Χ	Χ	Χ		Х	
25	•		Х	Χ		Х		Х		
30			Х	Χ		Χ	Х		Х	
36							Х			

661 Register*

- All-steel construction
- Used for ceiling or sidewall installations
- For heating or cooling
- Ideal for shallow duct installations
- Two-way deflection
- 1/3" spaced fins set at 20 degrees
- Galvanized multi-shutter valve
- Bright White finish





661 Standard Sizes (in.)										
HT		WIDTH								
	6	8	10	12	14	16	18	20	24	30
4	Х	Х	Х	Χ	Х	Х			Х	
5		Х	Х	Χ	Х					
6	Х	Х	Х	Х	Х	Х	Х	Х	Х	
8		Х	Х	Χ	Х	Х	Х	Х	Х	Х
10			Х	Χ						Х
12				Χ						

^{*}Some sizes special order

^{*}Some sizes special order



Ceiling Diffusers

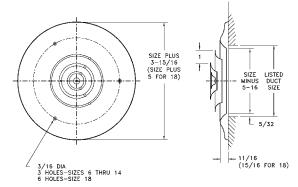
16 Ceiling Diffuser

- All-steel construction
- Step-down diffuser rings deflect air stream 360 degrees
- Bright White finish

Only available in sizes shown

	16 A	/ailab	le Size	es	
6"	8"	10"	12"	14"	





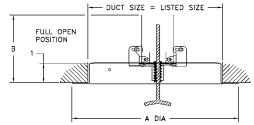
12 Butterfly Damper • All-steel construction

- Controls air volume evenly over entire #16 diffuser
- Removable knob operator for adjustment from closed to fully open
- Golden Sand enamel finish

Note: Knob permits diffuser to be held in position while attaching face screws

Only available in sizes shown





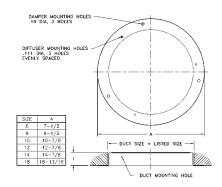
12 Available Sizes (in.)						
Size	Α	В				
6	7-1/2	3-11/16				
8	9-1/2	4-11/16				
10	10-7/8	5-11/16				
12	12-7/8	6-11/16				
14	14-7/8	7-11/16				

11 Duct Ring

- All-steel construction
- For installation of #16 diffuser when not using a damper
- Golden Sand enamel finish



	11 A	/ailabl	le Size	es	
6"	8"	10"	12"	14"	





Floor Registers & Grilles

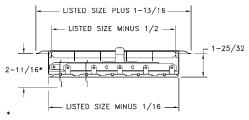
210 Floor Register*

- All-steel construction
- Provides firm, smooth surface
- Extremely rigid
- Free area averages over 75%
- Toe-operated valve control
- Golden Sand enamel finish
- *Some sizes special order



210 Standard Sizes (in.)							
HT			W	IDTH			
	6	8	10	12	14	16	
4		Х	Χ	Χ	Χ		
6	Х	Х	Х	Х	Х	X	
8		Х	Х	Χ	Х		
9				Х			
10			Х	Х	Х		
12				Х	Х		

End View Showing Depth with Valve Open:



*3-9/16 FOR SIZES OVER 14 x 20

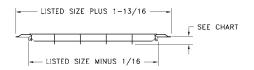
265 Floor Return* Air Grille

- All-steel construction
- Provides firm, smooth surface
- Extremely rigid
- Free area averages over 75%
- Golden Sand enamel finish

*Some sizes special order



	265 Standard Sizes (in.)										
НТ					W	/IDTH					
	8	10	12	14	16	18	20	24	25	30	36
4	X	Χ	X	Χ		X		Χ		Χ	
6		Χ	Χ	Χ	Χ	Χ	Χ	Χ		Χ	Χ
8	Χ	X	Χ	Χ	Χ	X	Χ	Χ		Х	
9			X								
10		Χ	Χ	Χ	Χ	Χ	Χ	Χ		Χ	
12			X	Χ	Χ	X	Χ	Χ		Χ	
14				Χ	Х		Χ	Χ		Х	
16					Χ		Χ	Χ		Χ	
18						Χ		Χ		Χ	
20		, and the second					Χ	Χ	Χ	Χ	
24								Х		Х	X

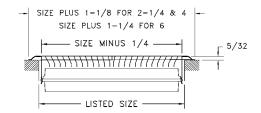


HEIGHT	WIDTH	MAXIMUM DEPTH
4 THRU 14	6 THRU 30	21/32
14 THRU 14	32 THRU 36	05 /70
16 THRU 18	16 THRU 36	25/32
20 THRU 24	20 THRU 36	1-13/32

411 Deluxe Floor* Diffuser

- All-steel construction
- Heavy-gauge individually welded diffusion vanes
- Multi-angle fin setting
- Foot-operated dial control
- Can be used in high traffic areas
- Golden Sand or Bright White enamel finish





411 Available Sizes (in.)				
Size	Free Area Sq. Inches			
2 x 10	15			
2 x 12	19			
2 x 14	22			
4 x 10	29			
4 x 12	35			
4 x 14	40			
6 x 10	44			
6 x 12	53			
6 x 14	60			

^{*}Some sizes special order

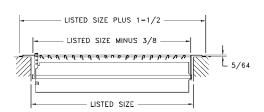


Floor Registers & Grilles

421 Floor Diffuser

- All-steel construction
- Multi-angle fin setting
- · Rolled fin for strength and safety
- Welded construction
- Foot-operated dial control
- Heavy-gauge stamped face
- Golden Sand or Bright White enamel finish



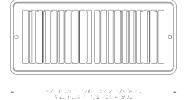


421 Ayailable Sizes (in.)				
Size	Free Area Sq. Inches			
2 x 10	15			
2 x 12	17			
2 x 14	20			
4 x 8	22			
4 x 10	27			
4 x 12	32			
4 x 14	37			
6 x 10	39			
6 x 12	48			
6 x 14	56			

420 Toe-Space Grille

- All-steel construction
- Heavy-gauge stamped face
- Multi-angle fins
- Golden Sand or Bright White enamel finish





420 Available Sizes (in.)				
Size	Free Area Sq. Inches			
10 x 2	15			
12 x 2	17			
14 x 2	20			
10 x 4	27			
12 x 4	32			
14 x 4	37			

Base

Projection

2-3/4

2-13/16

2-13/16

Baseboard Registers & Grilles

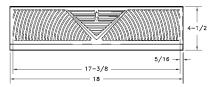
406 Baseboard Diffuser

- All-steel construction
- 406 blankets wall or window area
- · Golden Sand or Bright White enamel finish



7111		V	
	Name of the last		

	Catalog Number	Size	Free Area Sq. Inches	Overall Length	Height
	406	15"	32	15	4-1/2
WITH THE PARTY OF	406	18"	38	18	4-1/2
	407	18"	38	18	4-1/2





406 18" Shown

Return Air Grille

• All-steel construction

407 Matching

- Complementary return air grille for Model 406 supply
- · Golden Sand or Bright White enamel finish

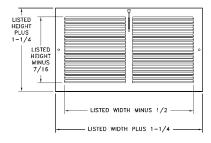


Baseboard Registers

654 Baseboard Register with Damper

- One-piece steel construction
- 1/3" spaced fins set at 20 degrees
- 7/8" margin turnback
- Exceptional free area
- Positive volume-control damper
- Bright White enamel finish





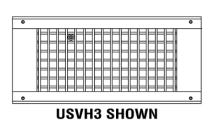
654 Available Sizes (in.)									
HT	V	WIDTH							
	10	12	14						
6	Х	Χ	Χ						

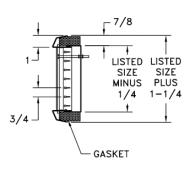
Spiral Registers

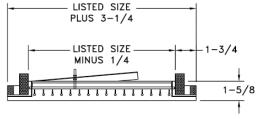
USVH3 Double Deflection Spiral Registers with Damper

- Extruded aluminum construction
- Two rows of individuallyadjustable blades for horizontaland vertical deflection control
- · Optional face adjustable scoopto direct airflow
- Counter-sunk screw holes
- Available sizes: 10x3 to 36x12
- Fits duct sizes 6" on up, basedon diffuser height
- Satin Anodized finish









For Models USV and USVH

Minimum Duct Diameter Width

		10	12	14	16	18	20	24	30	36
	3	6	6	6	6	6	6	6	6	6
	4	10	10	10	10	10	10	10	10	10
ght	6	12	12	12	12	12	12	12	12	12
Height	8			20	20	20	20	20	20	20
	10				24	24	24	24	24	24
	12					30	30	30	30	30

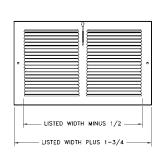


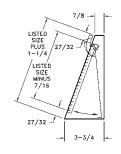
Baseboard Registers & Grilles

655 Baseboard Register* with Damper

- All-steel construction
- 1/3" spaced fins set at 20 degrees
- Positive volume-control damper
- Bright White enamel finish





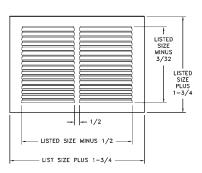


655 Available Sizes (in.)										
HT		WIDTH								
	8	8 10 12 14								
6	Х	Χ	Χ	Х						

657 Baseboard* Return Air Grille

- One-piece steel construction
- 1/3" spaced fins set at 20 degrees
- 7/8" margin turnback
- · Exceptional free area
- Install with fins upward or downward for best duct concealment
- Complementary return air grille for Model 654 or 664 supply
- Golden Sand or Bright White enamel finish



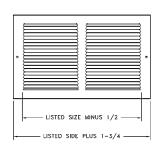


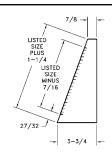
	657 Standard Sizes (in.)											
HT	WIDTH											
	10	10 12 14 16 20 24 30 36										
4			Х									
6	Х	Х	Х	Х	Х	Х	Х	Х				
8	Х	Х	Х	Х	Х	Х	Х	X				
10			Х		Х	Х	Х					
12			Х			Х	Х					

658 Baseboard* Return Air Grille

- All-steel construction
- 1/3" spaced fins set at 20 degrees
- Complementary return air grille for Model 655 supply
- Bright White enamel finish
- *Some sizes special order







	658 Available Sizes (in.)										
HT		WIDTH									
	10	10 12 14 24 30									
6	Х	Х	Х	Х	Х						
8			Х	Х	Х						

^{*}Some sizes special order

^{*}Some sizes special order



Ceiling Diffusers

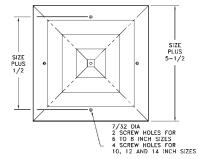
24 Ceiling Diffuser*

- All-steel construction
- Step down face deflects air stream 360 degrees
- Bright White finish

Only available in sizes shown

*Some sizes special order





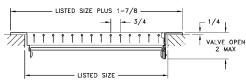
24 C	eiling Diffuser (in.)
Size	Free Area Sq. Inches
6	41
8	65
10	84
12	123
14	152
16	199
18	236
20	293
22	338
24	404

Registers & Grilles - Steel

821*

- All-steel construction
- · Vertical adjustable face bars
- Horizontal multi-shutter valve
- Bright White finish
- *Some sizes special order



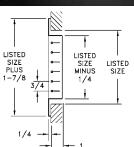


	821 Available Sizes (in.)											
HT					W	DTH						
	6	8	10	12	14	16	18	20	24	30	36	
4	X	X	X	Χ	X	X	X	X	Χ	Χ		
5			X	Χ	Χ							
6	Χ	Х	Х	Χ	Χ	Х	Х	Х	Χ	Χ	Х	
8		Χ	Х	Χ	Х	Χ	Χ	Χ	Х	Χ	Х	
10			X	Χ	Χ	X	X	X	Χ	Χ	Χ	
12				Χ	Χ	Х	Х	Х	Χ	Χ	Х	
14					Х	Χ	Χ	Χ	Х	Χ	Х	
16						Х	Х	Х	Х	Х		
18							Х	Х	Х	Х		
20								Х				
24									Х			

94 Grille*

- All-steel construction
- Horizontal face bars set straight
- Face bars permanently fixed into a heavy steel frame at 90-degree angle from face
- Bright White finish
- *Some sizes special order





	94 Available Sizes (in.)															
НТ		WIDTH														
	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
4	X	Χ	X	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	X	X
5	X	Χ	X	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	X	X
6	Х	Χ	X	Χ	Χ	Х	Χ	Χ	Χ	Х	Χ	X	Х	Χ	Х	Х
8		Х	Х	Χ	Χ	Χ	Х	Х	Χ	Х	Χ	X	Х	Χ	Х	X
10			X	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Х	Χ	Χ	X
12				Χ	Χ	Х	Χ	Χ	Χ	Х	Χ	X	Х	Χ	Х	Х
14					Χ	Χ	Х	Х	Χ	Х	Χ	X	Х	Χ	Х	X
16						Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	X	X
18							Χ	Χ	Χ	Х	Χ	X	Х	Χ	Х	Х
20								Χ	X	X	X	X	X	X	X	X
22									Χ	Х	Χ	X	Х	Χ	X	X
24										Х	Χ	X	Х	Χ	Х	Х
26											Χ	X	Х	Χ	Х	X
28												Χ	Χ	Χ	X	X
30													Х	Χ	Х	Х
32														Χ	Χ	X
34															X	X
36																X

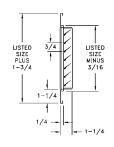


T-Bar Return Air Filter Grilles

RH45T Aluminum Bar-Style Return Grille

- Aluminum construction
- Horizontal Bars at 45 degrees
- Mount flush with T-Bar ceilings
- Bright White or Satin Anodized finish



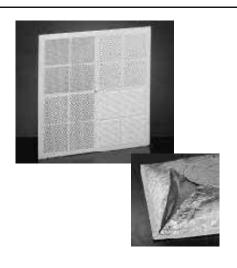


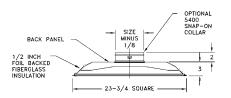
RH45T Available Sizes	
22" x 22" (overall 23-3/4" x 23-3/4") for 24" x24" openings	
46" x 22" (overall 47-3/4" x 23-3/4") for 48" x 24" openings	

T-Bar Return Air Grilles

444 SurfAire® Aluminum Face Renovator Series Diffuser

- Aluminum construction
- Unique deflector apertures
- Accepts snap-in collar (5400 Series) (6"-12")
- 444 14" collar is factory installed
- Utilizes butterfly damper (3800 Series) inserted in collar
- Damper adjusted thru diffuser face to allow proper air balancing
- Bright White finish





444 Available Sizes
Overall Size 23-3/4" x 23-3/4"

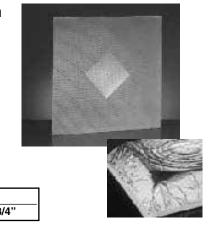
444

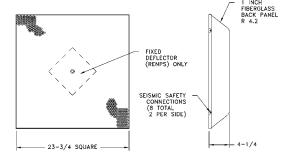
4-Way Throw

T-Bar Surfaire/Renovator Diffuser

RENPS Steel/Aluminum Perforated Supply Diffuser with Insulated Back

- Perforated steel face with deflector
- Molded fiberglass back
- Accepts 6" to 14" unique tab collar (6400 series) or 6" to 12" unique snap-in collar (5400 series); also accepts standard spin-in collar
- Bright White finish





RENPS Available Sizes 20" x 20", overall 23-3/4" x 23-3/4"



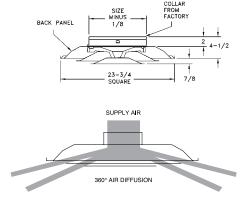
T-Bar Diffuser

FPD Steel/Aluminum Fixed Pattern Diffuser

- Steel construction
- Provides high air volume delivery
- 360-degree air diffusion
- Two-cone fixed core
- Fixed collar 6"-14"
- Unique 2" high collar permits easy flex connections
- Utilizes butterfly damper (3800 Series) inserted in collar – order separately
- Damper adjustable thru face
- · Formed back panel
- Bright White finish



FPD T-Bar Available Sizes
Overall Size 23-3/4" x 23-3/4"

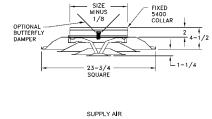


FPD3 Steel Fixed Pattern Diffuser

- Steel construction
- Provides high air volume delivery
- 360-degree air diffusion
- Three cone fixed core
- Fixed collar 6"-14"
- Unique 2" high collar permits easy flex connections
- Utilizes butterfly damper (3800 Series) inserted in collar-order separately
- Damper adjustable thru face
- · Formed steel back panel
- Bright White finish



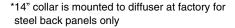
FPD3 T-Bar Available Sizes
Overall Size 23-3/4" x 23-3/4"





5400 Series Collar Ring

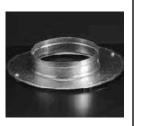
- Unique snap-in design for easy installation
- 2" high collar permits easy flex connections
- Bead on collar improves the strength and provides retention for flexible duct connections



16" and 18" available for PDR only

NOTE: Uses 5400PP with insulated back panels for collar sizes 6"-12" only

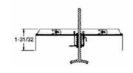
5400 Series Available Sizes (in.)												
6" 7" 8" 9" 10" 12" 14"* 16" 18"												

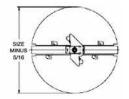




3800 Series Dampers

- Adjustable butterfly damper with removable handle (included)
- For usewith 5400 Series collar
- Golden Sand finish





						Sizes			
6"	7"	8"	9"	10"	12"	14"*	16"	18"	

CHIMNEY LINERS



Deflecto offers a number of "simple solutions" for todays complicated venting issues. The National Fuel Gas Code NFPA 54 and ANSI Z223. 1 give you specific rules to follow. We give you specific products that make those rules easy to follow.

When you install a category I gas fired heating appliance into a masonry chimney you must follow these rules:

- 1) The Chimney must be lined and sized properly. Most masonry chimneys are over sized and absorb too much heat to be considered a proper vent. If you have any doubts line the chimney with the right size liner. If it's unlined you must line it.
- 2) If the equipment is fan assisted, its imperative that you properly size and line the chimney in all cases.

Follow these two simple rules and your venting problems are over No more costly call backs or equipment failure. The additional cost to line the chimney will be realized immediately.

Aluminum Liner Kit

Kit Includes:
Aluminum Liner
Chimney Flashing
Rain Cap
Mortar Collar
Pull Fitting

Part #LK __Dia. __Lgth. Available diameter 4"-8" Available lengths 25'-35' Custom sizes available

PART#	Dia./Length
LK425	4"/25'
LK435	4"/35'
LK525	5"/25'
LK535	5"/35'
LK5525	5.5"/25'
LK5535	5.5"/35'
LK625	6"/25'
LK635	6"/35'
LK725	7"/25'
LK735	7"/35'
LK835	8"/35'



MODEL LK



Additional Aluminum Liner Lengths extensions

PART#	Dia./Length
LF525	5"/25'
LF625	6"/25'
LF635	6"/35'
LF725	7"/25'
LF825	8"/25'
	l



In Line Galvanized Drain Tee Part #02GADRTE - __Dia.

Available in:

5x5x4 7x7x4 6x6x4 8x8x4



Liner Coupling To attach two lengths of pipe.

Part #02CNNTRG- __Dia.

Available in 3" - 10" diameters. Custom sizes available.



MANUFACTURERS INDEX, SECTION 2

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Notes



SPLIT SYSTEM AIR CONDITIONERS

13.4 SEER2 – R-410A – 1 PHASE 1.5 THRU 5 NOMINAL TONS MODELS: J4AC3018 - 3060









CONDENSERS

DESCRIPTION

The Oxbox line of heating and cooling products offer you Mexible and affordable options for your HVAC equipment needs. Oxbox air conditioners have been tested to perform even in the hottest climates, with equipment that's quiet, dependable, and affordable.

WARRANTY

Our innovative 1-10 registration warranty gives you maximum peace of mind. Plus, every piece of equipment is warranted to the home, not the homeowner—providing an extra measure of coverage when it comes time to sell ypur home.

1 Year: Unit Replacement

Compressors or coils fail, complete unit replacement.

10 Years: Standard Parts Warranty10 Years: Compressor Replacement

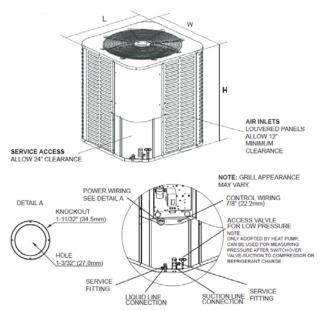
FEATURES

- General The J4AC is fully charged from the factory. This unit is designed to operate
 at outdoor ambient temperatures as high as 115°F. Cooling capacities are matched
 with air handlers and furnace coils that are AHRI certified. The unit is certified ETL.
 Exterior is designed for outdoor application
- Small Footprint Minimum footprint for easier handling, transportation, and installation.
- Casing Unit casing is constructed of heavy gauge, Galvanized steel and painted with a weather resistant powder coat on all grilles, panels, prepaint on all other panels. Salt spray rated to 500 hours.
- Refrigerant Controls Refrigerant system controls include condenser fan and compressor contactor.
- Rotary/hScroll Compressor Featrures include low vibration and noise.
- Consenser Coils The outdoor coil provides low airflow resistance and efficient heat flow transfer.
- Rugged Coil Protection Coils are protected from mechanical damage by a proven stamped steel coil guard design.
- Environmentally Friendly CFC-free R-410A refrigerant delivers environmentally friendly performance with zero ozone depletion.
- Top Discharge Warm air is blown up, away from the structure and any landscaping and allows compact location on multi-unit applications.
- Low Operating Sound Levels The sturdy cabinet and top design provides sound performance of 76 dBA or lower.
- Agency Listed Safety certified by ETL to UL 1995. Performance certified to AHRI Standard 210/240 in accordance with the Unitary Small Equipment certification program.h



PHYSICAL AND ELECTRICAL DATA

MODEL		J4AC18E 1000AA	J4AC24E 1000AA	J4AC30E 1000AA	J4AC36E 1000AA	J4AC42E 1000AA	J4AC48E 1000AA	J4AC60E 1000AA			
Unit Supply Vo	Itage	208-230V, 10, 60Hz									
Normal Voltage	Range		187 to 252								
Minimum Circu	it Ampacity	11.9	16.3	16.3	21.1	24.8	29.7	38.6			
Max. Overcurre	ent Device Amps	20	25	30	35	40	50	60			
Min. Overcurre	nt Device Amps	20	25	30	35	40	50	60			
Compressor Ty	/ре	Rotary	Rotary	Rotary	Scroll	Scroll	Scroll	Scroll			
Compressor	Rated Load	8.2	11.8	11.8	15.1	18.5	22.4	29.5			
Amps	Locked Rotor	35.0	43.0	58.0	72.0	112.3	108	127.9			
Crankcase Heater		No	No	No	No	No	No	No			
Factory External Discharge Muffler		No	No	No	No	No	No	No			
HS Kit Required with TXV		Yes	Yes	Yes	Yes	Yes	Yes	Yes			
Fan Diameter I	nches	18-7/8	18-7/8	23-1/6	23-5/8	23-1/6	23-1/6	23-5/8			
	Rated HP	1/6	1/6	1/6	1/3	1/3	1/3	1/3			
	Rated Load Amps	1.60	1.60	1.6	2.2	1.7	1.7	1.7			
Fan Motor	Nominal RPM	980	980	850	930	1075	1075	1075			
	Nominal CFM	1600	1900	2650	3100	3700	3700	4000			
	Face Area Sq. Ft.	10.0	10.0	12.8	13.6	17.4	17.4	18.4			
Coil	Rows Deep	1	2	2	2	2	2	Microchannel			
	Fins / Inches	19	21	21	21	21	21	Microchannel			
Liquid Line Set	OD (Field Installed)	3/8	3/8	3/8	3/8	3/8	3/8	3/8			
Vapor Line Set	OD (Field Installed)	3/4	3/4	3/4	3/4	3/4	7/8	7/8			
Unit Charge (Li	bs Oz.)	4 - 4	5.0	5 - 12	5 - 12	7 - 9	7 - 12	8 - 3			
Charge Per Foo	ot, Oz.	0.62	0.62	0.62	0.62	0.67	0.67	0.75			
Operating Weig		108	119	136	147	191	189	200			



	D	imensions (Inches)	Refrigerant Connection Service Valve Size		
Unit Model	L	W	Liquid	Vapor	
J4AC3018E1000A	24	24	25		
J4AC3024E1000A	24	24	25		
J4AC3030E1000A	28	28	25		3/4
J4AC3036E1000A	30	30	25	3/8	
J4AC3042E1000A	28	28	33		
J4AC3048E1000A	28	28	33		7/8
J4AC3060E1000A	30	30	34		



RAC SERIES
SPLIT-SYSTEM AIR
CONDITIONERS
13 SEER – R-410A
1.5 THRU 5 NOMINAL TONS

MODELS: RAC 18 THRU 60



DESCRIPTION

The 13 SEER Series unit is the outdoor part of a versatile climate system. It is designed with a matching indoor coil component from Johnson Controls Unitary Products. Available for typical applications this climate system is supported with accessories and documents to serve specific functions.

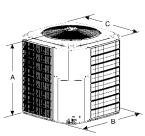
WARRANTY

Standard 5-Years limited parts warranty.
Standard 5-Years limited compressor warranty.
Extended 10-Years limited parts and compressor warranty
when product is registered online within 90 days of purchase for
replacement or closing for new home construction.

FEATURES

- Small Footprint Extremely lightweight with a compact footprint, it is a perfect fit for any application.
- Quality Condenser Coils The coil is constructed of aluminum microchannel tubing and enhanced aluminum fins for reduced size and increased
- Coil Protection Coils are protected from damage by a slotted, stamped steel coil guard.
- Optional Factory E-Coat Available ElectroFin® or factory approved equivalent (contact the factory for details) coated coil on select models.
- Protected Compressor Compressors are protected internally by a high pressure relief valve and a temperature sensor, and

- externally by the system high pressure switch. A factory installed liquid line filter-drier further protects the compressor against moisture and debris.
- Environmentally Friendly Refrigerant The R-410A refrigerant delivers environmentally friendly performance with zero ozone depletion.
- Durable Finish An automotive quality finish provides the ultimate protection from harmful UV rays and rust-creep, ensuring a long-lasting, high quality apprearance. A powder paint top coat is applied over a baked on primer using a galvanized, zinc coated steel base material.
- Lower Installed Cost Installation time and costs are reduced by easy power and control wiring connections. The unit is factory charged for a 15-foot lineset. The small base dimension means less space is required on the ground or roof.
- Top Discharge Warm air from the top mounted fan is blown up, away fro0m the structure and any landscaping. This allows compact location on multi-unit applications.
- Low Operating Sound Levels The upward air flow carries the normal operating noise away from the living area. The rigid top panel effectively isolates any motor sound. Isolator mounted compressor and the condenser coil muffle the normal fan motor and compressor operating sounds.
- Low Maintenance Long life, permanently lubricated motorbearings need no annual servicing.
- Easy Service Access Fully exposed refrigerant connections and a single panel covering the electrical controls make for easy servicing of the unit.
- Secured Service Valves Secured, re-usable service valves are provided on both the liquid and vapor sweat connections for ease of evacuating and charging.



Unit		Dimensions (Inches)	Refrigerant Connection Service Valve Size			
Model	Α	В	С	Liquid	Vapor	
18	28-1/4	24	24			
24	28-1/4	24	24		3/4"	
30	28-1/4	24	24			
36	28-1/4	29-1/2	29-1/2	3/8"		
42	30-1/4	29-1/2	29-1/2			
48	30-1/4	29-1/2	29-1/2		7/8"	
60	32-1/4	34	34			

PHYSICAL AND ELECTRICAL DATA

MODEL		RAC13J18 4S21	RAC13J24 4S21	RAC13J30 4S21	RAC13J36 4S21	RAC13J42 4S21	RAC13J48 4S21	RAC13J60 4S21		
Unit Supply Vo	oltage	208-230V, 1o, 60Hz								
Normal Voltage	e Range				187 to 252					
Minimum Circu	uit Ampacity	10.0	12.4	14.7	17.9	21.5	21.1	34.5		
Max. Overcurre	ent Device Amps	15	20	25	30	35	35	60		
Min. Overcurre	ent Device Amps	15	15	15	20	25	25	35		
Compressor	Туре	Rotary	Recip	Recip	Recip	Recip	Recip	Scroll		
Compressor Rated Load		7.6	9.3	10.6	13.1	16	15.7	26.4		
Amps	Locked Rotor	40	43	54	74	88	84	134		
Crankcase Heater		No	No	No	No	No	No	No		
Factory External Discharge Muffler		No	No	No	No	No	Yes	No		
Factory External Check Valve		No	No	No	No	No	No	No		
HS Kit Required with TXV ⁴		Yes	Yes	Yes	Yes	Yes	Yes	No		
Fan Diameter I	Inches	17.5	17.5	17.5	22.0	22.0	22.0	24.0		
	Rated HP	1/12	1/8	1/4	1/4	1/4	1/4	1/4		
Fan Motor	Rated Load Amps	0.5	0.8	1.4	1.5	1.5	1.5	1.5		
ran wotor	Nominal RPM	1100	1075	1100	850	850	850	850		
	Nominal CFM	1400	1950	2050	3200	3050	2950	3400		
	Face Area Sq. Ft.	9.60	9.60	9.60	13.07	14.16	14.16	18.68		
Coil	Rows Deep	1	1	1	1	1	1	1		
	Fin / Inches	23	23	23	23	23	23	23		
Liquid Line Set	t OD (Field Installed)	3/8	3/8	3/8	3/8	3/8	3/8	3/8		
Vapor Line Set OD (Field Installed)		5/8	3/4	3/4	3/4	7/8	7/8	7/8		
Unit Charge (L	bs Oz.)	3 - 3	3 - 13	3 - 14	4 - 9	4 - 10	4 - 9	5 - 8		
Charge Per Fo	· · · · · · · · · · · · · · · · · · ·	0.58	0.62	0.62	0.62	0.67	0.67	0.67		
Operating Wei		97	129	131	145	164	173	220		





ADD-ON COILS

J4GXC

FOR USE WITH SPLIT-SYSTEM COOLING MODELS: J4GX, J4MX 600 - 2000 CFM 1.5 - 5 TON COILS

UPFLOW/DOWNFLOW FULL CASED

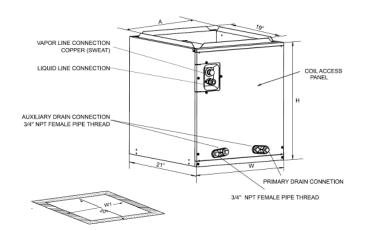
The Oxbox line of heating and cooling products offer you flexible and affordable options for your HVAC equipment needs. The function of indoor air coils is simple: heating or cooling your system's air and removing humidity. Oxbox indoor air coils make that process as effective as possible, maximizing the efficiency of all system components—and keeping you as comfortable as possible in all seasons.

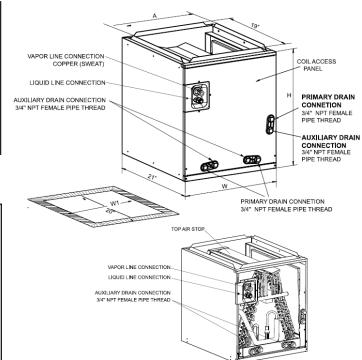
Dimensions - J4GX Up/Downflow Full Cased Coils

		Dime	nsions		Refrigerant	
Models ^h	Height Width Duct		Widths	Connections		
	Н	W	Α	W1	Liquid	Vapor
J4GXCB002	20"	17-1/2"	16"	16-1/2		
J4GXCA003	20"	14-1/2"	13"	13-1/2		3/4
J4GXCB004	20"	17-1/2"	16"	16-1/2"		
J4GXCC005	20"	21"	19-1/2"	20"	3/8	
J4GXCC007	26"	21"	19-1/2"	20		
J4GXCD008	26"	24-1/2"	23"	23-1/2"		7/8
J4GXCD010	30"	24-1/2	23"	23-1/2		

Dimensions - J4MX Multi-Position Full Cased Coils

Models	Height	Dime Width	Refrigerant Connections			
Models	Height Width Opening H W A		Widths W1	Liquid Vapor		
		•••		***	Liquid	rupoi
J4MXCA003	20"	14-1/2"	13"	13-1/2		
J4MXCB004	20"	17-1/2"	16"	16-1/2		3/4"
J4MXCC005	20"	21"	19-1/2"	20"		
J4MXCB006	26"	17-1/2"	16"	16-1/2"		
J4MXCC007	26"	21"	19-1/2"	20"	3/8	
J4MXCD008	26"	24-1/2"	23"	23-1/2"		
J4MXCC009	30"	21"	19-1/2"	20"		7/8
J4MXCD010	30"	24-1/2"	23"	23-1/2"		







FOR USE WITH SPLIT-SYSTEM COOLING & HEAT PUMPS

MODELS: J4AH SERIES







SINGLE PIECE PSC AIR HANDLERS

DESCRIPTION

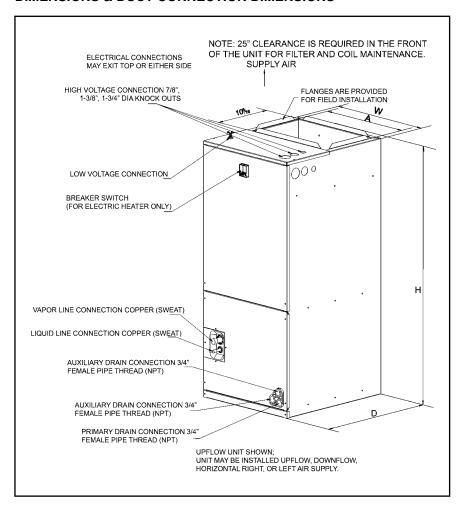
The Oxbox fan coil line offers you flexible and affordable options for your HVAC equipment needs. It's also the ultimate in application flexibility. This unit may be used for upflow, downflow, horizontal right, or horizontal left applications.

- Unique Cabinet Design-Metal shell and glass cotton thermal insulation layer
- Multi-Position UP/Down Flow Horizontal Left /Right
- Braze in Refrigerant Connection
- Primary/Secondary Condensate Connections
- Blower with Integrated Slide Deck for Easy Removal
- Inner-groove aluminum tube and high-efficiency aluminumfin Coil with Integrated Slide Deck for Easy Removal
- More auxiliary Electric Heaters optional
- PSC 3 Speed Motor
- High Efficiency
- Integrated Horizontal Drain pans and metal Vertical Drain
- Fused 24V Power
- Suitable for Manufactured/Mobile Home Use.

WARRANTY

Standard 5-year limited parts warranty.

DIMENSIONS & DUCT CONNECTION DIMENSIONS





SINGLE PIECE PSC AIR HANDLERS

ELECTRICAL DATA FOR SINGLE SOURCE POWER SUPPLY: 208/230-1-60

				Field Wiring					
Air Handler	Heater	Heater	Min. Circ	uit Ampacity	M	IOP. ¹			
Models	Models	KW	208V	230V	208V	230V			
	JAYHTR1A05BRKR	5	24.4	27.9	25	25			
18	JAYHTR1A08BRKR	7.5	35.7	40.9	40	45			
	JAYHTR1A10BRKR	10	47	53.9	50	60			
	JAYHTR1A05BRKR	5	25.9	29.4	30	30			
24	JAYHTR1A08BRKR	7.5	37.2	42.4	40	45			
	JAYHTR1A10BRKR	10	55.4	55.4	50	60			
	JAYHTR1A05BRKR	5	25.5	29	30	35			
30	JAYHTR1A08BRKR	7.5	36.8	42	40	45			
	JAYHTR1A10BRKR	10	48.1	55	50	60			
	JAYHTR1A15BRKR	15	48.1	55	50	60			
	JAYHTR1A05BRKR	5	26.4	29.9	30	30			
	JAYHTR1A08BRKR	7.5	37.7	42.9	40	45			
36	JAYHTR1A10BRKR	10	49	55.9	50	60			
	JAYHTR1A15BRKR	15	49	55.9	50	60			
	JAYHTR1A20BRKR	20	49	55.9	50	60			
	JAYHTR1A05BRKR	5	26.8	30.3	30	35			
	JAYHTR1A08BRKR	7.5	38.1	43.3	40	50			
48C	JAYHTR1A10BRKR	10	49.4	56.3	50	60			
	JAYHTR1A15BRKR	15	49.4	56.3	50	60			
	JAYHTR1A20BRKR	20	49.4	56.3	50	60			
	JAYHTR1A05BRKR	5	28.3	31.8	30	40			
	JAYHTR1A08BRKR	7.5	39.6	44.8	40	45			
60D	JAYHTR1A10BRKR	10	50.9	57.8	60	60			
	JAYHTR1A15BRKR	15	50.9	57.8	60	60			
	JAYHTR1A20BRKR	20	50.9	57.8	60	60			

^{1.} MOP = Maximum Overcurrent Protection device; must be HACR type service disconnect or time delay fuse. Refer to the latest edition of the National Electric Code or in Canada the Canadian electrical Code and local codes to determine correct wire sizing.

DIMENSIONS

		Dimensions ¹					Wiring Knockouts		
Models				Α	E	F	G		ctions Size
	Height	Width	Depth			Power (Conduit)	Control (Conduit)	Liquid	Vapor
J4AHP18	41-3/8	18	20-1/2	16	16-1/2				
J4AHP24	41	18	20-1/2	16	16-1/2	1/2"			
J4AHP30	46-1/2	19-5/8	21-5/8	18	18-1/2	1"	1/2	3/8	3/4
J4AHP36	46-1/2	19-1/2	21-5/8	18	18-1/2	1-1/4"			
J4AHP48	54-1/2	22	24	19-1/2	20	1			7/0
J4AHP60	55-1/2	24-1/2	26-5/8	21-1/4	23-1/2				7/8

^{1.} All dimensions are in inches..

PHYSICAL & ELECTRICAL DATA

Models		18B	24B	30B	36B	48C	60D
Blower - Diam	eter x Width	10 x 8	10 x 8	10 x 10	10 x 10	10 x 10	10 x 10
Matau	HP	1/8 HP	1/3 HP	1/5 HP	1/2 HP	2/5 HP	1/2 HP
Motor	Nominal RPM	705	1050	903	1050	925	990
Voltage		208/230	208/230	208/230	208/230	208/230	208/230
Full Load Amp	os @230V	1.36	2.6	1.8	3.0	3.01	3.8
	Туре		DISPOS	ABLE OR PERM	IANENT		
Filter ¹	Size	16 x 20 x 1	16 x 20 x 1	18 x 20 x 1	18 x 20 x 1	20 x 22 x 1	20 x 22 x 1
	Permanent Type Kit						
				177/159			

^{1.} Field supplied.

Wall-Mounted Heat Pumps E9RKUA / E12RKUA / E18RKUA / E24RKUA

Panasonic



Indoor Unit CS-E9RKUA / CS-E12RKUA



Outdoor Unit CU-E9RKUA / CU-E12RKUA



Wireless Remote Controller (Included)



Wired Remote Controller (CZ-RD516C-1) (Optional)



Indoor Unit CS-E18RKUA / CS-E24RKUA



Controller (Included)



Wired Remote Controller (CZ-RD516C-1) (Optional)

Outdoor Unit CU-E18RKUA / CU-E24RKUA

Model No.			E9	RKUA	E1:	2RKUA	E18	RKUA	E24R	KUA
Unit Model No.			Indoor Unit	Outdoor Unit	Indoor Unit	Outdoor Unit	Indoor Unit	Outdoor Unit	Indoor Unit	Outdoor Unit
			CS-E9RKUAW	CU-E9RKUA	CS-E12RKUAW	CU-E12RKUA	CS-E18RKUAW	CU-E18RKUA	CS-E24RKUAW	CU-E24RKUA
Performance & Electrical F	Ratings									
Capacity	Cooling	Btu/h		100–10,200)		11,500 (4,100–13,300) 17,200 (5,800–19,80			24,000 (5,80	
	Heating	Btu/h	12,000 (4	,100–14,100)	13,800 (4	,100–16,300)	21,600 (5,8	300–22,000)	28,800 (5,80	00-29,200)
Moisture Removal	High	Pints/H	I	1.3		1.7	1	3.0	7.0	-
Dry Air Flow	High	CFM		425		450	6	70	67	0
SEER	Cooling		2	23.0		22.5	1	9.5	19.	.0
EER	Cooling			13.0		12.5		3.2	10.	
HSPF	Heating		1	11.0		11.0	1	0.0	10.	.0
Power Supply	V, Phase, Hz		230/208,	1PH, 60Hz	230V,	1PH, 60Hz	230 / 208V	', 1PH, 60Hz	230 / 208V,	1PH, 60Hz
Running Amps	Cooling	Α	3.2	2/3.6	4.	2 / 4.7	6.3	/ 7.0	10.8 /	11.9
	Heating	Α	5.1	1 / 5.7	5.	6 / 6.3	8.3	/ 9.3	11.4/	12.6
Power Input	Cooling	W	690 (2	250-850)	920 (2	50-1,150)	1,300 (4	30-1,600)	2,350 (430	0-2,720)
	Heating	W	1,120 (2	200–1,500)	1,250 (200–1,710)	1,750 (3	80-1,800)	2,500(380	0-2,660)
Back-up Heater		kW	,							
Fuse or Circuit Breaker C	apacity	Α		15		15	1	20	25	5
eatures										-
Controls			Microp	processor	Micro	processor	Microp	rocessor	Micropro	ocessor
Low Ambient Control			Eqi	uipped	Eq	uipped	Equ	ipped	Equip	ped
Wireless Controller			Inc	luded	In	cluded	Incl	uded	Inclu	ded
Wired Remote Controller	(optional)		CZ-R	D516C-1	CZ-R	ID516C-1	CZ-RE	0516C-1	CZ-RD5	16C-1
Fan Speeds	, ,		5 Spee	eds + Auto	5 spec	eds + Auto	5 Spee	ds + Auto	5 Speeds	s + Auto
Timer			24-hr	Program	24-hr	Program	24-hr l	Program	24-hr Pr	rogram
Air Deflection	Horizontal			anual		lanual		matic	Auton	
	Vertical		Aut	omatic	Au	tomatic	Auto	matic	Auton	natic
Air Filter			Washable + A	nti Microbial Filter	Washable + A	nti Microbial Filter	Washable + An	ti Microbial Filter	Washable + Anti	Microbial Filter
Refrigerant			R-	410A	R	-410A	R-4	110A	R-41	10A
Refrigerant control			Electric Ex	pansion Valve	Electric Ex	pansion Valve	Electric Exc	ansion Valve	Electric Expa	nsion Valve
Operation Sound	In(Hi/Me/Lo/Qt)	dB-A		/25/20		/28/20		39 / 36	48 / 40	
	Outdoor(Hi)	dB-A		47		48		49	51	1
Refrigerant Piping	Type		F	lare		Flare	F	are	Fla	re
	Discharge	inches	-	1/4"		1/4"		/4"	1/4	
	Suction	inches		3/8"		1/2"		/2"	5/8	
Refrigerant Pipe Length		Ft.		x. 65.6		ıx. 65.6		c. 100	Max.	
Elevation Difference	Outdoor Above	Ft.		x. 49.2		ix. 49.2		. 49.2	Max.	
	Outdoor Below	Ft.		x. 49.2		ix. 49.2		. 49.2	Max.	
Dimensions & Weight			Indoor Unit	Outdoor Unit	Indoor Unit	Outdoor Unit	Indoor Unit	Outdoor Unit	Indoor Unit	Outdoor Unit
Height		inches	11-7/16"	21-9/32"	11-7/16"	21-9/32"	11-7/16"	31-5/16"	11-7/16"	31-5/16"
Width		inches	34-9/32"	30-23/32"	34-9/32"	30-23/32"	42-5/32"	34-15/32"	42-5/32"	34-15/32"
Depth		inches	8-7/16"	11-13/32"	8-7/16"	11-13/32"	9-15/32"	12-5/8"	9-15/32"	12-5/8"
			0 .,		0 .,		0 .0,02	0,0	0 .0,02	0,0

^{**} This is maximum elevation difference when the indoor unit is located above the outdoor unit.



PTAC UNITS

PTW-Series

MAIN FEATURES:

- Energy Efficient Operation with High EER (up to 11.6)
- Quiet 2 Fan Motors operation
- Industry Standard size (42' x 16')
- Attractive Appearance
- Easy to Operate Controls
- Solid State Control
- Fan Cycle Switch
- Discrete Electric Resistance Heater
- Freeze Protection
- 2-way Adjustable Discharge Louver
- Easy to Clean Up-front Filters

- Heat Pump Operation as low as 25°F (H/P only)
- Indoor Coil Freeze Control
- Manual Ventilation Control up to 70 CFM
- Weather-Resistant Super Seal
- Front Desk Control Capability
- Remote Control Capability
- Temperature Limiter
- · Load Shedding Control Capability
- Random Restart Circuit
- Automatic Emergency Heat
- Compressor Restart Function



MODEL IDENTIFICATION

PTW 09 2 * C 2

SANYO Packaged Terminal A/C J

 Development Series #
Unit Type: C: Cooling Only w/E. Heater
H: Heat Pump w/E. Heater
Heater Size (Refer to the table below)

Voltage: -

2: 230/208V 3: 265V

Heater Specification Table

Heater		230 / 208	/ Model	
Designator	Heater Amp	Watt	Min. Amp	BTU/h
2	11.1/10.0	2550/2090	15	8600/7100
3	15.0/13.6	3450/2820	20	11700/9600
5	21.7/19.7	5000/4090	30	17000/13900
Heater		265V N	lodel	
Designator	Heater Amp	Watt	Min. Amp	BTU/h
3	11.3	3000	15	10200
4	15.1	4000	20	13600
5	18.9	5000	30	17000

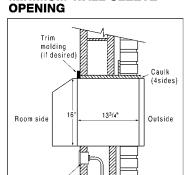
MINIMUM WALL SLEEVE

42" -

WALL CASE DIMENSIONS

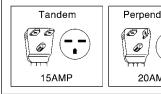
16"

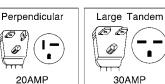
13 3#"



Box and receptacle

CORD PLUG AND WALL OUTLET (230/208V)

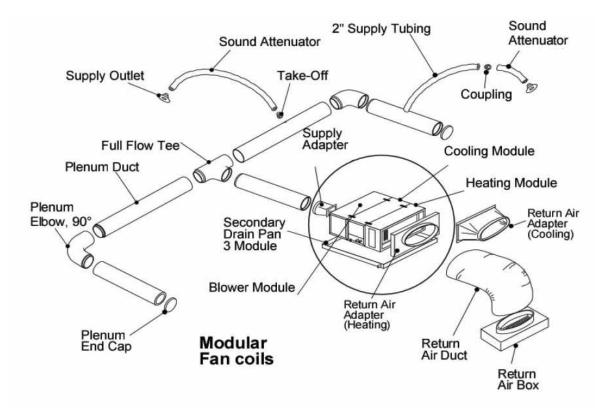


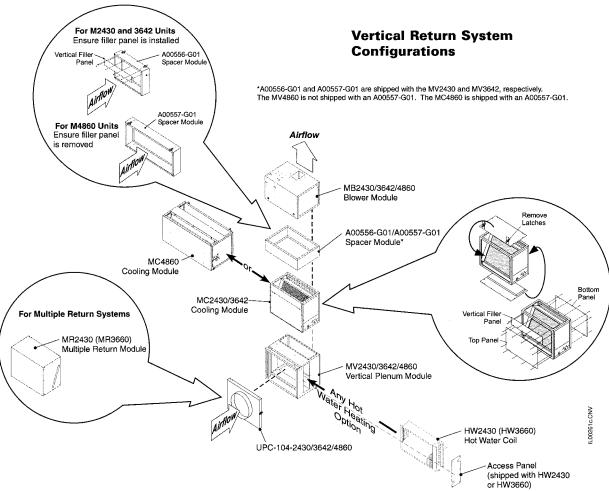


SPECIFICATION

or Loir IOATION								
			coc	LING & ELECTF	RIC HEATING MC	DEL		
Model Number	PTW0723H5C	PTW0734H5C	PTW0923H5C	PTW0934H5C	PTW1223H5C	PTW1234H5C	PTW1523H5C	PTW1534H5Ch
Voltage Rating	230/208	265	230/208	265	230/208	265	230/208	265
Cooling Capacity (BTU/h)	7100/7000	7100	9100/8900	9100	12000/11900	12000	14200/14000	14200
EER	11.6/11.6	11.6	11.4/11.4	11.4	10.9/10.9	10.9	9.5/9	6 9.5
Power (Watts)	610/600	610	800/780	800	1100/1090	1100	1490/1460	1490
Amp F.L.	2.7/2.9	2.4	3.5/3.8	3.1	4.9/5.4	4.2	6.9/7.2	5.8
Amp L.R.	17	13	22	15	29	24	41	31
CFM Hi	315/285	315	315/285	315	410/370	410	410/370	410
CFM Low	275/235	275	275/235	275	355/320	355	355/320	355
Moisture Removal (Pints/h)	1.8	1.8	2.3	2.3	2.8	2.8	3.8	3.8
Sensible Heat Ratio	0.71	0.71	0.71	0.71	0.69	0.69	0.65	0.65
Vent CFM	65	65	65	65	70	70	70	70
Weight (Ship/Net)	110/95	110/95	110/95	110/95	120/105	120/105	120/105	120/105









The Unico System is a small-duct central heating and air conditioning system that utilizes compact, modular air handlers and flexible 2" supply tubing to supply conditioned air to homes and commercial spaces. The flexible supply tubing snakes through a structure's existing cavities, eliminating the need for extensive remodeling or the construction of soffits or other concealments. This tubing terminates in round, plastic or wood outlets, about the size of a CD, that can be painted or stained to match any décor. A slotted outlet is also available.

The Unico System is 1/3 the size of conventional HVAC systems and can fit into smaller spaces. Once installed, the system is virtually invisible

The modules can be arranged in a horizontal, upflow, or downflow configuration.

Blowers suffixed with an "L" are low speed modules intended for new systems and most replacement applications and provide improved efficiency and radiated sound levels. Units suffixed with an "H" are high-speed modules intended for replacement installations with existing Unico System and other high static ducts that are restrictive and impractical to upgrade.

The Unico System operates at a higher static pressure than conventional duct systems and has unique design and layout requirements for proper air distribution. It is important that the manufacturer's installation instructions be followed exactly to achieve maximum effectiveness



BLOWER/MODULE

Match blower module with appropriate cooling/heat pump module (and/or heating module if hot water or electric heat are required).

LCB Blower modules have an electronic enhanced control board.

				CFM	Dim	nensions ((ln.)	Shipping	
PSC Motor	Usage	Voltage	Tonnage	@1.5" ESP	W	. D	Н	Wgt.	
U1218L-1ST2EX	Blower & Coil	208-230/1/60	1 to 1 1/2	370	20	38	12	100	
M2430BL2-ST2	Blower	208-230/1/60	2 to 2 1/2	600	25	13.75	17.5	62	
M3036BL2-ST2	Blower	208-230/1/60	2 1/2 to 3	1000	30	13.75	17.5	72	
M3642BL2-ST2	Blower	208-230/1/60	3 to 3 1/2	1000	38	13.75	17.5	72	
M4860BL2-ST2	Blower	208-230/1/60	4 to 5	1250	38	13.75	17.5	85	
ECM Motor, SMAF	ECM Motor, SMART Board								
U1218L-1EC1EX	Blower & Coil	115/1/60	1 to 1 1/2	300, 1.2" ESP, 160V	V 20	38	12	100	
U1218L-1EC2EX	Blower & Coil	208-230/1/60	1 to 1 1/2	300, 1.2" ESP, 160V	V 20	38	12	100	
M2430BL1-EC1	Blower	115/1/60	2 to 2 1/2	500, 1.2" ESP, 206V	V 25	13.75	17.5	62	
M2430BL1-EC2	Blower	208-230/1/60	2 to 2 1/2	500, 1.2" ESP, 206V	V 25	13.75	17.5	62	
M3036BL1-EC1	Blower	115/1/60	2 1/2 to 3	500, 1.2" ESP, 206V	V 30	13.75	17.5	62	
M3036BL1-EC2	Blower	208-230/1/60	2 1/2 to 3	500, 1.2" ESP, 206V	V 30	13.75	17.5	62	
M3642BL1-EC1	Blower	115/1/60	3 to 3 1/2	752, 1.2" ESP, 280V	V 38	13.75	17.5	72	
M3642BL1-EC2	Blower	208-230/1/60	3 to 3 1/2	752, 1.2" ESP, 280V	V 38	13.75	17.5	72	
M4860BL1-EC1	Blower	115/1/60	4 to 5	1000, 1.2" ESP, 346\	W 38	13.75	17.5	72	
M4860BL1-EC2	Blower	208-230/1/60	4 to 5	1000, 1.2" ESP, 346	W 38	13.75	17.5	72	



COOLING MODULE

These evaporator coil modules can be easily installed with the matching Unico System blower modules. M1218AC includes coil.

• Use unit width as a selection guide

			Dimensions (In.)			Shipping
Part No.	Usage	Tonnage	W	D	Н	Wgt. (Lbs.)
M2430CL1-B	Cooling, R410A	2 to 2 1/2	25	13.75	17.5	48
M3036CL1-B	Cooling, R410A	2 1/2 to 3	30	13.75	17.5	67
MC3642CL1-B	Cooling, R410A	3 to 3 1/2	38	13.75	17.5	74
M4860CL1-B	Cooling, R410A	4 to 5	38	24	17.5	67
M2430CL1-C	Chilled Water Cooling Module	2 to 2-1/2	25	13.75	17.5	48
M3036CL1-C	Chilled Water Cooling Module	2-1/2 to 3	30	13.75	17.5	67
M3642CL1-C	Chilled Water Cooling Module	2-1/2 to 3	38	13.75	17.5	67
M4860CL1-C	Chilled Water Cooling Module	4 TO 5	38	24	17.5	105





HEATING MODULE

Match with appropriate blower module for heating only applications or to improve cooling air flow and provide for future heat capability (sleeve only-add appropriate coil).

				Dimensions (In.)		Shipping	
Part No.	Tonnage	Capacity (BTUH)	Description	W	D	. н	Wgt. (Lbs.)
MH2430	2 to 2 1/2		Sleeve only	25	12	17 1/2	20
MH3660	3 to 5		Sleeve only	38	12	17 1/2	27
HW2430	2 to 2 1/2	73800	Hot Water Coil only	_	_	_	33
HW3660	3 to 5	120000	Hot Water Coil only	_	_	_	48



ELECTRIC HEAT COIL

The electric furnaces are designed to provide primary heating or auxiliary heating in a heat pump system.

Ships with a 10" round adapter.All units 230v/1ph.

Part No.	K.W.	System Matchup	Min. CFM
WON0202	2	All	200
WON0502	5	All	250
WON0752	7.5	All	300
WON1002	10	2430, 3642, 4860	500
WON1502	15	2430, 3642, 4860	600
WON2002	20	3642,4860	800



HORIZONTAL RETURN PLENUM

Vertical plenum kits include Plenum Module, Spacer Module (except 4860), pleated filter, 2 insulated filler plates and 2 brackets (except 4860), screws, latches latch keepers and insulation strips.

		Dimensions (In.)			
Part No.	Tonnage	L	W	Н	
MR2430	2 to 2 1/2	25	13.75	17.5	
MR3660	3 to 3 1/2	38	13.75	17.5	



RETURN AIR ADAPTER, HEATING MODULE

- Mates directly to heating module
- No additional fabrication
- Use for horizontal or vertical installations
- Height 17.5 in.

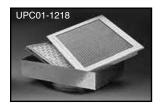
Part No.	Usage	Width (In.)	Duct Dia. (In.)
UPC104-1218	1218	20	12
UPC104-2430	2430	25	14
UPC104-3036	3036	30	16
UPC104-3642	3642	38	18
UPC104-4860	4860	38	20



VERTICAL RETURN PLENUM

The MV module features a built in secondary drain pan with a 3/4" PVC socket connection, pleated filter, and place for an optional hot water coil.

		Dimensions (In.)		
Part No.	Tonnage	L	W	Н
M2430V1	2 to 2 1/2	25	17.5	18.25
M3036V1	2 1/2 to 3	30	17.5	18.25
M3642V1	3 to 3 1/2	38	17.5	18.25
M4860V1	4 to 5	38	23	18.25



RETURN GRILLE/FILTER

Includes throwaway filter, 2 duct bands and clips.

Note: Unico supplies a return duct system, but field supplied systems are acceptable as long as pressure drop including filter does not exceed .15" W.G.

		Dimensions (In.)		
Part No.	Tonnage	L	W	Duct
UPC01-1218	1 to 1 1/2	15.5	10	12
UPC01-2430	2 to 2 1/2	25.25	14.25	14
UPC01-3036	2 1/2 to 3	30.25	14.25	16
UPC01-3642	3 to 3 1/2	30.25	14.25	18
UPC01-4860	4 to 5	30.25	24.25	20

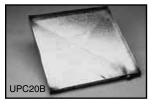


SUPPLY AIR PLENUM ADAPTER

- 1" insulation blanket provided
- Transitions blower module to indicated round duct

5		5	
Part No.	Usage	Diameter (In.)	Length (In.)
UPC61-1218	1218	7	12
UPC61-2430	2430	7	12
UPC61-3036	3036	9	18
UPC61-3642	3642	9	18
UPC61-4860	4860	10	18

The Unico System



SECONDARY DRAIN PAN

• For added protection against condensate drainage

			Dime	ensions	s (ln.)
Part No.	Usage	Modules	L	W	Н
UPC94	1218	1	42	24	1.5
UPC20B	2430	2	31.5	29	1.5
UPC20C	2430	3	43.75	29	1.5
UPC27B	3036	2	31.5	34	1.5
UPC27C	3036	3	43.75	34	1.5
UPC24B	3642	2	31.5	42	1.5
UPC24C	3642/4860	3	43.75	42	1.5
UPC24D	4860	3	54	42	1.5



CRIMPING TOOL

Part No.	Description	
UPC54	Clamp Pliers	
UPC55	Hole Cutter	



OUTLET KIT, 2 INCH

Kits include list below plus specific itemized takeoffs. UPC56B supply outlet (off-white) UPC53 scrim core clamp "575" UPC52 supply tube clamp "605" UPC51 toggle and screw
UPC35 balancing orifice kit
UPC42 winter shutoff

UPC38 supply duct coupling

Takeoff balancing cap

Part No.	Description	Includes Above Plus
UPC80F-1	Fiberglass Single Outlet Kit	UPC23 Fiberglass Takeoff + UPC26C 12' Sound Alternator tube
UPC89F	Fiberglass Multi-Install Kit	UPC23 Fiberglass Takeoffs
UPC80M-1	Metal Single Outlet Kit	UPC28 Metal Takeoff + UPC26C 12' Sound Alternator tube
UPC89M	Metal Multi-Install Kit	UPC28 Metal Takeoffs



SOUND ATTENUATOR

- Tough aluminized mylar outer wrap
- Spun-bonded nylon and helical wire core
- Fully insulated
- 12' length
- Certified as an air duct per UL181

Part No.	ID (In.)	R-Factor	Pkg. Quantity
UPC26C	2.0	R-3.2	6



RETURN AIR ADAPTER, COOLING MODULE • Includes insulation wrap

 Includes insulation wrap shipped loose

		Dimensions (In.)			.)
Part No.	Usage	L	Н	Depth	Duct
UPC59-2430	2430	23	13.5	11.5	14
UPC59-3036	3036	27	13.5	11.5	16
UPC59-3642	3642	35	13.5	10	18
UPC59-4860	4860	35	11.5	15	20



UPC59-2430

RETURN AIR DUCT

• 10 Ft

Part No.	R Value	Usage	Duct Dia. (In.)
UPC04-1218	R4.2	1218	12
UPC04-2430	R4.2	2430	14
UPC04-3036	R4.2	3036	16
UPC04-3642	R4.2	3642	18
UPC04-4860	R4.2	4860	20

SUPPLY TUBING

- Tough aluminized mylar outer wrap
- Two-ply aluminum core
- 25' length
- Certified as an air duct per UL181

Part N	lo. II) (ln.)	R-Factor	Pkg. Quantity
UPC2	5	2	R-3.2	4





SLOTTED OUTLET

OUTLET ACCESSORIES

Ħ	0
	UPC58125

Part No.

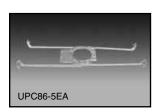
UPC56B

UPC57

SUPPLY TERMINATOR

Part No.	Description
UPC67A	90 Slotted Outlet w/hardware
UPC68	Straight Slotted Outlet w/hardware

Part No.	Description
UPC67A	90 Slotted Outlet w/hardware
UPC68	Straight Slotted Outlet w/hardware
UPC68	Straight Slotted Outlet w/hardware



PLASTER FRAME KIT

Description

Standard 0° Outlet, 2.0"

Oak Face 0° Outlet, 2.0"

Designed for locating outlet before sheetrock is applied (for new construction)

- 2 Left hanger bars
- 2 Right hanger bars
- 1 Plaster frame

Part No.	Includes above plus
UPC86	Plaster Frame Kit, pkg. 5



Part No.	Description
UPC45	Outlet Deflector, 2", each
UPC51	Outlet Toggle and Screw pkg. 10
UPC88	Outlet Screen, 2", pkg. 20



BALANCING ORIFICE KIT

Takeoff kit includes: 3 disks 15% - 50%

Outlet kit includes: 3 caps 15% - 50%

	1
	90
	0

Part No.	Description
UPC42	Winter Supply Shutoff, 2"

Part No.	Description
UPC35-15	Takeoff Orifice Kit
UPC36-15	Outlet Orifice Kit



PLENUM TAKE OFF

- Provides positive connection to ductwork
- UPC23 for round or square duct

99	UPC23810
	3

Part No.

UPC38C10EA

SUPPLY DUCT COUPLING

Includes tubing clamps and tape rings

	Tube	5
Part No.	Diameter (In.)	Description
UPC23B	2.0	For 1" Fiberglass
UPC28	2.0	For Metal, Includes Tape Ring, Gasket

TUBING CLAMP



EXPANSION VALVE, R410A

Description

Supply Connector, 2.0", ea



Part No.	Description
UPC52	Supply Tubing Clamp, 2", pkg 50
UPC53	Sound Atten. Tube Clamp, 2", pkg 50

A00805013	0
	9

Part No.	Usage
A00805013	2 Ton, A/C
A00808014	3 to 3 1/2 Ton, A/C
A00805015	4 Ton, A/C
A00808014	3 to 3 1/2 Ton, Heat Pump
A00808015	4 Ton, Heat Pump



CONDENSATE PUMPS

MEDIUM CONDENSATE PUMP - CB15 Series

These are Beckett's most popular and dependable units. They can handle high acidity condensation produced by High Efficiency furnaces. Units include a high impact polystyrene tank with a capacity of 1.7 U.S. quarts, a flame retardant plastic cover, 3/8" O.D. check valve, stainless steel shaft and a 6 ft power cord with a 3 prong plug. Mounting slots are provided on each end of the tank cover. 20 ft of clear vinyl tubing.



Model									Gallo	ns pei	hour	@ 60 H	tage	Safety	Check	Cord	Shut		
Number	н	W	L	Outlet	Volts	Amps	Watts	H.P.	1'	5'	10'	15'	20'	30'	40'	Switch	Valve	w/plug	Off (ft)
CB151UL	6.25"	5"	11-1/8	3/8" O.D.	115	1.1	60	1/50	85	70	50	_	_	_	_	Y	Y	Υ	15'
CB201TUL*	6.25"	5"	11-1/8	3/8" O.D.	115	2.2	85	1/30	105	95	73	36	_	_	_	Y	Y	Υ	20'

^{*}Includes tubing

COMPACT MODEL LOW PRO® CONDENSATE PUMP CL20 Series

This High Efficiency furnace model is compact and has a Low Profile so that they can be used in applications where space is limited. This unit is capable of handling high acidity condensation. The shut off height for the CL20 is 20 ft. Model includes a built in safety switch, 3/8" O.D. check valve, stainless steel shaft, 6 ft power cord with a 3 prong plug, high impact polystyrene tank and a flame retardant plastic cover.



Model									Gallons per hour @ 60 Hz & Rated Voltage								Check	Cord	Shut
Number	н	W	L	Outlet	Volts	Amps	Watts	H.P.	1'	5'	10'	15'	20'	30'	40'	Switch	Valve	w/plug	Off (ft)
CL201UL	4-3/4"	5"	11-1/8"	3/8" Barb	115	1.95	90	1/30	115	92	62	33	_	_	_	Y	Υ	Υ	20'

LARGE CONDENSATE PUMP - CB22 Series

This large condensate pump is capable of handling high acidity condensation. The shut off height for this model is 22 ft. Model includes a high impact, flame retardant ABS plastic tank with a capacity of one U.S. gallon, a flame retardant plastic motor cover, 3/8" O.D. check valve and stainless steel shaft.



Model									Gallo	ns pe	hour	@ 60 H	Safety	Check	Cord	Shut			
Number	н	w	L	Outlet	Volts	Amps	Watts	H.P.	1'	5'	10'	15'	20'	30'	40'	Switch	Valve	w/plug	Off (ft)
CB221UL	9-1/4"	6"	12"	3/8" O.D.	115	1.5	120	1/25	108	90	70	45	19	_	_	Y	Υ	Y	22'
CB222UL	9-1/4"	6"	12"	3/8" O.D.	230	1.0	120	1/25	108	90	70	45	19	_	_	Y	Υ	Y	22'

INDUSTRIAL CONDENSATE PUMP - CB50 Series

These are Beckett's Industrial models for your heavy duty pumping applications. They both feature a built in safety switch, a pre-wired terminal block, non-corrosive brass wetted parts and stainless steel shaft. CU55 has a 1/2" O.D. check valve. Model has a high quality painted galvanized steel cover and a high impact polystyrene tank with a capacity of 1 U.S. gallon.



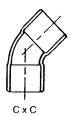
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Model									Gallo	ns pei	hour	@ 60 H	z & Ra	ted Vol	tage	Safety	Check	Cord	Shut
Number	н	W	L	Outlet	Volts	Amps	Watts	H.P.	1'	5'	10'	15'	20'	30'	40'	Switch	Valve	w/plug	Off (ft)
CB501UL	10-1/8"	6"	12"	1/2" O.D.	115	4.0	360	1/5	476	441	396	351	306	216	126	Y	Υ	Υ	48'



ELBOWS, 45° NO. WE-504, C x C

PART #	SIZE NOMINAL	SIZE O.D.
W3005	1/8"	1/4"
W3012	1/4"	3/8"
W3021	3/8"	1/2"
W3026	1/2"	5/8"
W3030	5/8"	3/4"
W3034	3/4"	7/8"
W3044	1"	1-1/8"
W3050	1-1/4"	1-3/8"
W3055	1-1/2"	1-5/8"
W3059	2"	2-1/8"
W3063	2-1/2"	2-5/8"
W3073	4"	4-1/8"



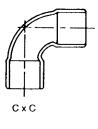
ELBOWS, 45° NO. WE-505, FTG x C

PART #	SIZE NOMINAL	SIZE O.D.
W3312	1/4"	3/8"
W3321	3/8"	1/2"
W3326	1/2"	5/8"
W3330	5/8"	3/4"
W3334	3/4	7/8"
W3344	1"	1-1/8"
W3350	1-1/4"	1-3/8"
W3355	1-1/2"	1-5/8"
W3363	2-1/2"	2-5/8"



ELBOWS, 90° SHORT RADIUS NO. WE-500, C X C

PART #	SIZE NOMINAL	SIZE O.D.
W2003	1/8"	1/4"
W2009	1/4"	3/8"
W2017	3/8"	1/2"
W1622	1/2"	5/8"
W2028	5/8"	3/4"
W1634	3/4"	7/8"
W1647	1"	1-1/8"
W2084	1-1/4"	1-3/8"
W2085	1-1/2"	1-5/8"
W2086	2"	2-1/8"
W2087	2-1/2"	2-5/8"
W2088	3"	3-1/8"
W2089	3-1/2"	3-5/8"



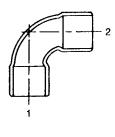
ELBOWS 90° LONG RADIUS

NO. WE-500L, C x C

	•				
PART#	SIZE NOMINAL	SIZE O.D.	PART#	SIZE NOMINAL	SIZE O.D.
W2715 W2710 W2716 W2717 W2722 W2728	1/8" 1/4" 3/8" 1/2" 5/8"	1/4" 5/16" 3/8" 1/2" 5/8" 3/4"	W2734 W2747 W2055 W2063 W2072	3/4" 1" 1-1/4" 1-1/2" 2"	7/8" 1-1/8" 1-3/8" 1-5/8" 2-1/8"

ELBOWS, 90° SHORT RADIUS - REDUCING NO. WE-500R, C x C

PART #	SIZ NOMI		SIZE O.D.				
	1	2	1	2			
W2011	1/4 x	1/8	3/8 x	1/4			
W2019	3/8 x	1/4	1/2 x	3/8			
W2023	1/2 x	3/8	5/8 x	1/2			
W2025	x	1/4	x	3/8			
W2029	5/8 x	1/2	3/4 x	5/8			
W2030	x	3/8	x	1/2			
W2035	3/4 x	5/8	7/8 x	3/4			
W2036	x	1/2	x	5/8			
W2037	x	3/8	x	1/2			
W2049	1 x	3/4	1-1/8 x	7/8			
W2050	x	5/8	x	3/4			
W2051	x	1/2	х	5/8			
W2056	1-1/4 x	1	1-3/8 x	1-1/8			
A2638*	х	3/4	x	7/8			
W2077	1- x	1-1/4	1-5/8 x	1-3/8			
W2078	2 x	1-1/2	2-1/8 x	1-5/8			
A2778*	3 x	2	3-1/8 x	2-1/8			

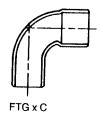


ELBOWS, 90° LONG RADIUS - REDUCING NO. WE-500LR, C x C

PART#	SIZE NOMINAL	SIZE O.D.
PARI#	NOMINAL	U.D.
W2067	1-1/2 x 3/4	1-5/8 x 7/8

ELBOWS, 90° SHORT RADIUS NO. WE-503, FTG x C

PART #	SIZE NOMINAL	SIZE O.D.
W2312	1/4"	3/8"
W2321	3/8"	1/2"
W1652	1/2"	5/8"
W2330	5/8"	3/4"
W1654	3/4"	7/8"
W2344	1"	1-1/8"
W2384	1-1/4"	1-3/8"
W2385	1-1/2"	1-5/8"
W2386	2"	2-1/8"
W2387	2-1/2"	2-5/8"
W2388	3"	3-1/8"
W2390	4"	4-1/8"



ELBOWS, 90° LONG RADIUS NO. WE-503L, FTG x C

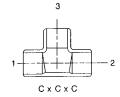
_			
	PART #	SIZE NOMINAL	SIZE O.D.
Γ	W2822	1/2"	5/8"
l	W2828	5/8"	3/4"
ı	W2834	3/4"	7/8"
ı	W2847	1"	1-1/8"
1	W2350	1-1/4"	1-3/8"

^{*} CAST BRONZE



TEES





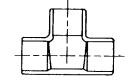
PART#		NC	SIZE	71				SIZE O.D.		
	1	•••	2	`-	3	1		2		3
W40368	1/8	Х	1/8	х	1/4	1/4	х	1/4	х	3/8
W4016	1/4	х	1/4	х	1/2	3/8	х	3/8	х	5/8
W4005				х	3/8				х	1/2
W40324				X	1/8				X	1/4
W40330			1/8	Х	1/4			1/4	Х	3/8
W40332	0 (0		0/0	X	1/8			4 (0	Χ	1/4
W4015	3/8	Х	3/8	X	1/2	1/2	Х	1/2	X	5/8
W4002 W40350				X	1/4 1/8				X	3/8 1/4
W4003		х	1/4	X	3/8		х	3/8	X	1/2
W4004				х	1/4				х	3/8
W40363		х	1/8	х	3/8		х	1/4	х	1/2
W40366				х	1/8				х	1/4
W4047	1/2	Х	1/2	Х	3/4	5/8	Х	5/8	Х	7/8
W4029				Х	5/8				Х	3/4
W4007				X	3/8				X	1/2
W4008		.,	2/0	X	1/4		.,	1/0	X	3/8
W4009 W4010		Х	3/8	X	1/2 3/8		Х	1/2	X	5/8 1/2
W4010 W4012		х	1/4	x	1/2		х	3/8	x	5/8
W4013				х	1/4				х	3/8
W4046	5/8	х	5/8	X	3/4	3/4	х	3/4	X	7/8
W4018				х	1/2				х	5/8
W4019				х	3/8				X	1/2
W4020				Х	1/4				X	3/8
W4021		X	1/2	X	5/8		X	5/8	Х	3/4
W4022			0/0	X	1/2			1/0	X	5/8
W4025 W4027		X	3/8	X	5/8 3/8		X	1/2	X X	3/4 1/2
W4065	3/4	х	3/4	X	1	7/8	х	7/8		1-1/8
W4032				х	5/8				х	3/4
W4033				х	1/2				х	5/8
W4034				х	3/8				х	1/2
W4036		Х	5/8	Х	3/4		Х	3/4	Х	7/8
W4041		X	1/2	X	3/4		X	5/8	X	7/8
W4043				Х	1/2				Х	5/8
W4044		٠,,	2/0	X	3/8		,,	1/0	X	1/2
W40232 W4049	1	X	3/8 1	X X	3/8 3/4	1_1/0	X	1/2 1-1/8	X	1/2 7/8
W4051	1	۸	'	X	1/2	1-1/0	^	1-1/0	X	7/8 5/8
W4055		х	3/4	х	1		х	7/8		1-1/8
W4056		•	-, .	x	3/4		••		X	7/8
W4059				х	3/8				Х	1/2
W4061		х	1/2	х	1		х	5/8		1-1/8
W4062				Х	3/4				Х	7/8
W40100	1-1/4	X	1-1/4		1-1/2	1-3/8	X	1-3/8		
W4069				X	1					1-1/8
W4070				X	3/4				X	7/8 =/0
W4071 W4073		v	1	X X	1/2 1-1/4		v	1-1/8	X	5/8 1-3/8
VV40/3		Х	1	X	1-1/4	<u> </u>	Х	1-1/8	X	1-3/8

	SIZE	SIZE
PART#	NOMINAL	O.D.
	1 2 3	1 2 3
W4074	1-1/4 x 1 x 1	1-3/8 x 1-1/8 x 1-1/8
W4075	x 3/4	x 7/8
W4076	x 1/2	x 5/8
W4078	x 3/4 x 1-1/4	x 7/8 x 1-3/8
W4080	x 3/4	x 7/8
W40121	1-1/2 x 1-1/2 x 2	1-5/8 x 1-5/8 x 2-1/8
W4085	x 1-1/4	x 1-3/8
W4086	x 1	x 1-1/8
W4087	x 3/4	x 7/8
W4088	x 1/2	x 5/8
W4090	1-1/2 x 1-1/4 x 1-1/2	1-5/8 x 1-3/8 x 1-5/8
W4091	x 1-1/4	x 1-3/8
W4092	x 1	x 1-1/8
W4093	x 3/4	x 7/8
W4095 W4096 W4097 W4098 W4099	x 1 x 1-1/2 x 1-1/4 x 1 x 3/4 x 3/4 x 1-1/2	x 1-1/8 x 1-5/8 x 1-3/8 x 1-1/8 x 7/8 x 7/8 x 7/8 x 1-5/8
W40244	x 1/2 x 1-1/2	x 5/8 x 1-5/8
W40144	2 x 2 x 2-1/2	2-1/8 x 2-1/8 x 2-5/8
W40103	x 1-1/2	x 1-5/8
W40104	x 1-1/4	x 1-3/8
W40105	x 1	x 1-1/8
W40106	x 3/4	x 7/8
W40107	x 1/2	x 5/8
W40109	x 1-1/2 x 2	x 1-5/8 x 2-1/8
W40110	x 1-1/2	x 1-5/8
W40111	x 1-1/4	x 1-3/8
W40113	x 3/4	x 7/8
W40114	x 1/2	x 5/8
W40115	x 1-1/4 x 2	x 1-3/8 x 2-1/8
W40245	x 1 x 2	x 1-1/8 x 2-1/8
W40248	x 3/4 x 2	x 7/8 x 2-1/8
A1812	2-1/2 x 2-1/2 x 3	2-5/8 x 2-5/8 x 3-1/8
W40124	x 2	x 2-1/8
W40125	x 1-1/2	x 1-5/8
W40126	x 1-1/4	x 1-3/8
W40127	x 1	x 1-1/8
W40129	x 1/2	x 5/8
W40132	x 2 x 1-1/2	x 2-1/8 x 1-5/8
W40149	3 x 3 x 1-1/2	3-1/8 x 3-1/8 x 1-5/8
W40145	x 1/2	x 5/8
W40167	x 2 x 3	x 2-1/8 x 3-1/8
W40196	4 x 4 x 2	4-1/8 x 4-1/8 x 2-1/8
W40195	x 1-1/2	x 1-5/8

TEES, NO. WT-600

PART #	SIZE NOMINAL	SIZE O.D.
W40306	1/8"	1/4"
W40313		5/16"
W4000	1/4"	3/8"
W4001	3/8"	1/2"
W4006	1/2"	5/8"
W4017	5/8"	3/4"
W4031	3/4"	7/8"
	1	ı

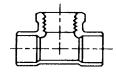
	SIZE	SIZE
PART #	NOMINAL	O.D.
W4048	1"	1-1/8"
W4068	1-1/4"	1-3/8"
W4084	1-1/2"	1-5/8"
W40102	2"	2-1/8"
W40123	2-1/2"	2-3/8"



TEES, FORGED BRASS

NO. WT-602 CxCxF

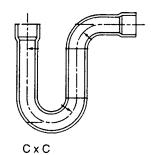
PART #			SIZE OMIN					SIZE O.D.	•	
	1		2		3	1		2		3
W4228	1/4	Х	1/4	х	1/4	3/8	х	3/8	Х	3/8
W4229	1/4	х	1/4	х	1/8	3/8	Х	3/8	х	1/4
W4259	3/8	Х	3/8	Х	1/4	1/2	Х	1/2	Х	3/8
W4283	1/2	Х	1/2	Х	3/8	5/8	Х	5/8	Х	1/2



SUCTION LINE P-TRAPS

NO. WE-544P

SIZE NOMINAL	SIZE O.D.
1/2"	5/8"
5/8"	3/4"
3/4"	7/8"
1"	1-1/8"
1-1/4"	1-3/8"
	1/2" 5/8" 3/4" 1"



SA-902 SANDCLOTH

PART #			
WG SC10			

If you can't find what you need...

CALL US

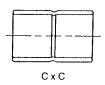
We have it or can get it



COUPLINGS

COUPLINGS, ROLLED STOP NO. WC-400, C x C

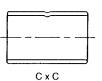
PART #	SIZE NOMINAL	SIZE O.D.
W1000		1/8"
W1003		1/4"
W1009	1/4"	3/8"
W1017	3/8"	1/2"
W1022	1/2"	5/8"
W1028	5/8"	3/4"
W1034	3/4"	7/8"
W1047	1"	1-1/8"
W1055	1-1/4"	1-3/8"
W1063	1-1/2"	1-5/8"
W1072	2"	2-1/8"
W1082	2-1/2"	2-5/8"



COUPLINGS, STAKED STOP

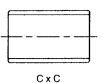
NO. WC-400S, C X C

PART #	SIZE NOMINAL	SIZE O.D.
W10142		5/16"



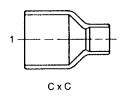
COUPLINGS, NO STOP NO. WC-400NS, C x C

PART #	SIZE NOMINAL	SIZE O.D.
W1901	1/4"	3/8"
W1902	3/8"	1/2"
W1903	1/2"	5/8"
W1904	5/8"	3/4"
W1905	3/4"	7/8"
W1906	1"	1-1/8"
W1907	1-1/4"	1-3/8"
W1908	1-1/2"	1-5/8"
W1909	2"	2-1/8"



COUPLINGS, REDUCING NO. WC-400R, C X C

PART #	SIZE NOMINAL	SIZE O.D.
PANI#		
	1 2	1 2
W1002		3/16 x 1/8
W1005		1/4 x 1/8
W1010		3/8 x 5/16
W1019	3/8 x 1/4	1/2 x 3/8
W1021	x 1/8	x 1/4
W1023	1/2 x 3/8	5/8 x 1/2
W1025	x 1/4	x 3/8
W1029	5/8 x 1/2	3/4 x 5/8
W1030	x 3/8	x 1/2
W1031	x 1/4	x 3/8
W1035	3/4 x 5/8	7/8 x 3/4
W1036	x 1/2	x 5/8
W1037	x 3/8	x 1/2
W1038	x 1/4	x 3/8
W1049	1 x 3/4	1-1/8 x 7/8
W1050	1 x 5/8	1-1/8 x 3/4
W1051	x 1/2	x 5/8
W1052	x 3/8	x 1/2
W1056	1-1/4 x 1	1-3/8 x 1-1/8
W1058	x 3/4	x 7/8
W1060	x 1/2	x 5/8
W1064	1-1/2 x 1-1/4	1-5/8 x 1-3/8
W1065	x 1	x 1-1/8
W1067	x 3/4	x 7/8
W1073	2 x 1-1/2	2-1/8 x 1-5/8
W1074	x 1-1/4	x 1-3/8
W1075	x 1	x 1-1/8
W1079	x 1/2	x 5/8
W1083	2-1/2 x 2	2-5/8 x 2-1/8
W1084	x 1-1/2	x 1-5/8
W1093	3 x 2-1/2	3-1/8 x 2-5/8



COUPLINGS, UNION

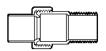
NO. WC-407, C x C

PART #	SIZE NOMINAL	SIZE O.D.
W8003	1/2"	5/8"
W8004	3/4"	7/8"
W8005	1"	1-1/8"
A11205*	1-1/4"	1-3/8"
A11206*	1-1/2"	1-5/8"
A11207*	2"	2-1/8"



COUPLINGS, UNION NO. C-108, C x MPT

PART #	SIZE NOMINAL	SIZE O.D.		
A11211*	3/4 x 3/4"	7/8 x 3/4"		



^{*}Cast Bronze

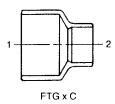
BUSHINGS

BUSHINGS, EXTENDED

NO. WC-403, FTG x C

PART #	SIZE NOMINAL 1 2	SIZE O.D. 1 2
W1306	1/4 x 1/8	3/8 x 1/4
W1312	3/8 x 1/4	1/2 x 3/8
W1314	3/8 x 1/8	1/2 x 1/4
W1315	1/2 x 3/8	5/8 x 1/2
W1317	1/2 x 1/4	5/8 x 3/8
W1320	5/8 x 1/2	3/4 x 5/8
W1321	5/8 x 3/8	3/4 x 1/2
W1325	3/4 x 5/8	7/8 x 3/4
W1326	3/4 x 1/2	7/8 x 5/8
W1327	3/4 x 3/8	7/8 x 1/2
W1337	1 x 3/4	1-1/8 x 7/8

PART #	SIZE NOMINAL	SIZE O.D.
	1 2	1 2
W1338	1 x 5/8	1-1/8 x 3/4
W1339	1 x 1/2	1-1/8 x 5/8
W1343	1-1/4 x 1	1-3/8 x 1-1/8
W1345	1-1/4 x 3/4	1-3/8 x 7/8
W1350	1-1/2 x 1-1/4	1-5/8 x 1-3/8
W1351	1-1/2 x 1	1-5/8 x 1-1/8
W1358	2 x 1-1/2	2-1/8 x 1-5/8
W1359	2 x 1-1/4	2-1/8 x 1-3/8



BUSHINGS, FLUSH

NO. WC-106, FTG x C

PART #	SIZE NOMINAL	SIZE O.D.
	1 2	1 2
W1706	1/4 x 1/8	3/8 x 1/4
W1712	3/8 x 1/4	1/2 x 3/8
W1714	x 1/8	x 1/4
W1715	1/2 x 3/8	5/8 x 1/2
W1717	x 1/4	x 3/8
W1720	5/8 x 1/2	3/4 x 5/8
W1721	x 3/8	x 1/2
W1725	3/4 x 5/8	7/8 x 3/4
W1726	x 1/2	x 5/8
W1727	x 3/8	x 1/2

PART #	SIZE NOMINAL	SIZE O.D.
	1 2	1 2
W1737	1 x 3/4	1-1/8 x 7/8
W1738	x 5/8	x 3/4
W1739	x 1/2	x 5/8
W1743	1-1/4 x 1	1-3/8 x 1-1/8
W1745	x 3/4	x 7/8
W1751	1-1/2 x 1	1-5/8 x 1-1/8
W1758	2 x 1-1/2	2-1/8 x 1-5/8
W1759	x 1-1/4	x 1-3/8



CAPS

CAPS, NO. WC-415, C

PART #	SIZE NOMINAL	SIZE O.D.
W7002	1/8"	1/4"
W7004	1/4"	3/8"
W7006	3/8"	1/2"
W7007	1/2"	5/8"
W7008	5/8"	3/4"
W7009	3/4"	7/8"

PART #	SIZE NOMINAL	SIZE O.D.
W7011	1"	1-1/8"
W7012	1-1/4"	1-3/8"
W7013	1-1/2"	1-5/8"
W7014	2"	2-1/8"
W7015	2-1/2"	2-5/8"



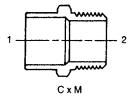


ADAPTORS

ADAPTORS, NO. WC-401, C x M

PART #	SIZE NOMINAL	SIZE O.D.
	1 2	1 2
W1106	1/8 x 1/4	1/4 x 1/4
W1110	_	5/16 x 1/4
W1114	1/4 x 3/8	3/8 x 3/8
W1115	x 1/4	x 1/4
W1124	3/8 x 1/2	1/2 x 1/2
W1125	x 3/8	x 3/8
W1126	x 1/4	x 1/4
W1129	1/2 x 1	5/8 x 1
W1130	x 3/4	x 3/4
W1131	x 1/2	x 1/2
W1132	x 3/8	x 3/8
W1139	5/8 x 1/2	3/4 x 1/2
W1145	3/4 x 1	7/8 x 1
W1146	x 3/4	x 3/4

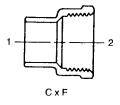
PART #	SIZE NOMINAL	SIZE O.D.
	1 2	1 2
W1147	3/4 x 1/2	7/8 x 1/2
W1162	1 x 1-1/4	1-1/8 x 1-1/4
W1163	x 1	x 1
W1164	x 3/4	x 3/4
W1165	x 1/2	x 1/2
W1170	1-1/4 x 1-1/2	1-3/8 x 1-1/2
W1171	x 1-1/4	x 1-1/4
W1172	x 1	x 1
W1179	1-1/2 x 1-1/2	1-5/8 x 1-1/2
W1180	x 1-1/4	x 1-1/4
W1187	2 x 2	2-1/8 x 2
W1188	x 1-1/2	x 1-1/2
W1196	2-1/2 x 2-1/2	2-5/8 x 2-1/2
W1199	3 x 3	3-1/8 x 3



ADAPTORS, NO. WC-402, C x FPT

PART #	SIZE NOMINAL	SIZE O.D.
	1 2	1 2
W1205	1/8 x 3/4	1/4 x 3/8
W1206	x 1/4	x 1/4
W1214	1/4 x 3/8	3/8 x 3/8
W1215	x 1/4	x 1/4
W1223	3/8 x 3/4	1/2 x 3/4
W1224	x 1/2	x 1/2
W1225	x 3/8	x 3/8
W1230	1/2 x 3/4	5/8 x 3/4
W1231	x 1/2	x 1/2
W1232	x 3/8	x 3/8
W1233	x 1/4	x 1/4
W1238	5/8 x 3/4	3/4 x 3/4
W1239	x 1/2	x 1/2
W1245	3/4 x 1	7/8 x 1

PART #	SIZE NOMINAL	SIZE O.D.
	1 2	1 2
W1246	3/4 x 3/4	7/8 x 3/4
W1247	x 1/2	x 1/2
W1263	1 x 1	1-1/8 x 1
W1264	x 3/4	x 3/4
W1265	x 1/2	x 1/2
W1270	1-1/4 x 1-1/2	1-3/8 x 1-1/2
W1271	x 1-1/4	x 1-1/4
W1272	x 1	x 1
W1278	1-1/2 x 2	1-5/8 x 2
W1279	x 1-1/2	x 1-1/2
W1287	2 x 2	2-1/8 x 2
W1296	2-1/2 x 2-1/2	2-5/8 x 2-1/2

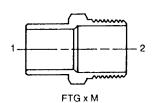


ADAPTORS

NO. WC-404, FTG x M

PART #	SIZE NOMINAL	SIZE O.D.
	1 2	1 2
W1425	3/8 x 3/8	1/2 x 3/8
W1431	1/2 x 1/2	5/8 x 1/2
W1432	x 3/8	x 3/8
W1446	3/4 x 3/4	7/8 x 3/4

PART #	SIZE NOMINAL	SIZE O.D.
	1 2	1 2
W1447	3/4 x 1/2	7/8 x 1/2
W1463	1 x 1	1-1/8 x 1
W1464	x 3/4	x 3/4
W1471	1-1/4 x 1-1/4	1-3/8 x 1-1/4





ADAPTORS

FITTING WC-405, FTG x FPT



PART # *	SIZE NOMINAL	SIZE O.D.
W1514	1/4 x 3/8	3/8 x 3/8
W1525	3/8 x 3/8	1/2 x 3/8
W1531	1/2 x 1/2	5/8 x 1/2
W1532	x 3/8	x 3/8
W1546	3/4 x 3/4	7/8 x 3/4
W1547	x 1/2	x 1/2
W1563	1 x 1	1-1/8 x 1
W1571	1-1/4 x 1-1/4	1-3/8 x 1-1/4
W1579	1-1/2 x 1-1/2	1-5/8 x 1-1/2
W1587	2 x 2	2-1/8 x 2

ADAPTORS

UNION





PART # *	SIZE NOMINAL	SIZE O.D.
A11422	1/2"	5/8"
A11423	3/4"	7/8"
A11424	1"	1-1/8"
A11425	1-1/4"	1-3/8"
A11426	1-1/2"	1-5/8"

^{*}CAST BRONZE

ELBOWS

REDUCING ELBOW - 90°,

E-202, C x FPT

PART # *	SIZE NOMINAL	SIZE O.D.
A2641	1-1/4 x 1-1/2	1-3/8 x 1-5/8



HIGH EAR ELBOW - 90°,

E-211HE, C x FPT

PART # *	SIZE NOMINAL	SIZE O.D.
A3038	1/2"	5/8"

^{*}CAST BRONZE

TEES

TEE, REDUCING T-302, C X C x FPT



PART # *	SIZE NOMINAL	SIZE O.D.
A1512	1/2 x 1/2 x 1/2	5/8 x 5/8 x 1/2
A1538	3/4 x 3/4 x 3/4	7/8 x 7/8 x 3/4
A1539	x 1/2	x 1/2
A2655	1-1/4 x 1-1/4 x 1	1-3/8 x 1-3/8 x 1
A1644	1-1/2 x 1-1/2 x 1-1/2	1-5/8 x 1-5/8 x 1-1/2
A3663	x 1-1/4	x 1-1/4
A2688	x 1	x 1
A2673	x 3/4	x 3/4
A2703	2 x 2 x 1	2-1/8 x 2-1/8 x 1
A2706	x 3/4	x 3/4

^{*}CAST BRONZE



TEE

T-303, C x FPT x C

		SIZE					SIZE O.D.		
3/4	х	3/4	х	3/4	7/8	Х	3/4	х	7/8

^{*}CAST BRONZE

PART # *

A1548



CxFxC

TEE, BASEBOARD

NO. T-301, C x FPT x C

PART # *			SIZE				SIZE O.D.	=
A7750	1/2	Х	1/8	Х	1/2	5/8 x	1/8	x 5/8
A7751	3/4	Х	1/8	Х	3/4	7/8 x	1/8	7/8
A7754	1	Х	1/8	х	1	1-1/8 x	1/8	x 1-1/8
A7775	1-1/4	Х	1/8	X	1-1/4	1-3/8 x	1/8	x 1-3/8

^{*}CAST BRONZE

^{*}CAST BRONZE

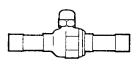


COMPRESSOR VALVES

BALL VALVES

COMPATIBLE WITH REFRIGERANTS R-11, R-12, R-22, R-500, R-502.

PART #	SIZE O.D.
904203	3/8"
904203	1/2"
904205	5/8"
904307	7/8"
905409	1-1/8"
904511	1-3/8"
905613	1-5/8"
905717	2-1/8"



PACKLESS LINE VALVES FLARE TO FLARE, TYPE I, CLASS IV

	SIZE
PART #	O.D.
A14833	1/4"
A14835	3/8"
A14836	1/2"
A14837	5/8"



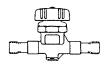
SOLDER TO SOLDER, TYPE I, CLASS II

PART #	SIZE O.D.
A14842	5/8"



EXTENDED END, TYPE I, CLASS II

PART #	SIZE O.D.
A14848	1/4"
A14850	3/8"



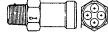
PRESSURE RELIEF VALVES

MPT INLET TO FLARE

PART # - PSI	INLET	OUTLET
5230-350	1/4"	3/8"
5230-425		
5231-235		
5231-350	3/8"	3/8"
5231-425		
5232-350	1/2"	5/8"
5232-425		



ATMOSPHERIC - MPT INLET



PART # - PSI	INLET	OUTLET
HE 5221-425	1/4"	N/A

VIBRATION ABSORBERS SWEAT CONNECTION





PART #	SIZE / ID	SIZE / OD	MAX. PSI
F14	1/8"	1/4"	800
F38	1/4"	3/8"	800
F12	3/8"	1/2"	600
F58	1/2"	5/8"	500
F34	5/8"	3/4"	430
F78	3/4"	7/8"	370
F118	1"	1-1/8"	250
F138	1-1/4"	1-3/8"	200
F158	1-1/2"	1-5/8"	190
F218	2"	2-1/8"	170





NITROGENIZED® ACR COPPER TUBE 20 FT. LENGTHS

PART #	SIZE O.D.	WALL THICKNESS
3/8ACR	3/8"	.030
1/2ACR	1/2"	.035
5/8ACR	5/8"	.040
3/4ACR	3/4"	.042
7/8ACR	7/8"	.045
1-1/8ACR	1-1/8"	.050
1-3/8ACR	1-3/8"	.055
1-5/8ACR	1-5/8"	.060
2-1/8ACR	2-1/8	.070
2-5/8ACR	2-5/8"	.080

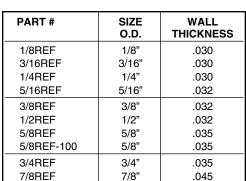
TYPE L 20 FT. LENGTHS

PART #	SIZE O.D.	SIZE NOMINAL	WALL THICKNESS
3/8L	1/2"	3/8"	.035
1/2L	5/8"	1/2"	.040
3/4L	7/8"	3/4"	.045
1L	1-1/8"	1"	.050
1-1/4L	1-3/8"	1-1/4"	.055
1-1/2L	1-5/8"	1-1/2"	.060
2L	2-1/8"	2"	.070
2-1/2L	2-5/8"	2-1/2"	.080

TYPE M 20 FT. LENGTHS

PART #	SIZE O.D.	SIZE NOMINAL	WALL THICKNESS
3/8M	1/2"	3/8"	.025
1/2M	5/8"	1/2"	.028
3/4M	7/8"	3/4"	.032
1M	1-1/8"	1"	.035
1-1/4M	1-3/8"	1-1/4"	.042
1-1/2M	1-5/8"	1-1/2"	.049
2M	2-1/8"	2"	.058
3M	3-1/8"	3"	.072
4M	4-1/8"	4"	.095

REFRIGERATION SERVICE TUBE 50 FT. COILS



1-1/8"



LINE SETS

1-1/8REF

PART #	LIQUID LINE	SUCTION LINE	INSULATION	LENGTH
610-25	3/8	5/8	3/8	25'
610-35	3/8	5/8	3/8	35'
610-50	3/8	5/8	3/8	50'
612-25	3/8	3/4	3/8	25'
612-35	3/8	3/4	3/8	35'
612-50	3/8	3/4	3/8	50'
614-25	3/8	7/8	3/8	25'
614-35	3/8	7/8	3/8	35'
614-50	3/8	7/8	3/8	50'

.050

COPPER TUBE INSULATION

6' LENGTH, 3/8" WALL

PART #	SIZE
38	3/8"
12XX	1/2"
58	5/8"
34	3/4"
78	7/8"
118	1-1/8"

PART#	SIZE
138	1-3/8"
158	1-5/8"
218	2-1/8"
258	2-5/8"
318X	3-1/8"



INSULATED SHEET

CONTINUOUS ROLLS

PART #	SIZE / IN.	THICKNESS
3648-34	36 x 48	3/4"
3648-1	36 x 48	1"

FLARED BRASS TUBE FITTINGS

FLARE NUT - OIL

PART #	TUBE - OD
41C	1/4
41 F	1/2
41 H	5/8



FORGED FLARE NUT - REFRIG.

PART #	TUBE - OD
NS4C	1/4
NS4D	5/16
NS4E	3/8
NS4F	1/2
NS4FE	1/2 x 3/8
NS4H	5/8
NS4J	3/4
NS4M	7/8



SWIVEL FORGED NUT CONNECTOR

PART #	TUBE - OD
US4C	1/4 x 1/4
US4D	5/16 x 5/16
US4E	3/8 x 3/8
US4H	5/8 x 5/8
US4J	3/4 x 3/4



UNIONS

PART #	TUBE - OD
42C	1/4 x 1/4
42D	5/16 x 5/16
42E	3/8 x 3/8
G42EC	3/8 x 1/4
42H	5/8 x 5/8
42J	3/4 x 3/4
42M	7/8 x 7/8



FEMALE CONNECTOR

PART #	TUBE - OD
46C	1/4 x 1/8
46CF	1/4 x 1/2



MALE CONNECTOR (FL x MPT)

PART #	TUBE - OD
48C	1/4 x 1/8
48CC	1/4 x 1/4
48CE	1/4 x 3/8
48E	3/8 x 1/8
48EE	3/8 x 1/4
48EEE	3/8 x 3/8
48EF	3/8 x 1/2
48F	1/2 x 3/8
48FF	1/2 x 1/2
48H	5/8 x 1/2
48J	3/4 x 1/2
48JJ	3/4 x 3/4
48MJ	7/8 x 3/4



MALE ELBOW

PART #	TUBE - OD x MPT
49C	1/4 x 1/8
49CC	1/4 x 1/4
49CE	1/4 x 3/8
49DE	5/16 x 3/8
49EE	3/8 x 1/4
49EEE	3/8 x 3/8
49EF	3/8 x 1/2
49F	1/2 x 3/8
49FF	1/2 X 1/2
49H	5/8 X 1/2
49HJ	5/8 x 3/4
49J	3/4 x 1/2



FLARE PLUG

PART #	TUBE - OD
P2D	5/16
P2H	5/8
P2J	3/4



FLARE UNION ELBOW

PART #	TUBE - OD
55C	1/4
55E	3/8



FLARED BRASS TUBE FITTINGS

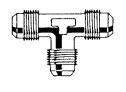
SOLDER CONNECTOR FLARE x SOLDER TUBE

PART #	TUBE - OD
US3-CC	1/4 x 1/4
US3FF	1/2 x 1/2



FLARE TEE

PART #	TUBE - OD
44C	1/4
44D	5/16
44E	3/8
44F	1/2
44H	5/8
44 J	3/4
	1



DRUM CONNECTOR

PART #	TUBE - OD x MPT
K1-1	1/4 x 3/4
K1-8	1/4 x 1/2



GASKET

PART #	TUBE - OD
K1-F	1/2
K1J	3/4



ELBOW TUBE x FEMALE THREAD

PART #	SIZE
E4C	1/4 x 1/4
E4E	3/8 x 3/8
E4F	1/2 x 1/2



GASKET 45° COPPER FLARE

PART #	TUBE - OD
B2B	3/16
B2E	3/8
B2F	1/2
B2H	3/4



REDUCING FLARE UNION

PART #	TUBE - OD
G42EC	3/8 x 1/4
UR2-84	1/2 x 1/4
UR2-86	1/2 x 3/8
UR2-106	5/8 x 3/8



FEMALE FLARE CONNECTOR

PART #	TUBE - OD x FPT
46C	1/4 x 1/8
U3-4B	1/4 x 1/4
46CF	1/4 x 3/8
U3-4D	1/4 x 1/2
U3-6A	3/8 x 1/8
U3-6C	3/8 x 3/8
U3-6D	3/8 x 1/2
U3-8B	1/2 x 1/4
U3-8C	1/2 x 3/8
U3-8D	1/2 x 1/2
U3-8E	1/2 x 3/4
U3-10C	5/8 x 3/8
U3-10D	5/8 x 1/2
U3-10E	5/8 x 3/4
	1



REDUCING FLARE FITTING FEMALE x MALE

PART #	SIZE
UR3-44	1/4 x 1/4
UR3-45	1/4 x 5/16
UR3-46	1/4 x 3/8
UR3-48	1/4 x 1/2
UR3-54	5/16 x 1/4
UR3-68	3/4 x 1/2
UR3-86	1/2 x 3/8
UR3-810	1/2 x 5/8
UR3-106	5/8 x 3/8
UR3-108	5/8 x 1/2



BRASS COMPRESSION FITTINGS

SLEEVE

PART #	TUBE - OD
60C	1/4
60D	5/16
60E	3/8
60F*	1/2
60H*	5/8
60M	7/8



STANDARD NUT

TUBE - OD
1/4
5/16
3/8
1/2
5/8
3/4



UNION

PART #	TUBE - OD
62A	1/8
62B	3/16
62C	1/4
62D	5/16
62E	3/8
62F*	1/2
62H*	5/8
62M	7/8



*HEAVY

REDUCING UNION

PART #	SIZE
62REC	3/8 x 1/4
62RFE	1/2 x 3/8
62RHF	5/8 x 1/2



PILOT LINE CONTROL NUT FOR THERMOSTATS

PART #	TUBE - OD
81 LC	1/4



MALE CONNECTOR

PART #	TUBE - OD x MPT
68A	1/8 x 1/8
68C	1/4 x 1/8
68CC	1/4 x 1/4
68E	3/8 x 1/8
68EE	3/8 x 1/4
68EEE	3/8 x 3/8
68EJ	3/8 x 3/4
68F*	1/2 x 3/8
68FF*	1/2 x 1/2
68FJ*	1/2 x 3/4
68H*	5/8 x 1/2
68HJ*	5/8 x 3/4
68JJ	3/4 x 3/4
68J	3/4 x 1/2
68MF	7/8 x 1/2
68MJ	7/8 x 3/4



FEMALE CONNECTOR

PART #	TUBE - OD x FPT
66EEE	3/8 x 3/8
66F	1/2 x 3/8



MALE ELBOW

PART #	TUBE - OD x FPT
69C	1/4 x 1/8
69CC	1/4 x 1/4
69E	3/8 x 1/8
69EE	3/8 x 1/4
69EEE	3/8 x 3/8
69EF	3/8 x 1/2
69FF*	1/2 x 1/2
69H	5/8 x 1/2
69JJ	3/4 x 3/4



UNION ELBOW

PART #	TUBE - OD
65C	1/4

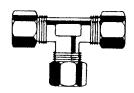


^{*}HEAVY

BRASS COMPRESSION FITTINGS

TEE

PART #	TUBE - OD
64C	1/4
64D	5/16
64E	3/8
64F*	1/2
64H*	5/8
64J	3/4

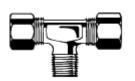


REDUCING TEE

PART #	TUBE - OD
64CCE	1/4 x 1/4 x 3/8

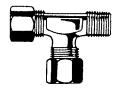
W/MPT

PART #	SIZE
72C	1/4 x 1/4 x 1/8



MALE RUN TEE

PART #	SIZE
71C	1/4 x 1/8 x 1/4



BRASS COMPRESSION TUBE FITTINGS POLYETHYLENE TUBING

PLASTIC SLEEVE

PART #	TUBE - OD
460C	1/4



INSERTS

PART #	TUBE - OD
461C	1/4



BRASS PIPE FITTINGS

SQUARE HEAD PLUG

PART #	MPT
109N	1"



BUSHING HEX HEAD PLUG

M	P.	T	X	F	P	I

PART#	SIZE
110C	1/4 x 1/8
110E	3/8 x 1/8
110EE	3/8 x 1/4
110FA	1/2 x 1/8
110FC	1/2 x 1/4
110J	3/4 x 1/2
110JC	3/4 x 1/4
110JE	3/4 x 3/8



COUPLING

PART #	SIZE / FPT
L103A	1/8
103C	1/4



CLOSE NIPPLES

PART #	SIZE / MPT
112A	1/8"



^{*}HEAVY

BRASS PIPE FITTINGS

PIPE NIPPLE

1/8" DIA.

PART #	LENGTH
117A1-1/2	1-1/2"
117A3	3"



1/4" DIA.

PART #	LENGTH
117C1-1/2 117C2	1-1/2"
117C2-1/2	2-1/2"
117C3	3"



REDUCING ADAPTOR

FPT x MPT

PART #	SIZE
120RFE	1/2 x 3/8



90° STREET ELBOW

FPT x MPT

PART #	SIZE
116SA-97	1/8"
116SE-30	3/8"



90° ELBOW

PART #	SIZE / FPT
100A	1/8"
100C	1/4"



TEE

PART #	SIZE / FPT
101CX	1/4"



FPT x MPT x FPT

PART #	SIZE
127C	1/4"



BRASS GARDEN HOSE FITTINGS

CONNECTOR MALE HOSE x MPT

PART #	SIZE
748JJF	3/4 x 3/4*



CONNECTOR MALE HOSE x FPT

PART #	SIZE
746JJ	3/4"



UNION MALE HOSE

PART #	SIZE
757JJ	3/4"



CAP

FEMALE HOSE

PART #	SIZE
708J	3/4"



SWIVEL UNION FEMALE HOSE

PART #	SIZE
703SJJ	3/4"



EVAPORATIVE COOLER DRAIN W/ LOCKNUT AND GASKET MALE HOSE x FPT

PART #	SIZE
2CDJF	3/4 x 1/2



WASHER

PART #	SIZE
700G	3/4"



^{*}TAPPED UNDER MPT END.

HOSE x MULTI BARB BRASS FITTINGS

HOSE BARB x MALE HOSE

PART #	SIZE
TAA2412	3/4 x 3/8barb
619HJ	3/4 x 5/8barb



HOSE BARB x MPT

PART #	HOSE ID	x	MALE PIPE
220B	3/16	X	
220E	3/8	Х	1/8
220EE	3/8	Х	1/4
220EEE	3/8	Х	3/8



HOSE BARB UNION

PART #	HOSE - ID
222E	3/8"
222F	1/2"



NYLON HOSE BARB FITTINGS

CONNECTOR BARB x MPT

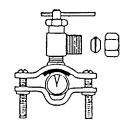
PART #	HOSE ID	х	MALE PIPE
NY220F NY220FF		X X	



BRASS NEEDLE VALVES FOR COMPRESSION TUBING

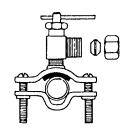
SELF PIERCING NEEDLE VALVE AND SADDLE CLAMP

PART #	TUBE OD	x	MALE PIPE
123KCSP	1/4	х	1/8



NEEDLE VALVE AND SADDLE CLAMP

PART #	TUBE OD	x	MALE PIPE
123KC	1/4	X	1/8



NEEDLE VALVE COMPRESSION TUBE BOTH ENDS

PART #	TUBE - OD
106KC	1/4
106KE	3/8



TANK & VENT VALVES HEAVY SPRING CORE

PART #	TUBE - MPT
1VAH	1/8"





TELE-SPOUT® OILER

Squeeze pressure on the container allows the oil to flow in any direction with the flexible spout.

PART #	DESCRIPTION
D01	4 OZ. BOTTLE WITH TELE-SPOUT



POCKET TESTERS

Just the thing to make that fast electrical circuit check

electrical circuit check.		
PART #	DESCRIPTION	
TE2	HIGH VOLTAGE, 90-250VAC/DC	
TE3	MULTI-VOLTAGE, 110, 220, 277 OR 440VAC/DC	

BRAZE-ON SERVICE VALVES

Copper-To-Copper M-Series

The M-Series is the first and best braze-on, self-piercing copper saddle valve. It is widely used and easily installed on a charged line. After brazing the saddle portion onto line, the steel pin with valve core penetrates the line and is locked into place simply by tightening the cap. Available in sizes ranging from 1/4" to 1-1/8".



PART # CD5514

PART # CD5558

copper saddle for 1/4" line

copper saddle for 5/8" line

PART # CD5516

PART # CD5578

copper saddle for 5/16" line

copper saddle for 7/8" line

FIN COMBS

Straighten and clean evaporator and condenser fins with these tough, durable nylon combs.

PART #	FINS PER INCH
P8	4, 5, 8 AND 10
P9	9 AND 15
P11	11 AND 13
P12	6, 7, 12 AND 14
P17	16 AND 17
P18	18 AND 20



CHARGEFASTER

Chargefaster is a calibrated restrictor device designed to meter liquid refrigerant into the low side of the system.



PART #	DESCRIPTION	
CH300	FOR SYSTEMS 5 TO 10 TONS	

ADJUSTABLE LINE TAP VALVES

Threading wing cap on the depressor pin pierces the line. When the wing cap is removed, the valve closes, the line is pierced and ready for the connection of the charging hose.



PART #	TUBING SIZE O.D.
A1	1/4", 5/16", 3/8"
A2X	1/2", 5/8"

SOLDER TYPE LINE TAP VALVE

This easy to install "solder on" piercing valve has a unique O-ringseal, which prevents blow-by when piercing the line.



PART #	TUBING SIZE O.D.
B1-6S	3/8"
B1-8S	1/2"

PART #	TUBING SIZE O.D.
B1-10S	5/8"
B1-14S	7/8"



QUIK-CAP AND VALVE CORES

Replacement valve cores are available 6 in a plastic tube. The cap is a QCR4 remover.

PART #	DESCRIPTION	
QC4	FOR 1/4" MALE FLARE	
AVC6	6 VALVE CORES IN TUBE WITH QC4R CAP	



ACCESS VALVES

Access valves are permanent access ports and are supplied with built-in valve cores and brass caps. All access valves have 1/4" male flare connections.

PART #	MODEL	SIZE / DESCRIPTION	
AV2456	STEP DOWN	1/8" I.D. HOLE, 3/16, 1/4, 5/16" STEPS	
AV3346		3/16" O.D. TUBE OR 1/4" & 3/8" SOLDER FITTING	
AV34	SOLDER	3/16" O.D. OR 1/4" SOLDER FITTING	
AV46		1/4" O.D. TUBE OR 3/8" SOLDER FITTING	
AVU24	HALF	1/8" MPT OR 1/4" O.D. SOLDER	
AVU45	UNION	1/4" MPT OR 5/16" O.D. SOLDER	
AVU44	UNION	1/4" MALE FLARE x 1/4" FEMALE FLARE	
AVX2		1/8" O.D. EXTENDED END TUBE	
AVX3		3/16" O.D. EXTENDED END TUBE	
AVX4	EXTENDED	1/4" O.D. EXTENDED END TUBE	
AVX5	END	5/16" O.D. EXTENDED END TUBE	
AVX6		3/8" O.D. EXTENDED END TUBE	
AVT4	SOLDER	1/4" O.D. TUBE OR 3/8" SOLDER FITTING x 1/4" SAE	
AVT5	TEE	5/16" O.D. TUBE OR 3/8" SOLDER FITTING X 1/4" SAE	
AVT6		3/8" O.D. TUBE OR 1/2" SOLDER FITTING x 1/4" SAE	
AVT34	UNION TEE	1/8" MPT x 1/4" MALE FLARE ON RUN	
AVS4	SWIVEL NUT	1/4" SAE ACCESS FLARE WITH SWIVEL NUT	
AVS44	UNION TEE	1/4" MALE x SWIVEL NUT ON RUN x 1/4" MALE BRANCH	
AVS64	W/SWIVEL NUT	1/4" MALE RUN x SWIVEL NUT ON BRANCH	
AVW8		1/2" O.D. TUBE WITH 1/4" ACCESS ON BRANCH	
AVW10	WROUGHT	5/8" O.D. TUBE WITH 1/4" ACCESS ON BRANCH	
AVW14	TEES	7/8" O.D. TUBE WITH 1/4" ACCESS ON BRANCH	



PRESSURE CONTROLS

High and low pressure controls.

PART #	KLIXON #	OPEN	CLOSE
PSLP10-25	20P003FA025E010E	10 PSI	25 PSI
PSLP25-80	20P003FA080E025E	25 PSI	80 PSI
PSLP40-80	20P003FA080E040E	40 PSI	80 PSI
PSHP350-250	20P003FB350K250K	350 PSI	250 PSI
PSHP400-200	20P003FB400K200K	400 PSI	200 PSI
PSHP400-200	20P003FB450K250K	450 PSI	250 PSI





AIR CONDITIONING ACCESSORIES

BULLET® PIERCING VALVES

Has a metal to metal seat that creates a permanent, leakproof seal that will withstand any pressure and temperature for the life of the

PART #	OD TUBE SIZE
BPV31*	1/4", 5/16", 3/8"
BPV21*	1/2", 5/8"
BPV58	5/8"
BPV34	3/4"
BPV78	7/8"

^{*} Adaptor sleeves furnished for multiple applications.

TD60 SERIES DELAY ON MAKE TIMERS APPLICATION

- . ON. Delay On Make
- . Multi Purpose .Delay on Make. timing.
- . Protects Air-conditioning, Refrigeration and Heat pumps from damage which
- may be caused by short cycling of compressor. . For compressor staging and stagger starting
- multiple units.
- . Helps to reduce power surges in multiple compressor applications.

١	PART #	DELAY	CONNECTIONS
	TD69	6 Sec - 8 Min	1/4" Stake - Ons

SOLID STATE POWER PAKS

SUPER BOOST

Increases starting torque up to 500%

PART #	VOLTAGE	INCREASED TORQUE
856	115-280	390 OUNCE INCHES



SUPER BOOST STARTER

Increases starting torque up to 600%

PART #	ART # VOLTAGE INCREASED TORQU	
SPP7S	120-230	450 OUNCE INCHES

Increases starting torque up to 690%

PART #	VOLTAGE	INCREASED TORQUE
SPP8E	120-230	520 OUNCE INCHES





Electric Element Re-String Kits

Designed to permit field repairs of damaged element sections of electric heaters.

Coil stretches to fit many applications. Contains 2 ceramic terminal insulator sets, plated bolts, nuts, washers and element.

PART #	DESCRIPTION
DH507	3kw @ 240v
DH506	4kw @ 240v
DH500	5kw @ 240v



TD73 SERIES DELAY ON BREAK TIMERS APPLICATION

- . OFF. Delay On Break
- . Multi Purpose .Delay on Make. timing.
- . Protects Air-conditioning, Refrigeration and Heat pumps from damage which
- may be caused by short cycling of compressor.
- For compressor staging and stagger starting multiple units.
- . Helps to reduce power surges in multiple compressor applications.

PART #	DELAY	CONNECTIONS
TD73	6 Sec - 5 Min	1/4" Stake - Ons
TD73W	6 Sec - 8 Min	Wire Leads & stake-ons

SIGHT GLASSES

PROVIDES A QUICK AND EASY INDICATION OF REFRIGERANT IN THE TUBE, AS WELL AS THE PRESENCE OF MOISTURE.

MALE/FEMALE FLARE

PART #	SIZE / IN.	LENGTH
SG115R*	3/8 x 3/8	3-1/4"
SG206R	1/2 x 1/2	3-11/16"

MALE/MALE FLARE

PART #	SIZE / IN.	LENGTH
SG110R*	1/4 x 1/4	3-1/8"
SG111R*	3/8 x 3/8	3-3/8"

SOLDER TYPE

PART #	SIZE / IN.	LENGTH
SG118R*	1/4 x 1/4	7-1/4"
SG119R*	3/8 x 3/8	7-3/4"

^{*} UL LISTED.





YELLOW JACKET® Charging Systems

YELLOW JACKET SERIES 41-45 MANIFOLDS

Bold easy-to-read gauges. Large bold numbers and colored scales are easy to read. Removable Lexan® crystals resist breakage. Standard gauge cases are color-coded red and blue. Brass and chrome are also available.

Pretested. Every manifold is individually pressure tested for reliability before shipping.

Limited Lifetime Warranty on manifold with valves. See manifold instructions for details.

Yellow Jacket Hoses. Most manifolds include color-coded Yellow Jacket charging hoses with 500 psi working pressure and all the other performance features you've come to expect. *Plus II* construction, different colors, lengths and fittings are available.

Sliding double "O" ring pistons. Non-rotating design reduces wear. Only 1-1/2 turns give you full flow. Long-life nylon seat is also for vacuum and 34a, R-404A, R-507, R-504A, etc.

SERIES 41-45 MANIFOLDS - Temperature Scales R-12, R-22 and R-502 with red and blue °F* gauges

R-22 Description R-410 R-502	Gauge Scales	Part # No Hose	Part# w/ Hoses
Basic unit: manifold,	R-12, R-22,		
gauges, hook and anchors	R-502	42001	41215

°F (FAHRENHEIT) PRESSURE & COMPOUND GAUGES - PSI



All Yellow Jacket gauges feature bold high-visibility dials with colored temperature scales for easy reading. And with Flutterless™ technology, surge protector minimizes the needle pulsation for improved accuracy.

Manifold dials feature R-12, R-502 and R-22 scales. New HFC refrigerant gauges for R-134a, R-507 and R-404A are available. Compound gauges feature over pressure protection to 350 pounds. 1/8" MPT lower mount fitting. Solid brass and chrome-plated brass gauges provide additional features:



- Heavy duty phosphor bronze and stainless steel internal components for precision reading and longer life under severe use.
- Improved pulsation suppression.

UPC#	Fig.	Description	
CFC & HCFC R-12, R-502, R-22			
49101	1	Red pressure 0-500° F	
49102	2	Blue pressure 30-0-120 °F	
49011	1	Brass pressure 0-500 °F	
R-410A			
49035	1	0-800 PSI	

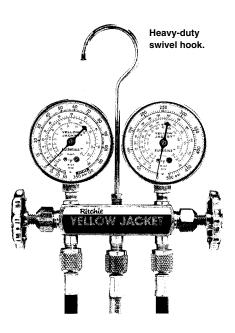
°F (FAHRENHEIT) BRUTE 4-VALVE SERIES with 1/2" or 3/8" vacuum ports



Large 3-1/8" liquid filled gauges available on some models. Larger, easier to read dials.

Other models available with red or blue gauges or the premium movement brass gauges. Both feature color coded protective boots.

UPC#	Vacuum Port	Hi&Lo Charge Ports	Gauge Type	Gauge Scales	Description
47312	3/8"	1/4"	R&B	R-410A	Manifold Only
46020	3/8"	1/4"	R&B	R-12,R-502,R-22	4V Manifold Only
46212	3/8"	1/4"	R&B	R-12,R-502,R-22	2V Manifold Only



YELLOW JACKET SLING PSYCHROMETER



Slim, compact tool easily checks humidity. One piece unit with self-contained housing fits into your pocket.

· Calibrated and easy-to-read.

UPC#	Description
69010	Sling psychrometer
69011	Replacement wicks (5 pack)
69015	Replacement thermometer

9" Flexflow™ and Low Loss Adapter Hose



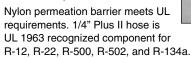
UPC #	Description
26002	3/8" Heavy Duty



YELLOW JACKET® Charging Hoses

Plus II[™] 1/4" CHARGING HOSES with double barrier protection

YELLOW JACKET® Plus II Hoses have proven performance benefits of the original line, plus double barrier protection for CFC, HCFC and HFC (R-404A, R-134a, R-507, R-407C, R-410A, etc.).



Moisture barrier provides improved resistance to moisture migration which contaminates expensive refrigerant.

Other features include 4000 psi minimum burst and 800 psi maximum working pressure for a 5 to 1 safety factor.

Standard 1/4" fitting or 45° with SealRight fitting at one end.

Operating temperature -20° to 180°F.

UPC #	Description
21986	Y/B/R 3-Pak

PLUS II HOSE with SealRight™ low loss anti-blow back fitting

Low loss anti-blowback SealRight fitting immediately traps refrigerant in the hose when disconnected, helping meet non-venting regulations and prevent finger burns. 45° end for ease in tight areas. Gaskets resist deterioration from existing CFC's, plus new HFC refrigerants and oils. Available with SealRight fittings on both ends. New ball valve hose recommended for R-410A.



UPC#	Description
22983	36" Y/B/R 3-Pak
22985	60" Y/B/R 3-Pak
22986	70" Y/B/R 3-Pak

UPC #	Description
22060	1 - 60" Yellow Hose
22260	1 - 60" Blue Hose
22660	1 - 60" Red Hose

MAX-FLOW™ DELUXE OIL PUMP

Improved for added reliability and a more powerful stroke, the Max-Flow deluxe oil pump is a high capacity unit for quick charging. Pumps 3.8 ounces or 112.38 ml per stroke. Other features:

- Remove oil for recovery and conversion.
- Add oil to existing systems.
- Operating unit in reverse with adapter hose accessory removes oil from equipment quickly and efficiently.
- Will pump against 250 psi pressure.

UPC #	Description	
77930	Max-Flow Deluxe oil pump	
77922	24" suction hose –	
	1/4" fitting one end only	



HEAVY DUTY PLUS II 1/2" and 5/8" COMBINATION CHARGING / HI-VACUUM HOSE

Heavy-use construction with a *Plus II* barrier that reduces permeation and vacuum loss. Features:

- 500 psi working pressure; 2000 psi burst. 1/2" and 5/8" assemblies.
- Various fittings available on request.

1/4" access valve connection standard on one end CA and DA hoses.



L	"C" 1/2" fl. x 1/2" fl.	
60"	#15860 C-60"	

HEAVY DUTY PLUS II 3/8" CHARGING / HI-VACUUM HOSE

Pull a vacuum much faster with heavy-duty 3/8" hose than with a 1/4" hose. 3/8" provides freer flow.

- Permeation resistant Plus II
 barrier
- Working pressure 500 psi; 2000 psi burst.

1	1	
	1	A

L	3/8" fl. sir. x 3/8" fl. str.	
72"	# 15672 BC-72"	

GAS PRESSURE TEST KIT

Easier to use than a manometer, this compact kit helps you accurately set manifold pressure for natural or L.P. gas.

UPC #	Capacity
78060	0- 35" WC



WATER-TYPE MANOMETER

Economical plastic tube manometer helps you set manifold pressure for natural or L.P. gas. Now goes to -2" W.C. for newer systems. Strong magnet on manometer holds it in convenient upright position. Includes tubing with fitting.

UPC#	Description	
78075	-2" - 15" Scale	





YELLOW JACKET® SUPEREVAC™ Systems YELLOW JACKET 4, 6, SUPEREVAC PUMPS

All the new design features build on the performance-proven quality features the industry already expects from the Yellow Jacket line:

- High efficiency. CFM rated as "free air displacement." 15 micron field rating. The lower the micron number - the better the pump.
- Vacuum indicator gauge at the pump intake fitting shows evacuation progress down to the green 29" to 30" range, so you'll know when to turn on electronic gauge for more precise readings.
- Heavy duty high torque motor assures cold weather starting.
- Gas ballast speeds evacuation and keeps oil cleaner.
- Low operating temperature to improve efficiency and vacuum.

- Large oil reservoir to help reduce operating temperature and better dilute corrosive contaminants.
- Two stage rotary vane design (at right) increases efficiency and speeds pump down to 15 microns.



YELLOW JACKET SUPEREVAC™ PUMPS SPECIFICATIONS

DOMESTIC	Model 93600
Free air displacement	7.0 CFM
Number of stages	2 stage rotary vane
Field blankoff	15 microns
Intake	1/4" x 1/4" x 3/8"
Motor 1725rpm	1/2hp -
Internal capacitor thermal overload	Temperature rise 40° C
Voltage (single phase)	115 Volt-60 cycle
Power cord	6' - motor mounted switch
Oil capacity	28 ounces
Dimensions	16.25" L x 6" x 11.5" H
Net weight	30.8 lbs. (14 kg)

MICRO LED UV LEAK DETECTION KITS

Use these high visibility lamps to spot leaks on all A/C systems. Individual reflectors surround each of five LEDs recessed for protection in the stainless steel head. 69790 features 3 UV and 2 blue bulbs A/C for detection at greater distances. For greatest contrast with all fluorescent dyes, use P/N 69721 with 5 UV bulbs.

- 110,000+ hour LEDs.
- Constant ON or momentary ON switch.
- · Sealing locks out moisture.
- · Long life lithium battery included.
- · Aircraft aluminum body.
- · Limited lifetime warranty.



#69789

FLARING/CUTTING KITS



Tool designed to flare on the larger sized tubing - up to 1-1/8". Flaring bars are hardened and grip tubing securely. Yoke slips over flaring bar and locks in place. Long handle and precision threaded feed screw ensure easy flaring.

UPC #	Capacity
60240	1/8" - 3/4"

LARGE SIZE 45° FLARING TOOLS 3/4" to 1-1/8" O.D.



Tool designed to flare on the larger sized tubing - up to 1-1/8". Flaring bars are hardened and grip tubing securely. Yoke slips over flaring bar and locks in place. Long handle and precision threaded feed screw ensure easy flaring.

UPC #	Capacity
60290	3/4" - 1-1/8"

PUNCH-TYPE SWAGING TOOL



5/8" to 7/8"

1/4" to 1/2

Durable heat-treated and plated alloy steel tool expands one end of copper tubing for connecting same size tubes

UPC #	Capacity
60460	3/16" - 5/8"
60464	1/4" OD
60465	5/16" OD
60466	3/8" OD
60467	1/2" OD
60469	3/4" OD
60470	7/8" OD

FULL RANGE HEAVY DUTY TUBE BENDERS for 1/4" to 7/8" radius

Make fast bends on almost every size of AC&R copper, brass, aluminum,

AC&H copper, brass, aluminum, steel and soft stainless steel tubing to 180°.

Line features special hardened wearing surfaces to help maintain accuracy. 60390 is a compact three-in-one bender for 1/4", 5/16" and 3/8" O.D. tubing.

Calibrated markings for bends up to 180° help you duplicate angles.

UPC #	Description
60390	3 in1 bender



REFRIGERATION RECOVERY

REFRIGERANT RECOVERY SYSTEM #95730

Yellow Jacket System R 60a is rated as fast or faster than all competitive units in the ARI directory or UL listings for most CFC, HCFC, and HFC refrigerants including R-410A. Features include all of the following:

- Single valve control for easy changeover from liquid to vapor to purge (patent pending)
- Constant Pressure Regulator (CPR) valve regulates refrigerant to the compressor. Eliminates the need for the technician to throttle the suction valve
- Advanced 1/2 hp, 3425 rpm oil-less compressor with precision valves manufactured in an ISO-9001 facility
- Recovers refrigerant and shuts off when unit reaches 13" of vacuum. Unit will automatically restart if system pressure rises
- Indicator signals "recovery complete"
- Quiet running with components nested to reduce vibration and noise. Oil-less compressor is inherently quiet
- Controls and gauges inset for protection and angled for easy access and viewing
- Senses back pressure from tank and shuts off automatically at 517 psi for safety
- Reusable mesh particulate filter inserts into suction port for protection. Simple cleaning eliminates replacement due to clogging
- "On-the-fly" purge with simple turn of a knob to remove residual refrigerant and help prevent cross-contamination
- High efficiency fan keeps air moving across condenser for cool running even in hot weather
- High strength HDPE case for lightweight and rugged use. Rounded corners help protect from nicks and scrrapes
- Single high pressure safety switch
- Includes three-year compressor warranty
- Made in the USA

Specifications:

Capabilities: Vapor, liquid, push/pull

Refrigerants: 12, 22, 134a, 407C, 410A, 500, 502, and other

Class III, IV and V refrigerants

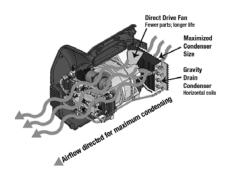
Compressor: ½ hp, twin cylinder, reciprocating, oil-less

Power Source: 115V/60 Hz Amps: 8.0 High Pressure Shut-Off: 517 psi – auto reset Operating Temperature: 40° to 122° F (4° to 50° C) Approvals: Performance tested by UL to ARI 740-98

Weight: 24 Lbs.

Dimensions: 9.0 (w) x 11.5 (h) x 13.5 (d) in. 22.86 (w) x 29.21 (h) x 34.29 (d) cm





High efficiency fan keeps air moving across an oversized condenser for cool running even in high temperature operating conditions.

Built-In High Side Pressure Gauge

- 2-1/2" Liquid-filled pressure gauge shows discharge pressure during recovery and internal pressure during purge.
- 0 40 bar; 0 600 psi helps you monitor recovery.
- Durable and easy to read under any conditions.



Built-In Purge Circuit

- Changeover from liquid to vapor to purge
- No external equipment required
- Simple to use move the hose and turn the selector button





REFRIGERATION PRODUCTS AND ACCESSORIES

SUCTION-LINE FILTER DRIERS

PART#	FITTING TYPE AND SIZE	CU. IN. DESICCANT	FILTER AREA SQ. IN.	O.A. LENGTH	SHELL DIA.
SLD8-3SV	3/8" SWEAT	8	17.25	4.31"	3"
SLD8-4SV	1/2" SWEAT	8	17.25	4.44"	3"
SSD5SC	5/8" SWEAT	8	17.27	4.69"	3"
SSD6SC	3/4" SWEAT	13-1/2	26	5-3/16"	4"
SSD7SC	7/8" SWEAT	13-1/2	26	5-13/16"	4"



REPLACEABLE FILTER CORE DRIER

PART#	CORES	FILTER AREA	REF. FLOW CAP. IN TONS @ 2psi				FITTING CONNECTIONS INCHES	REFRIGERANT 12 & 502 PERM. INST.	REFRIGERANT 22 PERM. INST.
			12	22	500	502			
P487	1		22	29	25	18-1/2	7/8	6	10
P489	1	66	29	38	34	28	1-1/8	8	15
P967	2		38	50	43	33	7/8	6	10
P969	2	132	45	60	52	40	1-1/8	10	20
P9611	2		54	72	61	49	1-3/8	10	20
P1449	3	198	55	72	63	49	1-1/8	15	20
P14411	3		64	85	74	56	1-3/8	20	25



REPLACEABLE CORE DRIER KITS

(SPRING RETAINERS, GASKET, RODS & SCREEN ASSY.)

PART #	SHELL #'S
K4607-01	P485-P4813
K4607-02	P967-P9613
K4067-03	P1449-P14411
K4067-04	P19211-P19213



SIGHT-GLASS MOISTURE INDICATOR

PART#	FITTING SIZE	LENGTH / IN.
LDE-2S	1/4" SWEAT	3.05
PSG2S	1/4" SWEAT	4.88
LDE3	3/8" FLARE	3.05
LDE3S	3/8" SWEAT	4.88
PSG4MF	1/2" M/F FLARE	3.39
LDE4S	1/2" SWEAT	4.88
PSG5S	5/8" SWEAT	3.69
LDE5S	5/8" SWEAT	4.88
LDE7S	7/8" SWEAT	6.25
PSG9S	1-1/8" SWEAT	6.25
PSG10T	REPLACEMENT INDICATOR ELEMENT & "O" RING	





REFRIGERATION PRODUCTS AND ACCESSORIES

LIQUID LINE FILTER DRYERS



• SWEAT

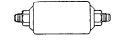
PART #	PIPE OD	LENGTH/ INCHES	DIAMETER/ INCHES
AH052S	1/4"	3-13/16	1-11/16
AH053S	3/8"	3-5/8	2-1/2
AH083S	3/8"	4-1/2	2-1/2
AH084S	1/2"	4-3/8	2-1/2
AH163S	3/8"	5-3/16	2-1/2
AH164S	1/2"	5-1/16	2-1/2
AH165S	5/8"	5-5/16	2-1/2
AH304S	1/2"	8	3
AH305S	5/8"	8	3
AH415S	5/8"	8	3-1/2
AH417S	7/8"	8	3-1/2
AH757S	7/8"	13-3/4	3-1/2
AH759S	1-1/8"	13-3/4	3-1/2

SUCTION LINE ACCUMULATOR*

FOR HEAT PUMP APPLICATIONS

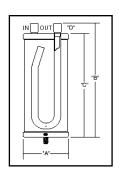
		Dime	Fittings		
Part #	Α	В	С	D	Inlet/Outlet
VA-56-7SRD	5"	13"	3"	1"	7/8"
VA-59-9SRD	5"	14"	3"	1"	1-1/8"

• FLARE



PART #	SAE FLARE	LENGTH/ INCHES	DIAMETER/ INCHES
AH032	1/4	4-1/8	1-11/16
AH052	1/4	4-3/4	2-1/2
AH053	3/8	5-3/16	2-1/2
AH083	3/8	6-1/16	2-1/2
AH162	1/4	6-15/16	2-1/2
AH163	3/8	6-3/4	2-1/2
AH164	1/2	7	2-1/2
AH305	5/8	10-3/16	3





CAPACITIES AND SELECTION RECOMMENDATIONS

Capacities (Ratings at ARI Standard Conditions) Water Capacity in drops Refrigerant flow									Selection Recommendation (Nominal Ratings-tons)										
		_		•								Refrigeration				Air Conditioning			
	Filter	R-		R-2	_	R-5			acity @			nmercial			OEM			d Replace	
Model Number	Area Sq. In.	(15p	pm)	(60 p	om)	(30 p	pm)	pre	essure d	lrop	Ten	ıp. Equip	ment	Self-contained			or	or Field Built-up	
Number	3q. III.	75°F	125°F	75°F	125°F	75°F	125°F	R-12	R-22	R-502	R-12	R-22	R-502	R-12	R-22	R-502	R-12	R-22	R-502
032	10	33.8	30.6	31.0	28.8	29.7	27.0	1.8	2.4	1.6	1/4	1/4	1/4	3/4	1	3/4	1/2	3/4	1/2
032S				•				2.0	2.6	1.7									
052								2.0	2.6	1.7		1/2		1	1-1/2	1	3/4	1	3/4
052S	17	71.5	64.7	65.6	60.8	62.7	57.0	2.1	2.8	1.8	1/3		1/3						
053		-				-		4.2	5.5	3.7		1		2	3	2	1-1/2	2-1/2	1-1/2
053S								5.0	6.6	4.4									
082								2.0	2.6	1.8	1/2	3/4	1/2	1	1-1/2	1	3/4	1-1/2	3/4
082S								2.2	2.9	1.9				_	_	_			
083	27	116.5	105.5	107.0	99.1	102.0	93.0	4.7 5.3	6.2	4.1		2		3	5	3	2	3	2
083S											1		1		7.4/0				
084 084S								7.5	9.8	6.6 6.7		3		4	7-1/2	4	3	5	3
162								2.3	3.1	2.0	1	1-1/2	3/4	1-1/2	2	1-1/2	1	2	1
162S								2.5	3.1	2.2	'	1-1/2	3/4	1-1/2	2	1-1/2	ļ !	2	'
1623								5.6	7.5	4.9	2	3	2	4	5	4	3	4	3
163S								6.2	8.3	5.4	2	3		4	3	-	3	7	3
164	34	206.0	187.0	190.0	176.0	181.0	165.0	9.5	12.7	7.8		4		5	7-1/2	5	3	5	3
164S								10.3	13.7	8.9	2	-	2	U	7 1/2				
165								13.3	17.7	11.6	_	5	1 -	7-1/2	10	7-1/2	5	7-1/2	5
165S								13.7	18.3	11.9		Ü				,_		,_	
303								5.7	7.7	5.0	3	4	2	4	5	4	3	5	3
303S								6.5	8.7	5.7									
304								11.3	15.1	9.8	3	5	3	7-1/2	10	7-1/2	5	7-1/2	5
304S	61	416.0	377.0	383.0	355.0	365.0	333.0	13.1	17.5	11.4									
305								15.5	20.7	13.5		7-1/2		10	15	10		10	
305S								17.1	22.8	14.9	5		- 5				7-1/2		7-1/2
307S								21.2	28.3	18.5		10		15	20	12-1/2		12-1/2	
413								5.7	7.7	5.0			4	5	7-1/2	5		5	4
414								11.4	15.3	9.9	4	5	5	7-1/2	10	7-1/2	5	7-1/2	5
414S	60	611.0	554.0	562.0	521.0	536.0	489.0	13.1	17.5	11.4									
415	00	011.0	334.0	302.0	321.0	300.0	400.0	15.5	20.7	13.5		7-1/2		10	15	10	7-1/2	10	7-1/2
415S								17.1	22.9	14.9	7-1/2		7-1/2						——
417S								24.3	32.4	21.1		10		15	20	12-1/2	10	15	10
756S	131	1072.0	972.0	986.0	915.0	940.0	858.0	20.7	27.6	18.0	12-1/2	20	1-1/2	15	25	12-1/2	12-1/2	20	12-1/2
757S								25.6	34.2	22.3	15	20	12-1/2	20	30	15	15	25	15
759S								28.3	37.7	24.6	20	25	15	20	30	20	20	30	20



REFRIGERATION PRODUCTS AND ACCESSORIES

GENERAL PURPOSE SOLENOID VALVES

PILOT OPERATED SOLENOID VALVES - TYPE I

COMMON FLUIDS 0°F TO 225°F

APPLICATIONS:

These general service two way valves are designed for normally closed operation with a wide range of non-corrosive fluids and gases.

GENERAL SPECIFICATIONS:

- FORGED BRASS BODY
- MAX MOPD 150psi
- MIN MOPD 1psi
- SWP 200psig

PART #	PIPE SIZE NPT	PORT SIZE INCHES	FLOW COEFFICIENT Cv
GP200	1/4"	5/16	.98
GP300	3/8"	1/2	3.35
GP400	1/2"	1/2	3.35
GP600	3/4"	3/4	7.40
GP10A	1"	1	12.20

^{*}COILS SOLD SEPARATELY

PILOT OPERATED SOLENOID VALVES - TYPE II

COMMON FLUIDS -20°F - 240°F

APPLICATIONS:

These two-way normally closed valves are for common fluid applications including water (to 180°F), light oils, fuel oils and other non-corrosive liquids.

GENERAL SPECIFICATIONS:

- CAST BRONZE BODY
- TEFLON DIAPHRAGM
- MAX MOPD 150psi
- MIN MOPD 2psi
- SWP 200psig

PART #	PIPE SIZE	PORT SIZE	FLOW COEFFICIENT
	NPT	INCHES	Cv
GP20X	2"	2	56.00

^{*}COILS SOLD SEPARATELY



PILOT OPERATED SOLENOID VALVES - TYPE III APPLICATIONS:

These two-way normally closed valves are for water (over 180°F) and steam service at temperatures to 240°F and 1 to 10 psi steam.

GENERAL SPECIFICATIONS:

- FORGED BRASS BODY
- TEFLON DIAPHRAGM
- MAX MOPD 150
- MIN MOPD 1
- SWP 200 psig

PART #	PIPE SIZE NPT	PORT SIZE INCHES	FLOW COEFFICIENT Cv
GP207	1/4"	5/16	.98
GP307	1/2"	1/2	3.35
GP407	1/2"	1/2	3.35
GP607	3/4"	3/4	7.40
GP1007	1"	1	12.20

^{*}COILS SOLD SEPARATELY

COILS

MODEL # / VOLTAGE
G23MM110V
G23MM208/230V
G23MM24V



GAUGES

Vari-Angle Thermometers

Weiss 9" Scale Vari-angle® Thermometers are the industry standard for HVAC applications. Union connection stem is offered for pipeline applications, for chilled and hot water installations with a 3-1/2" stem. Perforated 6" stem with a mounting flange is for air duct use.

UŅION CONN. STEM			
CAT. NO.	RANGE	SIZE	
9VS-110*	40-0-110F&C	9"	
7VS-110*	40-0-110F&C	7"	
7VS-240*	30-240F&C	7"	

^{*}E35-75BS well required.



6" Glass Thermometers

The Weiss 6" Navay Class Thermometer is compactly designed, ruggedly constructed and has excellent readability. The red-reading mercury-in-glass tube maintains accuracy despite vibrations and shock.

UNION CONN. STEM				
CAT. NO.	RANGE	SIZE		
5AS2	40-240F	6"		
5SS2*	40-240F	6"		

^{*}Straight shank



5AS2

Tri-O-meters

HTP40L

The Weiss Tri-O-meter is designed for use on all types of hot water heating systems. One instrument reads the water pressure, water temperature and system head in feet of H2O. Available in 2-1/2" dial with 1/4" NPT rear connection and 3-1/2" dial with 1/2" NPT lower or rear connected



1/2 NFT lower of real confidence.					
Series C	0-55 psi & Ft of H2O		70-250F		
Н	0-2	200 psi	70-320F		
CAT. NO.		DESCRIPTION	ON		
CTP25R		1/4" NPT rea	ır		
CTP25RX		1/2" NPT rear w/1-1/4" Ext.			
CPT40RSX		1/2" NPT rear			
CTP40L	1/2" NPT lower				

1/2" NPT lower

Hot Water Thermometers

The Weiss 6" Hot Water Thermometer is our most economical offering in industrial glass thermometers. The unit features components of non-corrosive materials and its compact design and excellent readability makes the HW Series ideal for a variety of general purpose applications. Typical applications include small pipe lines, residential and commercial boilers, solar heating systems.

UNION CONN. STEM					
CAT. NO.	RANGE	SIZE			
HW5S2	40-260F	6"			
HW5A2* 40-260F 6"					

^{*}Angle shank



Trade Line Pressure Gauges

Weiss TL Gauges are intended for general service conditions, for pressure or vacuum on air, oil, water, gas or other mediums that do not attack brass. TL Gauges are furnished in drawn steel cases, finished in black. 2" dial versions are available with 1/4" or 1/8" NPT connections. All other dial sizes are 1/4" NPT. All gauges conform with ANSI B40.1 accuracy Grade B - 2% mid scale.

2-1/2" DIAL 1/4" NP	T LOWER CONN.	3-1/2
CAT NO.	RANGE	
TL25-015	0-15 PSI	TLS
TL25-030	0-30 PSI	TLS
TL25-060	0-60 PSI	TLS
TL25-100	0-100 PSI	TLS

0-30 PSI

CAT NO.	RANGE	ľ
TL25-015	0-15 PSI	ľ
TL25-030	0-30 PSI	l
TL25-060	0-60 PSI	ľ
TL25-100	0-100 PSI	l
TL25-100MR	LAZY HAND	ľ
TL25-160	0-160 PSI	I
TL25-200	0-200 PSI	ľ
TL25-200MR	LAZY HAND	I
TL25-300	0-300 PSI	L
TL25-VAC	-30-0 VAC	

TL25P30-CBM

3-1/2" DIAL 1/4" NPT LOWER CONN.				
CAT NO.	RANGE			
TL35-015	0-15 PSI			
TL35-030	0-30 PSI			
TL350-30-CBM	0-30 Ctr Btm Mt			
TL35-060	0-60 PSI			
TL35-100	0-100 PSI			
TL35-160	0-160 PSI			
TL35-300	0-300 PSI			
TL35VP-30-0-30	-30-0-30 PSI			

4-1/2" DIAL 1/4" NPT LOWER CONN.			
CAT. NO.	RANGE		
TL45-015	0-15PSI		
TL45-030	0-30 PSI		
TL45-060	0-60 PSI		
TL45-100	0-100 PSI		
TL45-160	0-160 PSI		
TL45-300	0-300 PSI		
TL45-VAC	-30-0 VAC		
TL45VP-30-0-30	-30-0-30 PSI		

Dynatemp

REFRIGERANT

R-410A

R-410A is an azeotropic mixture of HFC-32 and HFC-125, with near-zero glide allowing for both

predictable performance and easy handling and recycling. Millions of R-410A air conditioners have been sold around the world, and over 25 equipment manufacturers now offer an R-410A option in their product line.



R421A

R421A is a unique non-ozone depleting green long term replacement for R22 refrigerant. R421A does not contain hydrocarbons such as Butane or Isobutane. Replaces R22 with no change of oil and is usable in R22 compressors. R421 is also comparable to R22's performance temperature. R421A is a two component blend packaged with a proprietary lubricant which should be transferred from the cylinder in the liquid phase,



R22

Genetron 22 is a single-component HCFC refrigerant manufactured to meet the tightest of manufacturer's specification, and can be used to service any equipment designed to use R-22. R-22 is popular in residential, commercial and industrial applications.





Rx11-flush is a unique solvent engineered specifically for flushing refrigeration and air conditioning systems. Based on patented HFC solvents developed by DuPont®, Rx11-flush is ozone-safe, nontoxic, and non-flammable. Used exactly like the old R-11 flushing process, its patented HFC based solvent formulation is powerful enough to flush away sludge, carbon residues, oils, acids, water and other particulate. It enhances system's service life and avoids the need for time-consuming repeat visits. Rx11-flush is ideal for system flushing after burnouts, during retrofits and for flushing line sets for R-410A conversions.

Rx11-flush has been the industry's standard for over a decade and contractors agree, it's the best flush for R-410A retrofits and after compressor burnouts. Over one million tons of system capacity has been successfully flushed with Rx11-flush solidifying its proven track record.

Rx11 Flush



#430009



#430099 Injection Valve

MANUFACTURERS INDEX, SECTION 3

A. O. SMITH	 	 3-1 – 3-25
APOLLO VALVES	 	





RESIDENTIAL GAS WATER HEATERS ATMOSPHERIC VENT



INTELLIGENT CONTROL LOGIC*

- The internal microprocessor provides enhanced operating parameters and tighter differentials for precise sensing and faster heating response to optimize performance.
- Uses a thermopile to generate the power needed to operate the electronic gas control without requiring an external power source.
- The electronic gas control incorporates an LED status indicator that monitors system operation and service diagnostics.
- *Not available on 60,000 BTU input models (GCRX-50).

GREEN CHOICE® GAS BURNER

 Patented eco-friendly burner design reduces NOx emissions by up to 33% and complies with Low-NOx emission requirements of less than 40 ng/J.

DYNACLEAN™ DIFFUSER DIP TUBE

 Reduces lime and sediment buildup and maximizes hot water output. Made from long-lasting PEX cross-linked polymer.

COREGARD™ ANODE ROD

 Our anode rods have a stainless steel core that extends the life of the anode rod allowing superior tank protection far longer than standard anode rods.

PUSH-BUTTON PIEZO IGNITOR

• Makes lighting the pilot fast and easy with one-hand push-button spark ignition.

HEAT TRAP NIPPLES

· Factory-installed for faster installation.

BLUE DIAMOND® GLASS COATING

 Provides superior corrosion resistance compared to industry standard glass lining.

ENHANCED-FLOW BRASS DRAIN VALVE

- Our residential water heaters have a solid brass, tamper resistant, enhanced-flow, ball type, drain valve.
- Uses a standard female hose fitting that allows for fast and easy draining during maintenance.
- Designed for easy operation, this valve includes an integral screwdriver slot that features a 1/4 turn (open/close) radius, which not only permits full straightthrough water flow but also a quick and positive shut off.

CODE COMPLIANCE

- Meets UBC, CEC and HUD National Codes.
- Meets the thermal efficiency and standby loss requirements of the U. S. Department of Energy and current edition of ASHRAE/IENSA 90.1.
- Complies with the Federal Energy Conservation Standards effective April 16, 2015, in accordance with the Energy Policy and Conservation Act, (EPCA), as amended.

HIGH ENERGY FACTORS

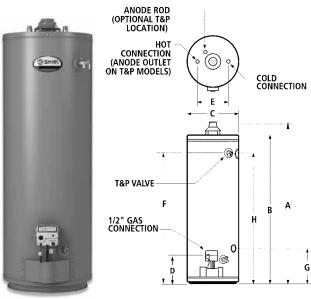
Eco-Friendly non-CFC foam insulation, external heat traps and specially designed combustion chamber combine to produce a high Energy Factor for maximum savings on operating costs.

CSA CERTIFIED AND ASME RATED T&P RELIEF VALVE MAXIMUM HYDROSTATIC WORKING PRESSURE 150 PSI DESIGN-CERTIFIED BY CSA INTERNATIONAL

Certified at 300 PSI test pressure and 150 PSI working pressure. Listed according to ANSI Z21.10.1-CSA 4.1 standards governing storage tank-type gas water heaters.

6-YEAR LIMITED TANK AND PARTS WARRANTY

• For complete information, consult written warranty or go to hotwater.com



Maximum Hydrostatic Working Pressure: 150 PSI

FLAMMABLE VAPOR IGNITION RESISTANT (FVIR) WATER HEATERS

A. O. Smith FVIR design meets the American National Standards Institute standards (ANSIZ21.10.1-CSA 4.1) that deal with the accidental or unintended ignition of flammable vapors, such as those emitted by gasoline.

Features a sealed combustion chamber with intake air filter and a flame arrestor built into the water heater base. In addition, a thermal cutoff (TCO) device, is designed to shut off gas flow to the burner and pilot if poor combustion is detected.

MODEL	GALLON	FIRST	ENERGY	BTU INPUT	BTU INPUT	RECOVERY 90°F RISE			DIN	MENSION	S IN I	NCHES			DRAFT	APPROX. SHIPPING
NUMBER	CAPACITY	RATING GALLONS	FACTOR			GALLONS PER HR.	Α	В	С	D	E	F	*G	*H	HOOD OUTLET	WEIGHT (LBS)
TALL MOD	ELS															
GCR-30	30	67	0.63	35,500	32,000	37	61-1/2	58	18	12-1/4	8	51-3/4	N/A	N/A	3 or 4	132
GCR-40	40	70	0.62	40,000	36,000	42	61-3/4	58-1/4	20	12-1/4	8	52	14-1/4	51-3/4	3 or 4	138
GCG-50	50	88	0.60	40,000	37,000	41	60-3/4	57-1/4	21	12-1/4	8	50-1/2	14-1/4	50-1/2	3 or 4	148
SHORT MO	DELS															
GCRL-30	30	62	0.63	35,500	32,000	37	50	46-1/2	20	12	8	40	N/A	N/A	3 or 4	118
GCRL-40	40	68	0.62	40,000	36,000	41	51-1/2	48	22	12	8	41-1/4	N/A	N/A	3 or 4	135
GCRL-50	50	93	0.60	40,000	40,000	43	53-3/4	49-3/4	24	12	8	41-3/8	N/A	N/A	3 or 4	177

Recovery capacities based on actual performance tests.

Water connection is 3/4" on all models

All models approved for installation from sea level to 10,100 ft. elevation.

Dimensions and specifications subject to change without notice in accordance with our policy of continuous product improvement.









FEATURES

HIGHEST RECOVERIES AND FIRST HOUR RATINGS

Capacity/input combinations up to 100 gallons/78,000 BTU produce recoveries up to 82 gallons per hour, with deliverable hot water up to 152 gallons.

6-YEAR LIMITED TANK AND PARTS WARRANTY

For complete information, consult written warranty or A.O. Smith Water Products Company.

A.O. SMITH DYNACLEAN™ DIFFUSER DIP TUBE

Helps reduce lime and sediment buildup, maximizes hot water output. Made from long-lasting PEX cross-link polymer.

GREEN CHOICE™ GAS BURNER

Patented "eco-friendly" design reduces NOx emissions by up to 33%, complies with Southern California and Texas requirements

COREGARD™ ANODE ROD

An A.O. Smith exclusive. Aluminum anode has stainless steel core, protects tank against corrosion longer than ordinary mild steel anodes.

PUSH-BUTTON PIEZO IGNITER

Makes lighting pilot fast and easy with one-hand push-button spark ignition. Standard on C3 Technology™ models.

DURABLE TAMPER-RESISTANT BRASS DRAIN VALVE

THICK CFC-FREE FOAM INSULATION

A.O. SMITH PERMAGLAS® GLASS COATING

Protects steel tank from rust.

FACTORY-INSTALLED TEMPERATURE

AND PRESSURE (T&P) RELIEF VALVE

Top-mounted T&P valve available as option on 40, 50 and 65-gallon models.

CODE COMPLIANCE: UBC, CEC, SBCC, CABO, HUD, BOCA NATIONAL **CODES, ASHRAE/IES 90.1-1999 AND 1990 NAECA**

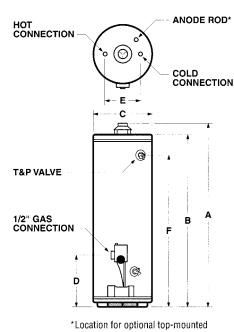
DESIGN-CERTIFIED BY CSA INTERNATIONAL

According to ANS Z21.10.1* standards governing storage-type water heaters.

ProMax Prlus **HIGH RECOVERY**

MODELS GCRT(X), FCG





T&P Valve if ordered from factory.

If flammable vapors accidentally enter the combustion chamber, the Corderite flame arrestor is designed so flames burn off the top surface and cannot escape down through the arrestor.





A. Easy-to-light piezo igniter B. View port for easy burner inspection



	FIRST HOUR			BTU INPUT	RECOVERY 90° RISE	DIMENSIONS IN INCHES							DRAFT	APPROX. SHIPPING
MODEL NUMBER	RATING GALLONS	ENERGY FACTOR	GAL CAP.	PER HOUR Natural	GALLONS PER HR.	R VALUE	Α	В	С	D	Е	F	HOOD OUTLET	WEIGHT (LBS)
GCRT50	92	.60	50	50,000	54	18	60-3/4	57-1/4	22	12-1/4	8	50-1/2	4	165
GCRX50	98	.60	50	60,000	65	18	65-1/2	61	22	13-1/2	8	54-1/4	4	190
FCG75*	N/A	N/A	74	75,100	81	16	61	58-1/2	26-1/2	15-3/16	16	50-1/4	4	275
FCG100*	N/A	N/A	98	75,100	81	10	68-1/2	65	27-3/4	15-3/16	16	57-3/8	4	350

Recovery capacity based on actual performance tests.

Water Connections-1" on 75-gallon, 1-1/4" on 100-gallon models, 3/4" on all other models.

* Not equipped with C3 Technology. 75 gallon model has 80% efficiency, 100 gallon model has 80% efficiency.





PROMAX® POWER VENT

The ProMax Power Vent water heaters have been engineered to maximize efficiency and deliver a greater energy factor (EF).

FEATURES

ENERGY STAR® QUALIFIED

- All models meet the September 2010 ENERGY STAR® EF requirement and may also qualify for local utility and rebate programs
- Dynaclean™ II dip tube optimizes inlet water pressure to minimize cold water regions within the tank. The self-cleaning action also reduces sediment accumulation on the bottom of the tank.
- Hot-surface ignitor is more robust and reliable than standing pilot, and reduces energy consumption
- Built-in heat traps on the water inlet and outlet reduce the amount of heat lost through piping
- 2-inch, thick, "Environmentally-Friendly" foam insulation reduces the amount of heat loss and contributes to overall energy efficiency

BLUE DIAMOND® GLASS COATING

 An A. O. Smith exclusive provides superior corrosion resistance compared to the industry-standard glass lining

VERSATILE POWER VENT DESIGN

 All models feature an exclusive 3-position rotatable blower outlet which adds flexibility

- Combined horizontal and vertical vent runs up to 180 equivalent feet with 4" diameter venting (ABS, PVC, CPVC and polypropylene)
- All models are equipped with a protected sensor that detects the presence of flammable vapors and automatically disables the burner to prevent ignition
- Air intake snorkel elevates the inlet location of combustion air to prevent flammable vapors from entering the sealed combustion chamber
- Reduced NOx emissions comply with air quality management district regulations

USER-FRIENDLY

- State-of-the-art electronic gas control provides more precise temperature control
- LED control light displays operation status and diagnostics information
- Factory-installed T&P and a durable, tamper-resistant brass drain valve are positioned for service accessibility

AVAILABLE IN NATURAL GAS AND PROPANE 6-YEAR LIMITED TANK AND PARTS WARRANTY









DIMENSIONS

MODEL NUMBER	SERIES	HEIGHT TO TOP OF BLOWER A	HEIGHT TO TOP OF TANK B	DIAMETER C	OVERALL DEPTH D	HEIGHT TO DRAIN E	HEIGHT TO GAS INLET F	HEIGHT TO T&P G	HEIGHT TO UPPER SIDE CONNECT G	HEIGHT TO LOWER SIDE CONNECT H	SHIPPING WEIGHT (LBS)
GPVL 40	200	59	49-5/8	22	29-1/8	11	13-1/4	42-1/2	N/A	N/A	174
GPVT 40	200	68-1/2	59-1/4	20	27-1/8	11	13-1/4	53-1/8	53-1/8	15-1/4	176
GPVL 50	200	60-1/8	50-3/4	24	31-1/8	11	13-1/4	43-3/4	N/A	N/A	198
GPVT 50	200	68-1/8	58-3/4	22	29-1/8	11	13-1/4	51-3/4	51-3/4	15-1/4	192
GPVX 50L	200	61-1/8	52	24	31-1/8	11	13-1/4	44-1/2	44-1/2	15-1/4	212
GPVX 75L	200	70-5/8	61-1/4	26	33-1/8	11	13-1/4	53	53	15-1/4	277

All dimensions in inches

Side connections standard on GPVX models.

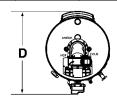
For side connect models, add 'L' to model number, e.g. GPVT 40L.

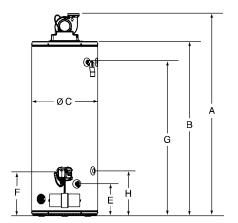
SPECIFICATIONS

MODEL NUMBER	GALLON CAPACITY	INPUT BTU/H	ENERGY FACTOR	FIRST HOUR RATING USG	RECOVERY 90°F RISE GPH
GPVL 40	40	40,000	0.70	73	44.7
GPVT 40	40	50,000	0.70	90	55.9
GPVL 50	50	40,000	0.70	90	44.7
GPVT 50	50	50,000	0.70	96	55.9
GPVX 50L	50	62,000	0.70	110	69.3
GPVX 75L	75	72,000	0.68	155	80.4

VENT LENGTH

MODEL	MA	MAXIMUM VENT LENGTH EQ. FT.								
NUMBER	Ø2"	Ø3"	Ø4"							
GPVL 40	50'	125'	180'							
GPVT 40	50'	125'	180'							
GPVL 50	50'	125'	180'							
GPVT 50	50'	125'	180'							
GPVX 50L	N/A	50'	125'							
GPVX 75L	N/A	50'	125'							







FEATURES

HELICAL INTERNAL HEAT EXCHANGER

- Positioned in the center of the tank, surrounded by water to virtually eliminate radiant heatloss from the chamber
- Achieves 90% thermal efficiency which saves money on operating costs compared to a standard 78% efficient gas water heater

POWER VENTS USING PVC PIPE

- Combined vertical and horizontal vent runs terminating through an outside wall, using Schedule 40 PVC
- 2" pipe, vents up to 25 equivalent feet
- 3" pipe, vents up to 65 equivalent feet
- 4" pipe, vents up to 128 equivalent feet

MODULAR BLOWER

- Equipped with 120 volt, 60 Hz electrical system (rating 5 amps or less), 6-foot cord with standard 3-prong connector
- 2" PVC pipe, elbows and condensate drain supplied to connect heat exchanger outlet to blower
- PVC Vent Attenuation Assembly (VAA) supplied

SIDE-MOUNTED HOT AND COLD RECIRCULATING TAPS

 Allows Vertex to be installed as part of combination space heating/water heating applications or any system requiring a recirculating hot water loop, including radiant floor heating INTELLI-VENT^{TM**}

GAS CONTROL

- Equipped with nearly indestructible silicon nitride hot surface ignitor
- Advanced electronics for more precise control of water temperature and easy to understand system diagnostics

COMMERCIAL GRADE GLASS LINING

- A. O. Smith PermaGlas® Ultra Coat[™] process provides superior protection against corrosion
- Protects all interior tank surfaces including inside and outside of helical heat exchanger

TWO HEAVY-DUTY ANODE RODS

- Provide maximum protection against corrosionGREEN CHOICE® GAS BURNER
- Patented "Eco-Friendly" design reduces NOx emissions by up to 33%

CERTIFIED AND ASME RATED T&P RELIEF VALVE MAXIMUM HYDROSTATIC WORKING PRESSURE: 150

®Residential Gas Water Heaters

 Spiral heat exchanger reduces scale and sediment from forming on water-side surface, which can reduce energy efficiency over time

VERTEX[™]

90% EFFICIENCY POWER VENT WATER HEATER MODEL GPHE-50

If flammable vapors accidentally enter the combustion chamber, the Corderite flame arrestor is designed so flames burn off the top surface and cannot escape down through the arrestor.



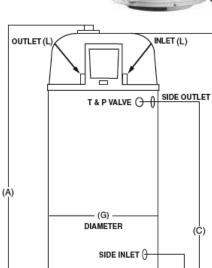


(B)





GAS-FIRED



THERMOSTAT

FRONT VIEW

(F)

DRAIN OVALVE

MODEL	вти		JM VENT DI Il Equivalen	
NUMBER	INPUT	2" Pipe	3" Pipe	4" Pipe
GPHE-50	76,000	25'	65'	128'

			NATURA	L GAS	PROPAN	IE GAS	Α	В	С	D	Е	F	G	
		Vent		GPH		GPH		Hgt. to	Side	Side	Hgt.	Ga	ıs	Approx.
	Gal.	Pipe		90°		90°		Top of	Out-	In-	Drain	Inle	et/	Ship.
Model	Cap.	Dia.	Input	Rise	Input	Rise	Hgt.	Jacket	let	Let	Valve	Diam	eter	Wt.
GPHE-50	50	3"	76,000	92	76,000	92	71	68-5/8	52	21	9-1/8	12	22	210



PROMAX® SPECIALTY ELECTRIC FEATURES

COMPACT ELECTRIC WATER HEATERS

Compact design, side-mounted plumbing and electrical connections (optional top-mounted connections). Designed for installation under a counter, in a crawl space or in other tight spaces. Tank capacities range from 6 through 20-gallons and offer single heating element and durable tamper-resistance brass drain valve.

POINT-OF-USE ELECTRIC WATER HEATER

Designed for low-demand, point-of-use applications, such as office lavatories or buildings with remote restrooms. Models have 2-1/2 gallon tank capacity and are equipped with a single heating element. Includes a standard 110/120V cord set with 3-prong plug and wall-mounting brackets for easy installation.

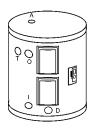
CSA CERTIFIED AND ASME RATED T&P RELIEF VALVE

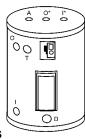
CODE COMPLIANCE

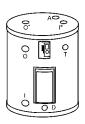
Meets or exceeds the Federal energy efficiency standards effective January 20, 2004, according to the National Appliance Energy Conservation Act (NAECA) of 1992. Also meets or exceeds the standby loss requirements of the U. S. Department of Energy and current edition of ASHRAE/IESNA 90.1.

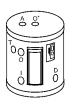
6-YEAR LIMITED TANK AND PARTS WARRANTY

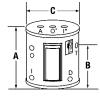
For complete information, consult written warranty or A. O. Smith Water Products Company.



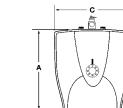


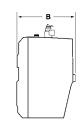






Point-Of-Use





COMPACT MODELS

	FIRST		GALLON	ELEMENT V	VATTAGE		_	DIMEN	ICHES	APPROX.	
MODEL NUMBER	HOUR RATING GALLONS	ENERGY FACTOR	GALLON CAPACITY	STANDARD 120V	MAXIMUM 240V	90°F RISE	R VALUE	Α	В	С	SHIPPING WEIGHT (LBS.)
EJC-6	N/A	N/A	6	1650	3000	8	8	15-1/4	10-3/4†	14-1/4	31
EJC-10	N/A	N/A	10	1650	6000	8	8	18-1/4	12-1/4†	16	45
EJCS-20	N/A	N/A	19	2500	6000	11	8	24-3/4	18-5/8†	18	65
EJCT-20	N/A	N/A	19.9	2500	6000	11	8	31-5/8	25-3/4†	16	62

LOWBOY SIDE-CONNECT MODELS

	FIRST	.		VATTAGE			DIMEN	ICHES	APPROX.		
MODEL NUMBER	HOUR RATING GALLONS	ENERGY FACTOR	GALLON CAPACITY	STANDARD 240V	MAXIMUM 240V	90°F RISE	R VALUE	A	В	С	SHIPPING WEIGHT (LBS.)
ENJ-30	39	.95	28	4500	6000	21	16	30	21-3/4	22	101
ENJ-40	44	.95	38	4500	6000	21	12	33-1/2	24	26	118

POINT-OF-USE MODEL

MODEL NUMBER	FIRST HOUR RATING	ENERGY FACTOR	GALLON CAPACITY	ELEMENT WATTAGE	RECOVERY 90°F RISE	R VALUE	DIMEN	SIONS IN I	NCHES	APPROX. SHIPPING WEIGHT
NOWIDER	GALLONS	PACION	CAPACITI	ELEMENT WATTAGE	90 F NISE	VALUE	Α	В	С	(LBS.)
EJC-2	N/A	N/A	2.5	1500@120V	7	8	13-3/4	11	13-3/4	18

ProMax SPECIALTY

ELECTRIC WATER HEATERS





Compact Models











RESIDENTIAL ELECTRIC WATER HEATERS
MODELS ENT, ENS, ENL

ENHANCED HEATING ELEMENTS

- Dual 4500 watt elements for fast recovery and reliable operation.
- Incoloy stainless steel lower element lasts longer than a standard copper element.

DYNACLEAN™ DIFFUSER DIP TUBE

 Helps reduce lime and sediment buildup and maximizes hot water output. Made from long-lasting PEX crosslinked polymer.

HIGH ENERGY FACTORS

 Eco-friendly non-CFC foam insulation, heat traps and other features combine to yield a higher Energy Factor that maximizes savings on operating costs.

COREGARD™ ANODE ROD

 Our anode rods have a stainless steel core that extends the life of the anode rod allowing superior tank protection far longer than standard anode rods.

BLUE DIAMOND® GLASS COATING

 Provides superior corrosion resistance compared to industry standard glass lining.

ENHANCED-FLOW BRASS DRAIN VALVE

- Our residential water heaters have a solid brass, tamper resistant, enhancedflow, ball type, drain valve.
- Uses a standard female hose fitting that allows for fast and easy draining during maintenance.

 Designed for easy operation, this valve includes an integral screwdriver slot that features a ¼ turn (open/close) radius, which not only permits full straightthrough water flow but also a quick and positive shut off.

CODE COMPLIANCE

- · Meets UBC, CEC and HUD National Codes.
- Meets the thermal efficiency and standby loss requirements of the U.S. Department of Energy and current edition of ASHRAE/IESNA 90.1.
- Complies with the Federal Energy Conservation Standards effective April 16, 2015, in accordance with the Energy Policy and Conservation Act (EPCA), as amended.

APPROVED FOR MANUFACTURED HOUSING

 All residential electric water heaters are compliant with HUD Standards for mobile homes/manufactured housing.

CERTIFIED TO UL 174 FOR HOUSEHOLD ELECTRIC WATER HEATERS

CSA CERTIFIED AND ASME RATED T&P RELIEF VALVE

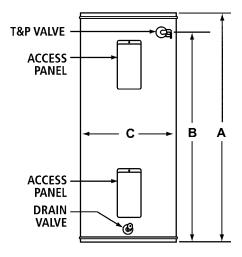
DESIGN-LISTED BY UNDERWRITERS LABORATORIES

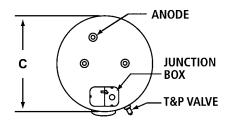
- Certified at 300 PSI test pressure and 150 PSI working pressure.
- Listed according to UL 174 standards governing storage tank-type electric water heaters.

6-YEAR LIMITED TANK AND PARTS WARRANTY

• For complete information, consult written warranty or go to hotwater.com.











MODEL	GALLON	FIRST HOUR	ENERGY	RECOVERY @ 90°F RISE	ELEMENT W	ATTAGE 240 V	DIMEN	ISIONS IN IN	CHES	APPROX. SHIPPING
NUMBER	CAPACITY	RATING GALLON	FACTOR	GALLON PER HOUR	STANDARD	MAXIMUM	Α	В	С	WEIGHT (LBS)
TALL MODELS			•				•			•
ENT-30	30	47	0.95	21	4500	6000	46-1/2	39-1/2	19	95
ENT-40	40	51	0.95	21	4500	6000	60-1/4	53-1/4	20	118
ENT-50	50	71	0.95	21	4500	6000	60-1/2	51-1/4	22	134
SHORT MODEL	s									
ENS-30	30	49	0.95	21	4500	6000	39-3/4	30-1/2	22	94
ENS-40	40	55	0.95	21	4500	6000	50	40-3/4	22	109
ENS-50	50	62	0.95	21	4500	6000	49-3/4	40-3/8	24	161
LOWBOY TOP	CONNECT MC	DELS								
ENL-20	19.5	N/A	N/A	21	4500	6000	30	21-1/4	20	65
ENL-30	28	43	0.95	21	4500	6000	31-1/4	21-1/4	24	115
ENL-40+	38	44	0.95	21	4500	6000	33-1/2	24	26	118

3/4" water connections on 8" center.

+ Top T&P option not available on this model.

Dimensions and specifications subject to change without notice in accordance with our policy of continuous product improvement.



COMMERCIAL ELECTRIC WATER HEATERS

LIGHT-SERVICE COMMERCIAL ELECTRIC WATER HEATERS

Designed for light duty commercial applications with intermittent hot water loads.

GLASSLINED TANK

Tank interior is coated with glass specially designed by A. O. Smith for water heater use.

HEATING ELEMENTS

Two 4.5 KW zinc plated copper sheathed elements are standard.

STANDARD VOLTAGES

The standard voltage is 240V single phase.

TOP MOUNTED RECESSED JUNCTION BOX

CONTROLS

Thermostat is adjustable through a range of 120° to 181°F with a manual reset high temperature cutoff. The heater is wired for non-simultaneous single phase operation.

COREGARD™ ANODE ROD

Our anode rods have a stainless steel core that extends the life of the anode rod allowing superior tank protection for longer than standard anode rods.

ENHANCED-FLOW BRASS DRAIN VALVE

Solid brass, tamper resistant, enhanced-flow, ball type, drain valve.

MAXIMUM WORKING PRESSURE 150 PSI

FACTORY INSTALLED CSA CERTIFIED AND ASME RATED TEMPERATURE AND PRESSURE RELIEF VALVE

CERTIFIED TO UL 1453 FOR COMMERCIAL ELECTRIC WATER HEATERS

COMPLIANCE

Meets the standby loss requirements of the U.S. Department of Energy and current edition of ASHRAE/IES 90.1.

WARRANTY

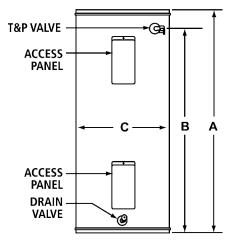
- 3-Year limited tank/1-Year limited parts.
- For complete information consult the written warranty or hotwater.com.

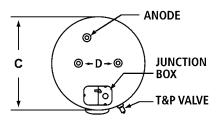












PRODUCT SPECIFICATIONS

Model	Gallon	Standard Element		Dimensions		Approx. Shipping	
Number	Capacity	Wattage 240 VAC	Α	В	C Diameter	D	Weight (lbs)
LTE 66D	66	4500	60-1/4	53	22	8	146
LTE 80D	80	4500	60-1/2	52-1/4	24	8	175
LTE 120D	119	4500	61-1/2	54-1/2	28	8	268



CONSERVATIONIST®

TANK-TYPE WATER HEATERS BT-65, 80 & 100

FEATURES

All models comply with ASHRAE/IES 90.1b-1992.

 $\textbf{GLASS-LINED TANK} \ -- \ \text{Assures years of rust-free clean hot water}.$

FULLY AUTOMATIC CONTROLS WITH SAFETY SHUTOFF — Accurate, dependable control system requires no electric connections. Fixed automatic gas shutoff device for added safety. Not recommended for 180°F sanitizing. Use Models BTC-80 & BTC-100 for 180°F sanitizing.

HEAVY GAUGE STEEL JACKET — Finished with baked enamel over bonderized undercoat.

 $\textbf{FOAM INSULATION} \ -- \ \text{Saves fuel, helps reduce standby heat loss.}$

CERTIFICATION — Units are design certified by the American Gas Association (Canadian Gas Association for units built in Canada). Meets rigid requirements of the National Sanitation Foundation when equipped with leg kit. Certified for installation on combustible flooring.

EASY TO INSTALL — Completely factory assembled. Only gas, water and vent connections need be made. All connections are located in front and top of heaters for ease of installation and service.

DRAFT DIVERTER — Low profile diverter furnished as standard equipment.

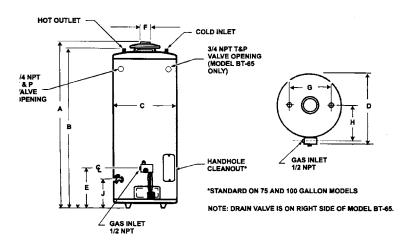
MAXIMUM WORKING PRESSURE — 150 psi.

MAXIMUM GAS INLET PRESSURE — 14" W.C.

 $\textbf{HANDHOLE CLEANOUT} \ - \ \text{On 75 and 100 gallon models. Allows easy tank cleaning.}$

OTHER FEATURES

• Built-in gas filter and integral dirt leg (propane only) • Anodic protection • Equipped with gas pressure regulator • Integral automatic gas shutoff system prevents excessive water temperature • Factory installed A.G.A./ASME rated temperature and pressure relief valve.



LIMITED WARRANTY OUTLINE

If the tank should leak any time during the first three years, under the terms of the warranty, A. O. Smith will furnish a replacement heater; installation, labor, handling and local delivery extra. **THIS OUTLINE IS NOT A WARRANTY.** For complete information, consult the written warranty or A. O. Smith Water Products Company.

Warranty does not apply to product installed outside of the United States of America or its territorial possessions and Canada.



ALL DIMENSIONS IN INCHES

											Approx.
										Inlet	Ship. Wt.
Model	Α	В	С	D	E	F	G	Н	J	Outlet	(Lbs.)
BT65	64-3/4	59-7/8	20-1/4	23-3/8	15-5/8	4	8	11-1/2	11-3/4	3/4	165
BT80	61-1/2	58-1/2	25-1/2	28-1/2	15-3/16	4	16	14	11-15/16	1	291
BT100	68-3/4	66-1/2	26-1/2	29-3/4	15-3/16	4	16	14-1/2	11-15/16	1-1/4	366



RECOVERY CAPACITIES

	Approx. Gal.	Type of	Input Rating				Tempe	rature	Rise - D	Degrees	F - Gal	lons Pe	r Hour		
Model	Сар	Gas	BTU/Hr.	30	40	50	60	70	80	90	100	110	120	130	140
BT65	65	Nat. & Prop.	50,000	162	131	97	81	69	61	54	48	44	40	37	35
BT80	74.5	Nat. & Prop.	75,000	227	170	136	114	97	85	76	68	62	57	52	49
BT100	100	Nat. & Prop.	75,000	227	170	136	114	97	85	76	68	62	57	52	49

NOTE: To compensate for the effects of high altitude areas above 2000 feet, recovery capacity should be reduced approximately 4% for every 1000 feet above sea level.

Capacity ratings are at 75% thermal efficiency (except as noted).



FEATURES

94% THERMAL EFFICIENCY — Fully condensing design is 16% more efficient than the ASHRAE requirement of 78%.

FLEXIBLE VENTING — 3" or 4" PVC, ABS or CPVC pipe is recom-mended. The CYCLONE XHE TM vents vertically, horizontally and is also approved for direct vent sealed combustion applications.50 equivalent feet maximum using 3" vent, 120 equivalent feet using 4" vent.

ADVANCED ELECTRONIC CONTROLS — A microprocessor controls the ignition and thermostat allowing precise setting of water temperatures from 110°F to 180°F. A digital display panel shows the operating mode, all user settings and any failure modes for ease of service.

PRESET POWER BURNER — Developed for the CYCLONE XHE TM ,a turbulent jet flame shoots down the submerged combustion chamber in a spiral action. This turbulence causes a thorough mixing of the gas and air for optimum combustion and high heat transfer efficiencies.

SUBMERGED COMBUSTION CHAMBER — Submerging the combustion chamber in the center of the water storage tank minimizes radiant heat loss and improves efficiency.

ZERO INCH CLEARANCE — The CYCLONE XHE™ jacket is cool and is approved for zero inches to combustibles for unsurpassed installation flexibility.

SPIRAL WOUND FLUE TUBE — The continuous spiral flue tube keeps the hot combustion gases moving at a high velocity. The combination of high turbulence and velocity causes an enormous rate of heat transfer into the water.

SCALE FREE — This flue design prevents scale and sediment from forming on the flue tube and reducing efficiency over time.

GLASS LINED TANK — Proprietary ceramic coating developed by A.O. Smith's ceramic engineers specifically for this heater is applied after the complete tank has been assembled to give a seamless barrier against corrosion by hot water. The maximum working pressure is 160 psi.

HANDHOLE CLEANOUT — Allows easy inspection and cleaning of the tank.

FOAM INSULATION — Thick foam insulation protected by a heavy gauge steel jacket contrib-

FOAM INSULATION — Thick foam insulation protected by a heavy gauge steel jacket contributes to low standby losses.

EASY INSTALLATION — All components are factory assembled and 100% tested prior to shipment. Only gas, water, electrical and venting connections need to be made. No major field adjustments are required for proper operation. Includes T&P valve and drain valve.

CYCLONE_{XHETM}

94% EXTRA HIGH EFFICIENCY TANK-TYPE WATER HEATERS BTH-120, BTH-150, BTH-199 & BTH-250

LIMITED WARRANTY OUTLINE

If the tank assembly which includes the combustion chamber and flue should leak any time during the first three years, under the terms of the warranty, A.O. Smith will furnish a replacement tank assembly. Installation, labor, handling and local delivery are extra. THIS OUTLINE IS NOT A WARRANTY. For complete information, consult the written warranty or A.O. Smith Water Products Company.

Warranty does not apply to product installed outside of the United States of America or its territorial possessions and Canada.

SCQAMD Approved, Rule 1146.2 Low NOx









RECOVERY CAPACITIES

	BTU	Approx. Gallon	Ship.			Ten	nperatu	re Rise	- Degre	es F - G	allons p	er Hour			
Model	Input	Capacity	Wt.	30	40	50	60	70	80	90	100	110	120	130	140
BTH-120	125,000	60	350	475	356	285	237	203	178	158	142	129	119	110	102
BTH-150	150,000	100	438	570	427	342	285	244	214	190	171	155	142	131	122
BTH-199	199,000	100	438	756	567	453	378	324	283	252	227	206	189	174	162
BTH-250	240,000	100	438	912	684	547	456	391	342	304	273	249	228	210	195
BTH-300	300,000	130	940	1164	873	699	582	499	436	388	349	318	291	269	250
BTH-400	400,000	130	940	1552	1164	931	776	665	582	517	465	423	388	359	332
BTH-500	500,000	130	940	1919	1439	1151	959	822	720	640	576	523	480	443	411

*BTH-250 NOT AVAILABLE IN LP GAS.

Combustible clearances 0". Approved for combustible floors.

MAXIMUM EQUIVALENT VENT LENGTH:

BTH-	using 3" pipe:
120 – 250	50 ft.
BTH-	using 4" pipe:
120 – 250	120 ft.
BTH-	using 3" pipe:
300 – 500	not applicable
BTH-	using 4" pipe:
300 – 500	70 ft.

GAS VALVE PIPING

BTH-120	1/2" NPT
BTH-150	3/4" NPT
BTH-199	1/2" NPT
BTH-250	1/2" NPT
BTH-300	1 1/4" NPT
BTH-400	1 1/4" NPT
BTH-500	1 1/2" NPT

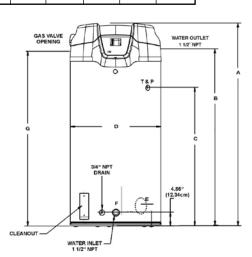
INSTALLATION CLEARANCES

Sides	0"
Front	4"
Rear	0"
Top	2"

CLEARANCES

Sides	0"
Front	0"
Rear	0"
Тор	1.5"
To Combustibles*	0"

Approved for combustible floors



DIMENSIONS AND SHIPPING WEIGHTS

				DIMENSIONS				SHIP WEIGHT	SHIP WEIGHT
MODEL	A INCHES/CM	B INCHES/CM	C INCHES/CM	D INCHES/CM	E INCHES/CM	F INCHES/CM	G INCHES/CM	STD LBS/KG	ASME LBS/KG
BTH-120	55.5/141	44.5/113	35/88.9	27.75/70.5	7.5/19.1	6.3/16	47/119.4	460Lbs/208.7Kg	490Lbs/222.2Kg
BTH-150	75.5/191.8	64.5/163.8	55.5/141	27.75/70.5	7.5/19.1	6.3/16	68/172.7	555Lbs/251.7Kg	595Lbs/269.9Kg
BTH-199, 250	75.5/191.8	64.5/163.8	55.5/141	27.75/70.5	7.5/19.1	6.3/16	72/182.9	555Lbs/251.7Kg	595Lbs/269.9Kg
BTH-300, 400, 500	75.5/191.8	64.5/163.8	50.77/129	33.12/84.1	8/20.3	4.86/12.3	67.25/170.8	N/A	940Lbs/426.4Kg



The Master-Fit® BTR-151 and BTR-201 are designed for installation in "booster" applications, to supply commercial dishwashers with very high temperature water...usually 180°F. A booster water heater is normally used in conjunction with a standard water heater water delivering hot water at a lower temperature to meet the non-dishwashing needs of a restaurant or other foodservice application.

Master - Fit

BOOSTER MODELS COMMERCIAL WATER HEATERS BTR-151, BTR-201

THE ELIMINATOR™ SELF-CLEANING SYSTEM

- Designed to significantly reduce or eliminate buildup of lime, sand and other sediment inside the tank
- Reduced sediment buildup helps Master-Fit water heaters maintain their rated energy-efficiency and reduce water heating costs
- · Self-cleaning system also helps prolong tank life

BUILT-IN INDUCED DRAFT BLOWER

- Produces power-induced draft of makeup air prior to burner ignition
- Provides more efficient control of heat through the flue collector
- Ideal for installations where negative air pressure is a potential problem
- No draft hood or barometric damper required

RATED AS CATEGORY 1 APPLIANCE

 Can be commonly vented with other Category 1 appliances, using standard metal type "B" vent

PERMAGLAS® ULTRA COAT GLASS LINING

- A.O. Smith exclusive process provides superior protection against corrosion
- A.O. Smith CoreGard anode rods with stainless steel core provide additional corrosion protection

THREE WATER CONNECTION OPTIONS

- Hot and cold water connections can be made through top, front or rear of water heater
- The Eliminator self-cleaning device operates when cold water is connected through front

INTERMITTENT ELECTRONIC IGNITION

- Eliminates standing pilot
- Includes power ON/OFF switch
- Provides flame failure response in less than one second

FACTORY-INSTALLED TEMPERATURE & PRESSURE RELIEF VALVE

MAXIMUM HYDROSTATIC WORKING

PRESSURE 160 PSI

80% THERMAL EFFICIENCY CODES AND STANDARDS

- Design-certified by CSA International, according to to ANSZ21.10.3 standards governing storage-type water heaters
- Optional ASME construction available

WARRANTY

- Three-year limited warranty against tank leaks
- For complete warranty information, consult written warranty shipped with water heater, or contact A.O. Smith Water Products Company



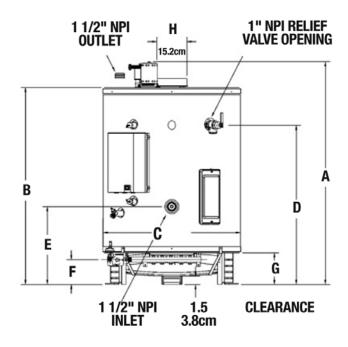


Master - Fit

BOOSTER MODELS COMMERCIAL WATER HEATERS BTR-151, BTR-201

CAPACITY, INPUT AND OUTPUT

MODEL NUMBER	GALS. CAP.	BTU INPUT PER HOUR	FIRST HOUR RATING 100°F RISE		OVERY – GALL AT °F TEMPER 100°	
BTR-151	32	150,000	167	364	145	104



DIMENSIONS AND WEIGHT

				IMENSION	IS IN INCHI	ES					APPROX.
MODEL NUMBER	A	В	С	D	E	F	G	н	GAS CONN.	WATER CONN.	SHIPPING WEIGHT (LBS.)
BTR-151	45	40	27-3/4	32-1/4	15-3/4	5	6-1/2"	6"	3/4"	1-1/2"	400

SUGGESTED SPECIFICATION

Gas booster water heater(s) shall be A.O. Smith Master-Fit, Model Number ________, with a 32-gallon storage capacity, an input rate of ________ BTU/HR, _________ gas, and a recovery rate of ________ gallons per hour at a ________ degree Fahrenheit temperature rise, and a maximum hydrostatic working pressure of 160 psi.

Unit(s) shall have a fan-assisted combustion system, providing a power-induced draft of makeup air prior to burner ignition.

Unit(s) shall be equipped with intermittent electronic ignition with power on/off switch, which shall provide flame failure response in less than one second. The burner for the unit(s) shall be easily removable. Unit(s) shall be equipped with a factory-installed temperature and pressure relief valve, and a 2-3/4" x 3-3/4" tank inspection port.

The water heater tank shall be glasslined and protected against premature failure in the following ways:

- 1. Against electrolytic corrosion by multiple, factory-installed anode rods
- Against failure due to overheating caused by the buildup of scale, film and other sediment by a self-cleaning device, positioned inside the tank so that it directs the flow of inlet water in such a way that microscopic particles of precipitated solids shall be kept in suspension and exhausted from the water heater on that or successive hot water draws.

Unit(s) shall meet or exceed ASHRAE/IESNA 90.1-1999, and be design certified by CSA International, according to ANSZ21.10.3 standards governing storage-type water heaters.



FEATURES

80+ % thermal efficiency affords lower operating costs on most models.

WATER CONNECTIONS — For ease of installation, BTR's feature on most models water connections on the top, front, and rear.

GLASS LINED TANK — Permaglas® Ultracoat is the proprietary ceramic coating developed by A.O. Smith's ceramic engineers specifically for this heater. It is applied after the complete tank has been assembled to give a seamless barrier against corrosion by hot water. The maximum working pressure is 160 psi.

FULLY AUTOMATIC CONTROLS WITH SAFETY SHUTOFF — Accurate, dependable control system. Manual reset gas shutoff device for added safety. Maximum inlet gas pressure is 14" W.C. Minimum gas pressure is 4.5" W.C. natural gas, 11" W.C. propane.

FOAM INSULATION — Saves fuel, helps reduce standby heat loss.

JACKET — Heavy gauge steel finished with a baked enamel finish over a bonderized undercoat.

EASY CLEANING — Handhole cleanout allows easy cleaning.

FULLY TESTED FOR SAFETY AND PERFORMANCE — Design certified by the Underwriters Laboratory for 180°F hot water service. Meets rigid requirements of the National Sanitation Foundation when equipped with optional leg kit. Certified for use on combustible flooring.

INTERMITTENT IGNITION DEVICE — Eliminates standing pilot. Provides flame failure response in less than one second. Power ON/OFF switch.

EASY TO INSTALL — Completely factory-assembled. Only gas, water, vent and electric connections need be made. Provided with drain valve.

FACTORY INSTALLED AND TESTED DRAFT DIVERTER — Low profile "snap action" diverter with automatic motorized flue damper to minimize standby losses.

ANODES — CoreGuardTM long-life, stainless steel core anode rods.

PLUG KITS — Pipe nipples and caps are included to plug unused water connections.

OTHER FEATURES

- Equipped with gas pressure regulator and pilot filter
- Integral automatic gas shutoff system prevents excessive water temperature
- A.G A. rated temperature and pressure relief valve factory-installed
- Maximum working pressure is 160 psi standard
- Cathodic protection
- Adjustable thermostat witha 120-180°F range.

OPTIONS

- Power vent kits for side wall venting.
- Manifold kits for multiple heater installations.
- Meets NSF Standard 5 with optional leg kit.



MasterFit®

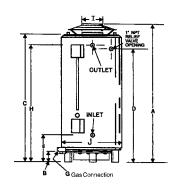
COMMERCIAL GAS TANK-TYPE WATER HEATERS BTR 120-500(A)

LIMITED WARRANTY OUTLINE

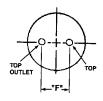
If the tank should leak any time during the first three years, under the terms of the limited warranty, A. 0. Smith will furnish a replacement heater; installation, labor, handling and local delivery extra. THIS OUTLINE IS NOT A WARRANTY. For complete information, consult the written warranty or A. 0. Smith Water Products Company.

Warranty does not apply to product installed outside of the United States of America or its territorial possessions and Canada.

ROUGH-IN DIMENSIONS SIDE VIEW OF BTR Models 120-500















					Dim	ension Tal Models 1	bles for B1 20-500	R							
	Approx													App	rox.
	Tank		Input											Ship	Wt.
	Cap.	Type of	Rating												т —
Model	(Gals.)	Gas	Btu/Hr	Α	В	С	D	E	F	G	Н	- 1	J	Std	ASM
BTR120	71	nat/prop	120,000	69-3/4	4-1/4	59-1/2	50-7/8	19-5/8	19	1/2	51-7/8	5	27-3/4	400	
BTR154	81	nat/prop	154,000	73	4-1/4	66-1/2	57-7/8	19-5/8	19	1/2	59	6	27-3/4	470	
BTR180	81	nat/prop	180,000	67-1/2	4-1/2	62	53-5/8	20-1/2	21	1/2	54-5/8	6	27-3/4	470	
BTR197	100	nat/prop	199,000	75	4-1/2	70	61-5/8	20-1/2	21	1/2	62-5/8	6	27-3/4	603	
BTR198	100	nat/prop	199,000	75	4-1/2	70	61-5/8	20-1/2	21	1/2	61-1/2	6	27-3/4	603	
BTR199	81	nat/prop	190,000	67-1/2	4-1/2	62	53-5/8	20-1/2	21	1/2	53-1/2	6	27-3/4	470	
BTR200(A)	100	nat/prop	199,000	72	4-1/2	65	55-7/8	19-3/4	23	1/2	54-7/8	6	30-1/4	630	724
BTR250(A)	100	nat/prop	250,000	72	4-1/2	65	55-7/8	19-3/4	23	1/2	56-3/8	8	30-1/4	630	724
BTR251(A)	65	nat/prop	251,000	75	4-1/2	65-3/4	57-1/4	20	NA	1/2	58-3/4	8	27-3/4	750	862
BTR275(A)*	100	nat/prop	275,000	72	4-1/2	65	55-7/8	19-3/4	23	1/2	56-3/8	8	30-1/4	630	724
BTR305(A)	65	nat/prop	305,000	75	4-1/2	65-3/4	57-1/4	20	NA	3/4	58-3/4	8	27-3/4	750	862
BTR365(A)	85	nat/prop	365,000	79-1/2	4-1/2	70-1/4	62-1/2	22-1/2	21	3/4	63	8	27-3/4	725	833
BTR400(A)	100	nat/prop	399,000	75-1/2	4-1/2	67-1/2	58-1/4	26-3/4	23	3/4	59	8	30-1/4	760	874
BTR500(A)	85	nat/prop	500.000	82-1/4	4-1/2	73-1/2	65-1/4	25-1/2	21	1	65-3/4	8	27-3/4	745	856

Gas Pre	ssure Requirements								
Natural Gas PropaneGas									
Max. Supply Pressure	13.8" w.c.	13.8" w.c.							
Min. Supply Pressure	4.5" w.c.	11" w.c.							
Manifold Pressure	3.5" w.c.	10" w.c.							

Electrical S	Specifications	
	Volts	Amps
BTR	120VAC	.7
BTR with Power Venter	120VAC	3.0 FLA



MasterFit®

COMMERCIAL GAS TANK-TYPE WATER HEATERS BTR 120-500(A)

POWER VENTS FOR BTR FEATURES

DESIGNED FOR FLEXIBILITY — Easy to install sidewall power vent system. Use these kits where gas is the preferred choice, but conventional venting is costly. Allows conversion from electric to gas or upgrading to units with higher inputs without having to do costly venting system upgrades. Easy to install and wire. Approved for use on all A.O. Smith water heaters listed below. Allows th~ use of smaller diameter vent pipe than allowed with conventional venting.

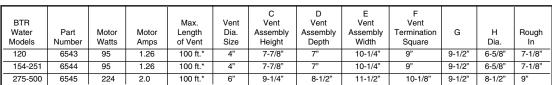
POWERFUL 115 VOLT POWER VENTER — Allows venting up to 100 equivalent feet away. Each model sized for a perfect match with A.O. Smith water heaters. Power Venters have one or more of the following depending on the heater's requirements. Built in 24/11 Svolt relay to interface with control systems. Combination 24 volt relay and adjustable post-purge timer control in lieu of relay on some models. Installed diaphragm draft proving switch. Vibration isolation mount works with common plumber's strap and helps keep operation quiet. All controls factory mounted and wired for simple installation.

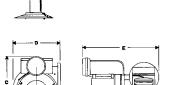
ALUMINUM VENT HOOD — Mounts on outside of wall. Features telescoping vent pipe connection sleeve, rust free construction, outside wall condensate shield, 1 airspace provides clearance forcombustibles, special heat shield protects building exterior. Mounting hardware included.

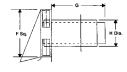
COLOR CODED WIRING HARNESS — Eliminates need for electrician (check codes). Simple 24 volt connections and a 25' lowvoltage cable. Includes grounded 115 volt power cord with plug on models up through 250,000 btu.

ADAPTER FITTINGS — Provided along with mounting hardware and instructions for a quick and simple installation. Approved vent pipe reducers supplied where applicable.

APPROVED FOR TYPE-B VENT — Non pressurized vent from heater to power venter allows the use of economical Type-B vent pipe.







*Vent pipe/vent hood connection based on Cla	ass B vent pipe sizes. C	Calculated usin	a total pipe le	nath, plus 5 t	ft. for every 90'	elbow an	d 2-1/2 ft. d	or every 45'	" elbow.

				R	ECOVER'	Y CAPAC	ITIES FO	R BTR						
	Input Rating			Tem	perature Ri	se - Degre	es F - Gallo	ons Per Ho	ur					
Model	Btu/Hr.	Gal.	30	40	50	60	70	80	90	100	110	120	130	140
BTR120	120,000	71	388	291	233	194	166	145	129	116	106	97	90	83
BTR154	154,000	81	498	373	299	249	213	187	166	149	136	124	115	107
BTR180	180,000	81	532	436	349	291	249	218	194	175	159	145	134	124
BTR197	199,000	100	643	482	386	322	276	241	214	193	175	161	148	132
BTR198	199,000	100	643	482	386	322	276	241	214	193	175	161	148	138
BTR199	190,000	81	614	461	368	307	263	230	205	184	167	154	142	132
BTR200(A)	199,000	100	643	482	386	322	276	241	214	193	175	161	148	132
BTR250(A)	250,000	100	808	606	485	404	346	303	269	242	220	202	186	173
BTR251(A)	251,000	65	811	608	487	406	348	304	270	243	221	203	187	174
BTR275(A)	275,000	100	889	667	533	444	381	333	296	267	242	222	205	190
BTR305(A)	305,000	65	986	739	592	493	423	370	329	296	269	246	228	211
BTR365(A)	365,000	85	1180	885	708	590	506	442	393	354	322	295	272	253
BTR400(A)	399,000	100	1293	970	776	646	554	485	431	388	353	323	298	277
BTR500(A)	500,000	85	1616	1212	970	808	693	606	539	485	441	404	373	346

	Cleara Combu	nce to istibles	Clearar Non-Comb	
Model	Sides & Rear	Top Cover	Sides & Rear	Top Cover
BTR120	1"	12"	0"	12"
BTR154	1"	12"	0"	12"
BTR180	1"	12"	0"	12"
BTR197	1"	12"	0"	12"
BTR198	1"	12"	0"	12"
BTR199	1"	12"	0"	12"
BTR200(A)	1"	12"	0"	12"
BTR250(A)	2"	12"	0"	12"
BTR251(A)	2"	12"	0"	12"
BTR275(A)	2"	12"	0"	12"
BTR305(A)	2"	12"	0"	12"
BTR365(A)	3"	12"	0"	12"
BTR400(A)	3"	12"	0"	12"
BTR500(A)	6"	12"	3"	12"

	W	ater Conn	ections in	Inches		
		Inlet			Outlet	
Models	Тор	Front	Back	Тор	Front	Back
BTR120	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2
BTR154	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2
BTR180	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2
BTR197	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2
BTR198	1-1/2	1-1/2	2	1-1/2	1-1/2	2
BTR199	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2
BTR200(A)	1-1/2	2	2	1-1/2	2	2
BTR250(A)	1-1/2	2	2	1-1/2	2	2
BTR251(A)	NA	1-1/2	1-1/2	NA	1-1/2	1-1/2
BTR275(A)	1-1/2	2	2	1-1/2	2	2
BTR305(A)	NA	1-1/2	1-1/2	NA	1-1/2	1-1/2
BTR365(A)	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2
BTR400(A)	1-1/2	2	2	1-1/2	2	2
BTR500(A)	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2



Meets or exceeds the requirements of ASHRAE-90.1-1989 & New York, California Codes for energy efficiencies as a water heater.

FEATURES

ALL NON-FERROUS WATERWAYS — Rustproof because water comes in contact with nothing but copper, brass or bronze. Copper transfers heat eight times faster than ferrous metals yet offers remarkable structural strength without excessive weight. Free from the effects of thermal shock.

EFFICIENT COPPER COIL COMBUSTION CHAMBER — Continuous coils of tightly wound copper tubing form a unique combustion chamber. Water circulating thru the coils, around the flame, captures radiant heat which may otherwise be lost. Eliminates any need for insulation.

OPTIMUM ENERGY TRANSFER FROM COPPER HEAT EXCHANGER — Integral extended surface copper tube having helical fins on the outside. Since the fins are extruded from the tube, surface contact is optimized resulting in maximum heat transfer and efficiency. Burkay design provides a liberal heat transfer area directly above the source of heat.

NEW HIGH-EFFICIENCY STAINLESS-STEEL BURNER — Developed especially for A. O. Smith water heaters using the very latest burner principles.

FORCED WATER CIRCULATION IMPROVES SYSTEM EFFICIENCY — Water moving at 2 to 4 feet per second helps to prevent lime build-up and also scrubs extra heat from the copper coil combustion chamber.

120V AC CONTROLS — Positive switch action. Max. inlet gas supply pressure 14" W.C. Heaters must be activated by external temperature control.

THERMAL BALANCER (HW-200M, HW-225M) — Patented thermal balancer functions as a pump shutoff delay switch. It allows the pump and heater to activate simultaneously but delays pump shut off for 120 ± 30 seconds after heater shuts down. This allows the high temperature water to clear the heater thus utilizing all heat that had been generated plus reducing the scale forming tendencies of motionless hot water (Not to be used on booster recovery systems.)

MAIN BURNER REGULATION — Factory adjusted for gas required.

JACKET — Prefinished with a bonderized coating followed by a bakedon enamel finish

CERTIFICATION — All models are design certified by the American Gas Association (Canadian Gas Association for units built in Canada) and are certified for installation on combustible flooring. All bear the ASME code symbol and are approved by the National Sanitation Foundation.

WORKING PRESSURE — 160 psi.

INTERMITTENT IGNITION — Available as an option (120/24 volt).

CONSERVATIONIST

COPPER HEAT EXCHANGER COMMERCIAL WATER HEATERS *HW-120M, *HW-160M, *HW-225M

LIMITED WARRANTY OUTLINE

If the coil, heat exchanger or burner should fail within 5 years, under the terms of the warranty, then A.O. Smith will furnish a replacement part; installation, labor, handling and local delivery extra. THIS OUTLINE IS <u>NOT A WARRANTY</u>. For complete information, consult the written warranty or A O Smith Water Products Company.



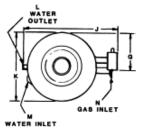


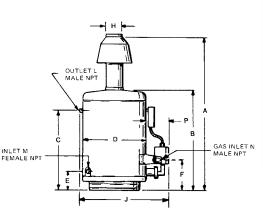


FOR UNITS BUILT IN USA

FOR UNITS BUILT IN CANADA

NSF







ALL DIMENSIONS IN INCHES

Models	Α	В	С	D	E	F	G	Н	J	K	L	М	N
HW120M	49-3/8	30-3/8	23-5/8	20-3/4	5-1/2	10	11-13/16	6	26-11/16	20-3/4	1-1/4	1	1/2
HW160M	50-1/8	30-3/8	23-5/8	20-3/4	5-1/2	10	11-13/16	7	26-11/16	20-3/4	1-1/4	1	1/2
HW200M	53-1/4	33-1/8	27-1/8	20-3/4	5-1/2	10	11-13/16	7	26-11/16	20-3/4	1-1/4	1	1/2
HW225M	60	33-1/8	27-1/8	20-3/4	5-1/2	10	11-13/16	7	26-11/16	20-3/4	1-1/4	1	3/4

				RECOVE	RY CAPA	ACITIES						
	Input Rating BTU/Hr.				Tempera	ture Rise	- Degrees	F - Gallor	ns Per Ho	ur		
Model	Nat. & Propane Gas	40										
HW120M	120,000	300									86	
HW160M	160,000	385	308	257	220	193	171	154	140	128	118	110
HW200M	199,000	487	389	324	278	243	216	195	177	162	150	139
HW225M	225,000 Nat. Gas Only	543	543 434 362 310 271 241 217 197 181 167 155									

Recovery rating of models shown in chart above are obtained by actual efficiency test data, by a recognized Certification Agency.



Meets or exceeds the requirements of ASHRAE 90.1b-1992, New York and California Energy Codes.

FEATURES

ALL NON-FERROUS WATERWAYS - All castings are made of Bronze or Brass. All water tubes are made from copper. Brazed joints or flare union construction make the heater immune to the effects of thermal shock and thermal cycling. A great boiler for domestic hot water supply

EFFICIENT COPPER COIL COMBUSTION CHAMBER — The combustion chamber is a heat exchanger formed from a two passage coil of tightly wound continuous copper tube. Water circulating through this coil surrounds the main burner and captures the radiant heat. A wrap of insulation on the outside of the coil retains the heat captured by the circulating water.

COPPER HEAT EXCHANGER — Directly above the coil and the main burner is a compact horizontal, copper fin tube heat exchanger. The flue gases must pass through this efficient heat exchanger before leaving the boiler. This unique Burkay coil and heat exchanger design provide maximum heat transfer and proven field durability.

BURKAY BURNER MAXIMIZES EFFICIENCY — The patented Burkay burner uses primary air injection at up to 72 individual orifices plus secondary entrainment of air. Approved for installation on combustible floors as shipped from factory.

GAS VALVES — Slow opening redundant gas valves ensure smooth light-off without flame rollout or pilot outage.

THERMAL BALANCER — Patented pump delay system that allows boiler and pump to run simultaneously but delays pump shut off at end of heating cycle to remove usable heat from the heat exchanger and reduce the scale forming tendencies of motionless hot water.

AUTOMATIC SAFETY CONTROLS AND ELECTRONIC IGNITION — Proven pilot ignition system provides flame failure response in under one (1) second. Redundant high limit controls and gas valves assure safe shutoff in the event of overheating or flame failure. Requires 120V 60Hz, maximum inlet gas pressure of 14" WC and activation of heater by external temperature control.

OPTIONAL POWERED VENT HOOD — for sidewall venting.

WORKING PRESSURE — ASME approved, hydrostatically tested and certified for 160 psi. *Except model HW-399 is 81%.

LIMITED WARRANTY OUTLINE

If the heat exchanger modules should fail within 5 years, under the terms of the warranty: A. O. Smith will furnish a replacement part: installation, labor, handling and local delivery extra. THIS OUTLINE IS NOT A WARRANTY. For complete information, consult the written warranty or A. O. Smith Water Products Company.

Note: When used as a hot water boiler, heat exchanger carries a 10 year warranty.

CONSERVATIONIST

COMMERCIAL BOILERS HW-300 THRU HW-670 Domestic Hot Water Supply Boiler

> HW - INDOOR IN-STALLATION ONLY

Not approved for instantaneous applications.





CANADA

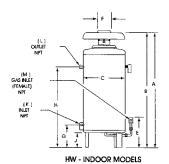


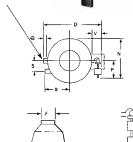




HW MODELS CERTIFICATION & APPROVAL

NOTE: MANIFOLD HAS EXTRA OPENINGS FOR THERMOMETER (3/4" AND RELIEF VALVE [1"] (HW-520 AND -670 ONLY)





HW - 300 ONLY



DIMENSIONS

Models	A	В	С	D	E	F	G	н	J	К	L	М	N	Р	Q	R	S	V	Approx Ship. Wt. Lbs.
HW-300	65	43-1/4	25-1/4	29-5/8	16-1/2	8	12	36	9	1-1/4	1-1/4	3/4	26-5/8	14	1	10-1/8	5-318	5	240
HW-420	57-1/8	45-1/8	27	31-1/2	16-3/4	10	12	38-3/4	9	1-1/2	1-1/2	1	27-1/2	14	1	11-1/4	5-1/2	5	291
HW-520	68-5/16	56-1/4	27	36-1/2	18	10	12	46-1/2	9	2	2	1-1/4	24-1/2	11	3-1/2	12	5-3/4	7	361
HW-670	67	56-1/4	27	38-1/4	17-3/4	12	12	46-1/2	9	2	2	1-1/4	26-3/4	13-1/4	3-1/2	12	5-3/4	7	361

SPECIFICATIONS AND RECOVERY CAPACITIES

	Input Rating A.G.A. BTUH Natural and						Temp	perature R	ise - Degr	ees F					
Model	Propane Gases		20	30	40	50	60	70	80	90	100	110	120	130	140
HW-300	300,000	GPH	1491	993.9	745	596	497	426	373	331	298	271	248	229	213
		GPM	24.8	16.6	12.4	9.9	8.3	7.1	6.2	5.5	4.9	4.5	4.1	3.8	3.5
HW-420	420,000	GPH	2087	1391	1044	935	696	596	521.9	464	417	379	348	321	298
		GPM	34.7	23.2	17.4	13.9	11.6	9.9	8.7	7.7	6.9	6.3	5.8	5.3	4.9
HW-520	520,000	GPH	2584	1723	1292	1034	861	738	646	574	516	470	430	396	369
		GPM	43	28.7	21.5	17.2	14.4	12.3	10.8	9.6	8.6	7.8	7.1	6.6	6.1
	660,000 Nat.	GPH	3280	2186	1640	1312	1093	937	820	729	656	596	547	504	468
HW-670		GPM	54.6	36.4	27.3	21.9	18.2	15.6	13.6	12.1	10.9	9.9	9.1	8.4	7.8
1100-070	670,000 LP	GPH	3249	2166	1624	1299	1083	928	812	722	650	591	541	500	464
		GPM	54.1	36.1	27.1	21.7	18.1	15.5	13.5	12.0	10.8	9.8	9.0	8.3	7.7



Dura-Power

COMMERCIAL ELECTRIC WATER HEATERS DRE-52, 80, 120

FEATURES

GLASS-LINED TANK — Three sizes: 50, 80 and 119 gallon capacity. Tank interior is coated with glass specially developed by A.O. Smith Ceramic Research for water heater use. Tanks rated 150 psi working pressure (ASME 150 psi). Foam insulation reduces costly heat loss and is vermin proof.

ELEMENTS — Incoloy sheathing for longer life. Low watt density: means lower surface temperature to minimize scale buildup and more surface to heat water. Element sizes from 3 to 6 Kw. Use 3, 6, or 9 elements standard; total of 9 to 54 Kw input (see chart on back).

FUSING — Protects all elements, thermostats, and internal wiring circuits against excess current flow. Meets National Electric Code requirements that non-ASME tanks must have internal fusing when current draw exceeds 48 amps.

STANDARD VOLTAGES — 208, 240 and 480V single-phase and three phase delta. Convertible from three-phase to single-phase (in field) and vice versa. 277V single-phase also available.

TERMINAL BLOCK — Factory installed. Just bring the service to the heater and connect to block.

CONTROLS — One temperature control (adjustable through a range of 120° to 180°F) and manual reset high temperature cutoft per element. Thermostat step control may be achieved by varying settings on individual temperature controls. Located behind hinged control compartment door for quick, easy access.

OTHER STANDARD FEATURES

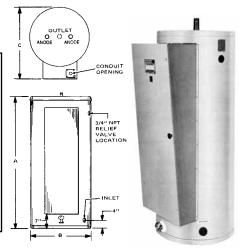
- Simplified circuitry, color coded for ease of service
- Two anode rods for maximum corrosion protection
- Cabinet has bonderized undercoat with baked enamel finish
- · Bottom inlet and top outlet openings
- Drain valve
- A.G.A./A.S.M.E. Temperature and Pressure relief valve
- · Single panel control box

OPTIONAL

- U.L. listed conversion kits to correct some voltage and Kw requirements in the field before and after installation.
- Manifold kits with gate valves available for multiple installation.
- ASME 150 psi tank construction
- International voltages 380, 415 and 480 volts, three-phase available with Y connected elements.
- Field conversion kits for voltage
 and Kw

RECOVERY RATE IN GALLONS PER HOUR* Temperature Rise °F

			_	_	_	_	_			_		_	
STANDARD	BTU/												
KW INPUT	HOUR	30º	40º	50º	60º	70º	80º	90º	100º	110º	120º	130º	140º
9	30,717	123	92	74	62	53	46	41	37	34	31	28	26
12	40,956	164	123	98	82	70	61	55	49	45	41	38	35
13.5	46,025	184	138	111	92	79	69	62	55	50	46	43	40
15	51,195	205	154	123	102	88	77	68	61	56	51	47	44
18	61,434	246	184	148	123	105	92	82	74	67	62	57	53
24	81,912	328	246	197	164	140	123	109	98	90	82	76	70
27	92,151	369	276	221	185	158	138	123	111	101	92	85	79
30	102,390	410	307	246	205	176	154	137	123	112	102	95	88
36	122,868	492	369	295	246	211	184	164	148	134	123	113	105
40.5	138,226	554	418	332	277	237	208	185	166	151	138	128	119
45	153,585	615	461	369	307	263	230	205	184	168	154	142	132
54	184,302	738	554	443	369	316	277	246	221	201	185	170	158



Figured at 1 KW (3413 Btu) = 4.1 Gallons at 100°F temperature rise.

To determine recovery rate per minute, divide recovery rate per hour by 60.

NSF ratings may be obtained by multiplying the above GPH figures by 0.98.

	Tank	Dime	ensions in I	nches		Approx	. Ship.
Model	Capacity				Inlet/	Wt. (I	_bs.)
Number	in Gallons	Α	В	С	Outlet	Standard	ASME
DRE-52	50	55-1/4	21-3/4	27-1/4	1-1/4	245	296
DRE-80	80	59-1/2	25-1/4	31-1/4	1-1/4	264	309
DRE-12	0 119	62-1/4	29-1/2	35-3/4	1-1/4	375	401

LIMITED WARRANTY OUTLINE

If the tank should leak any time during the first three years, under the terms of the warranty, A.O. Smith will furnish a replacement heater; installation, labor, handling and local delivery extra.

THIS OUTLINE IS NOT A WARRANTY.

For complete information, consult the written warranty or A.O. Smith Water Products Company.

kw		Model Numbers Capacity In Ga		No. of Elements and	Element		Single		ıd Currer	nt In Amp	eres ree Phas	se
Input	50	80	119	Thermostats	Wattage	208V	240V	277V	480V	208V	240V	480V
9	DRE-52-9	DRE-80-9	DRE-120-9	3	3000	43.3	37.5	32.5	18.8	25.0	21.7	10.8
12	DRE-52-12	DRE-80-12	DRE-120-12	3	4000	57.7	50.0	43.3	25.0	33.3	28.9	14.4
15	DRE-52-15	DRE-80-15	DRE-120-15	3	5000	72.1	62.5	54.2	31.3	41.6	36.1	18.0
13.5	DRE-52-13.5	DRE-80-13.5	DRE-120-13.5	3	4500	64.9	56.3	48.7	28.1	37.5	32.5	16.2
18	DRE-52-18	DRE-80-18	DRE-120-18	3+	6000	86.5	75.0	65.0	37.5	50.0	43.3	21.7
24	DRE-52-24	DRE-80-24	DRE-120-24	6	4000	115.4	100.0	86.6	50.0	66.6	57.7	28.9
27	DRE-52-27	DRE-80-27	DRE-120-27	6	4500	129.8	112.5	97.5	56.3	74.9	65.0	32.5
30	DRE-52-30	DRE-80-30	DRE-120-30	6	5000	144.2	125.0	108.3	62.5	83.3	72.2	36.1
36	DRE-52-36	DRE-80-36	DRE-120-36	6+	6000	173.1	150.0	130.0	75.0	99.9	86.6	43.3
40.5	N/A	DRE-80-40.5	DRE-120-40.5	9	4500	194.7	168.8	146.2	84.4	112.4	97.4	48.7
45	N/A	DRE-80-45	DRE-120-45	9	5000	216.3	187.5	162.5	93.8	124.9	108.3	54.1
54	N/A	DRE-80-54	DRE-120-54	9	6000	N/A	225.0	194.9	112.5	149.9	129.9	65.0





^{+ 208} volt models may contain three (3) additional elements and thermostats.



Dura-Power

COMMERCIAL ELECTRIC WATER HEATERS DVE-52, 80, 120

FEATURES

GLASS-LINED TANK — Three sizes; 52, 80 and 119 gallon capacity. Tank interior is coated with glass specially developed by A.O. Smith Ceramic Research for water heater use. Tanks rated at 150 psi working pressure; tested at 300 psi. Foam insulation reduces costly heat loss. ASME (optional) maximum working pressure is 160 psi.

ELEMENTS — Heavy duty elements have Incoloy sheaths and ceramic terminal block for rugged commercial service. Medium watt density means lower surface temperature to minimize scale buildup and more surface to heat water. Element sizes from 2 to 6 KW. Use 3, 6 or 9 elements; maximum input 54 KW. The design assures proper placement of elements in the tank to avoid bridging the sheaths with lime or scale deposits.

POWER CIRCUIT FUSING — Protects elements and contactors from short circuits, overloading or line surges. Meets National Electric Code requirements (fusing required when current draw exceeds 48 amps).

STANDARD VOLTAGES — 208, 240 and 480V single-phase and three phase delta. Convertible from three-phase to single-phase (in field) and vice versa (except 208/54 KW). 277V singlephase also available.

TERMINAL BLOCK — Factory installed. Just bring the service to the heater and connect to block.

MAGNETIC CONTACTORS — Heavy duty; UL rated 100,000 cycles.

Meets or exceeds the requirements of ASH RAE 90.1 b-i 992 Standard for energy efficiencies.

CONTROLS — 120V control circuit is powered by fused transformer, eliminating need for 120V service connection. Immersion temperature control adjustable through a range of 60°F to 180°F. Manual reset high temperature cutoff.

• Simplified circuitry, color coded for ease of service • Hinged control compartment door for quick, easy access • Two anode rods for maximum corrosion protection • Cabinet has bonderized undercoat with baked enamel finish • Top outlet, side inlet and relief valve openings • Nipple and brass drain valve • A.G.A./ ASME temperature and pressure relief valve.

OPTIONAL

MANIFOLD KITS WITH STOP VALVES — Available for multiple installations.

THERMOSTATIC SEQUENCING CONTROL — Energizes three elements at a time to prevent line surges when thermostat calls for heat. Available on units 24 KW and larger. See page C 029.0 for service wiring and fuse selection.

OPTIONAL INTERNATIONAL VOLTAGES — 380, 415, 480, 575 and 600 volts three-phase available with Y connected elements

RECOVERY CAPACITY IN GALLONS AT TEMPERATURE RISE OF

STANDARD	BTU/												
KW INPUT	HOUR	30º	40º	50º	60º	70º	80º	90º	100º	110º	120º	130º	140º
6	20,478	82	62	49	41	35	31	27	25	22	21	19	18
9	30,717	123	92	74	62	53	46	41	37	34	31	28	26
12	40,956	164	123	98	82	70	61	55	49	45	41	38	35
13.5	46,075	184	138	111	92	79	69	62	55	50	46	43	40
15	51,195	205	154	123	102	88	77	68	61	56	51	47	44
18	61,434	246	184	148	123	105	92	82	74	67	62	57	53
24	81,912	328	246	197	164	140	123	109	98	90	82	76	70
27	92,151	369	276	221	185	158	138	123	111	101	92	85	79
30	102,390	410	307	246	205	176	154	137	123	112	102	95	88
36	122,868	492	369	295	246	211	184	164	148	134	123	113	105
40.5	138,226	554	418	332	277	237	208	185	166	151	138	128	119
45	153,585	615	461	369	307	263	230	205	184	168	154	142	132
54	184,302	738	554	443	359	316	277	246	221	201	185	170	158

Figured at 1 KW (3413 BTU) = 4.1 Gallons at 100°F temperature rise. NSF ratings may be obtained by multiplying the above figures by 0.98.

	Tank	Dimensions in Inches				Approx	. Ship.
Model	Capacity				Inlet/	Wt. (I	_bs.)
Number	in Gallons	Α	В	С	Outlet	Standard	ASME
DVE-52	50	55-1/4	21-3/4	27-1/4	1-1/4	265	316
DVE-80	80	59-1/2	25-1/4	31-1/4	1-1/4	280	325
DVE-120	119	62-1/4	29-1/2	35-3/4	1-1/4	390	416

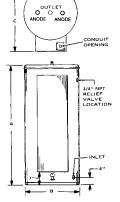




LIMITED WARRANTY OUTLINE

If the tank should leak any time during the first three years, under the terms of the warranty, A.O. Smith will furnish a replacement heater; installation,labor, handling and local delivery extra. THIS OUTLINE IS NOT A WARRANTY.

For complete information, consult the written warranty or A. 0. Smith Water Products Company





		Model Numbers	3	Number				Full Loa	d Currer	nt In Amp	eres	
KW	Tank	Capacity In Ga	llons	Of	Element		Single	Phase		Th	ree Phas	e
Input	50	80	119	Elements	Wattage	208V	240V	277V	480V	208V	240V	480V
6	DVE-52-6	DVE-80-6	DVE-120-6	3	2,000	28.8	25.0	21.7	12.5	16.7	14.4	7.2
9	DVE-52-9	DVE-80-9	DVE-120-9	3	3,000	43.3	37.5	32.5	18.8	25.0	21.7	10.8
12	DVE-52-12	DVE-80-12	DVE-120-12	3	4,000	57.7	50.0	43.3	25.0	33.3	28.9	14.4
13.5	DVE-52-13.5	DVE-80-13.5	DVE-120-13.5	3	4,500	64.9	56.3	48.7	28.1	37.5	32.5	16.2
15	DVE-52-15	DVE-80-15	DVE-120-15	3	5,000	72.1	62.5	54.2	31.3	41.6	36.1	18.0
18	DVE-52-18	DVE-80-18	DVE-120-18	3*	6,000	86.5	75.0	65.0	37.5	50.0	43.3	21.7
24	DVE-52-24	DVE-80-24	DVE-120-24	6	4,000	115.4	100.0	86.6	50.0	66.6	57.7	28.9
27	DVE-52-27	DVE-80-27	DVE-120-27	6	4,500	129.8	112.5	97.5	56.3	74.9	65.0	32.5
30	DVE-52-30	DVE-80-30	DVE-120-30	6	5,000	144.2	125.0	108.3	62.5	83.3	72.2	36.1
36	DVE-52-36	DVE-80-36	DVE-120-36	6*	6,000	173.1	150.0	130.0	75.0	99.9	86.6	43.3
40.5	DVE-52-40.5	DVE-80-40.5	DVE-120-40.5	9	4,500	194.7	168.8	146.2	84.4	112.4	97.4	48.7
45	DVE-52-45	DVE-80-45	DVE-120-45	9	5,000	216.3	187.5	162.5	93.8	124.9	108.3	54.1
54	DVE-52-54	DVE-80-54	DVE-120-54	9	6,000	N/A	225.0	194.9	112.5	149.9	129.9	65.0







^{* 208} volt models may contain three (3) additional elements.



Stainless Steel Indirect Fired Water Heaters

FEATURES

- Exclusive "Tank-in-Tank" Technology
- Abundant Domestic Hot Water at the Lowest Possible Cost
- A Limited Lifetime Warranty

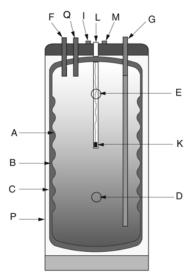
- 2" of Polyurethane Foam Insulation
- 8 Sizes to Choose From
- Self Cleaning/Self Descaling Heat Exchanger
- Lowest Pressure Drop in the Industry

PERFORMANCE

Model No.	Boiler Output Btu/hr	1st Hour Recovery (gal.)	Continuous Flow (gal.)	Peak/Flow Gal/10 min.
Smart 20	79,000	120	105	35
Smart 30	87,000	140	115	40
Smart 40	112,000	180	150	50
Smart 50	140,000	220	185	65
Smart 60	270,000	410	360	100
Smart 80	300,000	460	400	125
Smart 100	337,000	525	450	150
Smart 120	420,000	650	560	190

Conditions:

- 200º boiler water supply
- 90º temperature rise



- A. Inner stainless steel tank
- B. Outer steel tank
- C. 2" Polyurethane insulation
- D. Boiler water connection
- E. Boiler water connection
- F. Hot water outlet
- G. Cold water inlet
- H. Enameled steel jacket
- I. Thermostat control
- J. Temperature gauge
- K. Thermostat remote sensing bulb
- L. Air vent
- M. Electrical wiring plug
- N. Thermometer remote sensing bulb
- P Plastic jacket
- Q. Auxiliary connection

SUPERIOR DESIGN "TANK-IN-TANK" TECHNOLOGY

Superior Heat Exchange Surface Area

The domestic storage tank is constructed of stainless steel and is surrounded by boiler water in the outer tank, resulting in a full "wrap around" heat exchanger.

It's superior heat exchange surface (typically 1.5 to 2.5 times larger than a traditional coil) makes for a large volume of hot water in a short period of time. Thanks to this fast recovery, the storage capacity can be reduced, resulting in a reduced thermal loss.

Stainless Steel Tank Construction

The inner domestic storage tank is constructed of durable, corrosion resistant stainless steel.

Optimal Insulation

The Phase III®, Smart Series are insulated with 2" of either sprayed-on or injected polyurethane foam, resulting in a stand by heat loss of less than 19/Hr.



Self Cleaning / Self-descaling

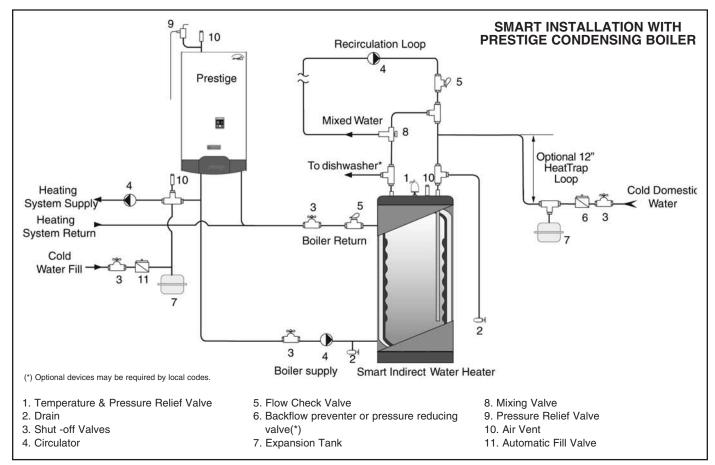
The inner, domestic tank is suspended within the outer tank so it is free to expand and contract as the pressure varies during hot water draws. Moreover, its corrugations amplify the movement and prevents the lime build up on the heat exchanger; thus maintaining its performance during the Phase III®'s life span.

Anti-Bacteria Growth / Maintenance Free

The "Tank-in-Tank" design allows us to store domestic water at higher temperatures preventing bacteria growth. Additionally constructed of high quality stainless steel, Phase III® does not require a protective anode.



Stainless Steel Indirect Fired Water Heaters



PRODUCT SPECIFICATIONS

Model No.	Dimension	Height	Boiler/Supply Return	Domestic Inlet/Outlet	3rd Domestic Connection*	Domestic Capacity (gal.)	Heating Water Capacity (gal.)	Heat Surface (sq. ft.)	Empty Weight (lbs)
Smart 20	22" dia.	32"	1"	3/4"	3/4"	22	5	11	100
Smart 30	22" dia.	38"	1"	3/4"	3/4"	28	5	13	115
Smart 40	22" dia.	46"	1"	3/4"	3/4"	36	6	16	135
Smart 50	22" dia.	57"	1-1/4"	3/4"	3/4"	46	8	20	165
Smart 60	22" dia.	66"	1-1/4"	3/4"	3/4"	56	8	24	190
Smart 80	26" dia.	61"	1-1/2"	1-1/2"	1-1/2"	70	14	28	271
Smart 100	26" dia.	78"	1-1/2"	1-1/2"	1-1/2"	95	25	36	362
Smart 120	32" dia.	72"	2"	1-1/2"	1-1/2"	119	43	42	479

^(*) This fitting can be used as a return connection if circulated domestic water is required or can be used as a connection for the T&P Relief Valve.



FEATURES

Exceeds ASHRAE 90.1b-1992.

A.O. Smith storage tanks are ideal for use with gas-fired copper heat exchanger equipment for storage of any potable water at temperatures up to 180°F.

GLASS-LINED TANK — Alkaline borosilicate composition permanently fused to steel by firing at a temperature of 1600°F, providing years of corrosion protection and dependable use. **HEAVY GAUGE STEEL JACKET** — With baked enamel finish.

THREADED OPENINGS — All tanks furnished with threaded openings for thermometer, relief valve, 2" recirculation lines, tankstat, and drain valve.

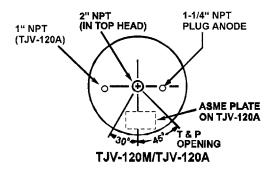
TJV-120M and TJV-120A

• Fits through 30" door • Magnesium anode • for anticorrosion protection

TJV-120M • 119 gallons • exceeds ASHRAE requirements • 150 psi working pressure.

OPTIONS

Perfectly balanced manifold kits (120 gallon models) allow installation where 240 to 480 gallons of stored water is required.



TJV-120M (SHIPPING WT. 320 LBS.) œ 2" NPT (FRONT) ⊕ 29 3/8 62 54" 42" 2" NPT (FRONT) 3/4" 11 1/2" NPT 6 7/8" 4 1/8" 2" NPT (FRONT & REAR) 119 GALLONS

COMMERCIAL HOT WATER STORAGE TANKS TJV-120M, TJV120A

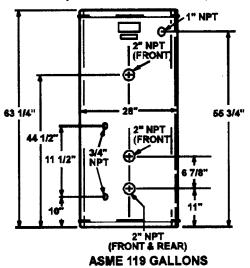
LIMITED WARRANTY OUTLINE

If the tank should leak any time during the first 5 years, under the terms of the warranty, A.O. Smith will repair or replace the tank; installation, labor, handling and local delivery extra. **THIS OUTLINE IS <u>NOT</u> A WARRANTY**. For complete information, consult the written warranty or A.O. Smith Water Products Company.

120 GALLON MODEL



TJV-120A (SHIPPING WT. 400 LBS.)





FEATURES

A.O. Smith storage tanks are ideal for use with gas4i red copper heat exchanger equipment and other A. 0. Smith hot water systems for storage of any potable water at temperatures as high as 180 degrees or lower.

GLASS-LINED — All internal surfaces exposed to water are glass-lined per ASME HLW procedures, using an NSF approved glass-lining compound.

SIZES FROM 80 TO 1,000 GALLONS — All tanks in table on reverse side are normally carried in stock. ASME construction available on all except 80 and 120 gallon size.

HORIZONTAL OR VERTICAL MOUNTING — Except TL-500 which is horizontal. MAGNESIUM ANODES — For extra protection.

Stock tanks T-140A and larger have threaded leg sockets on one head for vertical installations. (Except TL-500).

WORKING PRESSURES

Tanks tested at test pressures assigned in accordance with working pressures shown in table on reverse side.

OPTIONS

- ASME and National Board Certification sheets
- Tank saddles two per horizontal tank required.

NOTE: Custom line tanks available to meet military specifications, various working pressures, lifting lugs, handholes, manholes, special opening sizes or locations. Refer to sheet A 411.0.

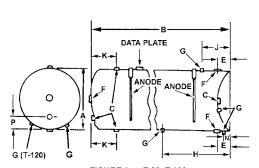


FIGURE 1 - T-80, T-120 NOTE: T-120 shown.

LARGE VOLUME HOT WATER STORAGE TANKS

LIMITED WARRANTY OUTLINE

If the tank should leak any time during the first 5 years, under the terms of the warranty, A.O. Smith will repair or replace the tank; installation, labor, handling and local delivery are extra. **THIS OUTLINE IS <u>NOT</u> A WARRANTY**. For complete information, consult the written warranty or A.O. Smith Water Products Company.

Warranty does not apply to product installed outside of the United States of America or its territorial possessions and Canada.



(ON ASME CONSTRUCTED TANKS)

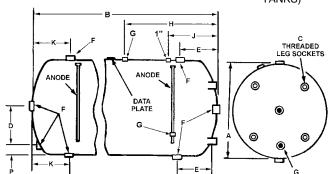


FIGURE 2 - T-140 thru T-1000A TL-500 - Horizontal mounting only. No leg sockets.

All Dimensions in Inches (mm)

Model	Overall Dimensions Inches	Working Pressure	Approx. Ship Wt.	Refer to Figure	A	В	С	D	E	F	G	н	J	к	N	P
T-80 STD.	23" x 62"	150	230	1	23-1/4	62-1/4		46-1/2	16		3/4		7	3-5/8	3/4	
T-120 STD	24" x 64"	150	287	1	24-1/4	64-3/8	2-1/2				3/4	34-1/2	15-1/2	10-1/2	3-1/2	4-1/8
T-140 ASME	24" x 76-1/4"	125	400	2	24	75	2-1/2	8	10-1/2	2	3/4	26	17	10-1/2		4
T-200 ASME	30" x 72"	125	460	2	30	70-3/4	2-1/2	11	13	2-1/2	3/4	28-1/2	19-1/2	13		4
T-250 ASME	30" x 84"	125	505	2	30	84	2-1/2	10	13	2-1/2	3/4	28-1/2	19-1/2	13		4
T-350 ASME	36" x 88"	125	670	2	36	86	2-1/2	13-3/8	14-1/2	2-1/2	3/4	30	21	14-1/2		4-5/8
T-400 ASME	36" x 97"	125	775	2	36	96	2-1/2	13-3/8	14-1/2	2-1/2	3/4	30	21	14-1/2		4-5/8
TL-500 ASME	36" x 122"	125	950	2	36	120-3/8		11	16-1/4	3	3/4	31-3/4	22-3/4	16-1/4		7
T-500 ASME	48" x 74"	125	950	2	48	72-3/4	3	18	19-3/4	3	3/4	32-3/4	26-3/4	19-3/4		6
T-750 ASME	48" x 106"	125	1290	2	48	105	3	18	19-3/4	3	3/4	32-3/4	26-3/4	19-3/4		6
T-1000 ASME	48" x 138"	125	1655	2	48	136	3	18	19-3/4	3	3/4	32-3/4	26-3/4	19-3/4		6



COMMERCIAL GAS CIRCULATING WATER HEATERS

BURKAY® GENESIS

85% EFFICIENT, ULTRA-LOW NOx HOT WATER HEATER

A. O. Smith Genesis® Water Heaters offer everything you could ask for in a non-condensing water heater. They provide a near condensing 85% thermal efficiency, outstanding venting flexibility, space-saving stackable design and a clean burning fan assisted combustion system with low NOx emissions that meet the most stringent California standards.

ELECTRONIC CONTROL WITH PRECISE TEMPERATURE MANAGEMENT

- Controls every electrical water heater function, including pump operation and main burner ignition, delivers precise temperature management, with ±1º accuracy.
- Display panel shows current operating status and fault readings
- Display also shows temperature setpoints, outlet temperature, current inlet/outlet differential (DT) and tank temperature.
- Included remote temperature sensor when mounted in the storage tank allows the tank temperature to be set and monitored at the water heater.

STAGE GAS FIRING SYSTEM

- Prevents short cycling and ensures smooth operation, saves fuel and extends product life.
- Delivers maximum output when demand is high, reduced firing rates during off peak times.

ULTRA-LOW NOX OPERATION

• Meets SCAQMD Rule 1146.2 air quality standards.

COPPER FINNED-TUBE HEAT EXCHANGER

- Gasketless glasslined headers and copperfinned tubes with extruded integral fins deliver exceptional heat transfer.
- Copper is lightweight for easier handling and immune to thermal shock.

SPACE-SAVING DESIGN

- Optional stack rack allows one unit to be stacked on top of another, doubling output within the footprint of a single unit.
- If floor space is limited, the Genesis water heater can be installed outdoors with an optional outdoor Vent Cap.

MEETS ASHRAE/IESNA 90.1-2004 MULTIPLE VENTING OPTIONS

 All Genesis models can vent vertically in Category I with double wall "B" vent or horizontally in Category IV with AL29-4C stainless steel vent material.

FACTORY START-UP INCLUDED

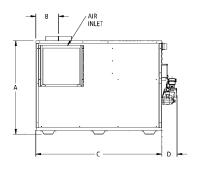
 Required for activating warranty and assuring maximum operating performance. Contact your local sales representative or Authorized Start-Up Agent to arrange a FREE Certified Start-Up.

5-YEAR LIMITED HEAT EXCHANGER WARRANTY

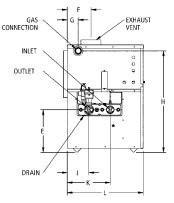
 For complete warranty information, consult written warranty or contact A. O. Smith.



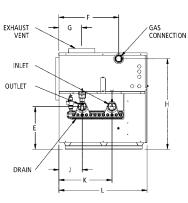
GWH-400 THRU GWH-2100



SIDE VIEW







GWH-1000 THRU GWH-2100









MODEL	INDUT	ODU 6	OBU 6	OBU 6						DIMENSI	ONS IN II	NCHES				APPROX.
MODEL NUMBER	MBH	GPH @ 40°F RISE	GPH @ 100°F RISE	GPH @ 140°F RISE	A	В	С	D	E	F	G	Н	J	К	L	WEIGHT (LBS)
GWH-400N	399	1,028	412	294	31-1/2	7	37-5/8	8-7/8	12-1/2	7	3-1/4	29-3/4	6-3/8	12-5/8	22-1/4	454
GWH-500N	500	1,288	515	368	31-1/2	7	45-3/8	8-7/8	12-1/2	7	3-1/4	29-3/4	6-3/8	12-5/8	22-1/4	467
GWH-650N	650	1,674	670	478	31-1/2	8-1/2	56-3/4	8-7/8	12-1/2	8-1/2	3-1/4	29-3/4	6-3/8	12-5/8	22-1/4	551
GWH-750N	750	1,932	773	552	31-1/2	8-1/2	64	8-7/8	12-1/2	8-1/2	3-1/4	29-3/4	6-3/8	12-5/8	22-1/4	611
GWH-1000N	990	2,550	1,020	729	36	8-3/4	48-1/2	5-7/8	15-7/8	22-1/2	8-1/2	33-3/4	8-3/4	19-7/8	33	843
GWH-1250N	1,260	3,245	1,298	927	36	9-3/4	58-3/4	5-7/8	15-7/8	22-1/2	9-3/4	33-3/4	8-3/4	19-7/8	33	939
GWH-1450N	1,440	3,709	1,484	1,060	36	10-1/2	68-7/8	5-7/8	15-7/8	22-1/2	10-1/4	33-3/4	8-3/4	19-7/8	33	1,035
GWH-1800N	1,800	4,636	1,855	1,325	36	11	82-3/8	5-7/8	15-7/8	22-1/2	10-7/8	33-3/4	8-3/4	19-7/8	33	1,168
GWH-2100N	2,070	5,332	2,133	1,523	36	11	92-5/8	5-7/8	15-7/8	22-1/2	10-7/8	33-3/4	8-3/4	19-7/8	33	1,285

Pump and flanges are shipped loose for field installation.

Gas connect pipe size is 11/4" for models GWH-400 to GWH-750 and is 2" for models GWH-1000 to GWH-2100.

Water connections for models GWH-400 to GWH-750 are 2" NPT on 6-1/2" centers.

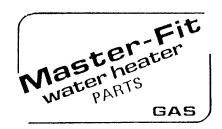
Water connections for models GWH-1000 to GWH-2100 are 2-1/2" NPT on 11-1/4" centers.

Performance data is based on manufacturer test results.

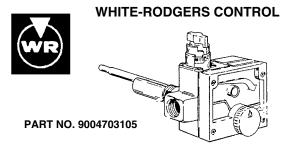
Dimensions and specifications subject to change without notice in accordance with our policy of continuous product improvement.

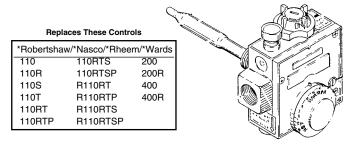


CONTROLS & PARTS









PART NO. 9005891105

A. O. Smith* American-Standard* Master-Fit*	J.C. Penney Kmart Sears* State*	Honey- well	Gra	nney/Kmart ainger/ Rodgers*	Rheem/Rudd Nasco/ Robertshaw
ALL RESIDENTIAL WATFR HEATERS MANUFACTURED AFTER 6/1/62	3773 3773U 37C73U 37C75U 	V5124C V5126C VSI3OC V5130R V5130W V5131C	3703 3708 3733 3753 3763 3763U 3767 3773	3773U 37C73U 3755 3775U 37C75U 3777 3777U 3779	Use No. 23910-1 Master-Fit Control

RESIDENTIAL

NATURAL GAS

3-1/2" main pressure regulator setting.

3" to 4" pilot pressure.

Energy cutoff at 1950F water temperature.

Temperature range: warm $120^{\circ}F$) to hot $(160^{\circ}F)$. PART NO. 9004703105 WITH 1-1/4" SHANK

PART NO. 9004353105 WITH 2-1/2" SHANK

*Where required, use Part No. 39079 to add 1-1/2" to control shank length.

RESIDENTIAL - TO 170°F MAX.

LIGHT COMMERCIAL

NATURAL GAS

96.000 Btuh maximum capacity.

4" main pressure regular setting.

3" to 4" pilot pressure.

Energy cutoff at 195°F water temperature.

Temperature range: Warm $120^{\circ}F$ to Hot $180^{\circ}F$.

PART NO. 9005891105



BC/HW COMMERCIALWATER HEATER PARTS





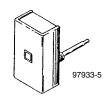
COPPER COMBUSTION COILS

BC 120-670 COMMON WATER HEATER PARTS

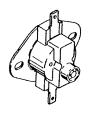
					-		
MODEL	SERIES	COIL	HEAT	COIL LIMIT	CONTROL	THERMO	GAS
			EXCHANGER	SWITCH	LIMIT	COUPLE	VALVE
	830,831,840,841						
BC120	832,833,842,843		100110246	100110201	097933-015	K16FA36	100109891
	830,831,840,841						
BC160	832,833,842,843	100110248	100110243	100110201	097933-015	K16FA36	100109891
	830,831,840,841						
BC200	832,833,842,843	100110249	100110243	100110201	097933-015	K16FA36	100109891
	830,831,840,841						
BC225	832,833,842,843	100110249	100110243	100110201	097933-015	K16FA36	100109891
	740, 741						
BC300	740A, 741A						
	740B/P, 741B/P		100110235	100110201	097933-015	K16FA36	
	760, 761S						
	740, 741						
BC399	740A, 741A						
	740B/P, 741B/P			100110201	097933-015	K16FA36	
	760, 761S						
	740, 741						
BC 420	740A, 741A						
	740B/P, 741B/P			100110201	097933-015	K16FA36	
	760, 761S						
	740, 741						
BC 670	740A, 741A						
	740B/P, 741B/P		100110261	100110201	097933-015	K16FA36	
1	760, 761S						



HEAT EXCHANGERS

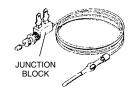


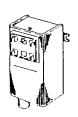
TEMPERATURE CONTROLS
For Coil and Tank Type heaters



Surface mounted high limit **TEMPERATURE CONTROLS**For Coil and Tank Type heaters

THERMOCOUPLES





MODULES

HW 80-670 COMMON WATER HEATER PARTS

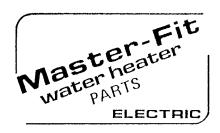
			HEAT		CONTROL	THERMO-	GAS
MODEL	SERIES	COIL	EXCHANGER	MODULE	LIMIT	COUPLE	VALVE*
	840-843	97282				78802	6390
HW80	880-883	97282-1	96582	78191	93661-4	32536-7	78190-4
	840-843	97283				78802	6390
HW120	880-883	97283-1	96582	78191	93661-4	32536-7	78190-4
	840-843	97284				78802	6390
HW160	880-883	97284-1	96558	78191	93661-4	32536-7	78190-4
	840-843	97285				78802	6390
HW200	880-883	97285-1	96558	78191	93661-4	32536-7	78190-4
	840-843	97285				78802	6390
HW225	880-883	97285-1	96558	78191	93661-4	32536-7	78190-4
						PILOT	
	872, 873		93997	78191-2		11201	
HW300	892, 893	97485	190922	191182	93661-4	78192-2	6390
HW399/	872, 873		94774			78192-2	
HW420	892, 893	97486	190913	78191-2	93661-1		CALL
	838, 839		98927	78191-2	97474-1	78192-2	
HW670	892, 893	99267	190889	191182	97474-1		CALL
	896, 897				93661-1		

*SMR S-12 use 6390. SMR S-13 use 78190-4.



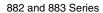
COMMERCIAL TANK-TYPE WATER HEATER PARTS LIST

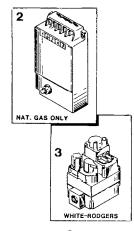
BTC-120, 154, 179, 240, 305, 365 SERIES 880 THRU 883 STANDARD AND ASME MODELS (A)

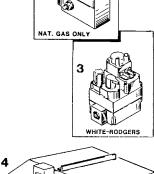


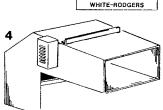
1 PILOT BURNER ASSEMBLIES

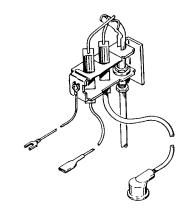
880 and 881 Series



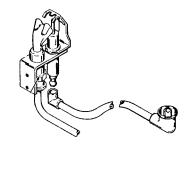


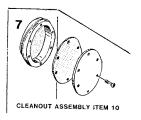












DESCRIPTION	BTC 120	BTC 154	BTC 179	BTC 197/240A	BTC 305A	BTC 365(A)
MAIN BURNER*	9005889205(2)*	9005889205(2)*	9005889205(3)*	9005889205(4)*	9005889205(6)*	9005889205(8)
1) PILOT BURNER: #880 SERIES #882 SERIES 2) SPARK MODULE #880 SERIES #882 SERIES	9004988115 9004998215 9004470205 AS 78191-2					
4) GAS VALVE	AS 77937-2	AS 77937-4				
5, 6) DRAFT HOOD: HORIZONTAL BTC 197 ONLY BTC 240A ONLY VERT. LO-PROFILE VERTICAL	CALL	CALL	CALL	CALL	CALL	CALL
7) CLEANOUT ASSY PRESS PLATE GASKET SCREWS	9005797205 9004099215 9004100215	9005797205 9004099215 9004100215	9005797205 9004099215 9004100215	9005797205 9004099215 9004100215	9005797205 9004099215 9004100215	9005797205 9004099215 9004100215

^{* ()} INDICATES NUMBER OF BURNERS

TEMPERATURE & PRESSURE RELIEF VALVES

Hi Capacity Commercial T&P Valves

The Apollo 18C-500 Series bronze automatic temperature and pressure relief valves are used for protection of high capacity commercial hot water heaters and storage tanks.

		ELEMENT	AGA/CGA TEMP.	ASME PRESS.
INLET	OUTLET	LENGHT	STEAM RATING	STEAM RATING
3/4" M	3/4" F	5"	205,000	1,619,000
3/4" M	3/4" F	5"	205,000	1,912,000
1"M	1"F	5"	500,000	1,825,000
1"M	1"F	5"	500,000	2,155,000
1"M	1"F	5"	750,000	3,070,000
1"M	1"F	5"	750,000	3,625,000
1-1/2"F	1-1/2"F	4"	1,200,000	5,125,000
1-1/2"F	1-1/2"F	4"	1,200,000	6,050,000
	3/4" M 3/4" M 1"M 1"M 1"M 1"M 1-1/2"F	3/4" M 3/4" F 3/4" M 3/4" F 1"M 1"F 1"M 1"F 1"M 1"F 1"M 1"F 1"M 1"F	INLET OUTLET LENGHT 3/4" M 3/4" F 5" 3/4" M 3/4" F 5" 1"M 1"F 5"	INLET OUTLET LENGHT STEAM RATING 3/4" M 3/4" F 5" 205,000 3/4" M 3/4" F 5" 205,000 1"M 1"F 5" 500,000 1"M 1"F 5" 500,000 1"M 1"F 5" 750,000 1"M 1"F 5" 750,000 1-1/2"F 1-1/2"F 4" 1,200,000





A.S.M.E. WATER PRESSURE RELIEF VALVE

Bronze body relief valves for pressure protection only of all types of hot water heating boiler equipment.

				8	STEAM DISCHAF	RGE CAPACITIE	S
MODEL #	INLET	OUTLET	HEIGHT	30 LBS	50 LBS	125 LBS	150 LBS
10-604-10	3/4"	3/4"	5-1/4"		1,209,000		
10-604-125	3/4"	3/4"	5-1/4"			2,639,000	
10-605-34	3/4"	1"	6-3/4"				5,044,000
10-607-25	1-1/2"	1-1/2"	10-3/4"			10,054,000	
10-614-07	3/4"	3/4"	5-1/4"	970,000			
10-614-10	3/4"	1"	5-1/4"		1,418,000		
10-615-05	1"	1-1/4"	6-3/4"	1,570,000			
10-615-10	1"	1-1/4"	6-3/4"		2,295,000		
10-616-05	1-1/4"	1-1/2"	8-1/3"	2,716,000			
10-616-10	1-1/4"	1-1/2"	8-1/3"		3,969,000		
10-617-05	1-1/2"	2"	10-3/4"	3,696,000			
10-617-10	1-1/2"	2"	10-3/4"		5,400,000		
10-618-05	2"	2-1/2"	14"	8,900,000			



10 Series

NO.100 XL

A thermostat with a thermo-bonded non-metallic protective coating and a protective dialectric barrier to protect thermostat from accumulations of mineral deposits.

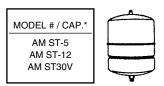
MODEL	INLET	OUTLET	HEIGHT	AGA/CGA TEMP. STEAM RATING
WV 100XL*	3/4"	3/4"	3-1/2"	100,000

^{*}Available in 125 or 150 psi.



THERM-X-TROL®

THERMAL EXPANSION ABSORBER. FOR POTABLE WATER HEATERS ONLY.



^{*} STANDARD AIR CHARGE 40 PSI.

Maximur	n Temperi	iture Sett	ing 140°F
Water Heater Size	Static	Supply P (psig)	ressure
(gals.)	40	60	80
40	ST-5	ST-5	ST-5
50	ST-5	ST-5	ST-5
60	ST-8	ST-8	ST-8
80	ST-8	ST-8	ST-12
120	ST-12	ST-12	ST-25V

MANUFACTURERS INDEX, SECTION 4

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Notes

SERIES X-2 GAS FIRED, CHIMNEY VENTED, CAST IRON WATER BOILER



Features

- 84% AFUE
- 70 280 MBH (7 sizes)
- · All controls concealed inside boiler jacket
- Integrated boiler control with diagnostics
- FREE additional pump relay
- Integral LWCO option requires no piping! (IDL-1200)
- Industry standard tapping locations, allows easy, direct replacement for thousands of existing boiler installations
- American-made cast iron heat exchanger
- Accepts return water temps as low as 110°F
- Designed to promote turbulent water flow within the section for efficient heat transfer
- A solid, reliable, full-featured boiler at a value price!
- · Lifetime limited warranty
- Made in Lancaster, PA, USA

Standard Equipment

- Insulated steel jacket
- Integrated draft diverter, damper and connector included
- Heavy gauge 1" base insulation
- Intelligent Hydronic Control Simple self-diagnostic control system with 3-digit readout for status settings and errors
- Step-opening redundant gas valve
- 110°F minimum return temperature rating
- Spark ignition with continuous retry
- User-friendly wiring with 120V J-box
- Circulator choice of Taco or Grundfos
- · Cast iron section assembly
- Resettable blocked vent switch
- Boiler drain valve
- Cast iron supply manifold with safety relief valve tapping

LWCO Options

"H" suffix models "Have" a pre-installed IDL-1200 integral LWCO (auto reset)

Model	Input (MBH)	DOE Heating Capacity (MBH)	Net AHRI Rating, Water (MBH)	AFUE%	Vent Size (Inches)	Approx. Shipping Weight (Lbs.)
X-203	70	59	51	84.0	4	254
X-204	105	88	77	84.0	5	304
X-205	140	117	102	84.0	6	357
X-206	175	146	127	84.0	6	405
X-207	210	176	153	84.0	7	462
X-208	245	205	178	84.0	7	518
X-209	280	234	203	84.0	8	564

* Add suffix "N" for natural gas, or suffix "L" for LP gas models

All models certified for use from sea level to 10,000 feet in elevation. Outputs are reduced by 4% per 1,000 feet above sea level for elevations above 2 0 ft. All X-2 boilers are shipped with 30 psi relief valves, MAWP is 50 psi.

DIMENSIONS & CONNECTIONS

	Dime	ensions (inc	ches)		Connections (inches)							
Model	Width "W"	Height	Depth (total)	Supply	Return	Gas Valve	Relief Valve	Content (gal.)				
X-203	14	40	33-1/4	1-1/4	1-1/4	1/2	3/4	2				
X-204	16	40	33-1/4	1-1/4	1-1/4	1/2	3/4	3				
X-205	19	40	33-1/4	1-1/4	1-1/4	1/2	3/4	4				
X-206	22	40	33-1/4	1-1/4	1-1/4	1/2	3/4	5				
X-207	25	40	33-1/4	1-1/4	1-1/4	3/4	3/4	6				
X-208	28	40	33-1/4	1-1/4	1-1/4	3/4	3/4	7				
X-209	31	40	33-1/4	1-1/4	1-1/4	3/4	3/4	8				

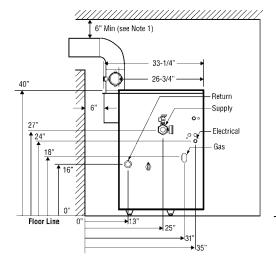
NOTES:

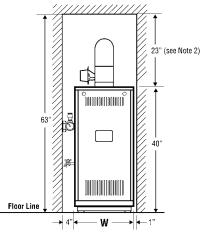
- 1.Minimal radial distance around vent pipe and breeching for single-wall metal pipe vent connector, otherwise follow vent connector manufacturer's recommended clearances.
- 2. Add height required to maintain 6" clearance from all breeching components.

















DIRECT VENT GAS FIRED HOT WATER BOILER

• 94+% AFUE ENERGY STAR® Certified

- Natural or LP Gas
- 70 to 280 MBH in 7 Sizes
- Cast Iron Sectional Design
- PVG Power Vented



Hassle Free Service & Installation

Long Lasting Performance

Designed and built with proven and readily available components. The PVG is designed for long lasting performance and ease of service.

Proven Controls

Proven Honeywell controls are used on a plug and play control panel for easy access and service.

Safe, Durable Vent System

The PVG uses a AL294C® stainless steel vent system. The durability and longevity of stainless steel ensures products of combustion are vented outside your home for the life of your boiler.

Venting Options

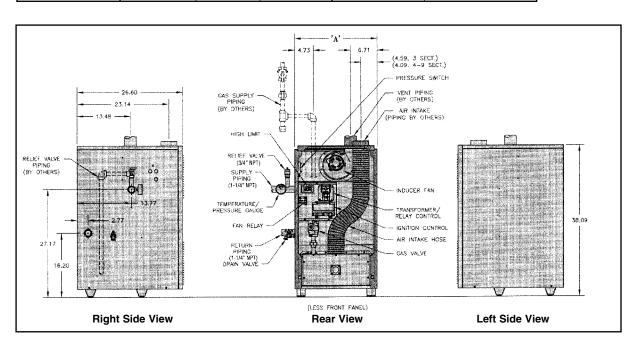
Sidewall and vertical venting options for maximum installation flexibility.

RATINGS

Model Number	Input	DOE Heating Capacity (MBH)	I=B=R Water Ratings	AFUE%
PVG3	70	60	52	85.5
PVG4	105	90	78	85.4
PVG5	140	120	104	85.3
PVG6	175	150	130	85.2
PVG7	210	179	156	85.0
PVG8	245	208	181	84.5
PVG9	280	238	207	84.0

SPECIFICATIONS

Model Number	Dim 'A'	ensions (inc 'B'	hes) 'C'	Water Content (gal.)	Approx. Shipping Weight (lbs.)
PVG3	11.65	26.60	38.09	2.16	210
PVG4	14.72	26.60	38.09	3.00	254
PVG5	17.78	26.60	38.09	3.84	298
PVG6	20.84	26.60	38.09	4.68	342
PVG7	23.90	26.60	38.09	5.52	386
PVG8	26.97	26.60	38.09	6.36	430
PVG9	30.03	26.60	38.09	7.20	474



INDEPENDENCE SERIES GAS FIRED, CAST IRON **STEAM BOILER**



Independence

Chimney vented, equipped with fuel saving vent damper and low profile rear drafthood which accommodates low overhead areas and permits flexibility of installation with existing heating system piping.

Standard Features

- Up 82% AFUE
- 62 382 MBH (10 sizes)
- · Natural or LP gas (chimney vented)
- Electronic ignition (sizes 3-9)
- American-made cast iron sections
- Stainless steel burners
- · Step-opening gas valve provides smooth & quiet start-up
- · Industrial-quality pressure limit control
- · Boiler controls concealed inside boiler jacket

Standard Equipment

- Section assembly
- · Insulated deluxe jacket
- · Base-burner manifold assy.
- Flame roll-out switch (FRS)
- · Gas control assembly
- Canopy
- Rear drafthood
- Blocked vent switch
- Vent damper
- Pressure limit
- 24V transformer
- Probe type LWCO
- Junction box
- Thermostat isolating relay
- · Electronic ignition assembly
- 15 PSI safety valve
- · Steam gauge
- Gauge glass
- 3/4" drain valve
- · Wiring harness



RATINGS & SPECIFICATIONS

	Input		I=B=R F	Rating (2)		Approx	Minimum Chimney Requirements	
Model*	MBH (1)	DOE Heating Capacity	Steam MBH	Steam Sq. Ft.	AFUE	Shipping Weight (Lbs.)	(Round) Dia. (In.) x Ht. (Ft.) (4) (5)	
PIN4I	105	87	65	271	82.0	420	5x15	
PIN5I	140	115	86	358	82.0	485	6x15	
PIN6I	175	144	108	450	82.1	555	6x15 (5)	
PIN7I	210	173	130	542	82.1	620	7x15	

DIMENSIONS

Boiler Model	A	A B C D E		F	G		
PIN4I	17-3/4	40	34-3/4	5	40-1/4	4-3/4	8-7/8
PIN5I	21	40	35-3/4	6	40-1/4	5-1/4	10-1/2
PIN6I	24-1/4	40	35-3/4	6*	40-1/4	5-1/4*	12-1/8*
PIN7I	27-1/2	40	36-3/4	7	40-1/4	7-1/2	13-3/4

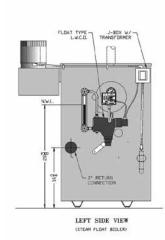
- *LP available on IN3-IN9
- 1. Ratings shown are for installations at sea level and elevations up to 2,000 ft. For higher elevations, reduce ratings 4% for each 1,000 ft. above sea level
- 2. Capacities, outputs, and ratings are based on steam combustion efficiency of 82 5%
- 3. For Canadian builds only: reduce input and output by 3%
- 4. 15 ft. height is measured from top of drafthood to top of chimney.
- 5. IN6, IN8, & IN10 Canada only: Increase chimney diameter by 1" Max Working Pressure: 15 PSI Steam

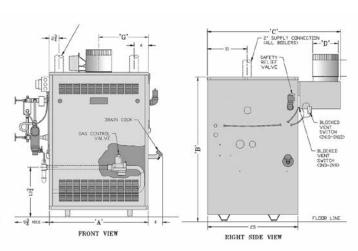






- 1. Capacities and ratings are based on steam combustion efficiency of 83.0%. (84.1% for PIN3PV)
- 2. The approved venting system for the Independence PV is 3" AL29-4C® stainless steel. Do not substitute other materials.
- 3. Vent pipe length is listed in equivalent feet. Any elbows or tees used can have specific values which must be subtracted from the total length to determine maximum length of straight pipe. Consult Installation, Operating, and Service Instructions for







Cast Iron Knockdown

- Steam or Hot Water
- Capacities 51 to 317 MBH

The Burnham Independence gas fired steam or hot water boiler offers several benefits to the homeowner, including safety, comfort, dependability and quality cast iron construction.

The Independence boiler is available in 10 heating capacities, from 51 to 317 MBH and can be used for natural gas or LP gas (IN3-IN9). Built-in gas safety systems provide homeowners residential security and confidence.

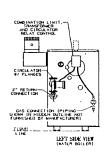
Standard Equipment: Deluxe insulated blue jacket, ASME safety relief valve, stainless steel burners, 100% shut-off redundant step opening combination gas valve, high limit (water only), flame-roll out switch, blocked vent switch (IN3-IN9), pressure control (steam only) vent damper (IN3-IN9). Packaged boiler IN3-IN9 semi-packaged IN10-IN12.

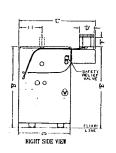
Optional Equipment: tankless heater and heater controls.* Circulator pump.

Order hot water and steam packages separately. Steam trim Honeywell probe type or McDonnell Miller float type LWCO

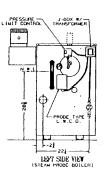
*Not available on IN3

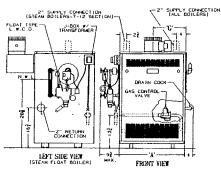
INDEPENDENCE™ GAS FIRED STEAM OR HOT WATER BOILER











SPECIFICATIONS*

			1=	=B=R Rati	ng		Al	FUE										Min.
						24	ıv	E	1									Recom- mended
	CGA/AG	DOE Heating		_								DIMENSI	ONS II	N INCHES	;		Approx. Shipping	Chimney Size Round
Model No.	Input MBH	Cap. MBH	Water MBH	Steam MBH	Steam Sq. Ft.	Water	Steam	Water	Steam	Α	В	С	D	E	F	G	Weight Lbs.	Dia. (In.) x Ht. (Ft.)
IN3	62	51	44	38	158	N/A	N/A	83.1	81.9	14-1/2		33-3/4	4		4.0/4	7-1/4	350	4x15
IN4	105	87	76	65	271	N/A	N/A	83.1	82.0	17-3/4		34-3/4	5		4-3/4	8-7/8	420	5x15
IN5	140	115	100	86	358	N/A	N/A	83.1	82.0	21				6 40-1/4	- 4/4	10-1/2	485	6x15
IN6	175	144	125	108	450	N/A	N/A	83.2	82.1	24-1/4	40	35-3/4	6		5-1/4	12-1/8	555	6x15
IN7	210	173	150	130	542	N/A	N/A	83.2	82.1	27-1/2		00.0/4	7			13-3/4	620	7x15
IN8	245	202	176	152	633	N/A	N/A	83.2	82.2	30-3/4		36-3/4			7-1/2	15-3/8	690	7x15
IN9	280	231	201	174	725	N/A	N/A	83.2	82.2	34		37-3/4	8			17	760	8x15
		AGA				Com	bustion E	fficiency	(%)									
		Gross Output MBH				Wa	ter	Ste	am					i	i			
IN10	315	259.87	226	195	812	83	3.5	82	.5	37-1/4			8			18-5/8	815	8x15
IN11	349	287.92	250	216	900	83	3.5	82	2.5	40-1/2	45	38-3/4		45-1/4	7-1/2	20-1/4	885	9x15
IN12	385	317.62	276	239	996	83	3.5	82	5	43-3/4			9			21-7/8	955	9x15

* STEAM TRIM: 6011012 with PS802 LWCO

WATER TRIM: 60110030

SERIES 8HE HOT WATER GAS BOILER



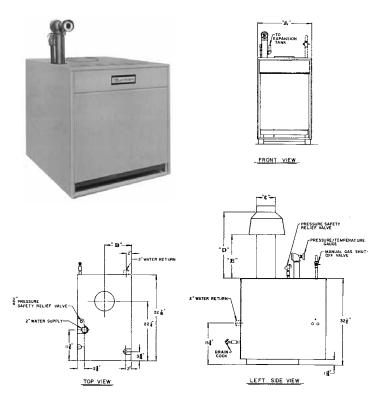
- Cast Iron, Knockdown
- Hot Water
- Capacities 340 to 505 MBH
- 83% Efficient

The Burnham Series 8HE gas boiler has a vertical flue design which provides for maximum heat transfer. Cast iron push nipples assure the integrity of the cast iron section assembly by expanding & contracting at the same rate and providing a water tight seal. The series 8HE boilers can be installed 1" apart making them ideally suited for modular applications.

Standard Equipment: deluxe insulated bluejacket, ASME safety relief valve, pressure-temperature gauge, boiler drain cock, 100% shut-off gas controls with dual valves, high limit, base burner manifold assembly, blocked vent switch, flame roll-out switch, steel burners, junction box, transformer, drafthood, vent damper.

Optional Equipment: electric ignition, vent damper (807HE-810HE), electronic control panel systems, water manifolds, four stage immersion type operating controls, eight stage boiler sequencing control panel system with outdoor reset.

Note: Not for direct installation on combustible flooring. A heat shield is required and available for combustible floor installation and concrete installation which is over a material that is subject to melting (PVC, Pex radiant tubing etc.).



STANDARD EQUIPMENT

- Cast Iron Section Assembly
- Aluminized Steel Burners
- 1" Gas Connection
- L4080D High Limit Control
- Safety Relief Valve
- Draft Hood
- Blocked Vent Switch
- - 50VA Transformer
 - Junction Box

Spark Ignition

• 2" Supply & Return

- Metal Section Connectors
- Installed Insulation
- 10 Year Limited Warranty

			1.0.0	DIMENSIONS**				000	
Boiler No.	Input (MBH)	Output (MBH)	I=B=R Net Rating MBH	"A"	"B"	"C"	"D"	"E"	Gas Connection (MPT)
K805HE	252	208	181	20"	10"	7"	24-3/4"	24-3/4"	3/4"
K806HE	315	253	220	23-3/4"	11-7/8	8	27-3/4"	18"	3/4
K807HE	340	275	239	27-1/2"	13-3/4"	8"	27-3/4"	18"	3/4"
K808HE	410	328	285	31-1/4"	15-5/8"	9"	30-3/4"	20"	3/4"
K809HE	460	370	322	35"	17-1/2"	10"	33-1/2"	22"	1"
K810HE	505	406	353	38-3/4"	19-3/8"	10"	33-1/2"	22"	1"



High Efficiency Condensing Gas Boilers Instinct Solo Floor Standing

The Instinct Floor Standing Boiler comes loaded with features such as a Calefi air separator and an all stainless fire tube heat exchanger. Instinct boilers can be paired with our Smart indirect tanks to provide an abundance of hot water.

- Calefi 548 Air Separator
- Stainless Steel Heat Exchanger
- Boiler Circulating Pump
- Turndown ratio up to 8:1
- ASME Stamped Heat Exchanger
- WiFi Connectivity

- AFUE Efficiency Rating of 95%
- Natural Gas or Propane Combatible
- CCTRLMAX Control System
- 3 in 1 Universal Vent Adapter
- Indirect Water Heater Compatible
- 10 Year Limited Heat Exchanger Warranty
- 5 Year Parts Warranty*
- "S" Models Boiler only
- "C" Models Boiler/Water Heater Combination











PERFORMANCE SPECIFICATIONS

Boiler Model	Fuel	Input Modulation MBH	AFUE	DOE Heating Capacity MBH	Turndown Ratio	Net AHRI Rating MBH
INSFS110S	Natural or Propane	13.75 to 110	95%	102	8 : 1	89
INSFS155S	Natural or Propane	19.375 to 155	95%	142	8 : 1	124
INSFS199S	Natural or Propane	24.875 to 199	95%	184	8 : 1	159
INSFS155C	Natural or Propane	19.375 to 155	95%	142	8:1	124
INSFS199C	Natural or Propane	24.875 to 199	95%	184	8 : 1	159

CONNECTIONS / DIMENSIONS / DATA

Boiler Model	Supply/Return Connections	Gas Connection	Vent/Air Diameter	Dimensions W x H x D	Weight Lbs.
INSFS110S	1"	3/4"	3"	22"x41"x22"	145
INSFS155S	1"	3/4"	3"	22"x41"x22"	157
INSFS199S	1"	3/4"	3"	22"x41"x22"	169
INSFS155C	1"	3/4"	3"	22"x41"x22"	181
INSFS199C	1"	3/4"	3"	22"x41"x22"	191

STANDARD FEATURES

Heat Exchanger

- 439 Stainless Steel Heat Exchanger for corrosion resistance
- · Self cleaning flueways reduce maintenance
- Compatible with Standard Glycol up to 50%
- 10 year limited warranty

Burner

- · Stainless steel premix burner
- Direct spark ignition
- · Variable speed blower assembly
- Negative pressure regulated gas valve
- · Propane conversion kit included

Sensors

- Outdoor temperature
- Boiler supply temperature
- Boiler return temperature
- Flue temperature
- Boiler system pressure

Intake and Venting

- 2" & 3" Parallel venting (standard)
- Concentric venting (optional)
- PVC, CPVC, PP, SS material options

CCTRLMax Control System

- Digital display with 5 navigation buttons
- Advanced modulating temperature control
- EZ setup allows quick and easy boiler setup
- Domestic hot water priority with optional timeout
- Boiler low water protection
- Freeze protection
- · High limit protection

Electrical Connections

- 120V/60Hz Power supply
- Primary pump
- Thermostat
- Outdoor sensor
- Indirect water heater aquastat
- · Indirect water heater pump

Piping Connections

- EZ Install piping mounting bracket
- 1" NPT boiler supply and return (LH or RH Connection)
- 3/4" Condensate drain
- * To receive 5yr warranty Online Registration Required



High Efficiency Condensing Gas Boilers Instinct Solo Wall Mounted

The Instinct Floor Standing Boiler comes loaded with features such as a Calefi air separator and an all stainless fire tube heat exchanger. Instinct boilers can be paired with our Smart indirect tanks to provide an abundance of hot water.

- Calefi 548 Air Separator
- Stainless Steel Heat Exchanger
- Boiler Circulating Pump
- Turndown ratio up to 8:1
- ASME Stamped Heat Exchanger
- WiFi Connectivity

- AFUE Efficiency Rating of 95%
- Natural Gas or Propane Combatible
- CCTRLMAX Control System
- 3 in 1 Universal Vent Adapter
- Indirect Water Heater Compatible
- 10 Year Limited Heat Exchanger Warranty
- 5 Year Parts Warranty*
- "S" Models Boiler only
- "C" Models Boiler/Water Heater Combination













STANDARD FEATURES

Instinct Solo Features

- · Light weight construction for wall mounting
- · Approved for zero clearance to combustibles
- 2" PVC, CPVC, PP venting up to 28 equivalent feet
- 3"PVC, CPVC PP or AL29-4C up to 100 equivalent feet
- 10 year limited warranty on heat exchanger
- Up to 6 year warranty on parts, except ignitor
- Up to 3 year labor allowance

Approvals

- 95% AFUE efficiency
- ENERGY STAR qualified
- ANSI Z21.13 and CSA 4.9 Boiler Standards Compliance
- ASME Boiler Certification ASME "H" stamp
- SCAQMD 2012 Low NOx Certification

Stainless Steel Fire Tube Heat Exchanger

- 439 Stainless Steel heat exchanger
- · High water content provides stable temperature contol
- Self cleaning flue ways reduce maintenance
- Suitable for use with proplyene glycol uo to 50%

CCTRLMax Control System

- · Graphical display with 5 navigation buttons
- EZ setup allows quick and easy boiler setup
- Flexible configuration of 3 circulator
- · Outdoor temperature reset
- · Accepts two space heating call inputs with inpedendent outdoor reset curves
- · Domestic hot water priority with optional time out
- Integrated cascade control for up to 6 boilers

- 0-10 VDC Modulation input
- Modbus building management system (BMS)
- Adjustable warm weather shut down
- · Adjustable boiler freeze protection
- · Logging function records sensor readings for system optimization and troubleshooting
- · Describes lockouts in plain English and suggests solutions while storing the last 8 errors

Standard Equipment

- · Stainless steel premix burner
- · Direct spark ignition with variable speed blower
- Full modulation with turndown ratio of 8:1
- · Outdoor temperature sensor
- · Automatic air vent
- ASME 30 PSI pressure relief valve
- Temperature and Pressure gauge
- · Automatic low water cuttoff feature with early warning
- · High temperature manual reset limit safety control
- Terminal block for circulator output
- Low voltage terminal strip with removable jumpers for manual or automatic reset
- · Swing out control for easy access and servicing
- Polypropylene condensate pan and internal flue pipe
- 3 in 1 Universal vent adapter directly accepts PVC, Polyproplyene, Stainless steel connections with test ports











High Efficiency Condensing Gas Boilers Instinct Solo Wall Mounted

CTRLMAX Control System -EZ Setup allows for quick 60 second setup. Easy troubleshooting in plain text, no codes.

Stainless Fire Tube Heat Exchanger



Large plate heat exchanger provides industry leading performance. 5+ GPM hot water while fully condensing in DHW mode.

Large plate heat exchanger provides industry leading performance. 5+ GPM hot water while fully condensing in DHW mode.

PERFORMANCE SPECIFICATIONS

Boiler Model	Fuel	Input Modulation MBH	AFUE	DOE Heating Capacity MBH	Turndown Ratio	Net AHRI Rating MBH
INS110S	Natural or Propane	13.75 to 110	95%	102	8 : 1	89
INS155S	Natural or Propane	19.375 to 155	95%	142	8 : 1	123
INS199S	Natural or Propane	24.875 to 199	95%	184	8 : 1	159
INS155C	Natural or Propane	19.375 to 155	95%	142	8 : 1	123
INS199C	Natural or Propane	24.875 to 199	95%	184	8:1	159

CONNECTIONS / DIMENSIONS / DATA

Boiler Model	Supply/Return Connections	Gas Connection	Vent/Air Diameter	Dimensions W x H x D	Weight Lbs.
INS110S	1"	3/4"	3"	21-3/4"x26"x16-1/2"	75
INS155S	1"	3/4"	3"	21-3/4"x26"x16-1/2"	95
INS199S	1"	3/4"	3"	21-3/4"x26"x16-1/2"	105
INS155C	1"	3/4"	3"	21-3/4"x33"x16-1/2"	110
INS199C	1"	3/4"	3"	21-3/4"x33"x16-1/2"	130



High Efficiency Condensing Gas Boilers Prestige Solo Wall Mounted

- 439 Stainless Steel Fire Tube Heat Exchanger
- ASME Stamped Heat Exchanger
- 95% AFUE
- Turndown ratios up to 5.5:1
- Low Pressure Drop with Proven Performance
- 2" to 4" Venting

- Multiple Venting Termination Options
- Low NOx 2012 SCAQMD Certified
- 7 Models from 80 to 399 MBH
- 5 Year Limited Parts Warranty
- 10 Year Limited Heat Exchanger Warranty
- 5 & 10 Year Extended Warranty Options

Featuring ACVMax Control with:

- 60 Second Set-up Based on Previous TriMax Platform
- Integrated Cascade Function for up to 6 Boilers
- Optional LonWorks® and BACnet BMS® Gateway
- Two Outdoor Reset Curves / Set Points
- Multiple Zone Control
- Multiple Circulator Control

60 Second Set-Up

- Choose from 6 standard heating applications to set up the boiler in 60 seconds or less.
- Finned Tube Baseboard
- High Mass Radiant
- · Cast Iron Baseboard
- Radiators
- · Low Mass Radiant
- Fancoil
- Preconfigured for indirect hot water applications

Integrated Cascade

 Joins up to 6 boilers: Master boiler automatically recognizes linked boilers: Meets simultaneous DHW & Space Heating calls: Full Parallel Modulation: Automatic Duty Cycling.

Multiple Zone Control

- Accepts 2 space heating calls with independent outdoor reset curves
- Simultaneously heat dual temperature heating systems with built-in mixing valve control
- Manage up to 2 space heating zones and 1 DHW zone without an external zone control panel

Multiple Circulator Control

- Presets allow quick configuration of 4 circulator outputs for the application
- · Each circulator output is fully configurable for custom applications

Intelligent Troubleshooting

Describes lockouts in plain english and suggests solutions:
 Stores last 8 errors. Records sensor readings for 24 hours.













Next Generation Fire Tube Heat Exchanger

High Water Content

- Provides stable temperature control
- Low sensitivity to water flow changes
- Reduces short cycling
- · Adapts to large or small heating loads

Unique Geometry

- Designed for maximum reliability with low thermal stress
- Improved water flow for maximum heat transfer
- 439 Stainless Steel with titanium for corrosion resistance
- Polypropylene condensate pan and flue resists corrosion

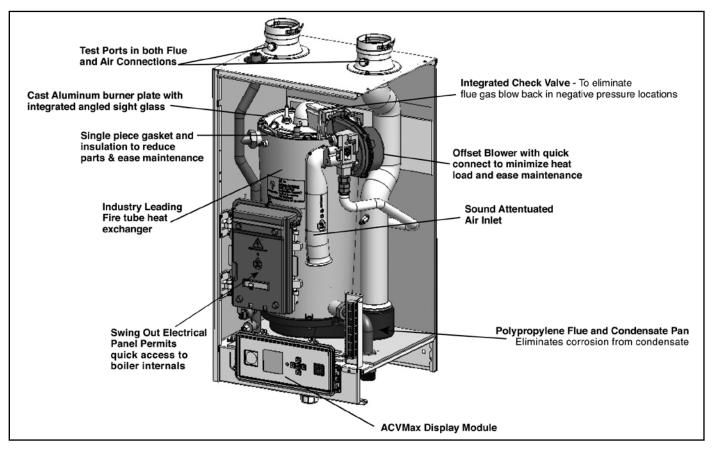
Reliable Low Maintenance Design

- Self cleaning design washes away combustion debris
- 12 year history of reliable performance
- High performance burner design
- · Low pressure drop allows piping directly to the system
- ASME Stamped





High Efficiency Condensing Gas Boilers Prestige Solo Wall Mounted



PERFORMANCE SPECIFICATIONS

Boiler Model	Fuel	Input Modulation MBH	AFUE	DOE Heating Capacity MBH	Turndown Ratio	Net AHRI Rating MBH	Water Volume Gal.
PA80	Natural or Propane	16 to 80	95%	74	5.0 : 1	64	2.1
PA110	Natural or Propane	20 to 110	95%	102	5.5 : 1	89	2.1
PA155	Natural or Propane	27.8 to 153	95%	142	5.5 : 1	123	4
PA175	Natural or Propane	30.9 to 170	95%	157	5.5 : 1	137	5.3
PA250	Natural or Propane	43.6 to 240	95%	222	5.5 : 1	193	4.5
PA299	Natural or Propane	72.5 to 299	95%	278	4.1 : 1	242	7.4
PA399	Natural or Propane	72.5 to 399	95.1%*	379	5.5 : 1	330	7.4

^{*}Thermal Efficiency

CONNECTIONS / DIMENSIONS / DATA

Boiler Model	Supply/Return Connections	Gas Connection	Vent/Air Diameter	Dimensions D x W x H	Weight Lbs.
PA80	1"	1/2"	3"	17-5/16" x 19-3/4" x 36-9/16"	103
PA110	1"	1/2"	3"	17-5/16" x 19-3/4" x 36-9/16"	103
PA155	1-1/4"	3/4"	3"	17-5/16" x 19-3/4" x 36-9/16"	118
PA175	1-1/4"	3/4"	3"	17-5/16" x 19-3/4" x 36-9/16"	128
PA250	1-1/4"	3/4"	3"	17-5/16" x 19-3/4" x 36-9/16"	140
PA299	1-1/2"	1"	4"	23-5/8" x 24-7/8" x 39-3/8"	210
PA399	1-1/2"	1"	4"	23-5/8" x 24-7/8" x 39-3/8"	216



Stainless Steel Indirect Fired Water Heaters

FEATURES

- Exclusive "Tank-in-Tank" Technology
- Abundant Domestic Hot Water at the Lowest Possible Cost
- A Limited Lifetime Warranty

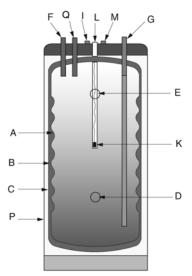
- 2" of Polyurethane Foam Insulation
- 8 Sizes to Choose From
- Self Cleaning/Self Descaling Heat Exchanger
- Lowest Pressure Drop in the Industry

PERFORMANCE

Model No.	Boiler Output Btu/hr	1st Hour Recovery (gal.)	Continuous Flow (gal.)	Peak/Flow Gal/10 min.
Smart 20	79,000	120	105	35
Smart 30	87,000	140	115	40
Smart 40	112,000	180	150	50
Smart 50	140,000	220	185	65
Smart 60	270,000	410	360	100
Smart 80	300,000	460	400	125
Smart 100	337,000	525	450	150
Smart 120	420,000	650	560	190

Conditions:

- 200º boiler water supply
- 90º temperature rise



- A. Inner stainless steel tank
- B. Outer steel tank
- C. 2" Polyurethane insulation
- D. Boiler water connection
- E. Boiler water connection
- F. Hot water outlet
- G. Cold water inlet
- H. Enameled steel jacket
- I. Thermostat control
- J. Temperature gauge
- K. Thermostat remote sensing bulb
- L. Air vent
- M. Electrical wiring plug
- N. Thermometer remote sensing bulb
- P Plastic jacket
- Q. Auxiliary connection

SUPERIOR DESIGN "TANK-IN-TANK" TECHNOLOGY

Superior Heat Exchange Surface Area

The domestic storage tank is constructed of stainless steel and is surrounded by boiler water in the outer tank, resulting in a full "wrap around" heat exchanger.

It's superior heat exchange surface (typically 1.5 to 2.5 times larger than a traditional coil) makes for a large volume of hot water in a short period of time. Thanks to this fast recovery, the storage capacity can be reduced, resulting in a reduced thermal loss.

Stainless Steel Tank Construction

The inner domestic storage tank is constructed of durable, corrosion resistant stainless steel.

Optimal Insulation

The Phase III®, Smart Series are insulated with 2" of either sprayed-on or injected polyurethane foam, resulting in a stand by heat loss of less than 19/Hr.



Self Cleaning / Self-descaling

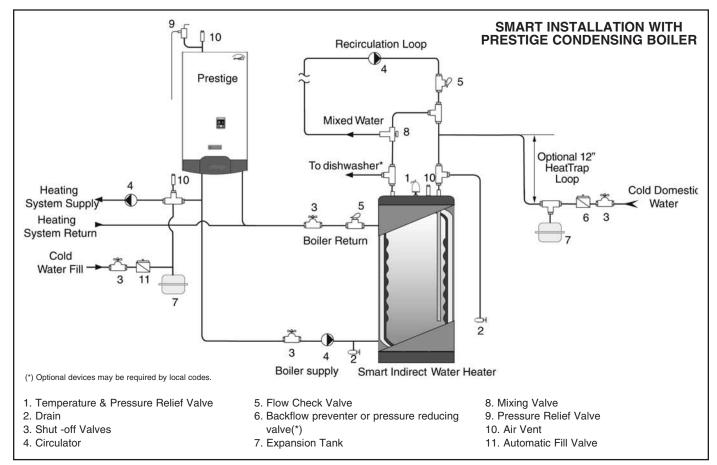
The inner, domestic tank is suspended within the outer tank so it is free to expand and contract as the pressure varies during hot water draws. Moreover, its corrugations amplify the movement and prevents the lime build up on the heat exchanger; thus maintaining its performance during the Phase III®'s life span.

Anti-Bacteria Growth / Maintenance Free

The "Tank-in-Tank" design allows us to store domestic water at higher temperatures preventing bacteria growth. Additionally constructed of high quality stainless steel, Phase III® does not require a protective anode.



Stainless Steel Indirect Fired Water Heaters



PRODUCT SPECIFICATIONS

Model No.	Dimension	Height	Boiler/Supply Return	Domestic Inlet/Outlet	3rd Domestic Connection*	Domestic Capacity (gal.)	Heating Water Capacity (gal.)	Heat Surface (sq. ft.)	Empty Weight (lbs)
Smart 20	22" dia.	32"	1"	3/4"	3/4"	22	5	11	100
Smart 30	22" dia.	38"	1"	3/4"	3/4"	28	5	13	115
Smart 40	22" dia.	46"	1"	3/4"	3/4"	36	6	16	135
Smart 50	22" dia.	57"	1-1/4"	3/4"	3/4"	46	8	20	165
Smart 60	22" dia.	66"	1-1/4"	3/4"	3/4"	56	8	24	190
Smart 80	26" dia.	61"	1-1/2"	1-1/2"	1-1/2"	70	14	28	271
Smart 100	26" dia.	78"	1-1/2"	1-1/2"	1-1/2"	95	25	36	362
Smart 120	32" dia.	72"	2"	1-1/2"	1-1/2"	119	43	42	479

^(*) This fitting can be used as a return connection if circulated domestic water is required or can be used as a connection for the T&P Relief Valve.

SERIES MI-e RESIDENTIAL GAS BOILERS



PeerlessBoilers.com

FEATURES

- Packaged Residential Hot Water Boilers
- Natural or LP Gas
- Natural Draft Venting

- Standing Pilot or Intermittent Ignition
- Low-Profile Design

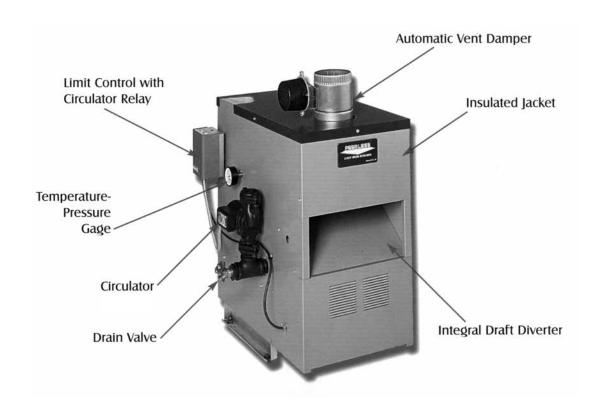
STANDARD EQUIPMENT

- Cast Iron Sections Factory Tested and Assembled with Steel Push Nipples
- Deluxe Insulated Enameled Steel Jacket
- 30 PSI Safety Relief Valve
- Standing Pilot or Honeywell SmartValve® Intermittent Ignition
- Limit Control with Circulator Relay
- Drain Valve

- Temperature-Pressure Gage
- Electrically Operated Automatic Vent Damper
- Flame Rollout Safety Shutoff Switch
- Vent Safety Shutoff Switch

SERIES MI STANDARD EQUIPMENT

Circulator



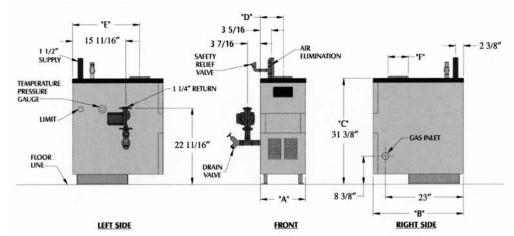


SERIES MI-e RESIDENTIAL GAS BOILERS

PeerlessBoilers.com

Boller Model Number	Input MBH	DOE Heating Capacity MBH ³	Net I-B-R Ratings Water MBH ^{1,2}	Standing Pilot Seasonal Efficiency (AFUE) ³	Intermittent Ignition Seasonal Efficiency (AFUE)	Water Content (Gallons)
MI-03	70	58	50	80.2%	82.2%	4.72
MI-04	105	86	75	80.2%	82.1%	6.00
MI-05	140	115	100	80.2%	82.0%	7.28
MI-06	175	143	124	80.3%	82.0%	8.56
MI-07	195	160	139	80.5%	82.0%	9.84
MI-08	227.5	186	162	80.3%	82.0%	11.12
MI-09	260	211	183	80.1%	82.0%	12.40

- 1. Net I=B=R water ratings based on an allowance of 1.15.
- 2. Consult factory before selecting a boiler for installations having unusual piping and pickup requirements such as intermittent system operations, extensive piping systems etc.
- 3. Heating Capacity and AFUE ratings are based on U.S. Government tests. Before purchasing this appliance, read important information about it's estimated annual energy consumption or energy efficiency rating that is available from your retailer.



Boiler Dimensions

-		Jacket				
Model Number			Top to Floor "C"	Left jacket to c/l of "D"	Rear Jacket to c/l of "E"	Vent "F"
MI-e-03	12-1/2"	26-5/8"	31-3/8"	6-1/4"	20-13/16"	5"
MI-e-04	15-7/8"	26-5/8"	31-3/8"	7-11/16"	20-13/16"	5"
MI-e-05	19-1/4"	26-5/8"	31-3/8"	9-5/8"	21-13/16"	6"
MI-e-06	22-5/8"	26-5/8"	31-3/8"	11-5/16"	21-13/16"	6"
MI-e-07	26"	26-5/8"	31-3/8"	13"	21-13/16"	7"
MI-e-08	29-3/8"	29-5/8"	31-3/8"	14-11/16"	23-5/16"	8"
MI-e-09	32-3/4"	29-5/8"	31-3/8"	16-3/8"	24-5/16"	8"

Crate Dimensions & Shipping Weights

Boiler Model Number	Width	Depth	Height	Approximate Shipping Weight (lbs)
MI-e-03	28-1/2"	30-7/8"	40-1/4"	315
MI-e-04	28-1/2"	30-7/8"	40-1/4"	375
MI-e-05	35-1/2"	30-7/8"	40-1/4"	435
MI-e-06	35-1/2"	30-7/8"	40-1/4"	505
MI-e-07	42-1/4"	33-7/8"	40-1/4"	575
MI-e-08	42-1/4"	33-7/8"	40-1/4"	630
MI-e-09	45-1/2"	33-7/8"	40-1/4"	685

4-16

Series 63

- · Residential Gas Packaged or Knockdown
- Natural Draft Venting
- Standing Pilot or Spark Ignition
- Steam or Hot Water Boilers
- Natural or LP Gas





The Series 63 boiler is a residential, gas-fired boiler for hot water or steam systems. Shipped as knockdown (factory assembled sections), the boiler comes in seven sizes ranging from three to six

nipples that provide a permanent, watertight seal between sections. A float type, low water cutoff is standard on steam boilers only. All Series 63 boilers include standard standing pilot ignition (spark

ignition is available as an option), Honeywell operating controls, vent damper and a slide-in, pre-as-sembled burner tray. A deluxe, insulated, enameled steel jacket completely encloses gas valves and burners, and reduces boiler heat loss. The low profile design of the Series 63 boiler works well



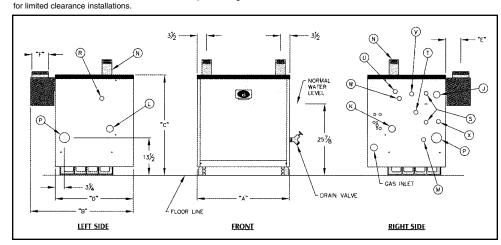


Series 63 Standard Equipment

- Deluxe Insulated Enameled Steel jacket
- Cast Iron Sections - Factory Tested & Assembled (3-6) or Split-Assembled (7-12)
- Pre-assembled Wiring Harnesses
- · Vent Damper (Series 63 Only)
- · Blocked Vent Switch
- Flame Roll-out Switch
- Drain Valve
- 30 PSI Safety Relief Valve
- Limit Control • Temperature-Pressure
- Manual Reset Limit Control (9-12)
- Circulator Relay

Steam

- 15 PSI Safety Valve
- Pressure Gage
- Gage G/ass
- Float Type Low Water Cut-off
- Pressure Control
- Tappings for Primary & Secondary Probe Low Water Cutoff
- Skim Tapping
- Manual Reset Limit Control (9-12)



Tapping Locations

Tap ID	Size N.P.T.	Steam	Water
J	1 1/4"	Skim Tapping	Skim Tapping
K	1"	Tank Supply/Limit	N/A
L	1"	Tank Return	N/A
M	3/4"	Boiler Drain	Boiler Drain
N	3"	Supply	Supply
Р	2 1/2"	Return	Return
R	3/4"	Safety Valve	Relief Valve
S	1/2"	Gauge Glass	N/A
Т	3/4"	Primary Probe Low Water Cut-Off	N/A
U	3/4"	Primary Limit	Primary Limit
V	3/4"	Secondary Limit	Pressure/ Temperature Gauge
W	3/4"	Pressure Gauge	Secondary Limit
х	3/4"	Secondary Probe Low Water Cut-Off	N/A

Boiler Dimensions

Boiler Model	Width "A"	Depth "B"	Top to Floor "C"	Jacket Depth "D"	Rear of Jacket to c/I of Flue "E"	Flue Size "F"
63-03	16 1/8"				5 5/8"	6"
63-04L		371/4"				- "
63-04	20 3/8"				5 1/8"	7"
63-05L			36 3/8"	28 1/8"		
63-05	24 5/8"	39 1/4"			6 5/8"	8"
63-06	28 7/8"				6 1/8"	9"

Series 63 Boiler Ratings

Boiler		Heating	OE Capacity BH	1	Net I=B=R Ratings		Standing Pilot w/Damper Seasonal Efficiency (AFUE)		w/Damper	gnition Seasonal y (AFUE)	Water Content (Gal.)		
Model Number	Input MBH	Water	Steam	Steam Sq. Ft.	Steam MBH	Water MBH	Water	Steam	Water	Steam	Water	Steam	
63-03L	88.5	73	74	231	64	55	80.9%	80.6%	82.4%	83.0%	13.2	9.3	
63-03	118.0	99	98	306	86	73	82.1%	81.2%	83.5%	82.6%	13.2	9.3	
63-04L	147.5	123	123	384	107	92	81.4%	80.6%	82.7%	82.6%	15.6	10.8	
63-04	177.0	148	147	459	129	110	82.1%	81.0%	83.4%	82.4%	15.6	10.8	
63-05L	206.5	172	171	536	150	129	81.9%	80.7%	82.9%	82.3%	18.0	12.4	
63-05	236.0	198	196	612	172	147	82.2%	80.9%	83.3%	82.2%	18.0	12.4	
63-06	287.5	241	238	744	209	179	82.3%	80.7%	83.2%	82.0%	20.4	13.9	







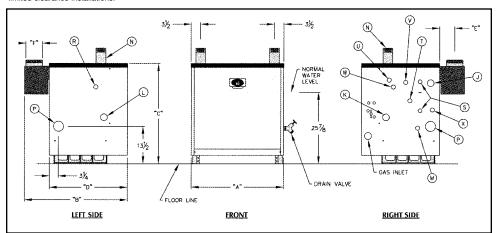


Series 64

PeerlessBoilers.com

- Semi-Commercial Gas Packaged or Knockdown
- Natural Draft Venting
- Standing Pilot or Spark Ignition
- Steam or Hot Water Boilers
- · Natural or LP Gas

The Series 64 boiler is a semi-commercial, atmospheric, gas-fired boiler for hot water or steam systems. Ranging from seven to 12 sections in six sizes, the Series 64 boiler has an 81% combustion efficiency and an input of 345 to 632.5 MBH. The Series 64 boiler is offered as either a packaged unit or knockdown with factory assembled split block sections for ease of handling. The boiler is available for either natural or LP gas with spark ignition (seven and eight section boilers are also available with standing pilot ignition). A single vent draft hood allows for natural draft (chimney) venting. The Series 64 boiler features a sizeable water content ideal for steam and large volume, hot water jobs. All boilers have steel push nipples that provide a permanent, watertight seal between sections, and a manual reset high limit control. Steam boilers offer a float type low water cut-off and skim tapping for thorough cleaning. Standard equipment on the Series 64 boiler include Honeywell operating controls and a deluxe, insulated, enameled steel jacket that completely encloses gas valves and burners, to reduce boiler heat loss. The low profile design of the boiler allows it to be used in limited clearance installations.



Tapping Locations

Tap ID	Size N.P.T.	Steam	Water
J	1 1/4"	Skim Tapping	Skim Tapping
K	1"	Tank Supply/Limit	N/A
L	1"	Tank Return	N/A
М	3/4"	Boiler Drain	Boiler Drain
N	3"	Supply	Supply
Р	2 1/2"	Return	Return
R	3/4"	Safety Valve	Relief Valve
S	1/2"	Gauge Glass	N/A
Т	3/4"	Primary Probe Low Water Cut-Off	N/A
U	3/4"	Primary Limit	Primary Limit
V	3/4"	Secondary Limit	Pressure/ Temperature Gauge
W	3/4"	Pressure Gauge	Secondary Limit
х	3/4"	Secondary Probe Low Water Cut-Off	N/A

Water



Steam



Series 64 Standard Equipment

- Deluxe Insulated Enameled Steel jacket
- Cast Iron Sections
 Factory Tested & Assembled (3-6) or Split-Assembled (7-12)
- Pre-assembled Wiring Harnesses
- Vent Damper (Series 63 Only)
- Blocked Vent Switch
- Flame Roll-out Switch
- Drain Valve

Water

- 30 PSI Safety Relief Valve
- Limit Control
- Temperature-Pressure Gage
- Manual Reset Limit Control (9-12)
- Circulator Relay

Steam

- 15 PSI Safety Valve
- Pressure Gage
- Gage G/ass
- CG450 LWCO
- Pressure Control
- Tappings for Primary & Secondary Probe Low Water Cutoff
- Skim Tapping
- Manual Reset Limit Control (9-12)

Boiler Dimensions

Boiler Model	Width "A"	Depth "B"	Top to Floor "C"	Jacket Depth "D"	Rear of Jacket to c/l of Flue "E"	Flue Size "F"
64-07	33 1/8"	39 1/4"			6 1/8"	9"
64-08	37 3/8"		00.0/0"	30 1/8"		
64-09	41 5/8"	43 1/8"			7 1/2"	10"
64-10	45 7/8"		36 3/8"	30 1/8		
64-11	50 1/8"	45 1/8"			8 1/2"	12"
64-12	54 3/8"					

Series 64 Boiler Ratings

Boiler		Heating	OE Capacity BH	Net I=B=R Ratings				Thermal Efficiency (AFUE)		ustion y (AFUE)	Water Content (Gal.)		
Model	Input			Steam	Water	Steam							
Number	MBH	Water	Steam	Sq. Ft.	MBH	MBH	Water	Steam	Water	Steam	Water	Steam	
64-07	345.0	286	279	873	249	210	81%	79.4%	83%	82.5%	22.8	15.5	
64-08	399.0	331	323	1,010	288	242	81%	79.6%	83%	82.5%	25.2	17.0	
64-09	460.0	382	373	1,165	332	280	81%	79.7%	83%	82.5%	27.6	18.6	
64-10	517.5	430	419	1,310	374	314	81%	79.8%	83%	82.5%	30.0	20.1	
64-11	575.0	477	466	1,456	415	349	81%	79.8%	83%	82.5%	32.4	21.7	
64-12	632.5	525	512	1,601	457	384	81%	79.9%	83%	82.4%	34.8	23.2	









SERIES 211A COMMERCIAL ATMOSPHERIC GAS BOILER



PeerlessBoilers.com

211A FEATURES

- Knocked Down
- Natural Draft Venting
- 630 9,450 MBH Input
- Steam or Hot Water Boilers
- Natural or LP Gas
- Combustion Efficiency meets the 80% ASHRAE 90.1 minimum as required by the federal standards for commercial boilers.
- Optional Mod-U-Pak unique three stage firing system provides improved boiler response and fuel economy.
- Built-in horizontal to verticle draft hood and aluminized steel flue collector provide a low boiler profile to allow installation in areas with low head room.
- The unique finned, tubular sections are spaced evenly using spacing rings which allow the sections to maintain their as-cast skin, providing maximum corrosion resistance and longer life.
- The Peerless Flow Port flexible seals assure a water-tight fit while providing faster boiler assembly and allow the sections to expand and contract independently.
- The exclusive Peerless access design, from both ends, allows easy accessibility to the fluways for inspection and cleaning, without removing the entire jacket.
- Optional tankless coils can be used to assure adequate domestic hot water production.



INSULATED BASE including pre-assembled gas train and manifold with orifice adapters to simplify field assembly.

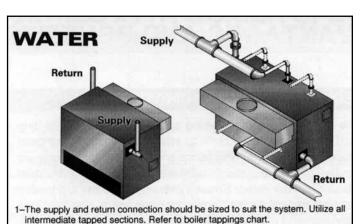
MULTIPLE FINNED WATER TUBE SECTIONS are a unique "closed H" design which provides strength without unnecessary weight. Thirteen staggered flue passages per boiler section force the hot gasses through, and around finned water tubes for greater heat absorption.

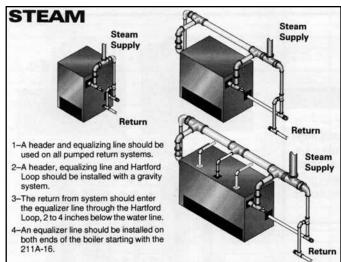
ACCESS DOORS AT BOTH ENDS provide easy access for inspection and cleaning.

ALUMINIZED STEEL FLUE COLLECTORS and horizontal-to-vertical draft diverters maintain a predetermined height of the flue outlet regardless of boiler size. while aluminized steel provides extra long life.

PRECISION GROUND SPACING RINGS permit even spacing of sections. but avoid long iron-to-iron contact to provide maximum corrosion protection.

FLOW PORT GASKET SEALING is achieved by machined surfaces which compress the gasket, assuring a water-tight seal and faster boiler assembly.





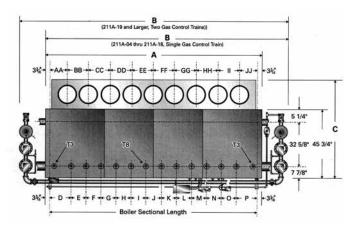


SERIES 211A COMMERCIAL ATMOSPHERIC GAS BOILER

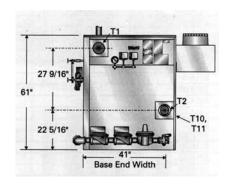
SERVICE AND COMBUSTIBLE CLEARANCES:

- 1. THE DESIGN OF THIS BOILER 1S CERTIFIED FOR THE FOLLOWING CLEARANCES TO COMBUSTIBLE CONSTRUCTION A. 48" BETWEEN THE FRONT, SIDES, AND REAR OF THE JACKET.
 - B. 7'6" FLOOR TO CEILING.
 - C. 6" FROM STEAM AND HOT WATER PIPES.
 - D. 6" FROM VENT CONNECTOR.

Boiler	Len	gth And Width	า	Boiler					
Model		Dimensions							
No.	Α	Length							
211A-04	28-1/2"	38-3/8"	63"	21-3/4"					
211A-05	33-3/4"	44"	63"	27-3/8"					
211A-06	39-3/8"	50-1/4"	65"	33"					
211A-07	45"	55-7/8"	63"	38-5/8"					
211A-08	50-5/8"	61-3/4"	63"	441/4"					
211A-09	56-1/4"	67-5/8"	63"	49-7/8"					
211A-10	61-7/8"	73-1/4"	65"	55-1/2"					
211A-11	67-1/2"	80-3/4"	65"	61-1/8"					
211A-12	73-1/8"	86-3/8"	63"	66-3/4"					
211A-13	78-3/4"	91-1/2"	63"	72-3/8"					
211A-14	84-3/8"	97-1/8"	65"	78"					
211A-15	90"	102-3/4"	65"	83"					

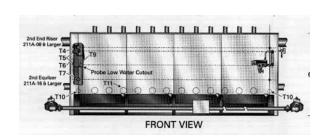


Boiler		Center Line	Dimension	าร	Draft	Flue	Size
Model		Draft I	Diverters		Hoods No.	Size To	Chimney
No.	AA	BB	CC	JJ	And Size	Stack	
211A-04	10-7/8"			10-7/8"	1-12"	12"	12" x 20'
211A-05	13-3/4"			13-5/8"	1-12"	12"	12" x 20'
211A-06	16-1/2"			16-1/2"	1-14"	14"	14" x 20'
211A-07	10-7/8"	16-7/8"		10-7/8"	2-12"	14"	14" x 20'
211A-08	13-3/4"	19-5/8"		10-7/8"	2-12"	15"	15" x 20'
211A-09	13-3/4"	22-1/2"		13-5/8"	2-12"	16"	16" x 20'
211A-10	16-1/2"	25-3/8"		13-5/8"	2-14"	17"	17" x 20'
211A-11	16-1/2"	28-1/8"		16-1/2"	2-14"	18"	18" x 20'
211A-12	13-3/4"	22-1/2"	19-5/8"	10-7/8"	3-12"	18"	18" x 20'
211A-13	13-3/4"	22-1/2"	22-1/2"	13-5/8"	3-12"	19"	19" x 20'
211A-14	16-1/2"	25-3/8"	22-1/2"	13-5/8"	3-14"	20"	20" x 20'
211A-15	16-1/2"	25-3/8"	25-1/2"	16-1/2"	3-14"	21"	21' x 20'



NATURAL GAS RATINGS*

			NET	I.B.R. RAT	ING	
BOILER	A.G.A.	A.G.A.	STEAM	STEAM	WATER	STEAM
MODEL	INPUT	OUTPUT	SQR.	M.B.H.	M.B.H.	PIPING
NO.	M.B.H.	M.B.H.	FT.			FACTOR
211A-04	630	504	1575	378	438	1.333
211A-05	840	672	2100	504	584	1.333
211A-06	1050	840	2625	630	730	1.333
211A-07	1260	1008	3150	756	877	1.333
211A-08	1470	1176	3675	882	1023	1.333
211A-09	1680	1344	4229	1015	1169	1.324
211A 10	1890	1521	4808	1154	1315	1.310
211A-11	2100	1680	5392	1294	1461	1.298
211A-12	2310	1848	5971	1433	1607	1.290
211A-13	2520	2016	6521	1565	1753	1.288
211A-14	2730	2184	7067	1696	1899	1.288
211A-15	2940	2352	7608	1826	2045	1.288



*AVAILABILITY OF 5" W.C. GAS TRAIN ON SOME MODELS LARGER SIZES AVAILABLE. PLEASE CALL FOR QUOTE.

TC Series Pressurized Wet Base Steam/Water Boiler



Designed to provide the highest efficiencies possible with forced draft firing, this line of Smith cast iron boilers is available in fifteen basic sizes, with gross output ratings from 900 to 4,629 MBH. Series 28A boilers may be used in either water or steam systems, and may be fired with light oil, gas or gas/light oil.

Series TC Boilers Include:

- Rugged cast-iron construction
- · Integral flue gas collector
- Cast-in heat extraction pins for increased performance
- Wet-Base design for top performance
- Hi-Temp Hydronic port seals, rather than conventional push nipples for ease of installation
- Short, individual section draw rods to simplify assembly, reduce stress
- Front and rear observation ports
- Aluminized steel breeching damper which can be easily adjusted and locked in position
- · Easy access side cleaning
- Obround shaped upper port for improved internal circulation and dry steam
- Wide variety of tankless heater options

That's the Peerless Series TC boiler... an efficient, rugged boiler designed specifically for apartments, schools, offices and other commercial and institutional buildings.

STANDARD EQUIPMENT All Boilers

- Cast iron wet-base sections
- Insulated metal jacket
- · Cast iron smokehood with integral damper
- Burner mounting plate with insulation block
- Front and rear flame observation ports
- · Steel angle floor rails
- Ceramic fiber rope seal between sections
- Hi-Temp hydronic port seals
- Flue brush

Water Boilers

80 psi working pressure sections

ASME relief valve, 40 psi

Theraltimeter

Return voke with flexible seals

Manual reset, Hi-Limit control (Boiler/Burner units only)

Operating control (Boiler/Burner units only)

Steam Boilers

ASME side outlet safety valve, 15 psi

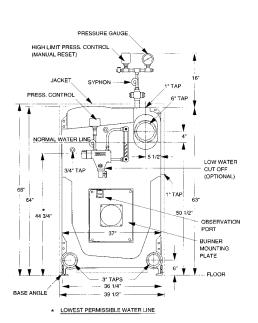
Steam gauge

Gauge glass with gauge cocks and guards

Manual reset, Hi-Limit control (Boiler/Burner units only)

Operating control (Boiler/Burner units only)

LIGHT OIL, GAS, OR GAS/LIGHT OIL



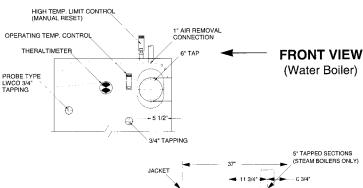
FRONT VIEW (Steam Boiler)

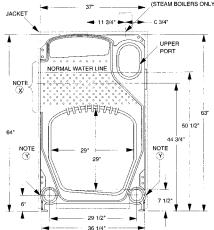












INTERMEDIATE SECTION

Note X - Flue cleanout opening. Allow 36" clear work space for using flue brush

Note Y - 1-1/2" Inspection tappings when ordered.





TC Series Pressurized Wet Base Steam/Water Boiler

PeerlessBoilers.com

Boiler Number	Boiler Horse-	I=B=R Gross Output	St	Net I=B=	R Ratings	Burner	B=R Capacity	Water C (Ga		Water Working Weight	Length Overall "A"	Boiler	Steam U	ptake Lo (Note 9)		Dia. Vent	Note (7) Height
(Note 1) Conn.	power	(MBH)	Sq. Ft.	мвн	мвн		Gas MBH (Note 4)	Steam	Water	(Lbs.)	Power Flame	Length "C"	"D"	"E"	"F"	Conn. "G"	Vent "H"
†TC-3-4	27	900	2813	675	783	8.0	1154	103.8	123.4	4,215	71-5/8	33	12-1/2			10	57-5/8
†TC-3-5	35	1166	3646	875	1014	10.4	1491	125.8	150.3	5,038	83-1/8	41	20-1/2			10	57-5/8
†TC-3-6	43	1433	4538	1089	1246	12.6	1827	147.8	177.2	5,861	91-1/8	49	12-1/2	16		10	56-5/8
†TC-3-7	51	1699	5458	1310	1477	15.0	2163	169.8	204.1	6,684	99-1/8	57	12-1/2	24		12	56-5/8
†TC-3-8	59	1965	6358	1526	1709	17.4	2499	191.8	231.0	7,507	107-1/8	65	12-1/2	32		12	55-5/8
†TC-3-9	67	2232	7221	1733	1941	19.6	2836	213.8	257.9	8,331	115-1/8	73	12-1/2	40		14	55-5/8
†TC-3-10	75	2498	8079	1939	2172	22.0	3172	235.8	284.8	9,169	128	81	20-1/2	40		14	55-5/8
†TC-3-11	83	2764	8942	2146	2403	24.5	3508	257.8	311.7	9,992	137-1/8	89	20-1/2	24	24	14	55-5/8
†TC-3-12	91	3031	9804	2353	2636	26.5	3844	279.8	338.6	10,815	145-1/8	97	20-1/2	24	32	14	54-5/8
†TC-3-13	98	3297	10667	2560	2867	29.0	4180	301.8	365.5	11,649	153-1/8	105	20-1/2	32	32	14	54-5/8
†TC-3-I4	106	3563	11525	2766	3098	31.5	4517	323.8	392.4	12,467	161-1/8	113	20-1/2	32	40	16	54-5/8
†TC-3-15	114	3830	12392	2974	3330	33.5	4853	345.8	419.3	13,511	169-1/8	121	20-1/2	40	40	16	54-5/8
†TC-3-16	122	4096	13250	3180	3562	36.0	5189	367.8	446.2	14,375	177-1/8	129	20-1/2	48	40	16	54-5/8
†TC-3-17	130	4362	14113	3387	3793	38.5	5525	389.8	473.1	15,239	191-1/8	137	20-1/2	48	48	18	54-5/8
†TC-3-18	138	4629	14975	3594	4025	40.5	5862	411.8	500.0	16,103	199-1/8	145	20-1/2	56	48	18	54-5/8

(Note 1) Important Ordering information

- (†) Add Prefix for type of fuel to be burned. "LO" for light oil, "G" for Gas or "GO" for gas/oil.
- (3) Insert "S" for steam, "W" for water.

Example: LO-28A-S-6 is the model no. for a six section steam boiler firing light oil.

(Note 2) Net I=B=R Water Ratings are based on an allowance of 1.15. Net I=B=R Ratings for steam boilers are based on piping and pick-up factor as follows: 4 and 5 section = 1.333, 6 section = 1.305, 8 section and larger =1.288. (Note 3) Light oil having a heat content of 140,000 BTU/Gal.

(Note 4) Gas having a heat content of 1,000 BTU/Cu. Ft., 0.60 specific gravity (Note 5) Burner operation: Low-fire start, high-fire run, two position air.

(Note 6) Burner operation: On-off, (4 sect.); Low-fire start, high-fire run, two position air (5-14 sect.).

* When 5th heater is required—relocate steam uptake and dimensions "E" = 32 in. and "F" = 16 in.

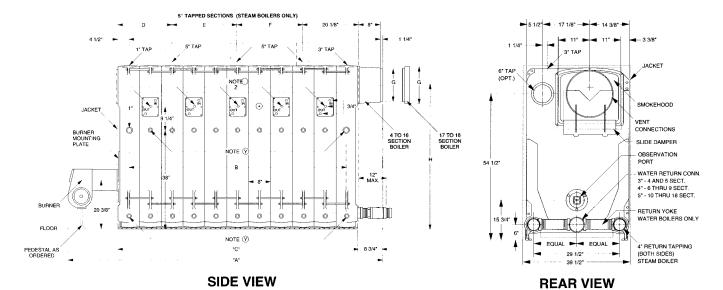
(Note 7) When unit is assembled or packaged, add 6" to heights for 4-14 sect., 8" to heights for 15-18 sect.

(Note 8) Add 2-3/4" to sect. 14 thru 18 for smoke hood adaptor.

†† Based on 0.10 ins. W.C. pressure at boiler outlet. If vent sizing results in a back pressure greater than 0.10 ins. W.C., consult Smith

(Note 9) These measurements are approximate.

The Smith representative should be consulted before selecting boilers for installation having unusual piping and pick-up requirements, such as intermittent system operation, extensive piping systems, etc. The boiler ratings have been determinied under previous governing forced draft units.

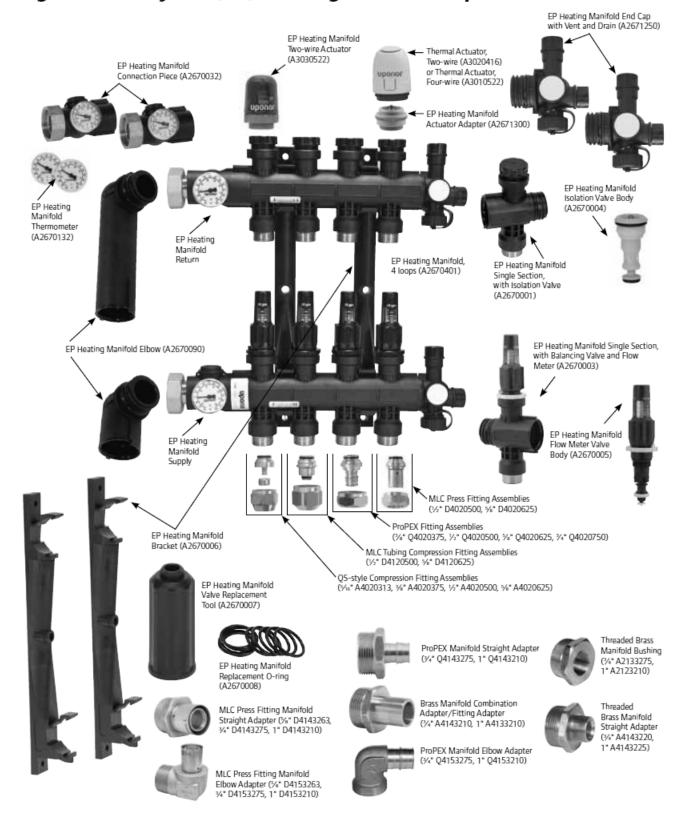


Note Z - Tankless heater sections when ordered. Allow 36" clear space for heater withdrawal.

uponor

In Floor Radiant Heating System

Engineered Polymer (EP) Heating Manifold Exploded View



In Floor Radiant Heating System

hePEX Barrier Tube



WIRSBO-hePEX (cross-linked polyethylene) is heat transfer tubing with an EVOH oxygen diffusion barrier. Wirsbo-hePEX tubing is rated and listed by the Hydrostatic Design Stress Board of PPI at: 73.4°F at 160 psi, 180°F at 100 psi and 200°F at 80° psi.

Description	Part No.
5/16" nom. hePex 250 ft. coil	A1180313*
5/16" nom. hePex 1000 ft. coil	A1220313*
3/8" nom. hePEX 400 ft. coil	A1210375
3/8" nom. hePEX 1000 ft. coil	A1220375
1/2" nom. hePEX 300 ft. coil	A1250500
1/2" nom. hePEX 1000 ft. coil	A1220500
5/8" nom. hePEX 300 ft. coil	A1250625
5/8" nom. hePEX 1000 ft. coil	A1220625
3/4" nom. hePEX 300 ft. coil	A1250750
1" nom, hePEX 300' ft. coil	A1251000

^{*}For use with Wirsbo Quik Track only.

Assembled EP Heating Manifolds



The EP Heating Manifold Assemblies feature isolation valves and balancing valves with flow meters, and come fully assembled, ready for installation. The manifolds are available in 2-

through 8-loop configurations with a maximum flow of 15.4 gpm.

Description	Part No.
2 loop, Supply & Return	A2670201
3 loop, Supply & Return	A2670301
4 loop, Supply & Return	A2670401
5 loop, Supply & Return	A2670501
6 loop, Supply & Return	A2670601
7 loop, Supply & Return	A2670701
8 loop, Supply & Return	A2670801

Manifold Extension Kit



The EP Heating Manifold Single Section with Isolation Valve is a single loop add-on used on the return side for EP Heating Manifold Assemblies.

Description	Part No.
Single section w/ isolation valve	A2670001

The EP Heating Manifold Single Section with Balancing Valve and Flow Meter is a single loop add-on used on the supply side for EP Heating Manifold Assemblies.



Description	Part No.
Single section w/ balancing valve & flow meter	A2670003



Quik Trak®

Quik Pac[™], Wirsbo's pre-assembled Quik Trac panels, consist of six panels fastened together with strapping tape. **Note:** For use with 5/16" hePEX tubing only.

Description	Part No.
Quik Trac 7" x 48" x 6" panels	A5060761



Quik Trak Return Panels

Quik Return Panels are designed with a "U" groove to complete to complete tubing turns.

Description	Part No.
Quik Trac 7" x 48" panels	A5060702

Quick Drive Sealant Quik Trak Sealant is 100% silicone and provides



Quik Trak Sealant is 100% silicone and provides good thermal transfer. Use to adhere 5/16" Wirsbo hePEX plus tubing in the Quik Trak groove.

Description	Part No.
Quick Drive Sealant	E6050010



Quik Trak Fitting Assembly

Quik Return Panels are designed with a "U" groove to complete to complete tubing turns.

Description	Part No.
Fitting Assembly	A4020313



Joist Trak™ Heat-Transfer Panel

Joist Trak heat transfer panels enable fast, effective installation of 3/8" and 1/2" hePEX tube in virtually any application for floors, walls, and ceilings. The rigid channel construction makes it easy for hePEX tube to be "snapped" into place tightly and securely.

Description	Part No.
3/8" Joist Trak 4" x 48"	A5080375
1/2" Joist Trak 4" x 48"	A5080500

uponor

In Floor Radiant Heating System

ProPEX® Ring



ProPEX Rings slide over ebd of tubing to make a ProPEX fitting connection.

Note: ProPEX expander tool required.

Description	Part No.
ProPEX Ring 3/8"	Q4690302
ProPEX Ring 1/2"	Q4690512
ProPEX Ring 5/8"	Q4690625
ProPEX Ring 3/4"	Q4690756

ProPEX Fitting Assembly



ProPEX Rings slide over ebd of tubing to make a ProPEX fitting connection.

Note: ProPEX expander tool required.

Description	Part No.
3/8" ProPEX Fitting	Q4020375
1/2" ProPEX Fitting	Q4020500
5/8" ProPEX Fitting	Q4020625
3/4" ProPEX Fitting	Q4020750

ProPEX Brass Coupling



ProPEX couplings make PEX to PEX connections. **Note**: ProPEX expander tool required.

Description	Part No.
1/2" ProPEX coupling	Q4775050
5/8" ProPEX coupling	Q4776363
3/4" ProPEX coupling	Q4777575

ProPEX PEX to Male NPT



ProPEX couplings make PEX to NPT connections. **Note**: ProPEX expander tool required.

Description	Part No.
1/2" ProPEX x 1/2" NPT	Q4525050
5/8" ProPEX x 3/4" NPT	Q4526375
3/4" ProPEX x 3/4" NPT	Q4527575

ProPEX Copper Adapter



ProPEX couplings make PEX to NPT connections. **Note**: ProPEX expander tool required.

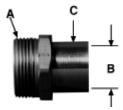
Description	Part No.
1/2" ProPEX x 1/2" CU	Q4515050
5/8" ProPEX x 3/4" CU	Q4516375



ProPEX Expander Tool

The ProPEX expander tool is required when installing the ProPEX tube. Comes with the sturdy expansion case.

Description	Part No.
ProPEX Hand Expander Tool	
with 1/2", 3/4", 1" heads	Q6295075
ProPEX Hand Expander Tool w/o heads	Q6275075
1/2" Head	Q6310500
5/8" Head	Q6310625
3/4" Head	Q6310750
1" Head	Q6311000



Manifold Adapter Copper

Adapter for 1-1/4" brass manifolds. Use R32 adapter to transition 1-1/4" manifold union nut to 1" copper pipe or 1-1/4" copper fittings and valves.

Description	Part No.
R32 x 3/4" CU adapter / 1" fitting adapter	A4143210
R32 x 1" CU adapter / 1-1/4" fitting adapter	A4133210

Control No.	Α	В	С
A4143210	R32	3/4"	1-1/8"
A4133210	R32	1"	1-1/4"



Manifold Bushing

Control No.	Α	В
A21232I0	R32	1" NPT

Manifold Bushing for 1-1/4" brass manifolds. Use to transition 1-1/4" manifold union nut to 1" NPT female thread.

Description	Part No.
Bushing	A21232I0



End Cap with Vent

End Cap with vent for 1-1/4" brass manifolds. Complete with drain valve and manual air vent. Required gasket included.

Description	Part No.
End cap with vent	A2803250

In Floor Radiant Heating System

QS Fitting Assemblies



Compression Fitting Assembly with O-ring. Connects 5/8" PEX tubing products to Wirsbo manifold* (brass) outlets, R20 and R25 components (5/8" currently only available as old style R20, less O-ring). Sold as a three piece component. Compression rings also sold separately.

Description	Part No.
5/16" QS20 Fitting Assembly	A4020313
3/8" QS20 Fitting Assembly	A4020375
1/2" QS20 Fitting AssemblY	A4020500
5/8" QS20 Fitting Assembly	A4020625
3/4" QS25 Fitting Assembly	A4020750



Basic End Cap

Basic end cap for 1-1/4" brass manifolds. Required gasket included.

Description	Part No.
B32 end cap	A2080032

Manifold End Cap



Closes off unused R20 manifold loop connections. Required gasket included.

Description	Part No.
Loop end cap, optional, 10/pkg	A2080020

Manifold Gaskets







3/4



Gasket for 1-1/4" manifold and manifold parts, spare part.

Description	Part No.
Manifold/End cap w/vent gasket, spare part, 10/pkg	A2403232
Basic end cap gasket, spare part, 10/pkg	A2400032
3/4" end cap gasket, spare part, 10/pkg	A2400020

Repair Coupling

Use 5/16" Repair Coupling to connect 5/16" Wirsbo hePEX plus together. Note: One-piece Repair Coupling comes as an assembly. No other fittings are necessary.

Description	Part No.
Repair Coupling	A4010313



QS Coupling Nipple

QS20 Coupling Nipple (brass). Use coupling nipple and the appropriate fitting assembly to connect PEX to PEX (33/8", 1/2", 5/8" and 3/4").

Description	Part No.
Coupling Nipple, R20 X R20, 10/pkg	A4322020
Coupling Nipple, R25 X R25, 10/pkg	A4322525



QS Conversion Nipple

QS20 Conversion Nipple (brass). Use conversion nipple and the appropriate fitting to connect 5/8" PEX tubing to 1/2", 3/4" and 1" NPT.

Description	Part No.
Conversion Nipple, R20 x1/2" NPT, 10/pkg	A4322050
Conversion Nipple, R20 x 3/4" NPT, 10/pkg	A4322075
Conversion Nipple, R20 x 3/4" NPT, 10/pkg	A4322075
Conversion Nipple, R25 x 3/4" NPT, 10/pkg	A4322575
Conversion Nipple, R25 x 1" NPT, 10/pkg	A4322510



QS Adapters

Adapter. Use R20 or R25 adapter and appropriate QS20 fitting assembly to transition REX tubing to 3/4" copper pipe.

Description	Control No.
Adapter R20 x 1/2" CU, 10/pkg	A4332050
Adapter R20 x 3/4" CU, 10/pkg	A4332075
Adapter R25 x 3/4" CU, 10/pkg	A4332575



QS Fitting Adapters

QS20 Fitting Adapter. Use R20 adapter and appropriate Q520 fitting assembly to transition PEX tubing to 1/2" and 3/4" copper fittings.

Description	Part No.
Fitting Adapter R20 x 1/2" CU, 10/pkg	A4342050
Fitting Adapter R20 x 3/4" CU, 10/pkg	A4342075



QS Compression Rings

QS Compression Ring (brass). Replacement part. The QS20 compression ring is designed and tested for use with Wirsbo-hePEX and Wirsbo-PEX. Do Not substitute similar compression rings.

Description	Part No.
1/2" Compression Ring, spare part, 10/pkg	A4160050
5/8" Compression Ring, spare part, 10/pkg	A4160625

Uponor

In Floor Radiant Heating System

Metal Bend Supports



Metal Bend Support (zinc plated). Provides rigid 90° bend for nominal PEX tubing.

Description	Part No.
3/8" Metal Bend supports	A5110325
5/8" Metal Bend supports	A5110625
3/4" Metal Bend supports	A5110750

Plastic Bend Supports



PVC bend support provides rigid 90° bend for nominal PEX tubing runs exiting a concrete slab.

Description	Part No.
1/2" PVC Bend Support	A5500500
5/8" PVC Bend Support	A5500625
3/4" PVC Bend Support	A5500750

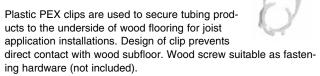
Drop Ear Bend Supports



Drop ear bend supports provide a rigid 90° bend and the ability to secure Wirsbo tubing where it exits a stud wall or wood subfloor.

Description	Part No.
1/2" Metal Bend Supports	F5120500
1/2" Plastic Bend Supports	F5200500

PEX Clip



Description	Part No.
PEX Clip (1/2" & 5/8"), 100/pkg.	F7051258

PEX Tubing Cutter



PEX Tubing Cutter (3/8" to 1" tube size capacity). Cutter has a reversible double blade.

Description	Part No.
Tube cutter	F6081125

Fixing Wire Twister



Description	Part No.
Fixing wire twister	F6090005

PEX Rail

Plastic rail used to secure 1/2" and 5/8" PEX tubing products to concrete floors and wooden subfloors. Suitable fastening hardware not included. 6'6" L x 1" H. 2" between channels.

Description	Part No.
5/8" Pex Rail	A5700625



Tube Fastener

U Shaped Tube Fastener. Galvanized staple used to manually secure PEX tubing products to wood subflooring.

Description	Part No.
U shaped tube fasteners, 250/pkg	A7040250



Foam Staple

Tubing staples for manual stapler (#E6025075). Plastic staple used tto secure 1/2" and 5/8" PEX to rigid insulation.

Description	Part No.
Foam Staple, 1-1/2", 300/pkg	A7015050
Foam Staple, 2-1/2", 300/pkg	A7015075



Staples

Tubing Staples. Use 1-1/4" staples in staple down installations to secure 1/2" and 5/8" PEX to wood subfloors.

Use the Pneumatic Stapler (#E6021620) with 2-1/2" staples to secure PEX tubing in joist and rigid foam insulation applications.

Description	Part No.
1-1/4", 10,000/pkg	A7011250
2-1/2" 4500/pkg	A7012500



Fixing Wire

Fixing Wire. 6" galvanized steel tie used to secure PEX tubing products to wire mesh or rebar. Use with fixing wire twister or auto fixing wire twister (rachet style).

Description	Part No.
Fixing wire 1000/pkg	A7031000



Ratchet Style Fixing Wire Twister

Use Ratchet-style Fixing Wire Twister with Fixing Wire (A7031000).

Description	Part No.
Fixing Wire Twister	E6090005
Auto Fixing Wire twister	E6091700

In Floor Radiant Heating System

SetPoint Controller Thermostat

SetPoint 521 programmable thermostats are designed to sense air, floor or both temperatures with the ability to select one or the other as the primary sensing point. The thermostats also include multistage functionality along with programmable schedules.

Description	Part No.
SetPoint 502	A3040521

Radiant Thermostat

The touchscreen thermostat can control room temperature through operative temperature sensing, an optional floor sensor or a com-

bination of both. The floor sensor can be used to maintain warm floors throughout the heating season as well as provide temperature limit protection. The thermostat is designed to operate using two wires.

Description	Part No.
2 Wire Thermostat	A3100101
Slab Sensor, 10k	A9010599

4 Wire Thermal Actuator



Four-wire thermal actuators mount directly onto TruFLOW Classic, TruFLOW Jr. valved, stainless-steel and EP heating manifolds. The actuators provide individual loop flow control on multi-zoned manifolds and feature an end switch for activation of a relay (pump), heat plant or other auxiliary devices. All adapter rings to mount to Uponor manifolds are included in the package.

Description	Part No.
4 Wire Actuator	A3023522
EP Adaptor	A2671300

Service Wrench



Lightweight, compact design. Use the 1-3/16" wrench to tighten 3/4" female NPT compression nut to 1-1/4" manifold. Use the 1-7/8" wrench to tighten manifold union nuts.

Description	Part No.
1-7/8" Service wrench	E6111875
1-3/16" Service wrench	F6111188



4 Zone Control Module

The Zone Control Module provides connection to the power supply trans-

former; interconnections between the individual thermostats and their respective MVAs; thermal actuators or zone valves; and the connection between the end switches and the pump or boiler relay.

Description	Part No.
Zone Control Module	A3030004



Powered Zone Controller

formers for low-voltage operations and relays to operate line-voltage controls. Fully fuse-protected, they also include an isolated end switch and built-in DHW priority switch. The indicator lights show full functionality of the products wired to the Powered Zone Controllers.

Four- and Six-zone Controllers include trans-

Description	Part No.
Powered 4 Zone Control	A3080404
Powered 6 Zone Control	A3080606



Pneumatic Stapler Kit

Pneumatic Stapler Kit fires 5/8" through 11/4" staples with a 1-inchcrown. Kit includes stapler, walking stick and conventional nose piece for attaching 1/2" and 5/8" Uponor PEX to subfloors.

Description	Part No.
Pneumatic Stapler	E6021638



Manual Foam Stapler

Use Manual Foam Stapler with Plastic Foam Staples (A7015050, A7015075) to attach3/8", 1/2" and 5/8" Uponor PEX to rigid insulation.

Description	Part No.
Foam Stapler	E6025075



Pressure Test Kit

Brass Manifold Pressure Test Kit contains R32 x 3/4" manifold bushing, R32 solid brass plug, 3/4" brass nipple and pressure gauge assembly (100 psi). Schraeder valveis included. Note:This fitting is not compatible with the TruFLOW Sr.

Description	Part No.
Pressure Test KIt	E6122000

uponor

In Floor Radiant Heating System

Multi-Layer Composite Tubing (MultiCor)

Uponor's MLC tubing is a multi-layered composite tubing consisting of an interioralu-

minum tubing lined with inner and outer layers of PEX. Layers are bonded to thealuminum by a special adhesive. MLC tubing offers 100% oxygen diffusion, protectsagainst corrosion and can be embedded in concrete and installed in walls, floors and ceilings. The flexibility of MLC tubing results in easy roll-outs. The stay-in-place rigid feature of the tubing works great for hydronic baseboard, radiator, unit heaters, air handlers or manifold connections.

Description	Part No.
1/2" MLC Tubing 1000'	D1220500
5/8" MLC Tubing 300'	D1250625
3/4" MLC Tubing 500'	D1240750
1" MLC Tubing 300'	D1141000

MLC Press Fitting Manifold Adapter

with the TruFLOW Sr.

MLC Press Fitting Manifold Adapter transitions
R32 manifold connection to 5/8", 3/4" and 1" MLC
tubing.Note:The Mini-Press Battery Tool or MLC
Press Fitting Manual Tool is required. This fitting is not compatible

Description	Part No.
Manifold Adpater 3/4" x R32 Angle	D4153275
Manifold Adpater 3/4" x R32 Straight	D4143275
Manifold Adpater 1" x R32 Angle	D4153210
Manifold Adpater 1" x R32 Angle	D4153210

MLC Press Fitting Brass Sweat Adapter

MLC Press Fitting Brass Sweat Adapter transitions MLC tubing to copper pipe. Fittings come disassembled for sweating. Note: The Mini-Press Battery Tool or MLC Press Fitting Manual Tool is required.

Description	Part No.
Sweat Adpater 3/4" x 3/4"	D4517575
Sweat Adpater 1" x 1"	D4511010

MLC Press Fitting Brass MPT Adapter

MLC Press Fitting Brass Male NPT Threaded Adapter connects MLC tubing to male NPT threads. Note: The Mini-Press Battery Tool or MLC Press Fitting Manual Tool is required.

Description	Part No.
MPT Adpater 3/4" x 3/4"	D4527575
MPT Adpater 1" x 1"	D4521010



MLC Press Fitting Adapter

MLC Press Fitting Brass Coupling connects two pieces of MLC tubing. Note:The Mini-Press Battery Tool or MLC Press Fitting Manual Tool is required.

Description	Part No.
Fitting Adapter 3/4"	D45417575
Fitting Adapter 1"	D45411010



MLC Press Fitting Brass Elbow

Press Fitting Elbow makes 90-degree connections for MLC tubing.

Description	Part No.
Fitting Elbow 3/4"	D4710750
Fitting Elbow 1"	D4711000

MLC Chamfering Tool



The MLC Tubing T-handle Chamfering Tool bevels the ends of MLC tubing in preparation for making a fitting connection. The T-handle is removable to use the tool with a drill for multiple chamfering.

Description	Part No.
Chamfering Tool 3/4"	D6100750
Chamfering Tool 1"	D6101000



Multi-Press BatteryTool

The MLC Battery Tool is a electro-hydraulic tool that makes easy connection to MultiCor

tubing. Eliminates the need for air compressors and generators.

Description	Part No.
Battery Tool	D6251500



Mini-Press BatteryTool

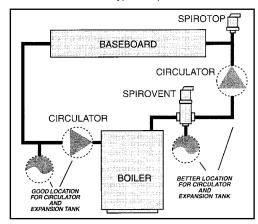
The Mini-Press Battery Tool Kit provides an electro-hydraulic tool that makes fast, easy connections from 1/2" through 1" MLC.

Description	Part No.
Battery Tool	D6261632

SPIROVENT®

A Complete Product Line

Spirovent Junior: Use the "Junior" for residential and light commercial jobs. It comes in 3/4", 1", 1/4", and 1-1/2" female-threaded sizes and is made of solid brass for long life. All models except for the 3/4" model are tapped 1/2" at the bottom to accommodate a bladder-type compression tank.

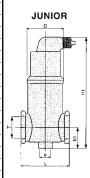


Applications:

If you want to avoid air-related callbacks, use a Spirovent on every new hot- and/or chilled-water system. You'll be amazed at the ease with which the system starts up.

You can also solve any air-related problems in an existing system with a Spirovent. It's a simple retrofit. Just locate the Spirovent in the common piping at the boiler. This is the point where the water is hottest. The sketches show you the best locations for the Spirovent.

SPIROVENT			JUNIOR	(Brass)	
T/Pipe Size		3/4"	1"	1-1/4"	1-1/2"
O.D.	Inch				
Thread	NPT	3/4*	1*	1-1/4*	1-1/2*
D	Inch	2.6	2.6	2.6	2.6
DF	Inch				
H1	Inch	6.0	7.0	7.8	9.1
H2	Inch				
h1	Inch	0.8	1.4	1.5	1.6
h2	Inch				
L	Inch	3.4	3.5	3.5	3.5
LF	Inch				
Plug e (JUNIOR/SE	ENIOR)		1/2"	1/2"	1/2"
Valve e (DIRT/DR/	AIN)				
Volume (JR/SR)	Gal.	0.05	0.06	0.07	0.09
Volume (DT/DN)	Gal.				
Weight† (JR/SR)	Lbs.	3.1	3.4	3.8	4.4
Weight† (DIRT)	Lbs.				
Weight† (DRAIN)	Lbs.				
Cv Rating		14	22	40	55
Maximum Flow	GPM	6	10	15	30



Part #	Size
VTP050TM	1/2"
VJR750FT	3/4"
VJR100TM	1"
	1

Part #	Size
VJR125TM	1-1/4"
VJR150TM	1-1/2"
VJR200MT	2"

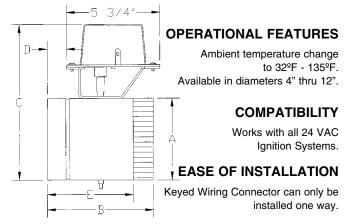
Maximum pressure 150 psi. Maximum temperature 270F

EFF!KAL

PRODUCTS

RVGP-KS SERIES VENT DAMPER

Standard 5 Year Warranty



SAFETY FEATURES

Dual Interlocking Switches allow burner to fire only if damper is in open position. Service switch eliminates midnight service calls.

ACCESSORIES

Wiring Harnesses are available to fit most applications.

ELECTRICAL

MINIMUM WIRING REQUIREMENTS
24VAC. 18 gauge 105C
THERMOSTAT HEAT ANTICIPATION
O.IA plus current draw for control circuit
POWER PLAN REQUIREMENT
3W at 24 VAC when opening or closing
TIMING

Opens in 15 seconds Closes in 15 seconds CHARACTERISTICS Power open Power close

RVGP-KS (pipe size) BKF DIMENSIONS							
DIM. A PIPE SIZE	DIM. E LENGTH	DIM. C HEIGHT	DIM. D	DIM. E			
4"	6-1/16"	8-7/8"	15/16"	4-13/16"			
5"	6-1/16"	9-7/8"	15/16"	4-13/16"			
6"	6-1/2"	10-7/8"	1-3/16"	5-1/4"			
7"	7-1/16"	11-7/8"	1-7/16"	5-13/16"			
8"	8-1/16"	12-7/8"	1-15/16"	6-13/16"			
9"	10-1/8"	13-7/8"	3"	8-7/8"			
10"	12-1/8"	14-7/8"	4"	10-7/8"			
12"	12-1/8"	16-7/8"	4"	10-7/8"			



Microprocessor Heating Controls

152 Two Stage Setpoint Control

The Two Stage Setpoint Control 152 is a microprocessor-based control that operates as either a two stage setpoint control or as two independent setpoint controls. As a two stage setpoint control, the 152 can provide two stage heating, two stage cooling or a combined heating / cooling interlock function. When operating as two independent setpoint controls, the 152 can control any combination of heating or cooling device.

Features

- 2 Stage operation or heat & cool control
- Control of up to 2 different setpoints (with additional sensor)
- Digital display
- Pulse Width Modulation



256 Single Stage Boiler Control

The Boiler Control 256 is designed to operate a single boiler using Outdoor Temperature Reset. It can be used in applications ranging from a single zone of baseboard to multiple zones of fan coils and baseboard. This control regulates a single heating water temperature through Outdoor Temperature Reset. The 256 replaces the 219, 230, 250, 253 boiler controllers

Features

- Outdoor Temperature Reset Test sequence
- Automatic Boiler Differential Quick setup for easy installation and programming
- Warm Weather Shut Down
 Setback input for night setbac
- Advanced settings to fine-tune building requirements



257 Two Stage DHW Boiler Control

The DHW Control 257 is designed to operate multiple boilers for volume water heating. It can be used in hotels, apartments, and laundromats to control multiple boilers and provide quick recovery for domestic hot water. This control regulates a single hot water temperature through DHW control. It is capable of controlling up to 2 on/off boilers using a sensor to maintain a tank setpoint temperature.

Features

- 2 Stage control Equal Runtime Rotation
- Cumulative boiler run time hours
- Proportional or PID staging



216 Two Stage Boiler & Set Point Controller

The Boiler Control 261 is designed to stage two on/off boilers using Outdoor Temperature Reset. It can be used in applications ranging from a single zone of baseboard, multiple baseboard and fan coil zones, to dedicated setpoint heating in commercial buildings. This control regulates a single heating water temperature through Outdoor Temperature Reset and/or setpoint target control. It is capable of controlling (stage and rotate) up to 2 on/off boilers, or a single 2 stage boiler, as well as the system pump.

Features

- 2 Stage control
 Equal Runtime Rotation
- Cumulative boiler run time hours
 Proportional or PID staging



274 Four Stage Boiler / DHW Set Point Controller

The Boiler Control 274 is designed to stage multiple boilers using Outdoor Temperature Reset. It can be used in applications ranging from a single zone of baseboard, multiple baseboard and fan coil zones, to dedicated domestic hot water heating in commercial buildings. This control regulates a single heating water temperature through Outdoor Temperature Reset and/or setpoint/DHW target control. It is capable of controlling (stage and rotate) up to 4 on/off boilers as well as the system pump.

Features

- Advanced settings to fine-tune building requirements
- Control 4 On-Off boilers
 DHW pump operation
- Powered system pump output Quick setup
- Test sequence to ensure proper component operation
- Automatic Boiler Differential
- Equal Run Time Rotation
- Warm Weather Shut Down
- Exercising
- Outdoor Temperature Reset





PANEL-TRACK®

KPT- D® HYDRONIC BASEBOARD PANELTRACK

Panel-Track baseboard heating is superior in every way! From modern design to maximum heating output. From the patented heating element to the rugged support brackets. From the fingertip controlled pivot damper to the newly designed, contoured accessory line. Panel-Track is attractive, economical and easy to install Which means no costly callbacks. Ideal for residential and light commercial applications.

EMBASSY'S PATENTED PANEL-TRACK HEATING ELEMENT

Continuous rails of tough polypropylene line the entire length of the heating element, enclosing all four corners and preventing injury. This eliminates all metal to metal contact and guarantees the ultimate in quiet, trouble-free performance.

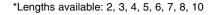
AVERAGE WATER TEMPERATURE - 65° Entering air

GPM	lb/hr.	170°	180°	190°	200°	210°	220°	230°	240°
4	2000	510	580	640	710	770	850	910	970
1	500	480	550	610	670	730	800	860	920

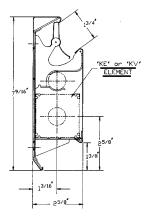
FIN TUBE BASEBOARD RADIATION

PART #	DESCRIPTION
KRP-*	Baseboard/Ft. (Complete)
KE-*	Element/Ft.
KCA-*	Cover/Ft.
KHCL	6" Hinged end cap, left
KHCR	6" Hinged end cap, right
KVEL	9" Valve enclosure left
KVER	9" Valve enclosure right
KEX7	7" Extension set
KCCL	3" End cap, left
KCCR	3" End cap, right

PART #	DESCRIPTION
KDJ	2" Damper joiner
KWJ-3	3" Wall joiner
KWJ-5	5" Wall Joiner
KIC	90º Inside corner
KIC-45	45º/135º Inside corner
KRB	U-bends
KOC	90º Outside corner
KOC-45	45º/135º Outside corner
KSP	Splicer set







SYSTEM6™

RESIDENTIAL/LIGHT COMMERCIAL BASEBOARD

System 6 is a heavy-duty baseboard the provides contractors a choice of six different interchangeable high output heating elements in one low profile enclosure. With more flexibity than any competitor, System6's low profile makes it ideal where space is at a premium.

System 6's 18 gauge steel front panel makes it ideal for high ttraffic areas while baked on white enamel finish blends with any decor.

Hot Water Ratings in SEN Enclosure

Model	Flow Rate	170°	180°	190°	200°	210°	220°	230°	240°
SCE-632	4 GPM	710	800	890	970	1070	1150	1250	1330
SCE-632	1 GPM	670	760	840	920	1010	1090	1180	1260
SCE-633	4 GPM	770	870	970	1070	1160	1270	1360	1460
SCE-633	1 GPM	730	820	920	1010	1100	1200	1290	1380
SCE-642	4 GPM	680	760	850	930	1030	1110	1190	1280
SCE-642	1 GPM	640	720	800	880	970	1050	1130	1210
SCE-643	4 GPM	740	840	930	1040	1130	1230	1320	1420
SCE-643	1 GPM	700	790	880	980	1070	1160	1250	1340
SCE-653	4 GPM	710	800	900	990	1090	1180	1290	1380
SCE-653	1 GPM	670	760	850	940	1030	1120	1220	1310
SCE-655*	4 GPM	610	690	770	850	930	1010	1090	1170
SCE-655*	1 GPM	580	650	730	800	880	960	1030	1110

^{*1-1/4} steel pipe.

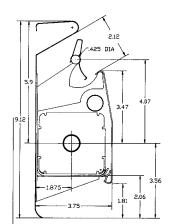
Stock Models

PART #	DESCRIPTION
SCP632-*	Baseboard/Ft. (Complete)
SCE632-*	3/4" Element/Ft.
SCE643-*	1" Element/Ft.
SEN-*	Cover only
SCCL	3" End cap, left
SCCR	3" End cap, right
SVEL	9" Valve enclosure left
SVER	9" Valve enclosure right

PART #	DESCRIPTION
SHB	Hanger Brackets
SWJ-5	5" Wall Joiner
SIC-90	90º Inside corner
SIC-135	45º/135º Inside corner
SRB	U-bends
SOC-90	90º Outside corner
SOC-135	45º/135º Outside corner
SSP	Splicer set

^{*}Lengths available: 2, 3, 4, 5, 6, 7, 8, 10





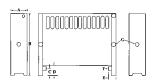


CAST-IRON RADIATION

RADIANT

DIMENSIONS

Α	В	С	D	E	F	G
5"	20"	2-3/4"	4-1/2"	1-7/8"	1-1/4"	1/8"



All Air Vent Tappings 1/8" All Bottom Tappings 1-1/4" Recess should be 1/2" longer and 1/4" higher than radiator

Maximum working pressure: 15 lb. steam, 30 lb. water. **GRILLES AVAILABLE**

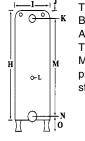
SQR. FT. PER LENGTH PART # SECTION 2.25 R20-4 9.0 R20-6 13-1/2" 13.5 R20-8 18" 18.0 R20-10 22-1/2" 22.5 R20-12 27" 27.0 R20-14 31-1/2" 31.5 R20-16 36.0 36" R20-18 40-1/2" 40.5 R20-20 45" 45.0 49-1/2" R20-22 49.5

PART #	LENGTH	SQR. FT. PER SECTION 2.25
R20-24	54"	54.0
R20-26	58-1/2"	58.5
R20-28	63"	63.0
R20-30	67-1/2"	67.5
R20-32	72"	72.0
R20-34	76-1/2"	76.5
R20-36	81"	81.0
R20-38	85-1/2"	85.0
R20-40	90"	90.0
R20-42	94-1/2"	94.5



Grille sold separately. Order part # G20 + size.

SLENDERIZED



Tappings - Top 1", Bottom 1-1/4" All Air Vent Tappings 1/8" Maximum working pressure: 15 lb. steam, 30 lb. water.

PART #*	LENGTH	EDR* 6-TUBE 25" HIGH
25-6-4	7"	12
25-6-6	10-1/2"	18
25-6-8	14"	24
25-6-10	17-1/2"	30
25-6-12	21"	36
25-6-14	24-1/2"	42
25-6-16	28"	48
25-6-18	31-1/2"	54
25-6-20	35"	60
25-6-22	38-1/2"	66
25-6-24	42"	72
25-6-26	45-1/2"	78

PART #	LENGTH	EDR* 6-TUBE 25" HIGH
25-6-28	49"	84
25-6-30	52-1/2"	90
25-6-32	56"	96
25-6-34	59-1/2"	102
25-6-36	63"	108
25-6-38	66-1/2"	114
25-6-40	70"	120
25-6-42	73-1/2"	126
25-6-44	77"	132
25-6-46	80-1/2"	138
25-6-48	84"	144



19" high x 4 tube available in above lengths

Rough in dimensions

Size	Н	I	J	K	L	М	N	0
25-6	24"	7"	1"	1"	1/8"	21-1/2"	1-1/4"	2-1/2"
19-4	17-1/2"	4-1/2"	1"	1"	1/8"	15-1/4"	1-1/4"	2-1/2"

Heat Emmision Chart (Based on room temp. of 70°F)

Avg. water temp. in Radiators ºF.	150	160	170	180	190	200	210	215
Heat emission BTU/hr. per Sq. Ft.	110	130	150	170	190	210	230	240

^{*}HEATING SURFACE BASED UPON THE STANDARD HEAT EMISSION OF 240 BTU

PER SQUARE FOOT/HOUR.

BASERAY

RATING DATA PRICE PER LINEAL FOOT

Г				WATER RATINGS						
	FLOW RATE	STEAM	RATING	BTUH Per Lineal Foot At Average Water Temperatures Indicated						
П	Lbs IHr	Sq Ft.	BTU/Hr At 215ºF	170ºF	180ºF	190ºF	200ºF	210ºF	220ºF	230ºF
	2000	3.40	820	550	620	690	750	810	880	940
	500	3.40	820	520	590	650	710	770	830	890

Baseray Cast Iron Baseboard



ACCESSORIES

PART #	DESCRIPTION
9A-AFP	ADJ. FILLER STRIPS
9A-9010	INSIDE CORNER 10-5/8"
9A-904	INSIDE CORNER 4-5/8"
9A-90S	CONNECTOR 4-5/8"
9A-90XL	CONNECTOR 10-5/8"
9A-AF	ALUMINUM FOIL TAPE
9A-AT	ASSEMBLY TOOL
9A-BCS	BOTTOM CENTER SUPPORT

PART #	DESCRIPTION
9A-LAEC	END CAP LEFT
9A-LHV	VALVE ENCLOSURE LEFT
9A-PN	PUSH NIPPLE 3/4"
9A-RAEC	END CAP RIGHT
9A-RHV	VALVE ENCLOSURE RIGHT
9A-SP	SPLICE PLATE 4"
9A-TBN	TIE BOLT W/NUT
9A-TCS	TOP CENTER SUPPORT

2-1/3

RADIATION DATA

SQUARE FEET OF RADIATION PER SECTION

OLD STYLE COLUMN RADIATORS NO. OF TUBES OR COLUMNS Width 4-1/2" 7-3/8" 9" 11-1/2" 12-1/2" 12-1/2"











Height I	n.					
45	3-1/2	5	6	10		
38	3	4	5	8	10	
32	2-1/2	3-1/3	4-1/2	6-1/2	8-1/2	
26	2	2-2/3	3-3/4	5	7	7
23	1-2/3	2-1/3	3-1/4	4-1/2		
22	1-2/3	2-1/4	3	4	6	6
20	1-1/2	2	2-3/4	3-1/2	5	5
18	1-1/3	1-3/4	2-1/4	3	5	4-1/3
17						4
16					4	3-3/4
15		1-1/2				
14					4	3
13					3	3

TUBE TYPE RADIATORS

NO. OF TUBES

	3	4	5	6	7
Width	5"	7"	8-3/4"	9-3/4"	12-1/2"











Height In.					
38	3-1/2	4-1/4	5	6	
36	3-1/2	4-1/4	5	6	7
32	3	3-1/2	4'/3	5	6
26	2-1/3	2-3/4	3 12	4	5
23	2	2-1/2	3	3-1/2	4-1/2
22					4-1/2
20	1-3/4	2-1/4	2-2/3	3	3-2/3
16					3-1/2
17					3
16					3
14					2-1/2

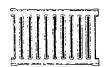
EXAMPLE:



Figure 7 is a tube type radiator, 20" high by 7" wide. There are 4 tubes per section and 8 sections. Table F shows this size tube type radiator has 21/4 square feet of radiation per section. 21/4 times 8 (the number of sections) equals 18 square feet of direct radiation. 18 times 240 (BTU/hr.) equals 4320 BTU/hr. for this radiator.

	THIN TUBE RADIATORS									
		NO. O	F TUBES							
	2	3	4	5	6					
Width	3-1/2"	4"	4-3/4"	6"	7-7/8"					
			ii N							
Height In	١.									
38	2-1/2	2-2/3								
32	2	2-1/3			3-2/3					
26			2-1/3	3	3					
25	1-1/2	1-2/3	2		3					
23				2						
22	1-1/3	1-1/3	1-4/5							
20			1-4/5		2-1/3					

1-1/4



19

WALL I	YPE RADIATORS
	Sq. Ft.
Size	Per Radiator
13-1/2" x 17" x 3"	5
13-1/2" x 21" x 3"	6
13-1/2" x 22" x 3"	7
13-1/2" v 29" v 3"	Q

WALL TYPE DARIATORS

1-2/3



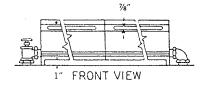
SECTIONAL WALL TYPE RADIATORS									
Height	37"	26-1/2"	21-1/2"	15"	13-7/8"				
Sq. Ft.	2-1/2	1-4/5	1-1/2	1	3/4				
Radiation									
Per Section									

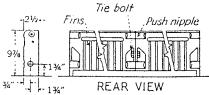
NOTE: 240 BTU/H only applies to steam. To Figure hot water BTU's multiply by 150 to get BTU/H rating at 170° water.

BASE-RAY SUB-ASSEMBLY CHART

ASSEMBLY				ASSEMBLY			
LENGTH	L. H.	CENTER	R. H.	LENGTH	L. H.	CENTER	R. H.
6-1/2 FT.	5-1/2 FT.		1 FT.	15-1/2 FT.	5-1/2 FT.	6 FT.	4 FT.
7 FT.	6 FT.		1 FT.	16 FT.	6 FT.	6 FT.	4 FT.
7-1/2 FT.	5-1/2 FT.		2 FT.	16-1/2 FT.	5-1/2 FT.	6 FT.	5 FT.
8 FT.	6 FT.		2 FT.	17 FT.	6 FT.	6 FT.	5 FT.
8-1/2 FT.	5-1/2 FT.		3 FT.	17-1/2 FT.	5-1/2 FT.	6 FT.	6 FT.
9 FT.	6 FT.		3 FT.	18 FT.	6 FT.	6 FT.	6 FT.
9-1/2 FT.	5-1/2 FT.		4 FT.	18-1/2 FT.	5-1/2 FT.	2-6 FT.	1 FT.
10 FT.	6 FT.		4 FT.	19 FT.	6 FT.	2-6 FT.	1 FT.
10-1/2 FT.	5-1/2 FT.		5 FT.	19-1/2 FT.	5-1/2 FT.	2-6 FT.	2 FT.
11 FT.	6 FT.		5 FT.	20 FT.	6 FT.	2-6 FT.	2 FT.
11-1/2 FT.	5-1/2 FT.		6 FT.	20-1/2 FT.	5-1/2 FT.	2-6 FT.	3 FT.
12 FT.	6 FT.		6 FT.	21 FT.	6 FT.	2-6 FT.	3 FT.
12-1/2 FT	5-1/2 FT.	6 FT.	1 FT.	21-1/2 FT	5-1/2 FT.	2-6 FT.	4 FT.
13 FT	6 FT.	6 FT.	1 FT.	22 FT.	6 FT.	2-6 FT.	4 FT.
13-1/2 FT.	5-1/2 FT.	6 FT.	2 FT.	22-1/2 FT.	5-1/2 FT.	2-6 FT	5 FT.
14 FT.	6 FT.	6 FT.	2 FT.	23 FT.	6 FT.	2-6 FT.	5 FT.
14-1/2 FT.	5-1/2 FT	6 FT	3 FT.	24 FT.	5-1/2 FT.	2-6 FT.	6 FT.
15 FT.	6 FT	6 FT	3 FT.	24-1/2 FT.	6 FT.	2-6 FT.	6 FT.

BASE-RAY TAPPINGS —Tapped 3/4" top and bottorn of end sections. AIR VENT TAPPINGS — Air Vent Tappings are located on the face of 18" and 24" left end sections and on 18" and 24" Panels. A 3/4" vented plug is furnished with each Base-Ray Assembly. Only one air vent need be used.





TURBONICS INC.

TOESTERS 4/5 Thru 16/19 UNDERCOUNTER HYDRONIC FAN COIL UNITS

TOESTER FEATURES

- "PURR-FECT" AIR WHEEL Ultra-low profile air handler that draws air from a 360 degree radius. Over eight years in development this wheel is truly an industry first.
- 2. SHADED 4 POLE 2 SPEED MOTOR This rugged encased motor runs at 850 and 650 RPM. Because the "PURR-FECT" Air Wheel is balanced optimally on the large shaft, motor life is double that of a tangential blower motor.
- REVERSE ACTING THERMOSTAT Built in thermostat senses the temperature of the water and determines when the unit should run. No secondary controls are needed.
- 4. UP TO 19,000 BTUH FROM UNDER THE COUNTER TOESTER'S come in a variety of sizes ranging from 4,000 to 19,000 BTUH's, the TOESTER 16/19 has a greater heating capacity than any other undercounter fan coil on the market.
- 5. ALL PARTS MANUFACTURED AND ASSEMBLED IN THE USA.

ALL RATINGS BASED ON 65° ENTERING AIR

Model TOESTER 4/5 BTU Output Per Hour

BTUH @ 2 GPM		Inlet Water Temperature						
Fan Control	100⁰	120⁰	140⁰	160⁰	180⁰	200⁰	220⁰	
High	2000	3000	3900	4800	5700	6500	7300	
Low	1400	2200	3100	4000	4800	5600	6400	

1 GPM multiply by .95 4 GPM multiply by 1.05 Pressure Drop: .33' @ 1 GPM 1.0' @ 2 GPM

1.0' @ 2 GPM 3.0' @ 4 GPM

Model TOESTER 6/8 BTU Output Per Hour

BTUH @ 2 GPM	Inlet Water Temperature							
Fan Control	100⁰	120⁰	140⁰	160⁰	180⁰	200⁰	220⁰	
High	2350	3800	5150	6600	7700	9100	10,600	
Low	1850	2900	4050	5200	6100	7200	8200	

1 GPM multiply by .95 4 GPM multiply by 1.05 Pressure Drop: .5' @ 1 GPM 1.5' @ 2 GPM

Model TOESTER 10/12 BTU Output Per Hour

BTUH @ 2 GPM		Inlet Water Temperature							
Fan Control	100⁰	120⁰	140⁰	160⁰	180º	200⁰	220⁰		
High	2700	4100	6200	8100	10,000	12,000	14,500		
Low	2200	3200	4800	6500	7800	9500	11,500		

1 GPM multiply by .95 4 GPM multiply by 1.05 Pressure Drop: .6' @ 1 GPM 1.8' @ 2 GPM

4.5' @ 4 GPM

4.0' @ 4 GPM

Model TOESTER 11/13 BTU Output Per Hour

BTUH @ 2 GPM		Inlet Water Temperature						
Fan Control	100⁰	120⁰	140⁰	160⁰	180⁰	200⁰	220⁰	
High	3500	5800	8200	10,900	13,200	16,200	19,100	
Low	2500	4000	6200	8800	10,900	13,800	16,700	

1 GPM multiply by .95

Pressure Drop: .6' @ 1 GPM

4 GPM multiply by 1.05

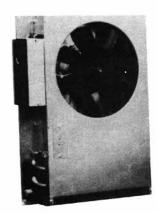
1.8' @ 2 GPM 4.5' @ 4 GPM

Model TOESTER 16/19 BTU Output Per Hour

BTUH @ 2 GPM		Inlet Water Temperature							
Fan Control	100⁰	120⁰	140⁰	160⁰	180⁰	200⁰	220⁰		
High	4340	6900	9900	13,250	16,200	19,100	21,800		
Low	3050	4900	7500	10,600	14,000	16,900	19,300		

1 GPM multiply by .95 4 GPM multiply by 1.05 Pressure Drop: .33' @ 1 GPM 1.0' @ 2 GPM

3.0' @ 4 GPM

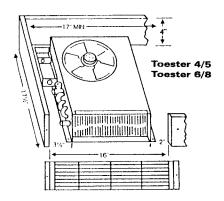


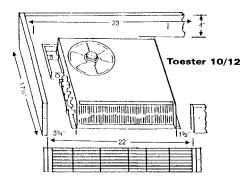
Toester 4/5
Toester 6/8

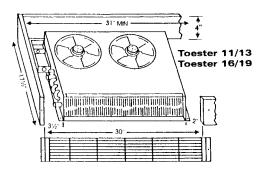


Listed For U.S. & Canada

ROUGH IN DIMENSIONS & OUTPUTS



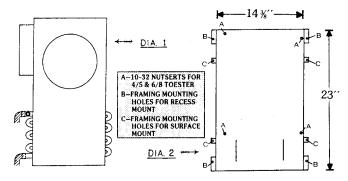




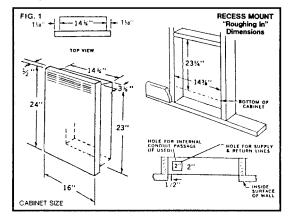
For best results, Turbonics recommends that you use monoflow tees off the main line.

TURBONICS INC.

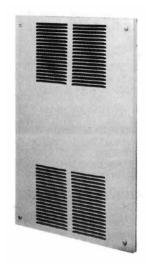
TOESTER 4/5-6/8* CABINETS HEATERS



For best results, Turbonics recommends that you use monoflow tees off the main line.



MODEL T45-WM-AR (Recess Flush Mount)



INSTALLATION INSTRUCTIONS

- STEP 1- Solder elbows onto Toester inlet & outlet before placing unit in cabinet. (See Diagram 1). Make sure elbows are fully seated or the Toester will not fit into the cabinet.
- STEP 2- Place unit in cabinet & center over appropriate nuts (See Diagram 2). Use 4 - 10 x 32 x 3/8" semsscrews provided to lock the Toester into the Toester cabinet.
- STEP 3- Recess Flush Mount Cut hole in wall between studs, 14-1/4" wide by 23-1/4" high. Place cabinet, with Toester in place, into hole. Secure cabinet to studs with 4 wood screws provided (See Diagram 2).
- STEP 4- Surface Mount Locate studs & mark for installation. Center cabinet with Toester in place & secure to studs with 4 screws provided (See Diagram 2).
- STEP 5- Wire in switch (if used) or direct wire unit per Toester instructions on either high or low speeds. If using optional 2-speed switch use wiring instructions provided with the switch. Wire in accordance with all local & national codes
- STEP 6- Complete piping. ¢ and bleed unit for five (5) minutes with systems pump operating.
- STEP 7- Install front cover with 4 10 x 32 x 5/8" cover bolts provided.

STANDARD LIMITED PRODUCT WARRANTY - ONE YEAR

TOESTER 4/5

IMPROVED OUTPUTS

R	ATING DA	TA	BTUH @ 2 GPM		INL	ET WATER	WATER TEMPERATURE			
AMPS	RPM	LPM	FAN CONTROL	100º	120º	140º	160º	180º	200⁰	220º
.6	1350	75	HIGH	2200	3100	4000	4900	5800	6500	7400
.18	900	55	LOW	1700	2400	3300	4100	5000	5700	6600

Rating based on 65º entering air.

1 GPM multiply by .95

Pressure Drop: .5' @ 1 GPM

1.5' @ 2 GPM

4 GPM multiply by 1.05

6.0' @ 4 GPM

TOESTER 6/8

RATING DATA		BTUH @ 2 GPM		INLI	ET WATER	TEMPERA	TURE			
AMPS	RPM	LPM	FAN CONTROL	100º	120º	140º	160º	180º	200⁰	220º
.6	1350	90	HIGH	2850	4300	5750	7200	8600	10,000	11,700
.18	900	65	LOW	2450	3400	4650	5800	7000	8100	9300

Rating based on 65º entering air.

1 GPM multiply by .95

Pressure Drop: .33' @ 1 GPM

4 GPM multiply by 1.05

1.0' @ 2 GPM

*Non-stock Item.

4.0' @ 4 GPM

TURBONICS INC.

WALL MOUNTED HYDRONIC FAN COILS TOESTER 11/13 WALL MOUNT*

I. INSTALLATION - GENERAL

- A. The Toester 11/13 WM unit heater is a forced air hot water space heater suitable for connection to hot water supply at any pressure up to 125 P.S.I. Maximum water temperature should not exceed 200°F. The amount and temperature of water flowing through the unit determine heating output.
- B. Building codes and plumbing regulations may vary. Check local codes and regulations before determining proper application and installation.

II. PIPING

- A. The piping to the unit will usually be either 1/2 or 3/4 I.D. type L copper. Valves in supply and return lines are recommended.
- B. Where the heater is located more than a few feet above the boiler or hot water main, some gravity, thermal circulation will occur even when the unit pump is not running. Lowering the supply water temperature when possible, either manually or with an automatic outside temperature control will minimize this condition. Restricting the heater circuit by partially closing one of the valves within the limits needed for the heater output will also reduce this circulation.
- C. As with any system employing circulated water, the pipes passing through unheated spaces should be insulated. With the unit presumably operating only in periods when space heating is needed, the heat given off from the water pipes which pass through heated areas would not be a loss. Insulation on the pipes reduces heat loss in piping maximum water temperature available at the unit and maximum unit output.

III. PIPING - HOT WATER BOILER

A. The unit supply line should be taken from the boiler side beyond of any flo-control valve. On a gravity hot water system the unit supply and return can be connected to the existing piping nearest the unit location.

IV. PIPING - WATER HEATER

- A. Where the unit is connected to a water heater and a separate pump is installed, several alternate piping arrangements may be used. The normal method is for water to be taken from the top of the tank by connecting to the pipe supplying the domestic water. The return water from the unit is brought back to the tank preferably at a point about half way between the top and bottom of the tank. (Normal location of water supply drop pipe in tank will provide for this). This location of the return line in the hot water tank is one of the most important points in the piping of the unit.
- B. The return line from the unit must not be attached to any drain tapping at the bottom of the tank, since sediment will be stirred up with this connection.
- C. The supply line for the unit can be taken from the existing hot water supply line at a point most convenient or closest to the unit. The return line from the unit, however, must go back to the water heater.

V. SETTING UP THE UNIT

- A. A bleed valve opened with a screw driver is provided on the unit at the left side above the water coil. A short piece of 1/8" I.D. rubber tubing may be slipped on the bleed valve, emptying into a small container while bleeding the air. The lines should be purged with water pressure on the system, but with the unit motor shut off.
- B. The valve on the return is first closed, the valve on the supply line opened. The bleed valve should be opened until water flows out steadily. Then, with the valve in the supply line closed and the valve in the return line opened, air is removed in the same manner from the return line.
- C. The time required for air removal will be 5 to 10 minutes for each leg of piping.
- NOTE: The bleed valve is designed to vent the unit. If the unit in not located at the high point of a system, or if fresh water is continually introduced to the system, an additional automatic air vent may be required.
- DO NOT attempt to bleed air with both lines open or with the unit running.



MODEL T13-WM-AR

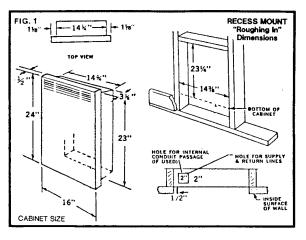
(Recess flush mount shown)

STANDARD LIMITED PRODUCT WARRANTY - FIVE YEAR

For best results, Turbonics recommends that you use monoflow tees off the main line.

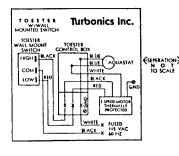
VI. MOUNTING THE UNIT

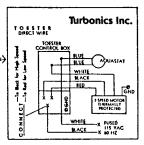
- A. Brackets are provided on the surface mount units. The brackets are on 15" centers and should be lined up with studs.
- B. Recess mount dimensions Fig. #1.



VII. WIRING THE UNIT

- A. A field wiring box is provided in the lower right hand corner of the unit. Connect wires at this point only.
- B. The unit is manufactured with a built-in aqua-stat that DOES NOT allow the unit to run until the water temp is 120°, the unit turns off when water temp drops below 105°.





RATING DATA BTUH @ 2 GPM				INLI	ET WATER	TEMPERA	TURE						
AMPS	RPM	CFM	FAN CONTROL	100º	120º	140º	160º	180º	200⁰	220º			
1.2	1350	110	HIGH	3500	5800	8200	10,900	13,200	16,200	19,100			
.36	900	80	LOW	2500	4000	6200	8800	10,900	13,800	16,700			

Rating based on 65° entering air.

1 GPM multiply by .95

4 GPM multiply by 1.05

Pressure Drop: .5' @ 1 GPM

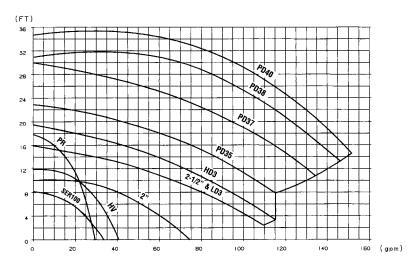
1.5' @ 2 GPM

6.0' @ 4 GPM

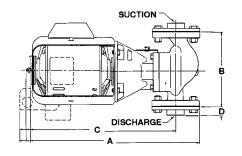
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BELL & GOSSETTOil Lubricated Circulators







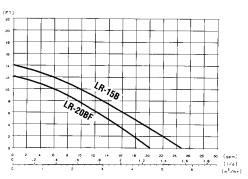
Dimensions & Weights

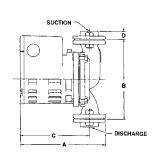
Model	Cast Iron	Bronze	Flange Size Inches	Mo	Motor Characteristics @ 60 Hz			Dimensions In Inches				
No.	Model No.	Model No.	(NPT)	HP	Ø	Voltage	Α	В	С	D		
Series 100	100L	B100L	3/4 1 & 1-1/4 1-1/2	1/12			14-7/8	6-3/8	12-3/4	9/16 3/4 15/16		
Series PR	PR	102208	3/4 1 & 1-1/4 1-1/2	1/6		115 - with built-in	15-1/4	8-1/2	12-3/4	9/16 3/4 15/16		
Series HV	HV	BHV	1 1-1/4 & 1-1/2	1/6		overload protection	15-3/8	8-1/2	13	5/8 3/4		
2"	2X	B2	2	1/6	1		16-5/8	8-1/2	14	13/16		
2-1/2"	2-1/2	B2-1/2	2-1/2	1/4			17-1/4	10	14	1-1/16		
LD3	LD3	102224	3	1/4			17-1/4	10	14	1-1/16		
HD3	HD3	HDB3	3	1/3		115/230	17-1/2	10	14-1/4	1-1/16		
PD-35S	PD35S	PDB35SBI	3	1/2		115/230	20-1/4	12	16-7/8	1-1/16		
PD-35T	PD35T	105096	3	1/2	3	208-230/460	20-1/4	12	16-7/8	1-1/16		
PD-37S	PD37S	105100	3	3/4	1	115/230	20-1/4	12	16-7/8	1-1/16		
PD-37T	PD37T	PDB37T	3	3/4	3	206-230/460	20-1/4	12	16-7/8	1-1/16		
PD-38S	PD38S	105123	3	1	1	115/230	24	14-1/2	19-1/2	1-1/4		
PD-38T	PD38T	105135	3	1	3	208-230/460	24-1/4	14-1/2	19-3/4	1-1/4		
PD-40S	PD40S	105153	3	1-1/2	1	115/230	24-5/8	14-1/2	20-1/8	1-1/4		
PD-40T	PD40T	105139	3	1-1/2	3	208-230/460	25-1/8	14-1/2	20-5/8	1-1/4		

Dimensions are approximate and subject to changes

BELL & GOSSETT

Oil Lubricated Circulators / LR









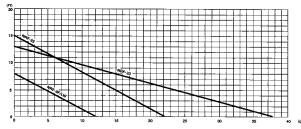


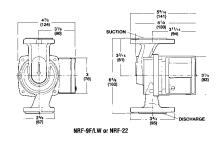
Dimensions & Weights

		Flange Size Inches	Motor Charactenstics* @ 60 Hz			Dimensions in Inches			
Model No.	Construction	(NPT)	HP	Ø	Voltage	Α	В	С	D
LR-20BF	Cast Iron	3/4 1 & 1-1/4 1-1/2	1/20	1	115 - With Built-in	6-15/16		5-5/8	9/16 3/4 15/16
LR-15B	Bronze	3/4 1 & 1-1/4 1-1/2	1/12		Thermal Overload Protection	7-15/16	6-3/8	6-5/8	9/16 3/4 15/16

230/60/1 motors available upon request. Dimensions are approximate and subject to change. Contact factory for certified dimensions.

Cast Iron & Bronze Wet Rotor / NRF







Cast Iron Circulators

Model	Model Flange Sizes		Standard 60 Cycle Motor Characteristics**							
No.	Inches - NPT	Watts	Ø	Voltage	F.L. AMPS	RPM				
NBF12* NRF-22 NBF-22*	3/4, 1,1-1/4,1-1/2	92	1	115	.80	2940				
NRF-9F/LW	3/4, 1,1-1/4,1-1/2	41	1	115	.40	2950				



Flanges for Cast Iron Circulators

	Size	
Models Where Used	(NPT)	Part No.
	3/4"	101001
Series 100, PR, NRF-22,	1"	101002
NRF-9F/LW, NRF-33,	1-1/4"	101003
PL-30, PL-36, PL-55	1-1/2"	101004
	1"	101005
Series HV, PL45, PL-50	1-1/4"	101006
	1-1/2"	101007

Flanges for Bronze Circulators

	Size	
Models Where Used	(NPT)	Part No.
Series 100B, PRAB,	3/4"	101011
NBF-22, NBF-12F/LW,	1"	101012
NBF-33, PL-30B,	1-1/4"	101013
PL-36B	1-1/2"	101014
	1"	101015
Series HVB, PL-45B,	1-1/4"	101016
PL-50B	1-1/2"	101017

^{*}Bronze

^{**230/60/1} motors available upon request. Impedance protected.

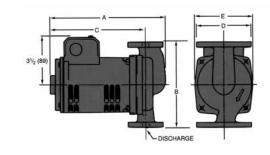


SERIES PL

A superior alternative to large wet rotor pumps.

Dimensions & Weights

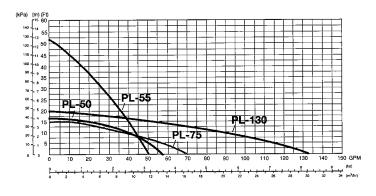


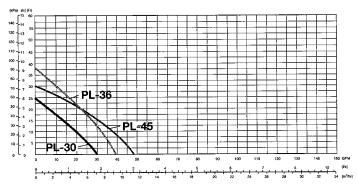




Cast Iron	Bronze	Flange Size		Motor C	Characterist	ics*	s* Dimensions in inches @ 60 Hz (Open Drip-Proof)					
Model No.	Model No.	Inches - NPT	HP	Ø	Voltage	RPM	Α	В	С	D	E	Shipg. Wt. Ibs.
PL-30	PL-30B	3/4 1 & 1-1/4 1-1/2	1/12			2650	8-5/8	6-3/8	7-1/8	4-3/16	4-3/8	11.6
PL-36	PL-36B	3/4 1 & 1-1/4 1-1/2	1/6			3300	8-5/8	6-3/8	7-1/8	4-3/16	4-3/8	13.1
PL-45	PL-45B	1 1-1/4 & 1-1/2	1/6	1	115	3300	9-1/8	8-1/2	7-1/4	4-5/8	4-3/8	14.5
PL-50	PL-50B	1 1-1/4 & 1-1/2	1/6			3300	9-1/8	8-1/2	7-1/4	4-5/8	4-3/8	14.5
PL-55	N/A	3/4 1 & 1-1/4 1-1/2	2/5			3250	9-9/16	6-3/8	7-15/16	4-3/16	4-3/4	13.1

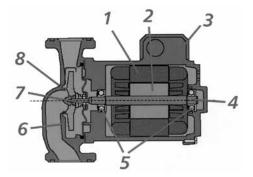
* 230/60/1 motors available upon request. Models PL-75 and PL-130 has a four bolt hole flange connection, all others have two bolt hole flange connectors. Dimensions are approximate and subject to changes. Contact factory for certified dimensions.





- 1 B&G's powerful, dry-motor design delivers exceptional performance...25% more efficient than competition.
- 2 Precision-machined and balanced alloy steel rotor for superior performance.
- **3** Quick-connect wire nut leads and dual knock-outs make for fast, sure hook-ups.
- 4 Solid "Stiff-Shaft" design is constructed of high-strength alloy steel impervious to cracking caused by thermal stresses.
- 5 XL-11™ Precision-Crafted Bearing System... is permanently oil lubricat-ed... completely maintenance free... precisely positioned for long-life and isolated for quiet operation.
- 6 Advanced close-coupled design increases pump life and efficiency, assures dependable seasonal start-ups and can easily handle difficult water conditions.
- 7 Tough, durable seal system features a carbon/silicon carbide seal on a stainless steel shaft sleeve for long life and rugged operation.
- 8 Double sided I-Seal[™]design for optimum efficiency.





BELL & GOSSETTRelief and Reducing Valves



Reducing Valves

- Reducing Valves fill the system to a preset pressure for optimum performance.
- Convenient cleanable strainer is designed
- tp prevent dirt and sediment from entering system.
- Brass body construction.
- Fast fill feature reduces start-up time and labor.

Low Pressure Reducing Valves With Fast Fill Feature

PART #	SIZE	PSI	DESCRIPTION
BG FB38	1/2"	12	BRASS
BG FB38TU	1/2"	12	W/TAIL UNION

LOW PRESSURE REDUCING VALVES

Γ	PART #	SIZE	PSI	DESCRIPTION
ľ	BG B7-12	3/4"	12	BRASS

HIGH PRESSURE REDUCING VALVES

PART #	SIZE	PSI	DESCRIPTION
BG 7VALVE	3/4"	45	BRASS

Dual Unit Valves

Reducing Valve Set @ 12 lb. Relief Valve Set @ 30 lb.

PART #	SIZE	DESCRIPTION
BG 8	1/2"	IRON

With Fast Fill

PART #	SIZE	DESCRIPTION
BG F8	1/2"	IRON
BG F8TU	1/2"	W/TAIL UNION

Isolation Valves

The Check-Trol flange is a combination isolation valve, flow control valve, and companion flange for circulators. The full port ball valve allows the circulator to be removed from the system without draining the system. The internal spring check prevents gravity circulation.

PART #	SIZE	DESCRIPTION
101231LF	3/4"	NPT x Flange
101232LF	1"	NPT x Flange
101233LF	1-1/4"	NPT x Flange
101236LF	3/4"	NPT x Sweat
101237LF	1"	NPT x Sweat
101238LF	1-1/4"	NPT x Sweat



Flo-Control Valves



Straight Angle Pattern
3/4" - 1" - 1-1/4" - 1-1/2" - 2"*
*Flanged one end on horizontal run



Bronze Straight Pattern 3/4"

PART #	PATTERN/CAST
BG SA3/4	STRAIGHT ANGLE/IRON
BG SB3/4	STRAIGHT BRONZED, SWEAT
BG SA1	STRAIGHT ANGLE/IRON
BG SA1-1/4	STRAIGHT ANGLE/IRON
BG SA1-1/2	STRAIGHT ANGLE/IRON
BG SA2	STRAIGHT ANGLE/IRON

Monoflow Fittings



PART #	SIZE
BG 108119	3/4 x 1/2
BG 108120	1 x 1/2
BG 108121	1 x 3/4
BG 108122	1-1/4 x 1/2
BG 108123	1-1/4 x 3/4
BG 108124	1-1/2 x 3/4
BG 108125	1-1/2 x 1



Automatic Air Vents

No. 7 AUTOMATIC AIR VENT — An improved valve for automatically removing air from the piping of any type of hot water heating system.
75 P.S.I.G. Working Pressure — Maximum 240°F Operating Temperature

PART #	SIZE
BG 7VENT	1/8" FPT
BG 67	1/8" MPT

Dole®

AIR VENTS

For Hydronic Heating Systems Automatic Hygroscopic Valves



No. 20 JR Disc Type Air Valve
For radlators and convectors. Provision for
manual or automatic venting. 1/8" connection. Max. pressure 30 psi. Packed 6 per
box. Net shipping weight 1.2 oz. each.



No. 20 SR Disc Type Air Valve
For radiators or convectors. Provision for
manual shut-off, manual and automatic
venting 1/8" connection. Max. pressure
30 psi. Packed 6 per box. Net shipping
weight 1.6 oz. each.

Manual Vents



No. 9 Coin Valve

1/8" NPT connection. Packed 24 per box. Net shipping weight 0.6 oz. each.



No. 9BX Special Coin Valve

For baseboard radiators.1/8" NPT connection. Packed 24 per box. Net shipping weight 0.5 oz. each.



No. 27-202-02 Key Vent

1/8" NPT connection. Packed 24 per box with 4 keys. Net shipping weight 0.6 oz. each.



No. H-2404-00 Key



No. 14 Key Air Valve Assembly

Vent outlet is on inside of enclosure. Tubing 20" long x 3/16" O.D. 1/8" NPT connection. Packed 12 per box with two keys. 144 per master shipping carton. Net shipping weight, 4.0 oz. each.



No. 14A Coin Air Valve Assembly

Vent outlet is outside of enclosure. Tubing 20" long x - 3/16" O.D. 1/8" NPT connection. Packed 12 per box. 144 per master shipping carton. Net shipping weight, 4.3 oz. each.



STEAM VENTS

FOR RADIATORS

Use **No. 4 Gorton Vapor Equalizing Valve** on radiators in room in which thermostat is located and on radiators that affect the operation of the thermostat.

Use **No. 5 Gorton Vapor Equalizing Valve** (venting capacity equal to 4 ordinary type air valves) on radiators near the boiler and in warm rooms; for example, on first floor radiators.

Use **No. 6 Gorton Vapor Equalizing Valve** (venting capacity equal to 8 ordinary type air valves) on radiators farther from the boiler and in cold rooms; for example, on second-floor radiators.

Use "C" Gorton Vapor Equalizing Valve (venting capacity equal to 15 ordinary type air valves) on radiators farthest from the boiler and in coldest rooms; for example, on third-floor radiators and above.

Use "D" Gorton Vapor Equalizing Valve (venting capacity equal to 27 ordinary type air valves) in cases where a large amount of air must be vented; for example, on radiators having particularly long branches and on very large radiators. (Not to be used on hand-fired systems unless radiator supply valves are left "on" all the time).

Use "1965" vent when you're looking for a cost effective vent that delivers the venting capacity of five or six ordinary vents. It will equal msot adjustable type air vents on the market today.

NO. 4

PART #	DESCRIPTION
4X	1/8" ANGLE

NO. 5

PART #	DESCRIPTION
5X	1/8" ANGLE



1/8" Side Connection

NO. 6

PART #	DESCRIPTION
6X	1/8" ANGLE

NO. C

PART #	DESCRIPTION
С	1/8" ANGLE
C-Verticle	1/8" STRAIGHT



1/8" or 1/4" Vertfcal Connection

NO. D

PART #	DESCRIPTION
D	1/8" ANGLE
D-Verticle	1/8" STRAIGHT

NO. 1965

PART #	DESCRIPTION
1965ANGLE	1/8" ANGLE
1965SS1/8	1/8" STRAIGHT
1965SS1/4	1/4" STRAIGHT



FOR MAINS

Install 1 or more **No. 1 Gorton Air Eliminators** with 3/8" or 3/4" x 1/2" vertical connection at the end of the short main or the main running to the warm side of the building.

Install 2 or 3 **No. 1** or 1 or more **No. 2 Gorton Air Eliminators** with 1/2" vertical connection at the end of the long main or the main running to the cold side of the building, depending upon the size of the building. The venting capacity of 1 No. 2 Gorton Air Eliminator Is equal to that of 4 No. 1 Gorton Air Eliminators.

NO. 1

PART #	DESCRIPTION
1X	3/4" x 1/2" STRAIGHT

NO. 2

PART #	DESCRIPTION
2XXX	1/2" STRAIGHT



Over-all height 6-3/8" 1/2" Vertical Connection



3/8" or 3/4" by 1/2" Vertical Connection



THERMOSTATIC RADIATOR VALVES

RA 2000 QUICK SELECTION CHART

						rators			
_	Valves*		Cap tube lengths						
Į F	For use on hot water				6-1/2"	6' + 6'	6'	16'	
2-р	(max 250°F) and ipe LPS (max.15 ps	ig)		Cina.		<u></u>			
Configuration	Connection FPT x MPT	C_v				4	Osi	(Ce)	
	I I I X IVII I		013G8250	013G8240	013G8252	013G8564	013G8562	013G8565	
A	1/2" NPT	1.6	013G8015						
禺	3/4" NPT	2.7	013G8020						
	1" NPT	2.8			0130	38025)25		
	1-1/4" NPT	2.8	013G8032						
A	1/2" NPT	1.6			0130	38014			
	3/4" NPT	2.7			0130	38019			
	1" NPT	2.8	013G8024						
	1-1/4" NPT	2.8	013G8031						
	1/2" NPT	1.6	1.6 013G8013						
3/4" NPT 2.7			0130	38018					
	1" NPT	2.8			0130	G8023			
1-1/4" NPT 2.8			013G8030						

^{*1/2&}quot; & 3/4" straight solder unions also available

1 PIPE LPS SYSTEM

A one pipe steam heating system equipped with DANFOSS thermostatic radiator valve type 013G0140 with an 013L8011vent.

This valve type Is designed for low pressure steam systems, max 15 psig connected to a boiler with time cycling mode of control. Changing temperature around the operator sensor effects a modulating action of air venting through the radiator, convector etc. When the operator calls for heat the steam enters the radiator and pushes the air through the valve and out the vent. When setting temp. is reached valve will close and venting stops.





RA 2000 VALVE FOR 1-PIPE LPS

NOTE: If the boiler is cycled by a space t-stat in a room no valve should be Installed. Otherwise improper boiler control may result. Don't use valves if vacuum operation exists.



HYDRONIC ACCESSORIES

NO. 740 SERIES

A.S.M.E. Water Pressure Relief ValveE. Iron body relief valve with expanded outlets for hot water space heating boiloers.

FEMALE INLET AND OUTLET.

				STE	STEAM DISCHARGE CAPACITIES		
MODEL #	INLET	OUTLET	HEIGHT	30 LBS	45 LBS	50 LBS	75 LBS
WV 740-3/4	3/4"	1"	5-7/8"	925,000	1,245,000	1,352,000	1,886,000
WV 740-1	1"	1-1/4"	7-1/4"	1,300,000	1,750,000	1,899,000	2,649,000
WV 740-1-1/4	1-1/4"	1-1/2"	8-3/4"	2,105,000	2,830,000	3,075,000	4,285,000
WV 740-1-1/2	1-1/2"	2"	9-1/4"	2,900,000	3,903,000	4,237,000	5,909,000
WV 740-2	2"	2-1/2"	11-5/8"	5,250,000	7,067,000	7,672,000	10,700,000



009 REDUCED PRESSURE ZONE (RPZ) BACKFLOW PREVENTERS

DESIGNED TO PROTECT POTABLE WATER SUPPLIES IN ACCORDANCE WITH NATIONAL PLUMBING CODES AND WATER UTILITY AUTHORITY REQUIREMENTS.

PART #	SIZE
009QTS-1/2	1/2"
009QTS-3/4	3/4"
009QTS-1	1"



SERIES 909AG AIR GAP

FOR USE ON HORIZONTAL INSTALLATIONS OF SERIES 009 BACKFLOW PREVENTERS.

PART #	SIZE
909AG-A	1/2" & 3/4"
909AG-C	1"



NO. 9D BACKFLOW PREVENTER

BACKFLOW PREVENTER CONTINUOUS PRESSURE TYPE WITH INTERMEDIATE ATMOSPHERIC VENT. FEMALE UNION INLET AND OUTLET CONNECTIONS.

PART #	SIZE
9D-1/2	1/2"
9D-3/4	3/4"



NO. 27 STRAINER

"V" TYPE WATER STRAINER. #40 SCREEN MESH.

PART #	SIZE
27-40	1/8"



NO. 1450F

IRON BODY DUAL CONTROL

COMBINES CONSTRUCTION FEATURES OF NO. 1156F AND RUGGED IRON BODY DIAPHRAGM RELIEF VALVE. SET 30 LBS.



PART #	SIZE	HEIGHT
WV 1450F	1/2"	5-3/8"

NO. N170, N170L SERIES

TEMPERING VALVES FOR LARGE COMMERCIAL AND INSTITUTIONAL INSTALLATIONS.



100°-130°

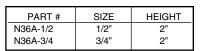
130°-160°

SIZE	MODEL #	SIZE
3/4"	N170-3/4	3/4"
1"	N170-1	1"
1-1/4"	N170-1-1/4	1-1/4"
1-1/2"	N170-1-1/2	1-1/2"
2"	N170-2	2"
	3/4" 1" 1-1/4" 1-1/2"	3/4" N170-3/4 1" N170-1 1-1/4" N170-1-1/4 1-1/2" N170-1-1/2

NO. 36A

VACUUM RELIEF VALVES

AUTOMATICALLY VENTS SYSTEM IF VACUUM OCCURS.







Float & Thermostatic Steam Traps

Series H, Series C

Float & Thermostatic Traps are used with a variety of steam equipment to readily release condensate and air but close to prevent steam loss. Hoffman Float & Thermostatic Traps function in "zero" to full capacity conditions and are well suited for intermittent service applications.

The Series 55 Float & Thermostatic Traps are available in sizes 3/4" through 2" and pressures up to 175 psi.

The Series 59 High Capacity Float & Thermostatic Traps are available in sizes 3/4" through 2-1/2" with pressures up to 175 psi and capacities to 55,600 pph.



PART #	SIZE
404200	3/4"
404210	1"
404200	1-1/4"

SIZE
1-1/2"
2"

"Y" STRAINERS*

Strainers are designed for steam, oil or water lines. Strainers should be installed ahead of temperature regulating and/or pressure reducing valves and steam traps to protect their moving parts, especially on new installations.

Model KEC

Cast iron body; maximum working pressure 250 psi for steam service, 400 psi for water service. Available in sizes 1/2" through 3".

*1/2" - 1-1/4" bronze water strainers available. Call for details.



PART #	SIZE
KEC-Y-3/4	3/4"
KEC-Y-1	1"
KEC-Y-1-1/4	1-1/4"
KEC-Y-1-1/2	1-1/2"
KEC-Y-2	2"

VENTING VALVES for Water Applications

No. 79 Water Main Vent

Designed for use on hot or cold water mains and process applications. Tapped at top for 1/8" NPT. Safety drain connection for discharging moisture entrained in the vented air. Built-in Check Valve. 1/2" NPT female and 3/4" NPT male straight shank. Maximum operating pressure 75 psi. Will withstand hydrostatic pressures of 200 psi.



No. 790 Water Valve.

Especially designed for removing air from convectors, baseboard and wall radiation. Safety drain connection at the top for discharging moisture entrained in the vented air. Fitting and ferrule for 3/16" OD tubing. Telescopic Siphon Tube. 1/8" NPT straight shank. Maximum operating pressure 30 psi.

#401479



No. 74 Quick Vent

Designed for sream unit heaters. Max. pressure 35 lbs. 3/4" male x 1/2" female connection. Nonadjustable port.

#401428



VENTING VALVES for Steam Applications

Model 41

#401488

Air Valve (non-vacuum)

- Single non-adjustable port
- For small steam systems
- Telescopic siphon tube wit angle cut assures drainage
- 1/8" (4mm) NPT straight shank
 Maximum operating pressure
- Maximum operating pressure
 6 psig
- Maximum pressure 10 psig

#401455



Model 71A

Air Valve (non-vacuum)

- Float-type vent
- Single non-adjustable port
- Telescopic siphon tube with with angle cut assures drainage
- 1/8" (4mm) NPT straight shank
- Maximum operating pressure 11 psig
- Maximum pressure 15 psig

#401470



Hoffman Vacuum Breakers

Model 62 Part No.401446

For use on closed vessels and piping systems tocontrol induced vacuum within safe limits

- Adjustable from 1/4" to 20" (8-508mm) Hg vacuum
- 3/4" (20mm) NPT straight shank
- Maximum operating temperature 3660F (186°C)
- Maximum operating pressure 150 psig (10.3 bar)

Thermostatic Steam Traps

Hoffman SPECIALTY

Low Pressure

No. 17-C Angle Steam Trap. 1/2" NPT pipe connections.



PART #	DESCRIPTION
HN 401536	ANGLE
HN 401545	SWIVEL
HN 600084	THERMOSTAT



No. 8-C Angle Steam Trap. 3/4" NPT pipe connections.



No. 17-C Swivel Steam Trap. 1/2" NPT pipe connections. Can be as right hand, left hand, or straightway trap where radiator or convector locations will not permit the use of an angle trap.



No. 8-C Straightway Steam Trap. 3/4" NPT pipe connections. For radiator or convector locations which will not permit the use of an angle trap.

PART #	DESCRIPTION
HN 402003	ANGLE
HN 402004	STRAIGHTWAY
HN 600205	THERMOSTAT

VENTING VALVES for Steam Applications Radiator Steam Vents

No.1-A Air Valve.

A float-type vent with adjustable port for true proportional venting. Port settings from (#1) slow to (#6) fast venting. 1/8" NPT angle connection. Operating pressure up to 1-1/2 psi. Maximum pressure 10 psi.

#401422

No. 40 Air Valve.

A float-type vent with a single non-adjustable port. For use on ordinary one-pipe system not requiring proportional venting. 1/8" NPT angle connection. Operating pressure up to 6 psi. Maximum pressure 10 psi.

#401440

No. 4 Quick Valve.

Thermostatic air vent for steam systems and process equipment. Operates on temperature changes only; does not close against water. Quick vent must be installed on a nipple 6" to 10" above horizontal return, which must be at least 18" above the boiler water line. 1/2" NPT female and 3/4" NPT male straight shank. Maximum operating pressure 25 psi.



#401416

Main Steam Vents

No. 4-A Air Valve.

A float-type vent with single non-adjustable port for use as a main vent on residential and other small one-pipe or two-pipe systems. 1/2" NPT female and 3/4" NPT male straight shank. Operating pressure up to 2 psi.

#401413



No. 75, 75-H Air Valves.

Float-type vents, each with single non-adjustable port for relieving air from the mains of medium and large systems. 1/2" N PT female and 3/4" NPT male straight shank. Operating pressure up to 3 psi (75) and up to 10 psi (75-H). Maximum pressure 15 psi.

75 - #401434 75H - #401437



No. 76 Vacuum Valves.

Float-type vents, each with single non-adjustable port for relieving air from the mains of medium and large size one-pipe vacuum systems. 1/2" NPT female and 3/4" NPT male straight shank. Operating pressure up to 3 psi. Maximum pressure 15 psi.

#401431



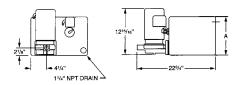


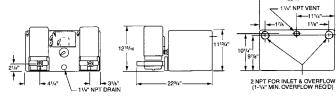
CONDENSATE PUMPS

WATCHMAN® SERIES WC™ CAST IRON RECEIVER

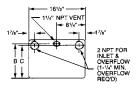
- For 6,000, 8,000 and 12,000 sq. ft. EDR systems
- Available with pumps in simplex or duplex design
- Low height NPT inlet for easy return line piping
- Separate NPT connections provide a secondary for safe operation (continued below)

Dimensions WC-6/8





EDR	Style	Rec.Cap	Α	В	С
6,000	Single	6	8-9/16	7-1/16	6-11/16
8,000	Single	9	10-7/8	9-3/8	9



		# OF	DISCH.	PUMP	PUMP	REC.	
PART #	MODEL #	EDR	PUMPS	PRESS.	CAP/GPM	CAP.	HP
HN 160029	WC-6-20-B	6000	1	22	9	6	1/3
HN 160030	WC-8-20-B	8000	1	21	12	9	1/3
HN 160031	WC-12-20-B	12000	1	20	18	14	1/3
HN 160032	WC-12-20-BMA	12000	2	20	18	14	1/3

WCS Duplex shown

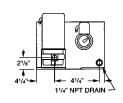
Dimensions WCS-12

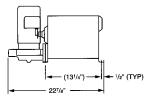
Dimensions WC-12

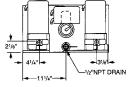
WATCHMAN® SERIES WCS™ STEEL RECEIVER

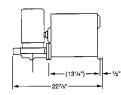
- NPT drain connection
- Double pole float switch simplex models
- Mechanical alternator duplex models
- Easy to install
- Easy to service with vertical pull out pumps
- 100% factory tested as a complete unit
- Series WC includes cast iron receiver with 20 year warranty against corrosion

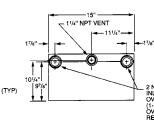
Dimensions WCS-6/8











EDR	Style	Rec. Cap	Α	В	С
6,000	Single	6	8-9/16	7-1/16	6-11/16
8,000	Single	9	10-7/8	9-3/8	9

	11/4" NPT	VENT	
	\ -	8"-	
1 ⁷ /8" —	\ <u> </u>		-1 ⁷ /8"
		- 6	
11		\sim	
ВĊ		//	2" NPT FOR INLET &
[]		7	OVERFLOW
11	<u> </u>		(1-1/4" MIN. OVERFLOW
			REQ'D)

—15" —

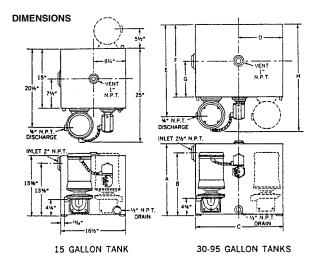
		# OF	DISCH.	PUMP	REC.		
PART #	MODEL #	EDR	PUMPS	PRESS.	CAP.	CAP.	HP
HN 160010	WCS-6-20-B	6000	1	22	9	6	1/3
HN 160011	WCS-8-20-B	8000	1	21	12	9	1/3
HN 160012	WCS-12-20-B	12000	1	20	15	14	1/3
HN 160013	WCS-12-20-BMA	12000	2	20	15	14	1/3



CONDENSATE PUMPS

4100 SERIES HEAVY GAUGE STEEL RECEIVERS

The 4100-G Series Condensate Pumps come with standard features such as, Heavy Duty 3/16" steel receivers, Simplex or Duplex construction, Bronze fitted centrifugal pumps, Energy Efficient 3450 RPM Motors, Automatic venting, Heavy Duty float switch and the SterlSealTM Ceramic pump seal.



Optional Features:

- Mechanical and electrical alternators available on duplex models
- Gauge glass
- Thermometer
- Discharge pressure gauges
- Special motor construction, explosion proof available.



DIMENSIONS/ENGINEERING DATA

Rec. Size Gal.	A	В	С	D	E	F	G	н
30	18-3/8	16-1/8	22	11	23-1/2	18	9	28
45	26-3/8	24-1/8	22	11	23-1/2	18	9	28

MODEL #	DISCH. PRESS.	# OF PUMPS	PUMP CAP./GPM	MOTOR HP	REC/ GAL	SQR. FT. EDR
SL 4128G	20	1	12	1/3	15	8,000
SL 41215G	20	1	22.5	1/2	30	15,000
SL 41215GD*	20	2	22.5	1/2	30	15,000
SL 41230B	20	1	45	1	45	30,000
SL 41230BD*	20	2	45	1	45	30,000

^{*}Denotes duplex motors.

BOILER FEED UNITS

Optional Features:

- Isolation valves
- Hot-dipped galvanized receivers
- Electric alternator for duplex units
- Solenoid operated make-up water valve with reverse acting float switch, and much more
- NEMA 1 or 12-control panel includes; circuit breaker or fuse disconnect switch with cover interlock, magnetic motor starter with three overloads, control transformer, pilot light and H-O-A switch. All completely assembled and wired to the terminal.



	BOILER	DISCH.	# OF	PUMP	MOTOR	REC/
MODEL #	HP	PRESS.	PUMPS	CAP. /GPM	HP	GAL
SL 4128GF	60	20	1	12	1/3	60
SL 4128GDF*	60	20	2	12	1/3	60
SL 41215GF	100	20	1	20	1/2	95
SL 41215GDF*	100	20	2	20	1/2	95

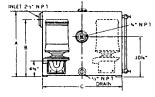
*Includes mechanical alternator.

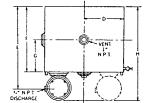
Denotes duplex motors.



DIMENSIONS/INCHES

REC/								
GAL	Α	В	С	D	E	F	G	Н
60	28-3/8	26-1/3	28	14	23-1/2	18	9	28
95	28-3/8	26-1/8	28	14	33-1/2	28	14	38

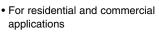






Low Water Cut-Offs — Probe Type

For Steam Boilers Series 450P/550P Low Water Cut-Offs



- Electronic operation
- Delay on Make (DOM) feature
- Delay on Break (DOB) feature
- LED low water indicator light Test switch and LED indicator light
- Optional manual reset switch available
- Optional remote sensor available Model PS-801 -RX2
- Meets ANSI specification Z21 .13a Model PS-802
- No lock out with loss of power (if probe is in water)
- No blow down required
- No moving parts
- Maximum ambient temperature 120°F (49°C)
- Voltage across probe to ground 14 VAC
- Probe sensitivity 3,000 ohms at 120 or 24 VAC supply
- Power consumption 3 VA
- Maximum water temperature 250°F (121°C)
- Maximum steam pressure 15 psi (1 kg/cm²)

Ordering Information

Model	Part		
Number	Number	Description	
450P	153876	120V w/ext. barrel	
550P	153603	w/ manual reset	

Water Feeders — Electric Uni-Match® Electric Water Feeders Series VXT

- For low pressure steam boilers (1,000,000 BTU/hr. max.)
- Three position slide switch allows the timing cycle to be matched to that of the major low water cut-off manufacturers



- Field adaptable feed rate 1, 2, or 4 gpm (3.8, 7.6, or 15.1 lpm)
- Field selectable delay compensates for slow condensate return rates and prevents flooding
- Electronic operation provides consistent, accurate cycle to-cycle repeatability
- Universal design simplifies selection and reduces stock
- Can be used with mechanical or electronic low water cut-off controls
- · Manual feed button
- Includes 3/8" x 1/2" (9.5 x 12.7mm) sweat adapters for quick installation with 1/2" (13mm) copper tubing
- Easy to clean strainer
- Maximum water pressure 150 psi (10.5 kg/cm²)
- Maximum boiler pressure 15 psi (1 kg/cm²)
- Maximum water temperature 175°F (79°C)
- Maximum ambient temperature 100°F (38°C)
- Maximum power consumption (during water feed only)
- -15 watts at 24 VAC
- -20 watts at 120 VAC

Ordering Information

Model Number	Part Number	Description
VXT24	45-026	Electric Water Feeder, 24V
VXT120	45-122	Electric Water Feeder, 120V

Boiler Water Feeders and Feeder Cut-Off Combinations

McDONNELL & MILLER Boiler Water Feeders and Feeder Cut-off Combinations are used to provide automatic operation, and to safeguard steam and hot water boilers against the hazards of a low water condition.

A feeder cut-off combination mechanically adds water as needed to maintain the required minimum water level and electrically stops the firing device in case of an emergency. McDONNELL & MILLER Feeder Cut-off Combinations include time-proven features such as—

- Packless Construction
- Cool Feed Valve

- Straight Thrust Valve Action
- · Stainless Steel Valve and Seat

NOTE: All McDONNELL & MILLER products must be installed by qualified personnel in accordance with all applicable codes.

NOTE: Maintenance and periodic testing procedures packaged with each product must be followed.

HOW TO SELECT

FOR STEAM BOILERS

Steam Heating Boilers are classified as boilers in closed heating systems where all condensate is returned to boiler. Best recommendation for all automatically fired boilers is a feeder cut-off combination. It adds water as needed to maintain a safe operating level, and stands by to interrupt circuit to burner if water level drops into emergency zone.

Steam Process Boilers are classified as boilers in systems where not all the condensate is returned, and some make-up water is needed. A separate feeder and separate cut-off are recommended, so operating levels can be set for the wider differential required in such service.

How to Select. Selection of the correct feeder cut-off combination, or feeder, depends upon:

- 1. Maximum boiler pressure.
- Differential between water supply pressure and the pressure setting of the steam pop safety valve.
- 3. Boiler size. (See chart below.)

Helpful Conversion Formulas Based on Sq. Ft. of Steam

 $\begin{array}{ll} \mbox{Boiler Horsepower} = & \mbox{\underline{Sq. Ft. of Steam}} \\ \mbox{138} \\ \mbox{Lbs. of Water Per Hour} = & \mbox{Sq. Ft. of Steam} \\ \end{array}$

4

Gallons per Minute = $\frac{\text{Sq. Ft. of Steam}}{2000}$

Btu. per Hour = Sq. Ft. of Steam x 250

	Boiler Size-Mfr. Gross Rating Sq. Ft. of EDR				McDONNELL & MILLER Products to Use						
Differential	Differential	Differential	Differential	Differential	Differential	Differential	Maximum	Heating	Boilers	Process	Boilers
Pressure* 10 psi	Pressure* 20 psi	Pressure* 30 psi	Pressure* 40 psi	Pressure* 50 psi	Pressure* 60 psi	Pressure* 70 psi	Boiler Pressure	Automatic Fired Jobs	Hand Fired Jobs	Boiler Water Feeder	Low Water Cut-off
·	All Boilers up to 5000 sq. ft.		,	· ·	25 psi	No. 47-2	No. 47				
	Alt Boilers up to 5000 sq. ft.				30 psi	No. 247-2	No. 247	No. 247	No. 63		
8,600	12,000	15,000	17,600	20,000	21,800	23,400	35 psi	No. 51-2	No. 51	No. 51	No. 63
10.500	17,500	22,400	26.500	30,000	32,600	35,000	35 psi	No. 51-S-2	No. 51-S	No. 51-S	No. 63
8,600	11,600	14,600	17,000	18,800	20,600	22,100	75 psi	No. 53-2	No. 53	No. 53	No. 150

^{*}Differential pressure should be based on water supply pressure at boiler, minus pressure setting of steam pop safety valve.

FOR HOT WATER SPACE HEATING BOILERS

Best recommendation for all automatically-fired boilers is a feeder cut-off combination. It adds water if needed to match the discharge capacity of the relief valve, and stands by to interrupt circuit to burner if water level drops into emergency zone.

How to Select. Selection of the correct feeder cut-off combination, or feeder, depends upon:

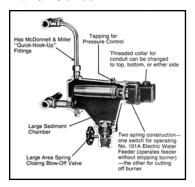
- 1. Maximum boiler pressure.
- 2. Differential between water supply pressure and the pressure setting of the safety relief valve.
- 3. Boiler size.

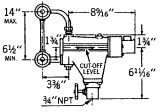
Boiler Size Btu/hr. Output Capacity					McDONNELL & MILLER Products to Use			
Differential	Differential	Differential	Differential	Differential	Maximum	Automatically	Hand	
Pressure*	Pressure*	Pressure*	Pressure*	Pressure*	Boiler	Fired	Fired	
10 psi	20 psi	30 psi	40 psi	50 psi	Pressure	Jobs	Jobs	
1,000,000	1,400,000	1,800,000	2,100,000	2,350,000	30 psi	No. 247-2	No. 247	
2,000,000	3,000,000	3,750,000	4,400,000	5,000,000	35 psi	No. 51-2	No. 51	
2,800,000	4;300,000	5,600,000	6,700,000	7,500,000	35 psi	No. 51-S-2	No. 51-S	
2,100,000	2,800.000	3,300,000	4,200,000	4,750,000	75 psi	No. 53-2	No. 53	

For larger size boilers, the McDONNELL & MILLER No.93 and a motorized valve of adequate size may be used instead of a feeder cut-off combination.

Low Water Cut-offs for Low Pressure Steam Boilers

No. 67 Series









This is the most widely used control of its kind. It interrupts electrical service to the burner when the water level falls below the prescribed cut-off level.

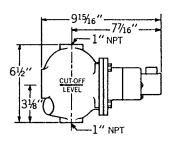
The time-saving "Quick Hook-up" fittings permit installation in the boiler gauge glass tappings, a feature which positions the control properly and provides correct reproduction of the boiler water level in the float chamber and gauge glass. Other features include deep sediment chamber, large area self-closing blow-off valve, adjustable conduit outlet, and 1/4" NPT pressure control tapping.

The twin switch construction provides an extra switch which closes on small drop in water level without stopping burner, and which can be used to operate low water alarm or to control the McDonnell No. 101A

For boilers of any size. Maximum steam pressure, 20 psi.







For installation on boilers where "Quick — Hook-up" fittings cannot — be used. Installed with — 1" steam and water equalizing lines, and requires a separate blow-off valve.

For boilers of any size. Maximum steam pressure, 20 psi.

AMPERE RATING

Motor Duty 120 VAC 240

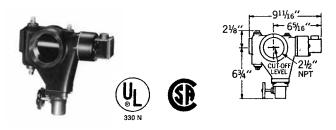
Motor Duty	120 VAC	240 VAC
Full Load	7.4	3.7
Locked Rotor	44.4	22.2

Pilot Duty: 120-240 VAC. 125 VA

NO. 61 REPLACEMENT PARTS

HEAD MECHANISM
SWITCH
SWITCH MILLIVOLT
HEAD GASKET
SYPHON GASKET
FLOAT & BELLOWS

No. 767



Self-contained cut-oft for side, close nipple, connection to 2-1/2" NPT boiler tapping. Has extra deep sediment chamber, integral self-closing blow-off valve, and 1/4" NPT pressure control tapping.

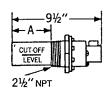
For boilers of any size.

Maximum steam pressure, 20 psi.

"Built-in" Low Water Cut-offs 69 Series







For installation in 2-1/2" NPT tappings provided by some boiler manufacturers. Selection of the particular model depends upon the insertion length into the boiler. Order the "Built-in" that provides maximum insertion length within the boiler.

Prod	uct Number	69	169	269	369	469*
	tion Length ension "A")	4-1/8"	3-1/8"	2-1/4"	1-3/4"	1-3/16"

^{*}No.569 same as 469 but includes 1/4" pressure control tapping.

NOS. 67 & 767 REPLACEMENT PARTS

1103.07 8	101 HEPLACEINENT PARTS
6667	COMPLETE MECHANISM
11X	SWITCH
11MV	SWITCH MILLIVOLT
14B	BLOW OFF VALVE
16	BLOW OFF VALVE, ALT.
37-39	BLOW OFF VLV. GSKT.
67-12	FLOAT GASKET
SA67-2	FLOAT & BELLOWS

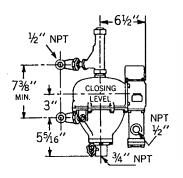
NO. 69 REPLACEMENT PARTS

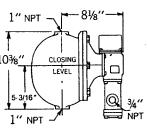
6667	REPL HEAD '
11X	SWITCH
11MV	SWITCH, MILLI
SA67-2	FLOAT & BELLOWS

Boiler Water Feeders and Feeder Cut-Off Combinations

No. 47-2 and No. 47









Most widely used feeder cut-off combination for the closed steam heating system boiler up to 5000 sq. ft. capacity. Has time-saving Quick Hook-up Fittings for installation in gauge glass tappings, and Self-Closing Blow-off Valve. No.47 is boiler feeder only, without cut-off switch.

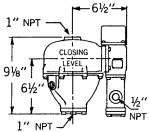
Maximum boiler pressure, 25 psi. Maximum water supply pressure, 150 psi.

No. 247-2 and No. 247









For steam heating and process boilers up to 5000 sq. ft. and small hot water boilers. Similar to No. 47-2 but without Quick Hook-up Fittings or Self-Closing Blow-off Valve. No. 247 is boiler feeder only, without cut-off switch.

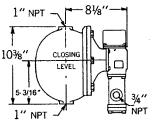
Maximum boiler pressure, 30 psi. Maximum water supply pressure, 150 psi.

SERIES 47/51 REPLACEMENT PARTS

MODEL #	DESCRIPTION	SERIES
2	SWITCH ASSY.	47/51
211	SWITCH WI MAN. RESET	47/51
CO-106	CAM	47/51
14B	BLOW OFF VLV. ASSY.	47
37-26	BODY GASKET	47
37-39	BLOW OFF VLV. GSKT.	47
59-18	PACKING WASHER	47
59-27	LEAD PACKING RING	47
A259	QUICK HOOKUP FITTINGS	47
SA37-30	FLOAT	47
SA47-4	BELLOWS ASSY.	47
SA47-101-102	VALVE W/ STRAINER ASSY.	47
SA51-101-102	VALVE W/ STRAINER ASSY.	51
SA101-38	STRAINER BSKT. ASSY.	47/51
51-2HD	HEAD MECH. W/ SWITCH	51
51HD	HEAD MECH. W/ SWITCH	51
SA51-4	SYPHON ASSY.	51
F-26	HEAD GASKET	51/518
37-27	VALVE GASKET ASSY.	51

^{*}Call for Additional Parts

No. 51-2 and No. 51



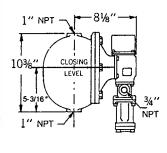


Has larger feeding capacity than the No. 47-2, for steam boilers above 5000 sq. ft. capacity, and for hot water boilers. No.51 is a boiler feeder only, without cut-off switch.

Maximum boiler pressure, 35 psi. Maximum water supply pressure, 150 psi.

No. 51-S





Largest feeding capacity of all McDonnell Feeder Cut-off Combinations, for low pressure service. Used on steam and hot water boilers. No. 51-S is boiler feeder only, without cut-oft switch.

Maximum boiler pressure, 35 psi. Maximum water supply pressure, 100 psi.

No. 2 and No. 2M **Cut-off and Alarm Switch (Model 2)**

Used to add electrical low water cut-off to mechanical water feeder. Supplied as a part of the feeder cut-off combinations above (Nos. 47-2, 247-2, 51-2, 51-S-2 and 53-2) or can be purchased separately and added to boiler feeders. Has high voltage terminals for low water cut-off and for low water alarm. Order No. 2 for automatic reset, No. 2M for manual reset.





ELECTRICAL RATINGS (Underwriters Listed) AMPERE RATING

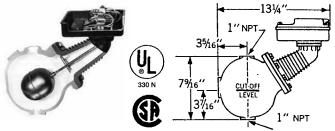
Motor Duty	120 VAC	240 VAC
Full Load	10.2	5.1
Locked Rotor	61.2	30.6

Pilot Duty: 120-240 VAC. 60 Hertz 125 VA pr 115 VDC, 0.5 Amps



Pump Controllers and Low Water Cut-offs

No. 150 and 150-M



The most widely used control of its kind. Packless construction utilizes Monel bellows. Has mercury tube type switches. Can also be used as a cut-off and alarm on many higher pressure hot water space heating boilers. Available with manual reset on cut-off switch; order No. 150-M.

For boilers of any size.

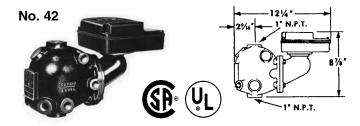
Maximum boiler pressure, 150 psi.

MODEL #	DESCRIPTION
150	LOW WATER CUT OFF
150M	W/ MAN. RESET

*150-MD (Max. Differential) ALSO AVAILABLE

REPLACEMENT PARTS

PART #	DESCRIPTION	SERIES
150-HD	HEAD MECHANISM	150
150-HD-MD	HEAD MECHANISM	150M
SA150-11	FLOAT & ROD	BOTH
150-14	HEAD GASKET	BOTH
SA150-124	3 WIRE CUT OFF AND ALARM	BOTH
SA150-125	2 WIRE PUMP SWITCH	BOTH



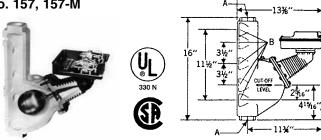
This is a float operated controller, with two mercury switches operating at different levels, to control the boiler feed pump according to the boiler water level itself, and cut off electrical current to the burner in event of any emergency low water condition. Switches are single pole, single throw mercury type. Construction is completely packless. Installed with 1" NPT equalized pipes. Electrical ratings same as for No. 150.

For boilers of any size. Maximum boiler pressure, 50 psi.

REPLACEMENT PARTS

PART #	DESCRIPTION	SERIES
42HD	HEAD ASSEMBLY	вотн
SA150-125	2 WIRE BURNER SWITCH	BOTH
CO-12	GASKET	вотн

No. 157, 157-M



No. 157 is basically the same as the No. 150, but has integral water column type of float chamber that simplifies installation and includes all necessary tappings for gauge glass and tricocks.

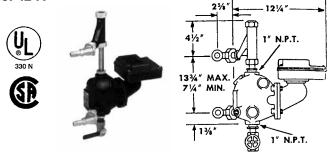
MODEL #	DESCRIPTION
157	LOW WATER CUT OFF
157M	W/ MAN. RESET

*157-MD (Max. Differential) ALSO AVAILABLE

REPLACEMENT PARTS

PART #	DESCRIPTION	SERIES
150HD	HEAD MECHANISM	157
150MHD	HEAD MECHANISM	157M
SA150-11	FLOAT & ROD	вотн
150-14	HEAD GASKET	вотн
SA150-124	3 WIRE CUT OFF AND ALARM	вотн
SA150-125	2 WIRE PUMP SWITCH	вотн

No. 42-A



Same construction and operation as No. 42 at left, but fitted with "Quick Hook-up" fittings for installation right in gauge glass tappings. Electrical ratings same as No. 150.

For boilers of any size. Maximum boiler pressure, 50 psi.

ELECTRICAL RATINGS

(Underwriters Listed)

For 150 Series, 157 Serles, and 42 Serles Ampere Rating for Pump and Cut-off Circuits

Motor Duty	120 VAC	240 VAC	120VDC	240VDC
Full Load	7.4	3.7	2.4	1.2
Locked Rotor	44.4	22.2	24.0	12.0

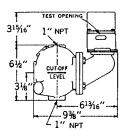
Pilot Duty Service: 345VA, 120 and 240 VAC

Low Water Cut-offs for Hot Water Boilers









This is the control that pioneered the use of low-water cut-offs on hot water boilers. Heavy duty construction throughout. Uses the No. 2 Switch shown on page 3. Installed with 1" NPT equalizing pipes.

The No. 63 offers two operating advantages not available in other McDonnell float-operated low pressure cut-offs:

- 1. A test opening is provided directly below the switch housing, so that a screwdriver may be inserted to manipulate the float to a lower position. This provides a check on the switch operation.
- 2. The No. 63 is available with a "manual reset" type switch. If desired, specify No. 63M.

The No. 63 can also be used on steam boilers.

ELECTRICAL RATINGS (Underwriters Listed)

AMPERE RATING 115 VDC, 0.5 Amps

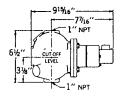
Motor Duty	120 VAC	240 VAC
Full Load	10.2	5.1
Locked Rotor	61.2	30.6

Pilot Duty: 120-240 VAC. 60 Hertz 125 VA

For boilers of any size. Maximum boiler pressure, 50 psi.

No. 64





These controls are compact in size and built for the pressures encountered in hot water service. They utilize the McDonnell No. 11 Switch, which provides an extra switch, operating at a different level, for low water alarm. Both controls can be used for steam service, and differ only in method of Installation. No. 64 requires 1" NPT equalizing pipes; No. 64-A has "Quick Hook-Up" fittings to permit installation right in the gauge glass tappings of low and medium pressure steam boilers.

Electrical ratings are shown below.

For boilers of any size. Maximum boiler pressure, 50 psi. **ELECTRICAL RATINGS** (Underwriters Listed)

AMPERE RATING

		•
Motor Duty	120 VAC	240 VAC
Full Load	7.4	3.7
Locked Rotor	44.4	22.2

Pilot Duty: 120-240 VAC, 125 VA

NO. 63 LOW WATER CUT-OFF

PART #	DESCRIPTION
63	LOW WATER CUT OFF

REPLACEMENT PARTS

2	SWITCH W/ COVER
2M	SWITCH W/ MAN.RESET
63HD	REPL. HEAD ASSY.
CO-12	HEAD GASKET

NO. 64 LOW WATER CUT-OFF

PART #	DESCRIPTION
64	LOW WATER CUT OFF

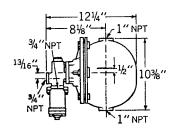
REPLACEMENT PARTS

64HD	HEAD ASSY.
11	SWITCH
11MV	SWITCH MILLIVOLT
CO-12	HEAD GASKET
67-12	SYPHON GASKET

Make-up Water Feeders

No. 25A





A dependable float-operated feeder used to add make-up water to condensate receiving tanks. It is mounted to the tank with 1" NPT top and bottom equalizing lines and feeds water through a separate pipe, permitting anti-syphon air gap. Has large capacity, with composition valve disc and Monel seat.

Maximum body pressure, 35 psi.

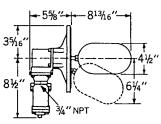
Maximum water supply pressure, 100 psi.

NO. 25A REPLACEMENT PARTS

MODEL #	DESCRIPTION
25AHD	HEAD
SA25-A-6	VALVE ASSEMBLY

No. 21





For supplying make-up water to condensate receivers. Flange mounts on side of receiver with six bolts—saves space and simplifies piping. Make-up water is fed through an integral strainer, through valve, and directly into tank. Flange bolt circles: No. 21—5-3/4"

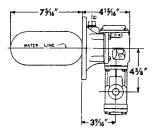
Maximum receiver pressure, 35 psi. Maximum water supply pressure, 150 psi.

NO. 21 REPLACEMENT PARTS

MODEL #	DESCRIPTION
51-14	VALVE SEAT
847-26	GASKET

No. 847





These make-up water feeders mount directly on the receiver, need no equalizing connections. They feed water through a separate line, permitting anti-syphon air gap in discharge into receiver. Operating mechanisms and capacities same as standard No. 47, 51 and 51-S feeders. Features include completely packless construction; isolated cool feed valve; straight-thrust valve action; and large built-in strainer. Mounting flanges have six 7/16" bolt holes, on 5-3/4" diameter circle.

Product Number	No. 847
Maximum Receiver Pressure	25 psi
Maximum Supply Pressure	150 psi
Feed Water Tappings, NPT	1/2"

53/A" ABOUT O

NO. 847 REPLACEMENT PARTS

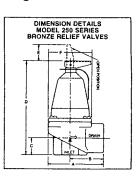
MODEL #	DESCRIPTION
847-26	HEAD GASKET
37-27	VALVE BRKT GSKT.
37-29	STRAINER GASKET
SA47-101-102	STRAINER BASKET ASSY

Pressure Relief Valves

250 Series Bronze Relief Valves

• 3/4" Inlet and Discharge Models





CONSTRUCTION (WETTED PARTS)

Body and Seat: Bronze

Seat Retainer: Bronze Diaphragm and Seat Disc: EPT Rubber.

Maximum working Pressure: 125 psi, 30 psi setting.

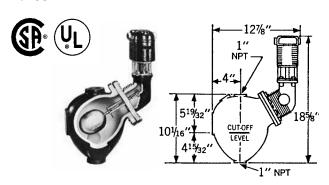
Maximum working Temperature: 250° F.

DIMENSIONS

	Dimensions Inches						Approx.	
Model	Inlet							Shipping
(All in	&	Α	В	С	D	Е	F	weight
Series)	Outlet							(LBS)
250	3/4	2-9/16	1-1/2	3/4	4-9/16	1-1/32	2-3/32	1.2

Pump Controllers and Low Water Cut-offs

No. 93

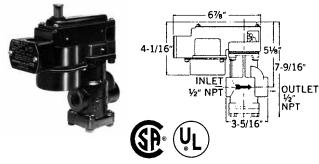


Utilizes the principle of repulsion magnetic operation for positive opening and closing. Permits wider adjustment of operating levels between pump switch and cut-off switch. No.93 is for boilers with separate water columns.

For boilers of any size. Maximum boiler pressure, 150 psi.

Water Feeders, Mechanical

Electric Water Feeders No. 101A



The No. 101A Electric

Water Feeder has the same packless construction, straight-thrust valve action and built-in strainer perfected in other McDonnell Feeders. It closes tight against supply pressures up to 150 psi.

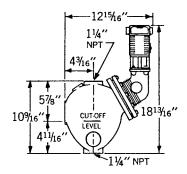
For Oil Boilers —The standard No. 101A Electric Water Feeder is furnished with 120VAC coil.

For Gas Bollers —The No. 101A is also available with low voltage coil and companion transformer for use on gas fired boilers having 24 volt control circuits. Order No. 101A-24 V (includes transformer).

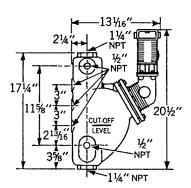
Maximum boiler size, 5000 sq. ft. steam. Maximum water pressure, 750 psi. Maximum boiler pressure, 25 psi. No. 94 and 194











Magnetic switching controls for high pressure boilers, up to 250 psi. Permit wide adjustment of operating levels. No. 94 is for boilers with separate water columns. No. 194 has water column type body with integral tappings for gauge glass and tricocks. For manual reset of cut-off switch order No. 94-M and No. 194-M.

For boilers of any size.

Maximum boiler pressure, 250 psi.

REPLACEMENT PARTS NOS. 93, 94, 194

PART #	DESCRIPTION	SERIES
51	SWITCH ASSEMBLY	ALL
92-68	HEAD GASKET	94/194
150-14	HEAD GASKET	93

ELECTRIC WATER FEEDER/PARTS

MODEL #	DESCRIPTION
101A-120V	FEEDER-120 volt
101A-24V	FEEDER-24 volt
346650	COIL 120v
347010	COIL 24v
SA101-38	STRAINER
SA101-102	VALVE/STRAINER



EXTROL TANKS

	TANK	ACCEPT			
MODEL	VOLUME	VOLUME	DIAMETER	LENGTH	SHIPPING
NO.	(Gallons)	(Gallons)	(Inches)	(Inches)	WT. (Lbs.)
15	2	.9	8	12-5/8	5
30X	4.4	2.4	11	15-1/2	9
60X	7.6	2.4	11	23	14
90X	14	11.3	15-3/8	21	23

Larger Closed Heating Systems

MODEL NO.	TANK VOLUME (Gallons)		"A" DIM. (Height) Inches	"B" DIM. (Dia.) Inches	SYSTEM CONN. (NPT)	SHIPPING WEIGHT (Lbs.)
SX-30V	14	11.5	23-13/16	15	1"	24
SX-40V	20	11.5	31-9/16	15	1"	32
SX-60V	32	11.5	46-7/16	15	1"	42
SX-90V	44	34	36	22	1-1/4"	69
SX110-V	62	34	46-3/4	22	1-1/4"	92

SPECIFICATIONS-ALL MODELS

- Maximum Working Pressure.....100 PSI
- (unless otherwise specified)

FILL-TROL® Tank

A specially adapted EXTROL with an automatic pressure reducing valve.

	TANK	ACCEPT			
MODEL	VOLUME	VOLUME	DIAMETER	LENGTH	SHIPPING
NO.	(Gallons)	(Gallons)	(Inches)	(Inches)	WT. (Lbs.)
109	2	.9	8	14-3/4	6
110	4.4	2.4	11	17-3/8	10
111	7.6	2.4	11	24-5/8	15
112	14	11.3	15	23	24

• Standard EXTROL cannot be used with FILL-TROL.



Compression Tanks

PART #	DIMENSION
G818008	9" x 32"
G818015	12" x 30"
G818018	12" x 36"
G818024	12" x 48"
G818030	12" x 60"
G818040	14" x 60"
G818182	20" x 60"
G818220	24" x 60"



Model	Tank Dia.	Connecti	on (NPT)	Approx. Shpg.
No.	Inches	Tank	Boiler	Wt. (Lbs)
ATF-9	9			2-1/4
ATF-12	12 - 14			2-1/2
ATF-16	16 - 18	1/2" M	3/4" M	
ATF-20	20 - 22			2-3/4
ATF-24	24			
ATFL	>100 gal	1" F	1" F	14





EXTROL SIZING TABLE FILL PRESSURE 12 PSI RELIEF PRESSURE 30 PSI AVERAGE SYSTEM TEMPERATURE 200°F.

	TYPE OF RADIATION						
BOILER NET OUTPUT IN 1000's OF BTU HR.	FINNED TUBE BASEBOARD OR RADIANT PANEL	CONVECTORS OR UNIT HEATERS	RADIATORS CAST IRON	BASEBOARD CAST IRON			
25	15	15	15	15			
50	15	15	30	30			
75	30	30	30	60			
100	30	30	60	60			
125	30	60	60	90			
150	30	60	90	90			
175	60	60	SX-30	SX-30			
200	60	60	SX-30	SX-30			
250	60	90	Sx-30	SX-40			
300	90	SX-30	SX-30	SX-40			
350	SX-30	SX-30	SX-40	SX-60			
400	SX-30	SX-40	SX-40	SX-60			

EXTROL CAPACITY AT VARIOUS SYSTEM OPERATING TEMPERATURES RELIEF PRESSURE 30 PSI FILL TEMPERATURE 40-70°F AND FILL PRESSURE 12 PSI

	SYSTEM CONTENT IN GALLONS							
AVERAGE SYSTEM TEMP. ºF	EXTROL MODEL 15	EXTROL MODEL 30	EXTROL MODEL 60	EXTROL MODEL 90				
100	140	308	417	980				
110	104	230	311	731				
120	80	177	240	564				
130	65	143	193	454				
140	53	118	160	376				
150	45	99	134	315				
160	38	84	114	269				
170	33	73	99	233				
180	29	64	87	204				
190	25	56	76	180				
200	22	50	68	160				
210	20	45	61	144				
220	18	40	55	130				
230	16	37	50	118				
240	15	34	46	108				

MAXIMUM WORKING PRESSURE 100 PSI — OPERATING TEMP. 40°-240°
#15 EXTROL = 109 FILL-TROL #60 EXTROL = 111 FILL-TROL
#30 EXTROL = 110 FILL.TROL #90 EXTROL = 112 FILL-TROL



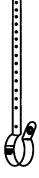
ACCESSORIES



Flexible Connector

Natick Strap Hanger

Model	Pipe	Hanger
No.	Size	Length
603-1/2 x 6	1/2"	6"
603-3/4 x 6	3/4"	6"
603-1 x 6	1"	6"
603-1-1/4 x 6	1-1/4"	6"



PART	SIZE	PRESSURE	DESCRIPTION
335-1	1/2"	55 PSI	7" COPPER
335-2	3/4"	40 PSI	THREADED
347-1	1/2"	55 PSI	7" COPPER
347-2	3/4"	40 PSI	SWEAT

Air Vents



Model	Туре	Maximum	Maximum	Slze
		Pressure	Temperature	
700-C	Float	45 psi	240ºF	1/8" MPS (NPTM)
701-C	Float	100 psi	240ºF	1/4" MPS (NPTM)
702	Float	45 psi	240ºF	1/4" MPS (NPTM)
703	Float	100 psi	240ºF	1/4" MPS (NPTM)
706	Float	150 psi	240ºF	3/4" MPS (NPTM)



Inso-line Strap Hanger

Model	Pipe	Hanger
No.	Size	Length
602-1/2 x 6	1/2"	6"
602-3/4 x 6	3/4"	6"
602-1 x 6	1"	6"
602-1-1/4 x 6	1-1/4"	6"



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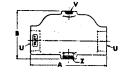
Angle Types

Model		Dimensions			Dimensions Typical Tappings - NPT							
No.	Size	Α	В	С	S	Т	Ū	V	W	Χ	Υ	Z
438-2	1"	7-3/8"	6-5/8"	3-1/4"	1-1/4"	1"	1"	1/8"	3/4"	3/4"	1/2"	1/2"
439-1	1-1/4"	7-3/8"	6-5/8"	3-1/4"	1-1/2"	1-1/4"	1-1/4"	1/8"	3/4"	3/4"	1/2"	1/2"

Other tapping combinations available.

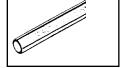
Air Purgers

Model No.	Size	Di	mensions		Tappings - NPT			
	0.20	Α	В	С	U	٧	Z	
443X	1"	6"	4"	2-1/2"	1"	1/8"	1/2"	
444-1	1-1/4"	6"	4"	2-1/2"	1-1/4"	1/8"	1/2"	
445X	1-1/2"	8"	5"	3-1/2"	1-1/2"	1/8"	1/2"	
446	2"	8"	5"	3-1/2"	2"	1/2"	1/2"	
447	2-1/2"	10"	6"	5"	2-1/2"	3/4"	1/2"	
448	3"	10"	6"	5"	3"	3/4"	1/2"	





SQUEEZE AND SNAP GAUGE GLASS CUTTER CUTS UP TO 3/4" GAUGE GLASS



PART # T100-370 Washers 5/8": 40593 Washers 3/4: D-1606-00

Nuts 1/2": C-1408-06



STANDARD GAUGE GLASS

		MAXIMUM RECOMMENDED WORKING PRESSURE, PSI			
PART #	LENGTH	TEMP. TO 150°F NO CORROSION	STEAM BOILER SERV. UP TO 425°F		
5812	12"	200 PSI	100 PSI		
5818	18"	190	100		
5824	24"	175	100		
5836	36"	165	100		
3412	12"	200 PSI	100 PSI		
3418	18"	190	100		
3424	24"	185	100		
3436	36"	165	100		

RED-LINED GAUGE GLASS

		MAXIMUM RECOMMENDED WORKING PRESSURE, PSI		
PART #	LENGTH	TEMP. TO 150°F NO CORROSION	STEAM BOILER SERV. UP TO 425°F	
5812RL	12"	335 PSI	295 PSI	
5818RL	18"	305	280	
5824RL	24"	265	270	
5836RL	36"	205	260	
3412RL	12"	330 PSI	280 PSI	
3418RL	18"	300	265	
3424RL	24"	260	255	
3436RL	36"	240	245	

Notes





GAS-FIRED UNIT HEATERS POWER VENTED & SEPARATED COMBUSTION



Hot Dawg® Model HD power-exhausted, gas-fired unit heater.

- · Hush-puppy quiet operation.
- · Uses natural or propane gas.
- Certified for residential, commercial and industrial use.
- Low-profile design and neutral color to blend in with decor.
- Lightweight, easily installs 1" from ceiling with only 2 angle brackets (included).
- Install quickly and easily with field wiring connections and knockouts for quick access to gas and electricity.
- Standard power exhaust simplifies side-wall or roof venting with small-diameter vent pipe.
- Versatile design allows for right or left hand controls and installation. Gas, electrical and flue connections can be changed from one side to the other by simply flipping the Hot Dawg over.
- Permanently-lubricated motor for trouble-free dependability.
- Full 10-year warranty on heat exchanger.



Hot Dawg® Model HDS separated-combustion, gas-fired unit heater.

The separated combustion Hot Dawg draws its combustion air from outside to ensure that the unit will always have plenty of fresh, clean air to breath. This fresh-air supply reduces common concerns about dusty, dirty or humid applications. In addition, by drawing the combustion air from the outside, the overall heating efficiency is increased.In short, the Hot Dawg separated combustion unit gives you the added advantages of:

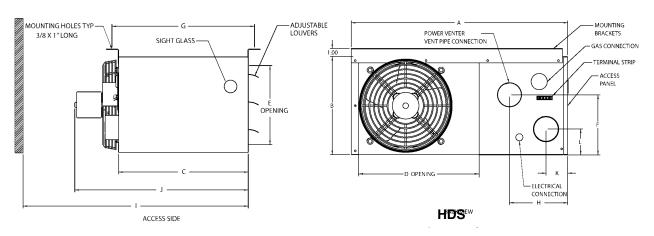
- Less maintenance in dusty environments,
- Improved efficiency by using outside air for combustion,
- Greater durability in "hostile" environments (environments possessing substances that may deteriorate the performance of the unit),
- External thermostat and gas connections.

Unit	Btu/Hr Input	Typical Application
HD/HDS 30	30,000	1 to 1-1/2 Car Garage
HD/HDS 45	45,000	2 to 2-1/2 Car Garage
HD/HDS 60	60,000	3 to 3-1/2 Car Garage
HD/HDS 75, 100, 125	75,000 - 125,000	Large Garage

GAS-FIRED UNIT HEATERS POWER VENTED & SEPARATED COMBUSTION

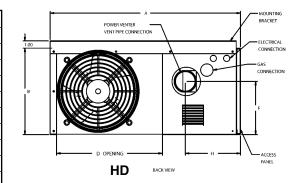






PERFORMANCE

Mod	dels	30	45	60	75	100	125
Btu/H	r Input	30,000	45,000	60,000	75,000	100,00	125,00
Btu/Hr	Output	24,000	36,000	48,000	60,000	80,000	100,00
Entering Ai	rflow (CFM)	505	720	990	1,160	1,490	1,980
Outlet '	Velocity	523	749	653	769	565	747
Air Temp	. Rise (°F)	44	46	45	48	50	47
Mounting He	eight (Max ft.)	10	10	12	14	12	16
Heat Th	row (ft.)	25	27	36	38	42	56
	Horsepower	1/25	1/15	1/12	1/12	1/12	1/8
Motor	RPM	1,550	1,550	1,625	1,625	1,050	1,550
Data	Type	S.P.	S.P.	P.S.C.	P.S.C.	S.P.	P.S.C.
	Amps		2.4	1.2	1.2	2.7	2.2
Unit Total Am	ıps	2.8	3.7	2.5	2.5	4.7	4.2
Vent Connect	tor Size (in.)	3	3	3/4	3/4	4	4





CLEARANCES

Unit Side Materials	Clearance To Combustible Clearance	Recommended
Top and Bottom	1"	1"
Access Side	18"	18"
Non-Access Side	1"	1"
Rear	18"	18"
Vent Connector	4"	4"

MOUNTING

	1" - a on 16	•		_		cets are slo	tted to ac	comi	moda	te joi:	sts
l	0°	0	0	0	0		0	0	0	0	°°
	0.00	3.10	5.10	7.10	9.10		17.10—	19.10	21.10	23.10-	25.10

DIMENSIONS (inches)

Models	30	45	60	75	100/125
Α	26.8	26.8	26.8	26.8	35.5
В	12.2	12.2	18.0	18.0	20.5
С	16.5	16.5	16.5	16.5	22.0
D	14.9	14.9	14.9	14.9	22.5
E	10.1	10.1	15.9	15.9	18.4
F	7.25	7.25	10.75	10.75	14.0
G	18.5	18.5	18.5	18.5	24.0
Н	7.6	7.6	7.835	7.835	8.4
Gas Connection	1/2	1/2	1/2	1/2	1/2
I	34.5	34.5	34.5	34.5	43.0
J	22	22	25	25	31.0
K	2.74	2.74	3.15	3.15	3.87
L	3.19	3,19	5.55	5.55	10.73
Fan Diameter	10	10	14	14	18.0
Approx. Weight (lbs.)	55	60	80	85	125





Power vented propeller unit heater (PDP)

Power Vented Unit Heater

The power vented unit heater was designed for use with a building's heating systems where negative pressure or energy savings may be an issue. Available in 12 propeller and 11 blower power vented model sizes, the unit covers a wide variety of applications. They have input ranges from 150,000 to 400,000 Btu/Hr and can operate on either natural or propane gas.

Standard Features:

- · CSA certification for use in the US and Canada
- 80% thermally efficient
- Power Exhauster Motor
- Differential pressure switch for proof of venting
- 20 gauge aluminized steel cabinet
- 115V control step down transformer with 24V gas controls
- Aluminized steel heat exchanger
- Aluminized steel burner with stainless steel separator strip
- Certified to 0.5" W.C. external static pressure
- Single stage intermitent pilot with continuos retry control system for operation on natural gas.
- High limit safety control
- Control terminal board
- Adjustable motor sheaves on blower models
- · Totally enclosed fan/blower motors

Optional Features - Factory Installed

- 409 stainless steel heat exchanger
- 409 stainless steel burner
- Single stage intermittent pilot control system for operation on propane gas
- Intermittent pilot with continuous retry control system with two-stage and mechanical modulation controls for either natural or propane gas
- Single stage standing pilot control system for either natural or propane gas
- Gas control step down transformers for 208/230V/1Ph for propeller models
- Gas control step down transformers for 208/230V/1Ph and 208/230/460/575V/3Ph for blower models
- Fan delay timer
- Fingerproof propeller fan guard

Power Vented Unit Heaters



Accessories - Field Installed

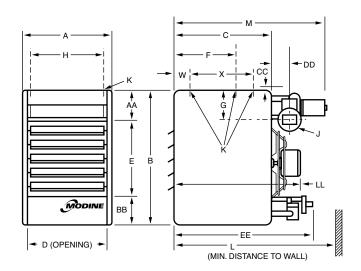
- Single-stage room thermostats
- Two stage room and duct thermostats
- Summer/winter switch
- Pipe hanger adapter kits
- 5-10 PSI gas pressure regulator
- Room thermostat guard
- Control transformers
- SPST relays
- · Energy saver kit
- Blower enclosure on blower models
- Filter rack and duct connector on blower models
- Outlet duct connector on blower models
- Belt guard on blower models
- Discharge nozzle on blower models
- Discharge transition for polytube on blower models
- Deflector hood
- Natural gas to propane gas conversion kit
- Unit step down transformers for propeller units operating on 200-208/230/460/575/3ph. supply power.

Special Applications

A 409 stainless steel heat exchanger and burner isrecommended when the combined entering/return air to the unit is below 40°F or if the unit is located in a humid environment.

Propeller Units - Model PDP





DIMENSIONS (INCHES) — PDP1

			Mode	el Number			
Dimensions	PDP 150	PDP 175	PDP 200	PDP 250	PDP 300	PDP 350	PDP 400
Α	21	23-1/2	25-5/8	25-5/8	28-5/8	33-5/8	40
В	35-1/4	35-1/4	40-1/4	40-1/4	40-1/4	40-1/4	40-1/4
С	22	22	25	25	25	25	25
D	18-9/16	21-1/16	23-3/16	23-3/16	26-3/16	31-3/16	37-1/2
E	20	20	24	24	24	24	24
F	12	12	13-1/2	13-1/2	14	_	-
G	6-9/16	6-9/16	7-1/2	7-1/2	7-1/2	7-1/2	7-1/2
Н	17-3/8	19-7/8	22	22	25	30	36-3/8
J ²	5	5	5	6	6	6	6
L ⁴	35-13/16	35-9/16	40-3/4	40-3/4	40-3/4	40-3/4	44-3/16
М	29-13/16	29-9/16	34-3/4	34-3/4	34-3/4	34-11/16	38-3/16
W	_	_	-	-	_	5	5
Х	_	_	-	-	_	16	16
AA	8	8	9	9	9	9	9
ВВ	7-1/4	7-1/4	7-1/4	7-1/4	7-1/4	7-1/4	7-1/4
СС	_	-	-	-	_	_	-
DD	2-3/4	2-3/4	3-3/8	3-3/8	3-3/8	3-3/8	6-13/16
EE	30-1/2	30-1/2	32-7/8	32-7/8	32-7/8	32-7/8	32-7/8
LL	31-1/8	31-1/8	34-7/8	34-7/8	36-1/4	35-1/2	40-1/2
Gas Connections	1/2	1/2	1/2	1/2	1/2	3/4	3/4
Fan Diameter	16	18	20	20	22	22	24
Approx. Weight	168	175	239	239	269	338	418

¹ Do not use propeller units with duct work.

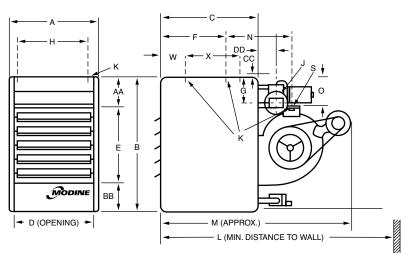
 $^{^{\}rm 2}$ For some models, this is the dimension of the vent transition outlet supplied.

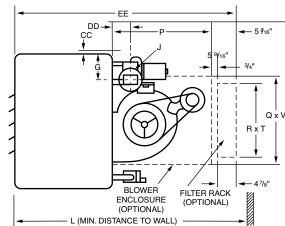
 $^{^3}$ PDP 30 through PDP 300 — 2 holes (and the level hanging adjustment feature). PDP 350 through PDP 400 — 4 holes. (Listed is the hole diameter and threads per inch to accept threaded rod).

⁴ Dimension equals overall plus 6".



Blower Units - Model BDP





DIMENSIONS (INCHES) — BDP

			М	odel Numb	er		
Dimension Symbol	BDP 150	BDP 175	BDP 200	BDP 250	BDP 300	BDP 350	BDP 400
Α	21	23-1/2	25-5/8	25-5/8	28-5/8	33-5/8	40
В	35-1/4	35-1/4	40-1/4	40-1/4	40-1/4	40-1/4	40-1/4
С	22	22	25	25	25	25	25
D	18-9/16	21-1/16	23-3/16	23-3/16	26-3/16	31-3/16	37-1/2
E	20	20	24	24	24	24	24
F	12	12	13-1/2	13-1/2	14	_	_
G	6-9/16	6-9/16	7-1/2	7-1/2	7-1/2	7-1/2	7-1/2
Н	17-3/8	19-7/8	22	22	25	30	36-3/8
J	5	5	5	6	6	6	6
K Mounting Holes	3/8-16	3/8-16	3/8-16	3/8-16	3/8-16	3/8-16	3/8-16
L w/ Blwr Encl & Filt Rk	62-5/8	62-5/8	69-5/8	69-5/8	69-5/8	69-5/8	69-5/8
L w/o Blwr Encl & Filt Rk	53-1/8	53-1/8	61	61	61	61	65
М	47-1/8	47-1/8	55	55	55	55	59
N	21-1/2	21-1/2	25-7/16	25-7/16	24-15/16	17-15/16	22
0	7-1/4	7-1/4	8-1/2	8-1/2	8-1/2	8-1/2	8-1/2
Р	30	30	34	34	34	34	34
Q Blower Encl Ht	21-3/8	21-3/8	25-1/8	25-1/8	25-1/8	25-1/8	25-1/8
R Inlet Duct Height	20	20	23-3/4	23-3/4	23-3/4	23-3/4	23-3/4
T Inlet Duct Width	27-1/2	27-1/2	32-3/4	32-3/4	32-3/4	42-7/8	42-7/8
V Blower Encl Width	29	29	34-1/4	34-1/4	34-1/4	44-3/8	44-3/8
W	_	_	_	_	_	5	5
Х	-	_	_	_	_	16	16
AA	8	8	9	9	9	9	9
ВВ	7-1/4	7-1/4	7-1/4	7-1/4	7-1/4	7-1/4	7-1/4
СС	_	_	_	_	_	_	_
DD	2-3/4	2-3/4	2-3/4	3-3/8	3-3/8	3-3/8	6-13/16
EE	56-5/8	56-5/8	63-5/8	63-5/8	63-5/8	63-5/8	63-5/8
Gas Connections	1/2	1/2	1/2	1/2	1/2	3/4	3/4
Std. Mtr. Sheave Dia.	3	3	3	3	3	3	4-1/2
Std. Blower Sheave Dia.	11	7	14	10	7	6	10
Blower Wheel Diameter	13	13	15	15	15	15	15
Approx. Weight	152	152	315	315	339	428	498
						1	

HIGH EFFICIENCY GAS-FIRED SEPARATED COMBUSTION UNIT HEATERS



Call for size & availability

Series PTS/BTS

Modine's new PTS/BTS, tubular heat exchanger, separated combustion unit is specifically designed for environments with hostile atmospheric conditions, such as chemicals, high humidity or negative pressure. Built on our successful Hot Dawg heater platform, this new line expands tubular heat exchanger coverage to units rated from 150,000 to 400,000 BTU/hr.

On these units, combustion air is brought in from outside the heated area, either from outdoor air or from an adjacent room. This eliminates the need to use contaminated indoor air for combustion.



All PTS/BTS units are packed with features to deliver maximum comfort:

- Swept wing fan on sizes from 100,000 to 200,000 BTU's/hr for superior airflow and noise reduction where it's needed most
- · In-shot burners fire each heat exchanger tube for reliable performance, ease of service and decreased noise on ignition
- Same-size vent and combustion air inlets throughout product line makes installation easier
- · Optional stainless steel heat exchanger
- Centrifugal blower models with adjustable sheaves for wide airflow range (BTS line)
- Longer allowable vent lengths (up to 50' vs 30') versus previous line, providing greater installation options

Effinity93

Modine is pleased to introduce the Effinity93 (model PTC), the most efficient gas-fired unit heater in North America.

With six models available - from 135,000 to 310,000 BTU/hr - all operating at 93% efficiency, the Effinity93 will dramatically lower energy costs through decreased gas/propane consumption. For those looking to feel even more green, each unit will reduce CO2 output by roughly 13% versus comparable sized heaters.



- •Modine's exclusive Conservicore™ technology relieves your fear of failure thanks to its ability to withstand acidic condensate
- •A design that was made with contractors in mind for faster installation and lower installation costs
- •Product line that's built off the successful PTS-model footprint; all Effinity93 box sizes are equal to a corresponding PTS model
- •The Contractor Convenience Package is standard on all units, allowing for easier connectivity and troubleshooting

Modine makes it easy to accessorize your Effinity93 to meet your specifications:

- •Complete line of accessories to handle the condensate
- •Energy Saver Kit
- •GFCI surge protection adapter plug
- •30, 60, 90 degree air deflector hoods
- •Horizontal and vertical concentric vent kits
- •Two-point mounting kit
- •Conversion kits for natural gas and propane, including high-altitude



GAS-FIRED INDOOR DUCT FURNACES



The indoor gravity vented duct furnace was designed for use with a building's heating, heating/cooling and make-up air systems. Available in 11 gravity vented model sizes, the unit covers a wide variety of applications. They have input ranges from 75,000 to 400,000 Btu/Hr and can operate on either natural or propane gas. The airflow direction can be spec?ified when ordering the unit. The duct furnace is certified for location either upstream or downstream from cooling coils and has a drain pan that allows connection to a condensate drain line.

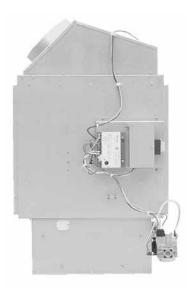
Standard Features:

- · CSA certification for use in the US and Canada
- ETL certification
- 80% thermally efficient
- · Blocked vent safety switch
- 20 gauge aluminumized steel cabinet
- 115V control step down transformer with 24V gas controls
- · Aluminized steel heat exchanger
- · Aluminized steel burner with stainless steel separator strip
- Certified to 3.0" W.C. external static pressure
- Single stage standing pilot control system for operation on natural gas
- Right side access to burner and gas controls (when looking into the discharge) with slide-out burner drawer
- · High limit safety control
- Control terminal board

Optional Features - Factory Installed

- 409 stainless steel heat exchanger and burner
- 409 stainless steel drip pan
- Single stage standing pilot control system for operation on propane gas
- Intermittent pilot with continuous retry control system with single-stage, two-stage, mechanical modulation, and electronic modulation controls for either natural or propane gas
- Building management compatible gas controls for modulation control using a 0-10 Vdc or 4-20 mA input
- Multiple furnace electronic amplifier for controlling up to 4 duct furnaces with one discharge air sensor
- Gas control step down transformers for 208/230V/1Ph and 208/230/460/575V/3Ph
- Left side access to burner and gas controls
- · Adjustable differential air flow proving system
- Fan delay timer
- High and/or low gas pressure switches
- Manual reset high limit switch
- Timed freeze protection
- · Supply air fire stat
- Control relay double pole, double throw
- Installed thermostat two-stage
- Separate line voltage and low voltage terminal strips
- · Premium control box and gas control string





Accessories - Field Installed

- · Power exhauster with vent adapter
- Electronic programmable heat/cool room thermostats—for single and two stage units
- Smoke detector
- 7-day digital and 7-day econo time clocks
- Single-stage room thermostats
- Two stage room and duct thermostats
- Electronic two stage duct thermostats
- Electronic modulating room and duct thermostats and a room override for the duct thermostat
- Summer/winter switch
- Condensate connection drain kits
- Pipe hanger adapter kits
- 5-10 PSI gas pressure regulator
- Room thermostat guards

Special Applications

A 409 stainless steel heat exchanger and burner is recommended when the unit is installed downstream of a cooling coil or evaporative cooler, and when the combined entering/return air to the unit is below 40°F.

Variable Air Movement Applications

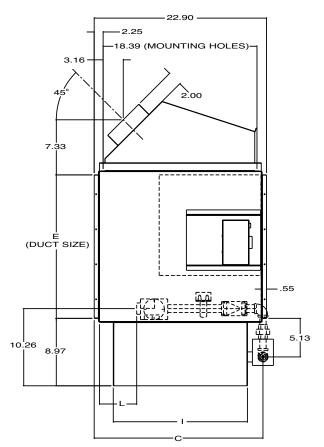
When the air mover supplied by others can provide variable air movement (i.e. 2-speed or variable frequency drive units), the certified allowable minimum CFM of the gravity vented duct furnace can be 66% of the minimum listed CFM in Table 8.2 if the unit is applied as follows:

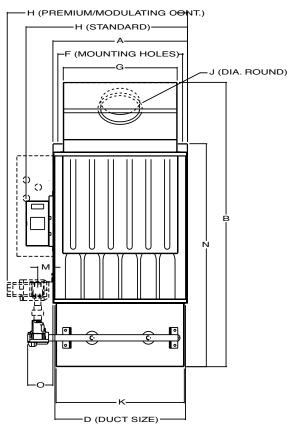
- The unit is provided with two-stage, mechanical modulation, or electronic modulation gas controls.
- 2. The unit is provided with a factory installed discharge air controller.
- 3. The system does not include a room thermostat.

The factory installed discharge air thermostat will prevent the unit from firing above the allowable 100°F rise when the unit is at or above the minimum CFM by monitoring the discharge air and going to low fire. A room thermostat cannot be used, because it is located remote from the unit, and could cause the unit to over-fire.



GAS-FIRED INDOOR DUCT FURNACES





Indoor Gravity Vented Duct Furnace Dimensions (DFG)

(All dimensions in inches)

				Model S	ize		
Dime	nsions	75	100/125	150/175	200/225	250/300	350/400
	Α	15.41	17.90	22.16	24.29	27.33	38.83
	В	37.80	37.80	37.80	41.80	41.80	41.80
	С	22.43	22.43	22.43	24.09	24.09	24.09
	D	15.21			24.09	27.13	38.63
	E	19.07	19.07	19.07	23.07	23.07	23.07
	F	14.09	4.09 16.59 20.85		22.98	26.01	37.51
	G	12.65	2.65 15.14 19.41		21.60	24.60	36.14
H (sta	andard)	18.98	21.47	25.73	28.06	31.40	42.40
H (premium/m	odulating cont.)	21.48	23.97	28.24	30.30	33.31	44.84
	I	17.83	17.83	17.83	20.68	20.68	20.68
	J	5	6	7	7	8/10	10
	K	14.55	14.55 17.04 2		23.26	26.44	37.80
L (min.	approx.)	5.0	5.0	5.0	6.6/6.1	6.1	6.1/5.8
	М	2.01	2.01	2.01	1.94	1.94	1.94
	N	29.65	29.65	29.65	33.65	33.65	33.65
O (max.	. approx.)	5.6	5.6	5.6	6.8/6.2	6.2	8.3/8.6
Gas Connection P	Pipe Size (max. std.)	1/2	1/2	1/2	1/2 / 3/4	3/4	3/4
Gas Connection Pi	pe Size (max. prem.)	3/4	3/4	3/4	3/4	3/4	3/4
Approx.	Unit Shipping	89#	113#	140#	175#	213#	284#
Weight	Unit Net	73#	95#	121#	155#	181#	251#

GAS-FIRED OUTDOOR DUCT FURNACES

MODINE APPLIED THERMAL INNOVATION*

OUTDOOR GRAVITY & POWER EXHAUSTED (HFG/HFP)

FOR HEATING, HEATING/COOLING AND MAKE-UP AIR SYSTEMS

The outdoor duct furnace was designed for use with a building's heating, heating/cooling and make-up air systems. Available in 11 gravity vented or power exhausted model sizes, the unit covers a wide variety of applications. They have input ranges from 75,000 to 400,000 Btu/Hr and can operate on either natural or propane gas. The airflow direction can be specified when ordering the unit. The duct furnace is certified for location either upstream or downstream from cooling coils and has holes to drain any condensate that may form onto the roof.

Standard Features:

- · C.S.A. certification for use in the US and Canada
- ETL certification
- All units a minimum of 80% thermally efficient
- 18 gauge aluminized steel cabinet with a baked-on polyester powder paint finish on exterior casing parts
- Single 115V control step down transformer with 24V gas control circuit
- Aluminized steel heat exchanger
- · Aluminized steel burner with stainless steel separator strip
- Certified to 3.0" W.C. external static pressure
- · Combination combustion air/exhaust vent cap
- Single stage intermittent pilot with continuous retry control system for operation on natural gas.
- · Separate line voltage and low voltage terminal strips
- Right side (when looking into the discharge) access to burner and gas controls with slide-out burner drawer
- Side or bottom gas connection access
- · High limit safety control
- · Rail type mounting base for slab installation

Optional Features - Factory Installed

- Power exhaust
- 409 stainless steel heat exchanger and burner
- 409 stainless steel drip pan
- Single stage intermittent pilot with lockout control system for operation on propane gas
- Two-stage, mechanical modulation, and electronic modulation controls for either natural or propane gas
- Building management compatible gas controls for modulation control using a 0-10 Vdc or 4-20 mA input
- Multiple furnace electronic amplifier for controlling up to 4 duct furnaces with one discharge air sensor
- Control step down transformers for 208/230V/1Ph and 208/230/460/575V/3Ph
- Left side access to burner and gas controls
- Adjustable differential air flow proving system
- Fan delay timer
- High and/or low gas pressure switches
- Manual reset high limit switch
- Timed freeze protection
- Supply air fire stat
- · Control relay double pole, double throw
- Installed thermostats two-stage and electronic modulation



Accessories - Field Installed

- Electronic programmable heat/cool room thermostats for single and two stage units
- Smoke detector
- 7-day digital and 7-day econo time clocks
- Single-stage room thermostats
- Two stage room and duct thermostats
- Electronic two stage duct thermostats
- Electronic modulating room and duct thermostats
- Room override for the duct thermostat
- 4 foot exhaust vent extension
- Summer/winter switch
- 5-10 PSI gas pressure regulator
- Room thermostat guards

Special Applications

A 409 stainless steel heat exchanger and burner is recommended when the unit is installed downstream of a cooling coil or evaporative cooler, and when the combined entering/return air to the unit is below 40°F.

Variable Air Movement Applications

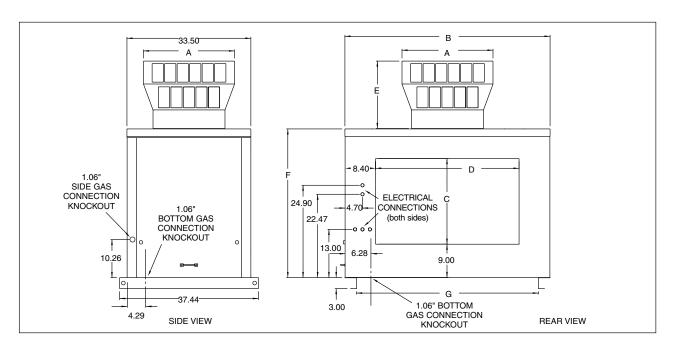
When the air mover supplied by others can provide variable air movement (i.e. 2-speed or variable frequency drive units), the certified allowable minimum CFM of the outdoor duct furnace can be 66% of the minimum listed CFM in Table 8.2 if the unit is applied as follows:

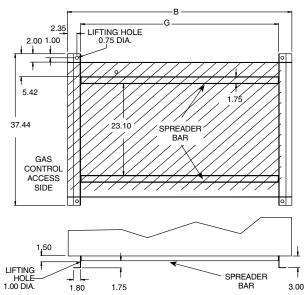
- The unit is provided with two-stage, mechanical modulation, or electronic modulation gas controls.
- 2. The unit is provided with a factory installed discharge air controller.
- 3. The system does not include a room thermostat.

The factory installed discharge air thermostat will prevent the unit from firing above the allowable 100°F rise when the unit is at or above the minimum CFM by monitoring the discharge air and going to low fire. A room thermostat cannot be used, because it is located remote from the unit, and could cause the unit to over-fire.



GAS-FIRED OUTDOOR DUCT FURNACES



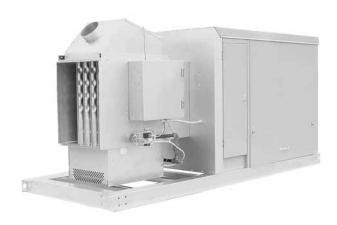


Outdoor Gravity Vented Duct Furnace Dimensions (HFG) (All dimensions in inches)

Мо	del Size	75	100/125	150/175	200/225	250/300	350/400
	Α	19.22	19.22	19.22	19.22	21.31	24.64
	В		34.46	38.72	40.84	43.86	55.38
	С		18.98	18.98	22.98	22.98	22.98
	D		17.69	21.94	24.06	27.09	38.60
	Е	14.20	14.20	14.20	14.20	15.18	18.38
	F	36.11	36.11	36.11	40.11	40.11	40.11
	G	25.50	28.00	32.25	34.38	37.40	48.92
Gas Conne	ction Pipe Size	1/2"	1/2"	1/2"	1/2"	3/4"	3/4"
Approx.	Unit Shipping	282#	305# 333# 383#		383#	428#	525#
Weight			225#	248#	288#	318#	400#
	Cap Net	16#	16#	16#	16#	26#	35#

GAS-FIRED INDOOR DUCT FURNACES FOR HEATING OR MAKE UP AIR





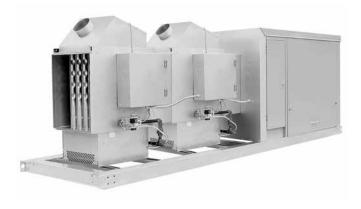
Indoor Gravity Vented Duct Furnace with Blower Section (DBG)

INDOOR GRAVITY VENTED FOR HEATING, HEATING/VENTILATING/COOLING AND MAKE-UP AIR SYSTEMS

The indoor gravity vented duct furnace with blower, and/or cooling sections was designed for use with a building's heating, heating/ventilating/cooling and make-up air systems. They have input ranges from 75,000 to 1,200,000 Btu/Hr and can operate on either natural or propane gas. The airflow ranges from 556 to 14,500 CFM and the airflow direction can be specified when ordering the unit. The unit can be provided with a cooling coil section with either a factory installed DX or chilled water cooling coil or the coil can be provided by others.

Standard Features:

- All standard duct furnace features (see page 4)
- ETL certification of the entire system unit
- 18 gauge aluminized steel blower cabinet with a baked-on polyester powder paint finish on blower and cooling cabinet exterior casing parts
- 115V step down transformer with 24V gas controls
- Aluminized steel heat exchanger and burner
- Blower performance up to 3.0" W.C. external static pressure
- Single stage standing pilot control system for operation on natural gas
- Separate line voltage and low voltage terminal strips
- Right side access to burner and gas controls (when looking into the discharge) with slide-out burner drawer
- Side gas and electrical connection access
- Fan timer and high limit safety control
- Combination suspension and slab type mounting
- Adjustable belt drive
- Premium control box



Indoor Gravity Vented Multiple Duct Furnace with Blower Section (DBG)

Optional Features - Factory Installed

- All optional duct furnace features (see page 4)
- DX or chilled water section with optional factory installed cooling coil (see page 62 for performance and CFM ranges)
- 409 stainless steel heat exchanger and burner
- Open drip proof, totally-enclosed, high efficiency, and two speed motors
- Motor starters and contactors with one normally open contact
- 1" or 2" permanent, 2" disposable, and 2" FARR® 30/30 filters
- 1" Insulation for the blower and/or cooling cabinet sections
- Double wall construction for blower, and/or cooling cabinet sections
- Dead-front disconnect switches
- Two position, modulating, building pressure sensing, three position, building management (0-10 Vdc or 4-20 mA) damper actuators
- Economizer warm-up packages
- Step-down transformers for 460/575V/3Ph
- Left side access to blower, burner, and gas controls
- Mild temperature thermostat
- · Supply and return air firestats
- Blower door interlock switch
- Convenience outlet
- Blower and motor vibration isolation
- Pillow block bearings
- Extended grease lines
- Burner/blower/damper service switches
- 6, 10, or 14 point circuit analyzer

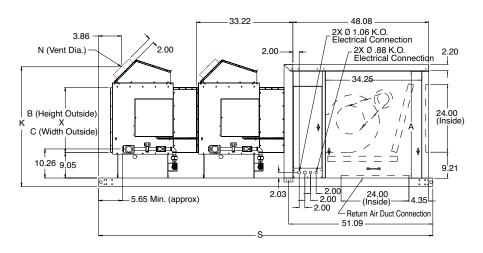
Accessories - Field Installed

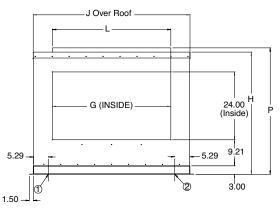
- All accessory duct furnace features
- Remote control panels
- Building pressure sensing damper controls
- Smoke detector
- 7-day digital and 7-day econo time clocks
- Single-stage room thermostats
- Two-stage room and duct thermostats
- Electronic two stage duct thermostats
- Electronic modulating room and duct thermostats and a room override for the duct thermostat
- Electronic temperature control allowing for two, three, four or six stage control



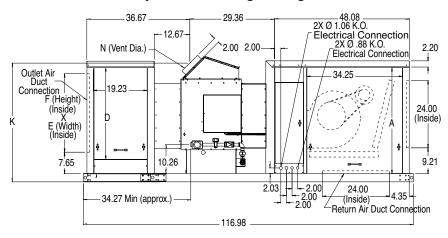
GAS-FIRED INDOOR DUCT FURNACES FOR HEATING OR MAKE UP AIR

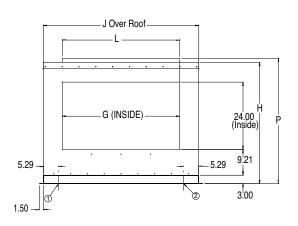
DBG Indoor Gravity Vented Blower Package Unit Dimensions





DCG Indoor Gravity Vented Cooling Package Unit Dimensions





DBG/DCG Indoor Gravity Vented Unit Dimensions (All dimensions in inches)

Model	Blower Type	Qty. of							Dim	nensions							Gas
Size	(Digit 16)	Furnaces	Α	В	С	D	E	F	G	Н	J	K	L	N	Р	S	Conn.
75	All	1	37.75	19.07	15.21	28.75	18.00	25.50	20.02	39.23	32.06	38.37	12.65	5	40.80	87.77	1/2
100/125	All	1	37.75	19.07	17.70	28.75	21.00	25.50	20.02	39.23	34.56	38.37	15.14	6	40.80	87.77	1/2
150/175	All	1	37.75	19.07	21.96	28.75	24.00	25.50	23.99	39.23	38.82	38.37	19.41	7	40.80	87.77	1/2
200/225	All	1	37.75	23.07	24.09	32.75	27.00	30.50	23.99	43.23	40.94	42.37	21.60	7	44.80	87.77	1/2 / 3/4
250/300	E, F, G, or H	1	37.75	23.07	27.13	32.75	30.00	30.50	29.96	43.23	44.05	42.37	24.60	8/10	44.80	87.77	3/4
350/400	E, F, G, or H	1	37.75	23.07	38.63	32.75	42.00	30.50	41.90	43.23	55.57	42.37	36.14	10	44.80	87.77	3/4
500/600	G or H	2	37.75	23.07	27.13	32.75	n/a	n/a	29.96	43.23	44.05	42.37	24.60	8/10	44.80	120.90	3/4
700/800	G or H	2	37.75	23.07	38.63	32.75	n/a	n/a	41.90	43.23	55.57	42.37	36.14	10	44.80	120.90	3/4

- 1 For Right Hand Access Units Location of electrical connection knock-outs are identical sizes as side electrical connections.
- @ For Left Hand Access Units Location of electrical connection knock-outs are identical sizes as side electrical connections.

GAS-FIRED INDOOR AND OUTDOOR DUCT FURNACES







OUTDOOR GRAVITY VENTED & POWER EXHAUSTED

FOR HEATING, HEATING/VENTILATING/COOLING AND MAKE-UP AIR SYSTEMS

The outdoor duct furnace with blower, cooling, and/or downturn plenum sections was designed for use with a building's heating, heating/ventilating/cooling and make-up air systems. They have input ranges from 75,000 to 1,200,000 Btu/Hr and can operate on either natural or propane gas. The airflow ranges from 556 to 14,500 CFM and the airflow direction can be specified when ordering the unit. The unit can be provided with a cooling coil section with either a factory installed DX or chilled water cooling coil or the coil can be provided by others.

Standard Features:

- All standard duct furnace features (see page 7)
- ETL certification of the entire system unit
- 18 gauge insulated aluminized steel cabinet with a baked-on polyester powder paint finish on exterior casing parts
- 1" insulation for blower, cooling cabinet, and downturn plenum sections
- Single 115V control step down transformer with 24V gas control circuit
- · Aluminized steel heat exchanger and burner
- Blower performance up to 3.0" W.C. external static pressure
- Single stage intermittent pilot with continuous retry control system for operation on natural gas
- · Separate line voltage and low voltage terminal strips
- Right side (when looking into the discharge) access to burner and gas controls with slide-out burner drawer
- Side or bottom (through a roof curb) gas and electrical connection access
- · Fan timer and high limit safety control
- Combination curb and slab type mounting base
- Adjustable belt drive

Optional Features - Factory Installed

- All optional duct furnace features (see page 7)
- Downturn plenum section
- DX or chilled water section with optional factory installed cooling coil
- 409 stainless steel heat exchanger and burner
- Open drip proof, totally-enclosed, high efficiency, and two speed motors
- Low voltage motor starters and contactors with one normally open contact
- 1" or 2" permanent, 2" disposable, and 2" FARR® 30/30 filters
- Double wall construction for blower, cooling cabinet, and/or downturn plenum sections
- · Dead-front disconnect switches
- Two position, modulating, building pressure sensing, three position, building management (0-10 Vdc or 4-20 mA) damper actuators
- Economizer warm-up packages
- Discharge air dampers (Downturn plenum units only)
- Step-down transformers for 460/575V/3Ph
- Left side access to blower, burner, and gas controls
- Mild temperature thermostat
- Supply and return air firestats
- Blower door interlock switch
- Convenience outlet
- Evaporative cooling section
- Blower and motor vibration isolation
- Pillow block bearings
- Extended grease lines
- Burner/blower/damper service switches
- 6, 10, or 14 point circuit analyzer
- Electronic temperature control allows for two, three, four or six stage control

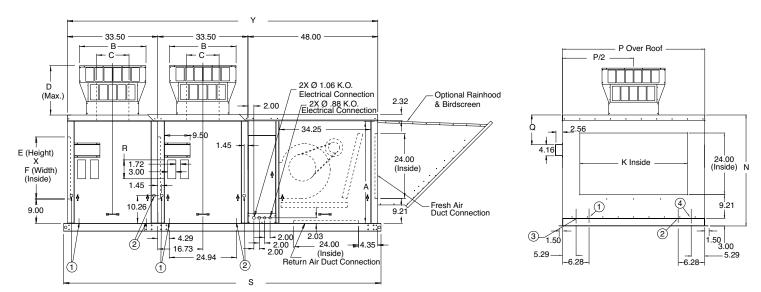
Accessories - Field Installed

- · All accessory duct furnace features
- Remote control panels
- Building pressure sensing damper controls
- Evaporative cooler fill and drain kits
- Insulated roof curbs
- Roof curb discharge and return air connection kits
- Smoke detector
- 7-day digital and 7-day econo time clocks
- · Single-stage room thermostats
- Two-stage room and duct thermostats
- Electronic two stage duct thermostats
- Electronic modulating room and duct thermostats
- Electronic temperature control allows for two, three, four or six stage control
- Room override for the duct thermostat

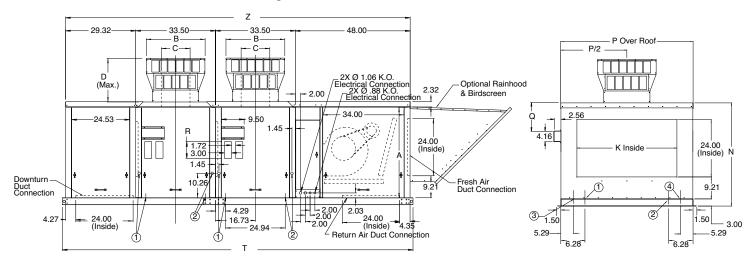


GAS-FIRED INDOOR AND OUTDOOR DUCT FURNACES

HBG/HBP Outdoor Blower Package Unit Dimensions



HDG/HDP Outdoor Downturn Package Unit Dimensions



HBG/HBP/HDG/HDP Outdoor Unit Dimensions (All dimensions in inches)

Model	Blower Type	Qty. of								Dimen	sions							Gas
Size	(Digit 16)	Furnaces	Α	B 5	C 5	D (5)	E	F	K	N	P	Q 5	R ⑤	S	T	Υ	Z	Conn.
75	All	1	33.75	19.22	8.62	14.07	18.98	15.18	20.02	39.23	32.06	10.75	7.00	84.41	108.39	81.49	110.82	1/2
100/125	All	1	33.75	19.22	8.62	14.07	18.98	17.69	20.02	39.23	34.56	10.75	7.00	84.41	108.39	81.49	110.82	1/2
150/175	All	1	33.75	19.22	8.62	14.07	18.98	21.94	23.99	39.23	38.82	10.75	7.00	84.41	108.39	81.49	110.82	1/2
200/225	All	1	37.75	19.22	8.62	14.07	22.98	24.06	23.99	43.23	40.94	11.58	9.90	84.41	108.39	81.49	110.82	1/2
250/300	E, F, G, or H	1	37.75	21.31	10.62	15.05	22.98	27.09	29.96	43.23	44.05	11.58	9.90	84.41	108.39	81.49	110.82	3/4
350/400	E, F, G, or H	1	37.75	24.64	12.62	18.25	22.98	38.60	41.90	43.23	55.07	11.58	9.90	84.41	108.39	81.49	110.82	3/4
500/600	G or H	2	37.75	21.31	10.62	15.05	22.98	27.09	29.96	43.23	44.05	11.58	9.90	117.53	146.77	114.94	144.12	3/4
700/800	G or H	2	37.75	24.64	12.62	18.25	22.98	38.60	41.90	43.23	55.07	11.58	9.90	117.53	146.77	114.94	144.12	3/4

- ① For Right Hand Access Units Location of 1.06" gas connection knock-out one side of unit and one on bottom.
- ② For Left Hand Access Units Location of 1.06" gas connection knock-out one side of unit and one on bottom.
- ® For Right Hand Access Units Location of electrical connection, knock-outs are identical sizes as side electrical connections.
- For Left Hand Access Units Location of electrical connection, knock-outs are identical sizes as side electrical connections.
- ⑤ For Gravity Vented Models, the combustion air/vent cap is required so only dimensions B, C and D apply. For Power Vented Models, the power exhauster discharge cover and inlet louvers are included so only dimensions Q and R apply.

Steam/Hot Water Unit Heaters



GENERAL INFORMATION

Installation and service instructions in this manual are applicable to the three types of steam/hot water unit heaters which should be installed in their proper applications for their most effective function as overhead heating units.

The copper condensers are warranted for operation at steam or hot water pressures up to 150 lbs. per sq. in. gauge, and or temperatures up to 375°F, cupronickel tube units are warranted for operating pressures up to 250 PSI and operating temperatures up to 400°F. Canadian Standards Association (CSA) requriements state that explosion-proof units may not be used with a fluid temperature in excess of 329°F and still maintain their explosion-proof rating, for national electric code ignition temperature rating T3B for grain dust.

Motors are designed for continuous duty. They can operate in a maximum



Model HSB Horizontal Delivery Top/Bottom Inlet/Outlet



Model HC Horizontal Delivery Side Inlet/Outlet

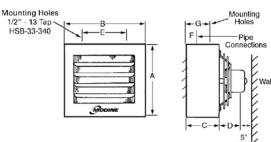


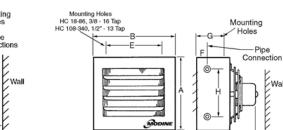
Models V/VN Vertical Delivery

DIMENSIONAL / MOTOR DATA

ambient temperature of 104°F (40°C).

Horizontal Air Delivery Models — Two Styles Model HSB - Top/Bottom — Inlet/Outlet





Model HC - Side Inlet/Outlet





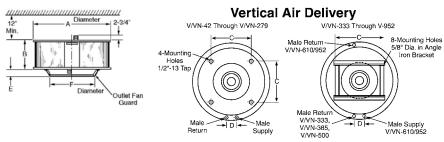
Model HSB and HC Dimensions*

					D					Female		Approx.
Model				115 Std.	115V Exp.					Connections	Fan	Shipping
Number	Α	В	С	Motor	Motor	E	F	G	Н	NPT	Diameter	Wt. lb.
HSB-18	12-3/8	13	6	5	12	-	3	-	-	3/4	9	16
HSB-24	12-3/8	13	6	6-1/2	12	-	3	-	-	3/4	9	20
HSB-33	16-3/8	17-1/2	8-3/4	6-1/2	12-1/4	11	3-5/8	6	-	1-1/4	12	34
HSB-47	16-3/8	17-1/2	8-3/4	8	12-1/4	11	3-5/8	6	-	1-1/4	12	36
HSB-63	20-7/16	21-1/2	8-3/4	8	12-3/4	15	3-5/8	6	-	1-1/4	14	48
HSB-86	20-7/16	21-1/2	8-3/4	9	12-3/4	15	3-5/8	6	-	1-1/4	14	52
HSB-108	24-7/16	25-1/2	9-1/2	8	11-1/2	18	3-3/4	6-3/8	-	1-1/4	18	74
HSB-121	24-7/16	25-1/2	9-1/2	7-1/2	11	18	3-3/4	6-3/8	-	1-1/4	18	76
HSB-165	30-1/2	30-1/2	9-1/4	9-1/2	14	21-1/4	3-3/4	6-3/8	-	1-1/4	22	92
HSB-193	30-1/2	30-1/2	9-1/4	9-1/2	14	21-1/4	3-3/4	6-3/8	-	1-1/4	22	98
HSB-258	38-1/2	38-1/2	12-1/2	10-1/2	14	18-1/2	3-5/8	7-7/8	-	1-1/4	22	162
HSB-290	38-1/2	38-1/2	12-1/2	10-1/2	14	18-1/2	3-5/8	7-7/8	-	1-1/4	24	168
HSB-340	38-1/2	44-1/2	12-1/2	10-1/2	14	18-1/2	3-5/8	7-7/8	-	1-1/4	24	176
HC-18	11-1/2	12-3/4	6	5	12	5-5/8	2-1/4	4-1/8	7-1/2	1/2	9	16
HC-24	11-1/2	12-3/4	6	6-1/2	12	5-5/8	2-1/4	4-1/8	7-1/2	1/2	9	20
HC-33	15	17-1/2	8-3/4	6-1/2	12-1/4	11	3-5/8	6	10	3/4	12	34
HC-47	15	17-1/2	8-3/4	8	12-1/4	11	3-5/8	6	10	3/4	12	35
HC-63	18-1/2	21-1/2	8-3/4	8	12-3/4	15	3-5/8	6	14	3/4	12	48
HC-86	18-1/2	21-1/2	8-3/4	9	12-3/4	15	3-5/8	6	14	3/4	14	52
HC-108	22-1/2	25-1/2	9-1/2	8	11-1/2	18	3-5/8	6-3/8	18	3/4	18	74
HC-121	22-1/2	25-1/2	9-1/2	7-1/2	11	18	3-5/8	6-3/8	18	3/4	18	76
HC-165	26-1/2	29-1/2	9-1/4	9-1/2	14	21-1/4	3-5/8	6-3/8	22	3/4	22	92
HC-193	30-1/2	32-1/2	9-1/4	9-1/2	14	21-1/4	3-5/8	4-3/4	26	1-1/4	22	98
HC-258	38-1/2	38-1/2	12-1/2	10-1/2	14	18-1/2	3-5/8	8	34	1-1/4	22	163
HC-290	38-1/2	38-1/2	12-1/2	10-1/2	14	18-1/2	3-5/8	8	34	1-1/4	24	168
HC-340	38-1/2	44-1/2	12-1/2	10-1/2	14	18-1/2	3-5/8	8	34	1-1/4	24	176



Steam/Hot Water Unit Heaters

DIMENSIONAL / MOTOR DATA



DIMENSIONAL / MOTOR DATA Models V/VN and PT/PTN Dimensions*

Model											Fan		ale n. NPT	Approx. Shipping
Number	Α	В	С	D	E	F	L	М	N	P	Dia.	Top	Bottom	Wt. Lbs.
V/VN-42	24-3/4	3-5/8	11-3/8	2-1/8	4-3/8	14-1/2	6-1/2	12	10-1/4	6-1/2	14	1-1/4	1-1/4	36
V/VN-59	24-3/4	5-1/8	11-3/8	2-1/8	4-3/8	14-1/2	6-1/2	12	10-1/4	6-1/2	14	1-1/4	1-1/4	42
V/VN-78	24-3/4	6-5/8	11-3/8	2-1/8	2-5/8	16-1/2	6-1/2	12	13	6-1/2	16	1-1/4	1-1/4	46
V/VN-95	24-3/4	8-1/8	11-3/8	2-1/8	2-5/8	16-1/2	6-1/2	12	13	6-1/2	16	1-1/4	1-1/4	48
V/VN-139	34-3/4	6-7/8	18-3/8	2-1/8	3	19-1/2	7-1/2	13	11-1/4	7-1/2	19	1-1/2	1	70
V/VN-161	34-3/4	8-3/8	18-3/8	2-1/8	3	19-1/2	7-1/2	13	11-1/4	7-1/2	19	1-1/2	1	80
V/VN-193	34-3/4	9-7/8	18-3/8	2-1/8	3	19-1/2	7-1/2	13	11-1/4	7-1/2	19	1-1/2	1	86
V/VN-212	34-3/4	12-7/8	18-3/8	2-1/2	3	19-1/2	7-1/2	13	11-1/4	7-1/2	19	2	1-1/4	94
V/VN-247	34-3/4	12-7/8	18-3/8	2-1/2	3	21-1/2	8	16	12-3/4	8	21	2	1-1/4	108
V/VN-279	34-3/4	14-3/8	18-3/8	2-1/2	3	21-1/2	8	16	12-3/4	8	21	2	1-1/4	112
V/VN-333	43-1/4	14-5/8	24	2-7/8	3-1/8	22-1/2	8-1/2	16	12	8-1/2	22	2-1/2	1-1/2	166
V/VN-385	43-1/4	14-1/2	24	2-7/8	3-1/2	27-1/2	10	21	14	10	27	2-1/2	1-1/2	168
V/VN-500	43-1/4	19	24	2-7/8	3-1/2	27-1/2	10	21	14	10	27	2-1/2	1-1/2	360
V/VN-610	51-1/2	19-1/8	29-7/8	_	3-3/4	30-1/2	10-1/2	21	_	10-1/2	30	2-1/2	1-1/2	450
V-952	53-3/4	21-1/8	30	_	3-1/2	31	_	22	_	18-3/4	30	3	3	487

^{*}All dimensions in inches. Dimensions shown are for Standard and Low Outlet Temperature Models.

Hot Water Performance Data – Standard Models

Performance Data for Standard Units at Standard Conditions of 200°F Entering Water and 60°F Entering Air High Motor Speed

				Water Da	ıta		Air Data							Motor Data	
Type	Model No.	Btu/hr.	GPM	Pressure Drop (Ft. of Water)	Min/Max GPM	Sound Class	Maxii Mour Hei	nting ght	Heat or Sp @ N Hei	read	Cfm	Outlet Velocity (Fpm)	Final Air Temp. (°F)	Нр	Approx. RPM
	HSB/HC-18	12,600	1.3	0.5	0.3 / 5.0	II	. 6)	1	8	340	615	93	1/60	1550
	HSB/HC-24	16,200	1.7	0.8	0.3 / 5.0	II	10	0	1	9	370	675	100	1/25	1550
	HSB/HC-33	21,700	2.3	0.2	0.4 / 10.0	П	1	1	2	3	630	675	91	1/25	1550
	HSB/HC-47	30,900	3.2	0.4	0.4 / 10.0	III	1:	3	3	0	730	785	98	1/12	1550
	HSB/HC-63	45,600	4.7	0.6	0.5 / 20.0	III	1:	5	3	1	1120	680	97	1/12	1550
Horizontal	HSB/HC-86	60,200	6.3	1.0	0.5 / 20.0	III	10	6	3	3	1340	820	101	1/8	1625
Delivery	HSB/HC-108	83,700	8.7	2.8	0.5 / 30.0	III	1:	8	3	3	2010	775	98	1/8	1625
	HSB/HC-121	93,000	9.7	3.3	0.7 / 30.0	III	1	7	2	7	1775	700	107	1/5	1075
	HSB/HC-165	130,900	13.6	8.6	2.0 / 30.0	IV	2	0	4	3	3240	870	96	1/3	1075
	HSB/HC-193	143,000	14.9	1.4	2.0 / 50.0	IV	1:	9	4	1	2900	790	105	1/3	1075
	HSB/HC-258	201,900	21.0	5.7	2.5 / 70.0	V	2	0	4	7	4560	740	100	1/2	1075
	HSB/HC-290	228,600	23.8	7.1	2.5 / 70.0	V	2:	2	5	0	4590	750	105	1/2	1075
	HSB/HC-340	271,100	28.2	11.3	2.8 / 70.0	V	2:	2	5	0	5130	720	108	1/2	1075
	V/VN-42	30,100	3.1	0.6	0.5 / 10.0	II	12	16	18	12	950	825	90	1/30	1050
	V/VN-59	42,600	4.4	0.5	0.8 / 15.0	II	15	20	22	15	1155	1005	96	1/30	1050
	V/VN-78	57,000	5.9	0.5	1.0 / 20.0	II	16	22	24	16	1590	1065	95	1/15	1050
	V/VN-95	69,300	7.2	0.5	1.3 / 25.0	П	16	22	24	16	1665	1120	101	1/15	1050
	V/VN-139	106,600	11.1	2.6	1.0 / 30.0	III	19	26	29	19	2660	1285	99	1/6	1075
Vertical	V/VN-161	123,200	12.8	2.2	1.3 / 40.0	IV	21	29	32	22	2945	1420	101	1/3	1075
Delivery	V/VN-193	147,200	15.3	2.2	1.5 / 50.0	IV	23	32	35	24	3500	1690	101	1/3	1075
	V/VN-212	161,700	16.8	1.5	2.0 / 60.0	IV	23	32	35	24	3610	1740	104	1/3	1075
	V/VN-247	188,700	19.7	2.1	2.0 / 60.0	V	28	37	41	28	4820	1910	98	1/2	1075
	V/VN-279	212,600	22.2	2.1	2.3 / 75.0	V	32	40	48	32	5460	2165	98	1/2	1075
	V/VN-333	260,100	27.1	3.8	2.8 / 75.0	V	32	40	48	32	5980	2165	102	3/4	1140
	V/VN-385	302,100	31.5	5.0	3.3 / 75.0	VI	32	39	48	32	7680	1860	98	1	1140
	V/VN-500	391,700	40.8	4.8	3.0 / 100.0	VI	39	47	59	40	10,390	2520	96	1-1/2	1140
	V/VN-610	450,400	46.9	1.0	6.0 / 100.0	VI	38	46	57	39	11,750	2315	97	1-1/2	1140
	V-952	721,600	75.2	1.1	14.0 / 200.0	VI	39	63	59	70	12,166	2321	120	2	1140

Steam/Hot Water Unit Heaters



Steam Performance Data - Standard Models

Performance Data for Standard Units at Standard Conditions of 2 lb. Steam and 60°F Entering Air High Motor Speed

Type No. Btu/hr EDR Class Height (ft.) Height Cfm (Fpm) (°F) Ib/hr Hp RP										Air Data	ı			Motor	r Data
HSB/HC-24 24,000 100 II 9 18 370 695 119 25 1/25 15 15 15 15 15 15 15	Type		Btu/hr			Mou	nting	or S @ I	pread Max.	Cfm	Velocity	Air Temp.		Нр	Approx.
HSB/HC-33 33,000 138 II 10 21 630 690 108 34 1/25 15 15 HSB/HC-47 47,000 196 III 12 28 730 810 119 49 1/12 15 15 HSB/HC-63 63,000 263 III 14 29 1120 690 111 65 1/12 15 15 HSB/HC-66 86,000 358 III 15 31 1340 835 118 89 1/8 16 HSB/HC-108 108,000 450 III 17 31 2010 790 109 112 1/8 16 HSB/HC-121 121,000 504 III 16 25 1775 715 122 125 1/5 10 HSB/HC-165 165,000 688 IV 19 40 3240 880 106 171 1/3 10 HSB/HC-193 193,000 804 IV 18 38 2900 810 121 200 1/3 10 HSB/HC-290 290,000 1208 V 20 46 4590 765 111 267 1/2 10 HSB/HC-340 340,000 1417 V 20 46 5130 735 120 352 1/2 10 V/NN-82 42,000 175 II 11 15 17 11 950 825 103 43 1/30 10 V/NN-78 78,000 325 II 15 20 23 15 1690 1065 109 81 1/15 10 V/NN-193 193,000 804 IV 22 30 33 22 3500 1690 116 200 1/3 10 V/NN-193 193,000 671 IV 20 27 30 20 2945 1420 115 167 1/3 10 V/NN-193 193,000 671 IV 20 27 30 30 5460 1285 112 144 1/6 10 V/NN-279 279,000 1163 V 30 37 45 30 580 2165 111 289 1/2 10 V/NN-335 335,000 1604 VI 30 36 45 30 7680 1860 110 398 1 11 V/NN-385 385,000 1604 VI 30 36 45 30 7680 1860 110 398 1 11 V/NN-385 385,000 1604 VI 30 36 45 30 7680 1860 110 398 1 11 V/NN-385 385,000 2542 VI 36 43 54 36 11,750 2315 112 631 1-1/2 11 11 11 11 11 11 11		HSB/HC-18	18,000	75	II	3	В	1	17	340	625	107	19	1/60	1550
HSB/HC-47		HSB/HC-24	24,000	100	II	9	9	1	18	370	695	119	25	1/25	1550
HSB/HC-63		HSB/HC-33	33,000	138	II	1	0	2	21	630	690	108	34	1/25	1550
HSB/HC-86 86,000 358 III 15 31 1340 835 118 89 1/8 16		HSB/HC-47	47,000	196	III	1	2	2	28	730	810	119	49	1/12	1550
Horizontal Delivery HSB/HC-108 108,000 450 III 17 31 2010 790 109 112 1/8 16 16 HSB/HC-121 121,000 504 III 16 25 1775 715 122 125 1/5 10 HSB/HC-165 165,000 688 IV 19 40 3240 880 106 171 1/3 10 HSB/HC-193 193,000 804 IV 18 38 2900 810 121 200 1/3 10 HSB/HC-258 258,000 1075 V 19 44 4560 750 111 267 1/2 10 HSB/HC-290 290,000 1208 V 20 46 4590 765 117 300 1/2 10 HSB/HC-340 340,000 1417 V 20 46 5130 735 120 352 1/2 10 HSB/HC-340 340,000 175 II 11 15 17 11 950 825 103 43 1/30 10 V/VN-59 59,000 226 II 14 19 21 14 1155 1005 111 61 1/30 10 V/VN-78 78,000 325 II 15 20 23 15 1590 1065 109 81 1/15 10 V/VN-95 95,000 396 II 15 20 23 15 1665 1120 118 98 1/15 10 V/VN-193 193,000 579 III 18 24 27 18 2660 1285 112 144 1/6 10 V/VN-193 193,000 804 IV 22 30 33 22 3610 1740 120 219 1/3 10 V/VN-193 193,000 804 IV 22 30 33 22 360 1690 116 200 11/3 10 V/VN-212 212,000 883 IV 22 30 33 22 3610 1740 120 219 1/3 10 V/VN-212 212,000 883 IV 22 30 33 22 3610 1740 120 219 1/3 10 V/VN-212 212,000 883 IV 22 30 33 22 3610 1740 120 219 1/3 10 V/VN-279 279,000 1163 V 30 37 45 30 5860 2165 111 289 1/2 10 V/VN-385 385,000 1604 VI 30 36 45 30 7680 1860 110 398 17 1-1/2 11 V/VN-385 385,000 1604 VI 30 36 45 30 7680 1860 110 398 17 1-1/2 11 V/VN-385 385,000 2683 VI 37 44 56 37 10,390 2520 108 517 1-1/2 11 V/VN-610 610,000 2542 VI 36 43 54 36 11,750 2315 112 631 1-1/2 11		HSB/HC-63	63,000	263	III	1	4	2	29	1120	690	111	65	1/12	1550
Delivery HSB/HC-121 121,000 504 III 16 25 1775 715 122 125 1/5 10 HSB/HC-165 165,000 688 IV 19		HSB/HC-86	86,000	358	III	1	5	3	31	1340	835	118	89	1/8	1625
HSB/HC-165 165,000 688 IV 19 40 3240 880 106 171 1/3 10 HSB/HC-193 193,000 804 IV 18 38 2900 810 121 200 1/3 10 HSB/HC-258 258,000 1075 V 19 44 4560 750 111 267 1/2 10 HSB/HC-290 290,000 1208 V 20 46 4590 765 117 300 1/2 10 HSB/HC-340 340,000 1417 V 20 46 5130 735 120 352 1/2 10 V/VN-42 42,000 175 II 11 15 17 11 950 825 103 43 1/30 10 V/VN-59 59,000 246 II 14 19 21 14 1155 1005 1111 61 1/30 10 V/VN-78 78,000 325 II 15 20 23 15 1590 1065 109 81 1/15 10 V/VN-95 95,000 396 II 15 20 23 15 1665 1120 118 98 1/15 10 V/VN-193 193,000 579 III 18 24 27 18 2660 1285 112 144 1/6 10 V/VN-193 193,000 804 IV 22 30 33 22 3500 1690 116 200 1/3 10 V/VN-247 247,000 1029 V 26 34 39 26 4820 1910 111 289 1/2 10 V/VN-279 279,000 1163 V 30 37 45 30 5980 2165 116 345 3/4 11 V/VN-385 385,000 1604 VI 30 36 43 54 36 11,750 2315 112 631 1-1/2 11 V/VN-610 610,000 2542 VI 36 43 54 36 11,750 2315 112 631 1-1/2 11	Horizontal	HSB/HC-108	108,000	450	III	1	7	3	31	2010	790	109	112	1/8	1625
HSB/HC-193 193,000 804 IV 18 38 2900 810 121 200 1/3 10 HSB/HC-258 258,000 1075 V 19 44 4560 750 1111 267 1/2 10 HSB/HC-290 290,000 1208 V 20 46 4590 765 117 300 1/2 10 HSB/HC-340 340,000 1417 V 20 46 5130 735 120 352 1/2 10 V/VN-42 42,000 175 II 11 15 17 11 950 825 103 43 1/30 10 V/VN-78 78,000 325 III 15 20 23 15 1590 1065 109 81 1/15 10 V/VN-95 95,000 396 III 15 20 23 15 1590 1065 1190 81 1/15 10 V/VN-95 95,000 396 III 15 20 23 15 1665 1120 118 98 1/15 10 V/VN-193 139,000 579 III 18 24 27 18 2660 1285 112 144 1/6 10 V/VN-193 193,000 804 IV 22 30 33 22 3500 1690 116 200 1/3 10 V/VN-193 193,000 804 IV 22 30 33 22 3610 1740 120 219 1/3 10 V/VN-247 247,000 1029 V 26 34 39 26 4820 1910 111 289 1/2 10 V/VN-333 333,000 1388 V 30 36 45 30 7680 1860 110 398 1 11 V/V 10 V/VN-385 335,000 1604 VI 30 36 45 30 7680 1860 110 398 1 11 V/V 11 V/VN-305 335,000 2083 VI 37 44 56 37 10,390 2520 108 517 1-1/2 11 V/VN-500 500,000 2542 VI 36 43 54 36 11,750 2315 112 631 1-1/2 11	Delivery	HSB/HC-121	121,000	504	III	1	6	2	25	1775	715	122	125	1/5	1075
HSB/HC-288 258,000 1075 V 19 44 4560 750 111 267 1/2 10 HSB/HC-290 290,000 1208 V 20 46 4590 765 117 300 1/2 10 HSB/HC-340 340,000 1417 V 20 46 5130 735 120 352 1/2 10 V/N-42 42,000 175 II 11 15 17 11 950 825 103 43 1/30 10 V/N-59 59,000 246 II 14 19 21 14 1155 1005 111 61 1/30 10 V/N-78 78,000 325 II 15 20 23 15 1590 1065 109 81 1/15 10 V/N-95 95,000 396 II 15 20 23 15 1665 1120 118 98 1/15 10 V/N-191 193,000 579 III 18 24 27 18 2660 1285 112 144 1/6 10 V/N-193 193,000 804 IV 20 27 30 20 2945 1420 115 167 1/3 10 V/N-212 212,000 883 IV 22 30 33 22 3500 1690 116 200 1/3 10 V/N-247 247,000 1029 V 26 34 39 26 4820 1910 111 256 1/2 10 V/N-279 279,000 1163 V 30 37 45 30 5980 2165 116 345 3/4 11 V/N-385 385,000 1604 VI 30 36 43 54 36 11,750 2315 112 631 1-1/2 11		HSB/HC-165	165,000	688	IV	1	9	4	10	3240	880	106	171	1/3	1075
HSB/HC-290 290,000 1208 V 20 46 4590 765 117 300 1/2 10 HSB/HC-340 340,000 1417 V 20 46 5130 735 120 352 1/2 10 V/VN-42 42,000 175 II 11 15 17 11 950 825 103 43 1/30 10 V/VN-59 59,000 246 II 14 19 21 14 1155 1005 1111 61 1/30 10 V/VN-78 78,000 325 II 15 20 23 15 1590 1065 109 81 1/15 10 V/VN-95 95,000 396 II 15 20 23 15 1665 1120 118 98 1/15 10 V/VN-139 139,000 579 III 18 24 27 18 2660 1285 112 144 1/6 10 V/VN-161 161,000 671 IV 20 27 30 20 2945 1420 115 167 1/3 10 V/VN-212 212,000 883 IV 22 30 33 22 3500 1690 116 200 1/3 10 V/VN-247 247,000 1029 V 26 34 39 26 4820 1910 111 256 1/2 10 V/VN-279 279,000 1163 V 30 37 45 30 5980 2165 116 345 3/4 11 V/VN-385 385,000 1604 VI 30 36 45 30 7680 1860 110 398 1 V/VN-500 500,000 2542 VI 36 43 54 36 11,750 2315 112 631 1-1/2 11		HSB/HC-193	193,000	804	IV	1	8	3	38	2900	810	121	200	1/3	1075
HSB/HC-340 340,000 1417 V 20 46 5130 735 120 352 1/2 10 V/VN-42 42,000 175 II 11 15 17 11 950 825 103 43 1/30 10 V/VN-59 59,000 246 II 14 19 21 14 1155 1005 1111 61 1/30 10 V/VN-78 78,000 325 II 15 20 23 15 1590 1065 109 81 1/15 10 V/VN-95 95,000 396 II 15 20 23 15 1665 1120 118 98 1/15 10 V/VN-139 139,000 579 III 18 24 27 18 2660 1285 112 144 1/6 10 V/VN-161 161,000 671 IV 20 27 30 20 2945 1420 115 167 1/3 10 V/VN-193 193,000 804 IV 22 30 33 22 3500 1690 116 200 1/3 10 V/VN-212 212,000 883 IV 22 30 33 22 3610 1740 120 219 1/3 10 V/VN-247 247,000 1029 V 26 34 39 26 4820 1910 111 289 1/2 10 V/VN-333 333,000 1388 V 30 37 45 30 5980 2165 1110 398 1 11 V/VN-385 385,000 1604 VI 30 36 45 30 7680 1860 110 398 1 11 V/VN-500 500,000 2542 VI 36 43 54 36 11,750 2315 112 631 1-1/2 11		HSB/HC-258	258,000	1075	V	1	9	4	14	4560	750	111	267	1/2	1075
Vertical Delivery3 V/VN-193 193,000 804 IV 22 30 33 22 3500 1690 116 200 1/3 10 10 1/3 10 V/VN-212 212,000 883 IV 22 30 33 22 3500 1690 116 200 1/3 10 10 1/3 10 10 10 1/3 10 10 10 10 10 10 10 10 10 10 10 10 10		HSB/HC-290	290,000	1208	V	2	20	4	16	4590	765	117	300	1/2	1075
Vertical Delivery3 V/VN-193		HSB/HC-340	340,000	1417	V	2	20	4	16	5130	735	120	352	1/2	1075
Vertical Delivery3 Polivery4 Vertical Delivery3 Vertical Delivery3 Vertical Delivery3 Vertical Delivery3 Vertical Delivery3 Vertical Delivery3 Vivia 193,000 579 III 18 24 27 18 2660 1285 112 144 1/6 10 10 10 11 10 10 10 10 10 10 10 10 10		V/VN-42	42,000	175	II	11	15	17	11	950	825	103	43	1/30	1050
Vertical Delivery3		V/VN-59	59,000	246	II	14	19	21	14	1155	1005	111	61	1/30	1050
Vertical Delivery ³ V/VN-139 139,000 579 III 18 24 27 18 2660 1285 112 144 1/6 10 10 10 10 115 167 1/3 10 10 10 10 10 116 10 10 10 10 116 10 10 10 10 116 10 10 10 10 116 10 10 10 10 116 10 10 117 10 10 10 117 10 10 10 11 10 10 11 10 10 11 10 10 11 10 10		V/VN-78	78,000	325	II	15	20	23	15	1590	1065	109	81	1/15	1050
Delivery ³ V/VN-161 161,000 671 IV 20 27 30 20 2945 1420 115 167 1/3 10 V/VN-193 193,000 804 IV 22 30 33 22 3500 1690 116 200 1/3 10 V/VN-212 212,000 883 IV 22 30 33 22 3610 1740 120 219 1/3 10 V/VN-247 247,000 1029 V 26 34 39 26 4820 1910 111 256 1/2 10 V/VN-279 279,000 1163 V 30 37 45 30 5460 2165 111 289 1/2 10 V/VN-333 333,000 1388 V 30 37 45 30 5980 2165 116 345 3/4 11 V/VN-385 385,000 1604 VI 30 36 45 30 7680 1860 110 398 1 11 V/VN-500 500,000 2083 VI 37 44 56 37 10,390 2520 108 517 1-1/2 11 V/VN-610 610,000 2542 VI 36 43 54 36 11,750 2315 112 631 1-1/2 11		V/VN-95	95,000	396	II	15	20	23	15	1665	1120	118	98	1/15	1050
V/VN-193 193,000 804 IV 22 30 33 22 3500 1690 116 200 1/3 10 V/VN-212 212,000 883 IV 22 30 33 22 3610 1740 120 219 1/3 10 V/VN-247 247,000 1029 V 26 34 39 26 4820 1910 111 256 1/2 10 V/VN-279 279,000 1163 V 30 37 45 30 5460 2165 111 289 1/2 10 V/VN-333 333,000 1388 V 30 37 45 30 5980 2165 116 345 3/4 11 V/VN-385 385,000 1604 VI 30 36 45 30 7680 1860 110 398 1 11 V/VN-500 500,000 2083 VI 37 44<	Vertical	V/VN-139	139,000	579	III	18	24	27	18	2660	1285	112	144	1/6	1075
V/VN-212 212,000 883 IV 22 30 33 22 3610 1740 120 219 1/3 10 V/VN-247 247,000 1029 V 26 34 39 26 4820 1910 111 256 1/2 10 V/VN-279 279,000 1163 V 30 37 45 30 5460 2165 111 289 1/2 10 V/VN-333 333,000 1388 V 30 37 45 30 5980 2165 116 345 3/4 11 V/VN-385 385,000 1604 VI 30 36 45 30 7680 1860 110 398 1 11 V/VN-500 500,000 2083 VI 37 44 56 37 10,390 2520 108 517 1-1/2 11 V/VN-610 610,000 2542 VI 36 <t< td=""><td>Delivery³</td><td>V/VN-161</td><td>161,000</td><td>671</td><td>IV</td><td>20</td><td>27</td><td>30</td><td>20</td><td>2945</td><td>1420</td><td>115</td><td>167</td><td>1/3</td><td>1075</td></t<>	Delivery ³	V/VN-161	161,000	671	IV	20	27	30	20	2945	1420	115	167	1/3	1075
V/VN-247 247,000 1029 V 26 34 39 26 4820 1910 111 256 1/2 10 V/VN-279 279,000 1163 V 30 37 45 30 5460 2165 111 289 1/2 10 V/VN-333 333,000 1388 V 30 37 45 30 5980 2165 116 345 3/4 11 V/VN-385 385,000 1604 VI 30 36 45 30 7680 1860 110 398 1 11 V/VN-500 500,000 2083 VI 37 44 56 37 10,390 2520 108 517 1-1/2 11 V/VN-610 610,000 2542 VI 36 43 54 36 11,750 2315 112 631 1-1/2 11		V/VN-193	193,000	804	IV	22	30	33	22	3500	1690	116	200	1/3	1075
V/VN-279 279,000 1163 V 30 37 45 30 5460 2165 111 289 1/2 10 V/VN-333 333,000 1388 V 30 37 45 30 5980 2165 116 345 3/4 11 V/VN-385 385,000 1604 VI 30 36 45 30 7680 1860 110 398 1 11 V/VN-500 500,000 2083 VI 37 44 56 37 10,390 2520 108 517 1-1/2 11 V/VN-610 610,000 2542 VI 36 43 54 36 11,750 2315 112 631 1-1/2 11		V/VN-212	212,000	883	IV	22	30	33	22	3610	1740	120	219	1/3	1075
V/VN-333 333,000 1388 V 30 37 45 30 5980 2165 116 345 3/4 11 V/VN-385 385,000 1604 VI 30 36 45 30 7680 1860 110 398 1 11 V/VN-500 500,000 2083 VI 37 44 56 37 10,390 2520 108 517 1-1/2 11 V/VN-610 610,000 2542 VI 36 43 54 36 11,750 2315 112 631 1-1/2 11		V/VN-247	247,000	1029	V	26	34	39	26	4820	1910	111	256	1/2	1075
V/VN-385 385,000 1604 VI 30 36 45 30 7680 1860 110 398 1 11 V/VN-500 500,000 2083 VI 37 44 56 37 10,390 2520 108 517 1-1/2 11 V/VN-610 610,000 2542 VI 36 43 54 36 11,750 2315 112 631 1-1/2 11		V/VN-279	279,000	1163	V	30	37	45	30	5460	2165	111	289	1/2	1075
V/VN-500 500,000 2083 VI 37 44 56 37 10,390 2520 108 517 1-1/2 11 V/VN-610 610,000 2542 VI 36 43 54 36 11,750 2315 112 631 1-1/2 11		V/VN-333	333,000	1388	V	30	37	45	30	5980	2165	116	345	3/4	1140
V/VN-610 610,000 2542 VI 36 43 54 36 11,750 2315 112 631 1-1/2 11		V/VN-385	385,000	1604	VI	30	36	45	30	7680	1860	110	398	1	1140
		V/VN-500	500,000	2083	VI	37	44	56	37	10,390	2520	108	517	1-1/2	1140
V-952 952,000 3967 VI 37 45 56 56 12,170 2321 139 985 2 11		V/VN-610	610,000	2542	VI	36	43	54	36	11,750	2315	112	631	1-1/2	1140
		V-952	952,000	3967	VI	37	45	56	56	12,170	2321	139	985	2	1140

MANUFACTURERS INDEX, SECTION 6	
POWERFLAME	6-1



FORCED DRAFT BURNERS

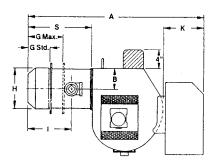
MODEL CG

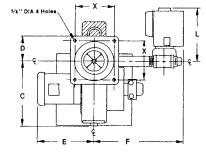
The Power Flame Model CG gas burner presents optimum state-of-the-art design for maximum combustion efficiency and operating dependability.

STANDARD EQUIPMENT

- 3450 RPM motor, squirrel cage blower, panel with two lights (power, main fuel) & control switch.
- Gas electric pilot and gas ignition transformer
- Leakage test cock, pilot, and main gas cock
- Pilot and main pressure regulators
- Air saftey switch

MODEL C CONFIGURATION





NOTE: Add $\,rac{\pi}{4}$ " to "H" for size of opening in boller front plate.

DIMENSIONS

MODEL #	Α	В	B(R)	С	C(R)	D	E	F	G STD.	G MAX.	н	ı	К	L	s	х
PF C1-G-12	34-1/8	3-1/4	5-1/2	14-1/2	14-1/2	4-5/8	12-1/4	20	3-1/4	4-3/4	7-1/4	7-3/8	10-1/4	11-1/8	12-5/8	7-1/4
PF C2-G-15	39-1/8	4-1/2	6-1/8	14-7/8	14	5-1/4	14	20	4	6-3/4	8-3/4	8-1/2	10-1/4	11-1/4	13-3/8	8-1/2
PF C2-G-20A	39-1/8	4-1/2	6-1/8	14-7/8	14	5-1/4	14	20	4	6-3/4	8-3/4	8-1/2	10-1/4	11-1/4	13-3/8	8-1/2
PF C2-G-20B	39-1/8	4-1/2	6-1/8	14-7/8	14	5-1/4	14	20	4	6-3/4	8-3/4	8-1/2	10-1/4	11-1/4	13-3/8	8-1/2
PF C3-G-20	44	5-1/4	7	16-5/8	15-1/4	6	16	22-3/8	4-1/2	8	10-1/8	10	10-1/4	11-3/4	15-1/2	10
PF C3-G-25	44	5-1/4	7	16-5/8	15-1/4	6	16	22-3/8	4-1/2	8	10-1/8	10	10-1/4	11-3/4	15-1/2	10
PF C3-G-25B	44	5-1/4	7	16-5/8	15-1/4	6	16	22-3/8	4-1/2	8	10-1/8	10	10-1/4	11-3/4	15-1/2	10
PF C4-G-25	50	6-1/4	7-1/4	18-7/8	17-3/4	7	18-1/2	28	6	9	12-1/8	12	10-1/4	11-3/4	19-1/8	12
PF C4-G-30	50	6-1/4	7-1/4	18-7/8	17-3/4	7	18-1/2	28	6	9	12-1/8	12	10-1/4	11-3/4	19-1/8	12
PF C5-G-30	50	6-1/4	7-1/4	18-7/8	17-3/4	7	18-1/2	26-1/2	6	9	12-1/8	12	0-1/4	11-3/4	19-1/8	12
PF C6-G-30	49-7/8	6-1/4	7-1/4	18-7/8	17-3/4	7-3/4	19-7/8	26-1/2	5	11-3/4	13-5/8	13-1/2	0-1/4	11-3/4	19	13-1/2

RATINGS, SPECIFICATIONS

	CAPA	CITY	BLOWER HP	STANDARD	GAS PRESSURE
PART #	MBH MAX.	BOILER	(3450 RPM)	GAS TRAIN	REQUIRED (IN W.C.)
PF CR1-G-12-LHO	1,360	32.3	1/3	1-1/4"	4.5
PF CR2-G-15-LHO	2,200	52.3	1/2	1-1/2"	6.8
PF CR2-G-20A-LHO	2,500	60.0	3/4	2"	4.5
PF CR2-G-20B-LHO	3,080	73.5	1	2"	5.0
PF CR3-G-20-LHL	3,650	87.0	1-1/2	2"	6.0
PF CR3-G-25-LHL	4,718	112.0	1-1/2	2-1/2"	6.4
PF CR3-G-25B-LHL	5,250	125.0	3	2-1/2"	8.3
PF CR4-G-25LHL-3	5,250	125.0	3	2-1/2"	8.3
PF CR4-G-25	6,300	150.0	3	2-1/2"	11.0
PF CR4-G-30	7,840	190.0	5	3"	14.0
PF CR5-G-30(B)	10,500	250.0	7-1/2	3"	19.5,16.0
PF CR6-G-30	14,215	340.0	10	3"	16.0

Notes

MANUFACTURERS INDEX, SECTION 7

HONEYWELL	7-1 – 7-49
JOHNSON CONTROLS	. 7-50 – 7-63
MAXITROL	⁷ -102 – 7-103
ROBERTSHAW	7-86 – 7-101
WHITE-RODGERS	. 7-64 – 7-85

T4039 Fan Coil Thermostat

Control line voltage valves of a fan coil unit in cooling, manual or automatic changeover heating-cooling systems.

- Directly operate one or two valves.
- Includes allen wrench for cover and mounting screws.

Dimensions, Approximate: 4 5/8 in. high x 4 15/16 in. wide x 1 5/16 in. deep.

Mounting: 4 in. square outlet box or 2-ganged outlet box

Display: No

Electrical Ratings: Thermostat (Valve load): 120 Vac: 0.32 FLA,

240 Vac: 0.16 FLA

Fan Switch: 120 Vac: 5.5 FLA; 240 Vac: 2.75 FLA

Voltage: 120 to 277 Vac

Setting Temperature Range: 55 F to 95 F



Product		Differential		n		
Number	Application	Temperature (F)	System	Fan	Changeover	Color
T4039B1008	Fan coil, cooling only	Approximately 2 F at midscale	ON-OFF	HI-MEDLO	_	Tan

T921 Proportional Thermostat

Proportional Thermostats provide low voltage, 3-wire control for valve motors, damper motors, and balancing relays in heating or cooling system applications.

- Bellows element adjusts potentiometer slider to regulate motor operation.
- Removable setting knob prevents unauthorized tampering with setpoint.

Dimensions, Approximate: 5 11/16 in. high x 3 3/8 in. wide x 2 1/4 in. deep

Mounting: Wall mount	ted		
Product Number	Setpoint Temperature Range (F)	Output Signal	Includes
T001 A 1 1 0 1	EC C to 04 C	10E Ohm notantiamatar	Tradeline model which includes eletted sides and an odd

T921A1191 56 F to 84 F 135 Ohm potentiometer Tradeline model which includes slotted sides and an add-on faceplate to allow thermostat to be mounted horizontally.

T651 Medium Duty Line Voltage Thermostat

Light Duty Line Voltage Thermostats control line voltage valves, motors, contractors, electric heat, elements, duct furnaces, and fan coil units in heating/cooling systems.

· Automatic cooling and heating anticipation. Mount on standard vertical or horizontal outlet box.

Dimensions, Approximate: 4 1/2 in. high x 2 15/16 in. wide x 1 1/2 in. deep (switches and wiring terminals protrude into outlet box 3/4 in.) Electrical Ratings: 9.8 FLA @ 120 Vac; 5.6 FLA @ 208 Vac, 4.9 FLA @240 Vac

Voltage: 120 Vac -277 Vac Frequency: 50/60 Hz **Differential Temperature:** 2 F Sensor Element: Vapor filled dual diaphragm.

Color: Champagne gold faceplate with beige cover.



Product Number	Application	Setting Temperature Range (F)	Switch Position System	Switching Action	Includes
T651A3018	Heating and cooling	44 F to 86 F	heating and cooling	SPDT - breaks heating and makes cooling on temperature rise	Thermometer, range stops and locking cover screws, wall plate, horizontal scaleplate with no thermometer, high accuracy Dual Diaphragm sensor

PRO 3000 Non-Programmable Thermostats

Honeywell's PRO 3000 offers a basic thermostat with the convenience of an easy-to-read digital display. Best of all, it's backed by the Honeywell brand name.

- Non-programmable digital thermostat
- Backlit digital display both current and set temperatures are easy to read in various lighting conditions
- Shows both current and set temperatures at the same time
- Precise comfort control [± 1°F (± 0.5°C)] maintains consistent comfort to the highest level of accuracy
- Basic operation slide switches allow you to select the heat or cool mode, and operate the fan

Display Size: 1.32 sq in. Color: Premier White® Changeover: Manual

Switch Positions (Fan): AUTO-ON

Accuracy: ±1°F (± 0.5°C)

Operating Humidity Range (% RH): 5 to 90% RH, non-condensing

Power Method: Dual Powered:

Battery or HardwireFrequency: 50 Hz; 60 HzElectrical Ratings: 20 to 30 Vac or 750 mVDimensions: 3 13/16 in.

High X 5 3/8 in. Wide X 1 1/4 in. Deep (97 mm High X 137 mm Wide X 32 mm Deep)

Product Number	Switching	Temperature Range	Switching Action	Stages	Supply Voltage
TH3110D1008	Heat-Off-Cool	40F - 90F	SPDT	1 Heat / 1 Cool	20 to 30 VAC

WiFi VisionPRO® 8000

Your customers want comfort, convenience and connectivity. With the Wi-Fi VisionPRO, you can offer them all three. Using an existing Wi-Fi network plus Honeywell's free Total Connect Comfort services, the Wi-Fi VisionPRO allows homeowners to remotely control their comfort settings and manage their energy costs – with ease.

- Intuitive programming for easier setup
- Remote comfort control via any connected device
- Universal application across more system types
- Equipment check/change reminders
- Programmable for annual energy savings

Applications: Up to 3 Heat/2 Cool heat pump or up to 2 Heat/2

Cool conventional

Display Size: 10 sq in.Color: Arctic White

Changeover: Auto or Manual

Stages: Up to 3 Heat / 2 Cool Heat Pump or Up to 2 Heat / 2

Cool Conventional

Switch Positions (System): HEAT-OFF-COOL-AUTO-EM. Switch Positions (Fan): AUTO-ON-CIRC-FOLLOW Setting Temperature Range: Heat: 40°F to 90°F; Cool 50°F to 99°F

(Heat: 4.5°C to 32.0°C; Cool: 10°C to 37.0°C) Operating Temperature Range: 32°F to 120°F Humidification Setting Range: Cooling: 40 to 80% RH.



Heating: 10 to 60% RH.

Dehumidification Setting Range: 40 to 80% RH. Operating Humidity Range (% RH): 5 to 90% RH

Power Method: Hardwired

Supply Voltage: 18 to 30 Vac or 750 mVFrequency: 50 Hz; 60

Hz Electrical Connections: Screw terminals

Electrical Ratings: 18 to 30 Vac or 750 mVDimensions: 4 5/8

in. High, 4 15/16 in. Wide, 1 1/8 in. Deep

Product Number	Switch Positions System	Fan	Terminal Designations	Stages	Comments
TH8321WF1001	HEAT-OFF-COOL AUTO	AUTO-ON	R, RC, C, W (O/B), Y, Y2, G, A-L/A, K, U1 U2, S1 S1	Up to 3 Heat/ 2 Cool	Selectable to Heat Only or Cool Only



PRO 4000 5-2 Day Programmable Thermostat

The PRO series provides programmable thermostats for 24 Vac conventional and heat pump systems or 750 mV heating systems.

- Weekday/Weekend programming 5-2 (Weekdays, Weekend) programming to fit your lifestyle.
- Backlit digital display both current and set temperatures are easy to read in various lighting conditions.
- Precise comfort control (±1 F) maintains consistent comfort to the highest level of accuracy.
- Basic operation easy-to-use slide switches allow you to select the heat or cool mode, and operate the fan.
- Built in instructions simple, pull out instruction manual.
- Adaptive Intelligent RecoveryTM ensures programmed temperature is reached by programmed time.

Dimensions, Approximate: 3 13/16 in. High X 5 3/8 in. Wide

Programmability: 5-2 Day Program

Changeover: Manual Color: Premier White®

Setting Temperature Range: Heat: 40 F to 90 F; Cool: 50 F to 99 F Electrical Ratings: 20 to 30 Vac or 750mV

Operating Temperature Range: 32 F

to 120 F (0 C to 48.9 C) **Differential Temperature:** ± 1 F (± 0.5

Currents (Cooling): 0.02 A to 1.0 A

running

Currents (Heating): 0.02 A to 1.0 A running

Frequency: 50 Hz; 60 Hz

Power Method: Battery or Hardwired

Sensor Element: Thermistor Mounting: Horizontal

Accessories:

50002883-001 PRO 4000 Cover Plate

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Product		Switch Positions		Terminal		
Number	Application	System	Fan	Designations	Stages	
TH4110U2005	1 Heat / 1 Cool Conventional and Heat Pump	COOL-OFF-HEAT	AUTO-ON	R, Rc, W, Y, G, O, B, C	1 Heat/1 Cool	

FocusPRO™ T6 Programmable Thermostat

The FocusPRO™ programmable thermostat provides electronic control of 24 Vac conventional and heat pump systems or 750 mV heating systems.

- Weekday/Weekend programming use as a 5-1-1 (Weekdays, Saturday, Sunday) or 5-2 (Weekdays, Weekend) programmable thermostat, whichever best fits your lifestyle.
- Large, clear, backlit display easy to read in various lighting conditions.
- Display size options available in large screen or standard.
- Precise comfort control (±1 F) maintains consistent comfort to the highest level of accuracy.
- Simplified programming and operation.
- Easy change battery door flip out door allows for easy battery replacement without removing or disassembling the thermostat.
- Built in instructions simple, pull out instruction manual.
- Adaptive Intelligent Recovery? ensures programmed temperature is reached by programmed time.
- Temperature range stops prevents user from setting the temperature too high or too low.

Application: Conventional and Heat Pump systems

Dimensions, Approximate: 3 9/16 in. High X 5 13/16 in. Wide

Color: Premier White®

Programmability: 5-1-1 Day Program Changeover: Auto or Manual Setting Temperature Range: Heat: 40 F to 90 F; Cool: 50 F to 99 F Electrical Ratings: 20 to 30 Vac or 750mV

Operating Temperature Range: 32 F to 120 F (0 C to 48.9 C)

Power Method: Battery or Hardwired

Sensor Element: Thermistor Mounting: Horizontal

Accessories:

50002883-001 FocusPRO 6000 Cover Plate



Product Switch Positions					
Number	System	Fan	Terminal Designations	Stages	Comments
TH6210U2001	HEAT-OFF-COOL-AUTO	AUTO-ON	Rc, R, W (O/B), Y, G, C	Up to 2 Heat/1 Cool	Standard Display

Wireless Thermostat Kits

Everything you need to relocate thermostat or upgrade equipment without running new wires. Includes the Portable Comfort Control to sense and control temperature from any room and a Wireless Outdoor sensor to display outdoor temperature and humidity on all devices.

•WIRELESS FocusPRO® THERMOSTAT: Same great features of the FocusPRO® thermostat - now wireless. Installs in minutes. Displays outdoor temperature and humidity. 1 year battery life. 2 month low battery warning. Dual Fuel enabled.

•EQUIPMENT INTERFACE MODULE (EIM): All HVAC equipment is wired to the module. Module receives communication from the wireless devices.

•RETURN AIR SENSOR: Works with the Equipment Interface Module to maintain safe indoor temperatures if power is lost at the wireless thermostat. Maintains 62 F for heating and 82 F for cooling.

•PORTABLE COMFORT CONTROL: Allows homeowners to sense and control temperature from any room in the home to provide comfort where they spend their time. Manage comfort and energy savings from one convenient control. Touchscreen interface with backlit display. Displays outdoor temperature and humidity. 1 year battery life. 2 month low battery warning

.•WIRELESS OUTDOOR SENSOR: Reliable performance in all climates. Installs in minutes. Up to 5 year battery life. 2 month low battery warning

.•RedLINK™ WIRELESS TECHNOLOGY: Powered by RedLINK™ reliability. No interference with other wireless devices in the home.

Application: Gas, oil, electric, heat pump, forced warm air, hot water, steam or gravityElectrical Ratings: Equipment Interface Module--18 to 30 Vac, 50 Hz; 60 HzChangeover: Auto/Manual

SelectableCurrents (Cooling): 1.0 A runningCurrents (Heating): 1.0 A runningCurrents (Fan): 0.6 A running-Power Method: Thermostat-





BatteryAccessories:50002883-001 FocusPRO® 5000/6000 and PRO 3000/4000 Cover Plate Assembly50007298-001 12 **p**

Product	Switch Positions System Fan				
Number			Terminal Designations	Stages	Accessories
YTH6320R1001	HEAT-OFF COOL-AUTO EM. HEAT	AUTO ON	C, R, Rc, Rh, W-O/B, W2- Aux/E, Y, Y2, G, L, RAS	Up to 3 Heat/ 2 Cool Heat Pump Up to 2 Heat 2 Cool Conventional	REM5000R1001 Personal Comfort Station; TH6320R1004 Wireless FocusPRO® 5-1-1 C7089R1013 Wireless Outdoor Sensor C7735A1000 Return Air Sensor

T498 Electric Heat Thermostat

Electric Heat Thermostats provide line voltage control of electric heating systems.

- Easy to install; color-coded leads.
- Include thermometer. Include long-lasting Micro Switch™ mechanism; makes on temperature fall.
- Rugged, plastic mounting base.
- Mount on standard 2 x 4 in. outlet box or 4 x 4 in. junction box.
- Select models include extra knob decal for recalibration, if necessary.

Dimensions: 4 9/16 in. high x 2 7/8 in. wide x 1 15/16 in.

Color: Brush gold finish

Electrical Ratings: Noninductive Resistive 22A at 120/208/240 Vac.

19A at 277 Vac.

Electrical Connections: 6 in. black and red leadwires **Operating Temperature Range:** 40 F to 80 F

Differential Temperature: 3 F

Frequency: 60 Hz Sensor Element: Bimetal Mounting: Vertical

Approvals:

Canadian Standards
Association: Listed: File No.

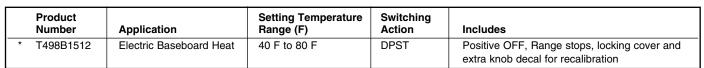
LR1322

Underwriters Laboratories, Inc. Listed; File No. E47434, Guide No.

XAPX

Accessories:

272804A Range Stop and Locking Screws Assembly 272823 Blind Locking Cover and Range Stop Assembly





T87 Thermostats

The Round® Thermostat provides temperature control for 24 to 27 Vac residential heating, cooling or heating-cooling systems.

- Available with two- or three-wire wallplate for heating-only, cooling only, or heating-cooling systems with remote switching.
- Adjustable heat anticipator for comfortable temperature control.
- Use Q539 Subbase in heating and cooling systems requiring system and fan switching at the thermostat location.
- Temperature scale in Fahrenheit on thermostat.
- Separate temperature setting and thermometer scale on thermostat face.
- Honeywell offers other T87F models to meet specific needs and applications.
- The Easy-To-See T87F Thermostat has enlarged scale and raised designations.

Application: Single stage heating and cooling systems

Dimensions, Approximate: 3 11/16 in. diameter x 1 3/4 in. deep.

Electrical Ratings: 1.5A @ 30 Vac

Changeover: Manual

Anticipator (heating): 0.1 to 1.2A Adj. Anticipator (cooling): 0 to 1.5A, 24 to 30 Vac

Accuracy: 2 F Switch Type: Relay

Sensor Element: Thermistor

Mounting: Round

Used With: Q539 Subbase

Accessories:

104456B Two terminal heat only T87 wallplate.

137421AE 3 terminal heat only wall-plate assembly with positive off. **137421K** 3 terminal heat only wall-plate assembly.

137421R 3 terminal heat only wall-plate assembly.

198170A Designer Beige Adapter Kit 198172 Cover Ring for T87 Designer Beige models

199933 Cover Ring for Taupe T87 models

202687A Premier White® Adapter Kit 32005439-001 Taupe Adapter Kit includes Cover Plate and Adaptor TG587F1008 Thermostat Guard for T87/Q539 with see-through face TG587F1016 Thermostat Guard for T87/Q539 with opaque window





Product Number	Color	Terminal Designations	Setting Temperature Range (F)	Stages	Comments	Includes
T87F5199	White	R, W, Y	40 F to 90 F	SPDT	EASY-TO-SEE model with Large	137421R Wallplate, 6 in.
					raised markings. A click at each 2	cover ring and switch
					degree setpoint change	position labels.
T78K1007	White	R, W, Y	40 F To 90 F	1 Heat	Mercury Free	
T87N1000	White	R, Rc, W, Y, G	40 F To 90 F	1 Heat/	Mercury Free	
		O, B		1 Cool		
T87N1026	White	R, Rc, W, Y, G	40 F To 90 F	1 Heat/	EASY-TO-SEE model with Large	6 in. cover ring
		О, В		1 Cool	raised markings. A click at each 2 degree setpoint change	and switch position labels



TG510 Versaguard Universal Thermostat Guards

Enclose and protect wall thermostats against tampering, damage and unauthorized adjustment of thermostat settings.

- Unique double-wall construction provides extra measure of tamperresistance.
- Used in both new and existing applications.
- Constructed of opaque polystyrene, clear acrylic, or beige painted steel.
- Includes opaque polystyrene wallplate, ring base, guard cover, tumbler lock, two keys and optional Honeywell logo insert.
- Tamper-resistant lock; key cannot be removed unless in locked position.

- All models mount vertically or horizontally on wall or exposed junction box.
- Vents in guard base allow airflow for optimum thermostat performance.

Inside Height: 4 7/16 in. Inside Width: 4 7/16 in. Outside Height: 5 7/8 in. Outside Width: 5 7/8 in. Outside Depth: 2 1/2 in.

Accessories:

191990A Replacement Keys (set of 2)



Product Number	Size	Color	Ring Base Color	Wallplate Color	Used With
TG510A1001	small	Clear Acrylic	clear acrylic	Opaque Polystyrene	T87/Q539, TP970 Family, Others of similar size

TG511 Versaguard Universal Thermostat Guards

Enclose and protect wall thermostats against tampering, damage and unauthorized adjustment of thermostat settings.

- Unique double-wall construction provides extra measure of tamperresistance.
- Used in both new and existing applications.
- Constructed of opaque polystyrene, clear acrylic, or beige painted steel.
- Includes opaque polystyrene wallplate, ring base, guard cover, tumbler lock, two keys and optional Honeywell logo insert.
- Tamper-resistant lock; key cannot be removed unless in locked position.

- All models mount vertically or horizontally on wall or exposed junction box.
- Vents in guard base allow airflow for optimum thermostat performance.

Inside Height: 5 1/16 in. Inside Width: 6 1/16 in. Outside Height: 6 1/2 in. Outside Width: 7 1/2 in. Outside Depth: 2 15/16 in.

Accessories:

191990A Replacement Keys (set of 2)



Product Number	Size	Color	Ring Base Color	Wallplate Color	Used With
TG511A1000	medium	Clear Acrylic	clear acrylic	Opaque Polystyrene	T874/Q674, Others of similar size
TG511B1008	medium	Opaque polystyrene	opaque polystyrene	Opaque Polystyrene	T874/Q674, Others of similar size

TG512 Versaguard Universal Thermostat Guards

Enclose and protect wall thermostats against tampering, damage and unauthorized adjustment of thermostat settings.

- Unique double-wall construction provides extra measure of tamperresistance.
- Used in both new and existing applications.
- Constructed of opaque polystyrene, clear acrylic, or beige painted steel.
- Includes opaque polystyrene wallplate, ring base, guard cover, tumbler lock, two keys and optional Honeywell logo insert.
- Tamper-resistant lock; key cannot be removed unless in locked position.
- All models mount vertically or horizontally on wall or exposed junction box.

- Vents in guard base allow airflow for optimum thermostat performance.
- TG512A1058 Cover has a hole for access to up and down keys on thermostat.

Inside Height: 5 7/8 in. Inside Width: 8 3/8 in. Outside Height: 7 1/4 in. Outside Width: 9 3/4 in. Outside Depth: 3 3/8 in.

Accessories:

191990A Replacement Keys (set of 2)





Product I	Number	Size	Color	Ring Base Color	Wallplate Color	Used With
TG512A1	009	large	Clear Acrylic	clear plastic	Opaque Polystyrene	T8600, T8090, Others of similar size
TG512B1	007	large	Opaque polystyrene	opaque polystyrene	Opaque Polystyrene	T8600, T8090, Others of similar size

CONTACTORS

Definite Purpose Contactors – 1 and 2 pole

These electromagnetically-operated Definite Purpose Contactors provide switching for starting induction motors.

- Meets ARI-780 Standard at started ratings (500,000 cycle mechanical life, 200,000 cycle electrical life and 10,000 cycle recycle life); the most demanding ARI requirement.
- Silver cadmium oxide contacts provide long life under demanding duty cycles.
- Low profile design allows for more wiring room.
- Multiple mounting holes and slots for convenient, interchangeable mounting with most competitive devices.

Application: PowerPro Definite Purpose

Contactor

Temperature Range: -4 F to +149 F Contact Connections (coil): 1/4 in. quick-con-

nects

Approvals:

Underwriters Laboratories, Inc. UL Component Recognized: File No. 14480, Guide No. NLDX2



	Contact Electrical Ra	atings	Dimensions,		Coil	Electrical	
Product Nimber	(AFL @ 277, 480, 600 Vac)	(Resistive @ 277, 480, 600 Vac)	Approximate (inch)	Poles	Ratings Voltage	Connections (main)	
DP1030A5013	30 A @ 240/277 Vac	48 A @ 240/277 Vac	2 3/16 in. high x 2 1/2 in. wide x 3 5/16 in. deep	1 with shunt	24 Vac	#10-32 combination head screws	
DP2030A5004	30 A @ 240/277 Vac	48 A @ 240/277 Vac	3 1/4 in. high x 2 5/8 in. wide x 3 3/4 in. deep	2	24 Vac	#10-32 combination head screws and sems screws	
DP2030A5012	30 A @ 240/277 Vac	48 A @ 240/277 Vac	3 1/4 in. high x 2 5/8 in. wide x 3 3/4 in. deep	2	24 Vac	sems screws	
DP2030B5003	30 A @ 240/277 Vac	48 A @ 240/277 Vac, 480 Vac, 600 Vac	2 3/16 in. high x 3 5/16 in. wide x 2 5/32 in. deep	2	120 Vac	sems screws	

Definite Purpose Contactors – 3 pole

These three pole definite purpose electromagnetically operated contactors provide switching for starting of induction motors.

- Meets ARI-780 Standard at started ratings (500,000 cycle mechanical life, 200,000 cycle electrical life and 10,000 cycle recycle life); the most demanding ARI requirement.
- Shrouded coils on 3 pole (25A to 60A) models protect the coil from harsh environment factors.
- Moisture proof epoxy is used to encapsulate the 3 pole 75A through 120A coils.
- Multiple mounting holes and slots for convenient, interchangeable mounting with most competitive devices.
- · Traditional design meets many needs.
- Full array of replacement coils, contact sets and accessories available.

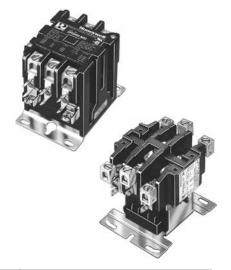
Application: PowerPro Definite

Purpose Contactor

Temperature Range: -4 F to +149 F Contact Connections (coil): 1/4 in. quick-connects and #6 screws

Approvals:

Underwriters Laboratories, Inc.UL Component Recognized: File No. 14480, Guide No. NLDX2



	Contact Electrical Rating	Contact Electrical Ratings			Coil	Electrical	
Product Nimber	(AFL @ 277, 480, (Resistive @ 277 600 Vac)		Approximate (inch)	Poles	Ratings Voltage	Connections (main)	
DP3030A5003	30 A @ 240 Vac/277 Vac, 480 Vac, 600 Vac	40 A @ 240/277 Vac, 480 Vac, 600 Vac	2 7/8 in. high x 2 7/8 in. wide x 4 in. deep	3	24 Vac	#10-32 combination head screws	
DP3040A5002	40 A @ 240/277 Vac, 480 Vac, 600 Vac	50 A @ 240/277 Vac, 480 Vac, 600 Vac	3 1/8 in. high x 2 7/8 in. wide x 4 1/16 in. deep	3	24 Vac	lug connectors	

CONTACTORS

Definite Purpose Contactors - 2 Pole

These electromagnetically-operated Definite Purpose Contactors provide switching for starting induction motors.

- Silver cadmium oxide contacts provide long life under demanding duty cycles.
- Low profile design allows for more wiring room.
- Multiple mounting holes and slots for convenient, interchangeable mounting with most competitive devices.

Temperature Range: -4 F to +149 F (-20 C to +65 C)

Contact Connections (coil): double 1/4 in. quick-connects

Approvals:

Underwriters Laboratories, Inc. UL Component Recognized: File No. E59779, Guide No. NLDX2



	Contact Electrical Ratir	ngs	Dimensions,		Coil	Electrical	
Product Nimber	(AFL @ 277, 480, 600 Vac)	(Resistive @ 277, 480, 600 Vac)	Approximate (inch)	Poles	Ratings Voltage	Connections (main)	
DP2030A1003	30 A @ 240/277 Vac	48 A @ 240/277 Vac, 480 Vac, 600 Vac	3 1/4 in. high x 2 5/8 in. wide x 3 3/4 in. deep	2	24 Vac	#10 combination head screws	
DP2030C1001	30 A @ 240/277 Vac	40 A @ 240/277 Vac, 480 Vac, 600 Vac	2 3/16 in. high x 3 5/16 in. wide x 2 1/2 in. deep	2	208 Vac; 240 Vac	#10 combination head screws	
DP2040A5003	40 A @ 277 Vac, 480 Vac & 600 Vac	55 A @ 277 Vac, 480 Vac & 600 Vac	2 3/16 in. high x 3 5/16 in. wide x 2 5/32 in. deep	2	24 Vac	#10-32 combination head screws	

Definite Purpose Contactors - 3 and 4 Pole

Definite purpose four (40A) pole contactors provide switching for across-the-line starting of induction motors.

- Shrouded coils on 3 pole (25A to 60A) models protect the coil from harsh environment factors.
- Moisture proof epoxy is used to encapsulate the 3 pole 75A through 120A coils.
- Multiple mounting holes and slots for convenient, interchangeable mounting with most competitive devices
- Traditional design meets many needs.

• Full array of replacement coils, contact sets and accessories available.

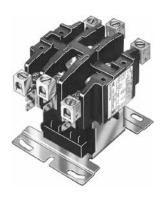
Temperature Range: -4 F to +149 F (-20 C to +65 C)

Contact Connections (coil): 1/4 in. quick-connects and #6 screws

Approvals:

Underwriters Laboratories, Inc. Component Recognized: File No. 14480, Guide No.

NLDX2



	Contact Electrical Ratings		Dimensions,		Coil	Electrical	
Product Nimber	(AFL @ 277, 480, 600 Vac)	(Resistive @ 277, 480, 600 Vac)	Approximate (inch)	Poles	Ratings Voltage	Connections (main)	
DP3030A1002	_	_	2 7/8 in. high, 2 1/4 in. wide, 4 in. deep	3	24 Vac	#10 combination head screws	
DP3040A1001	40 A @ 240/277 Vac, 480 Vac, 600 Vac	50 A @ 240/277 Vac, 480 Vac, 600 Vac	2 7/8 in. high x 2 1/4 in. wide x 4 in. deep	3	24 Vac	lug connectors	
DP3050A1000	50 A @240/277 Vac, 480 Vac, 600 Vac	63 A @ 240/277 Vac, 480 Vac, 600 Vac	2 7/8 in. high x 2 7/8 in. wide x 4 in. deep	3	24 Vac	lug connectors	
DP3040B5001	40 A @ 240/277 Vac, 480 Vac, 600 Vac	50 A @ 240/277 Vac, 480 Vac, 600 Vac	2 7/8 in. high x 2 1/4 in. wide x 4 in. deep	3	120 Vac	lug connectors	
DP3040C1009	40 A @ 240/277 Vac, 480 Vac, 600 Vac	50 A @ 240/277 Vac, 480 Vac, 600 Vac	2 7/8 in. high x 2 1/4 in. wide x 4 in. deep	3	208 Vac 240 Vac	lug connectors	



R8246 Electric Heat Contactor

Provide conventional on-off control of heating elements and fan in an electric furnace.

- Designed for quiet operation. TheR8246A replaces over 50 Honeywell and competitive electric heat primaries, including the Honeywell R8330 Electric Furnace Sequencer.
- Use on furnaces with a line voltage or pilot duty limit
- Simple ON-OFF switching readily understood and easily serviced-
- Eliminates cold drafts on system startup.

Application: Electric Heat Contactor

Temperature Range: -40 F to +165 F (-40 C to

+74

Contact Electrical Ratings: First Pole Resistive Only, Second Pole Resistive/Inductive Combined:

See Specs.

Approvals:

Canadian Standards Association: Recognized Underwriters Laboratories, Inc. UL Component

Recognized



Product Number	Dimensions, Approximate (inch)	Poles	Electrical Connections (main)	Description
R8246A1038	2 3/16 in. high x 3 5/16 in. wide x 2 3/16 in. deep	2	Male 1/4 in. (6 mm) quick-connects plus terminal clamp screws	2 pole Electric Heat Relay

ST9103 Electronic Fan Timers

ST9103A integrates control of burner and circulating fan operations in an oil furnace.

- Central appliance wiring point simplifies appliance assembly and service.
- Fixed or field-adjustable heat fan on delay; field adjustable heat fanoff delay.

Application: A single circuit board providing combustion air blower control, two speed circulating air blower control, oil primary control, limit circuit inputs,

thermostat wiring terminations, & a central appliance wiring point for an oil fixed furnace.

Electrical Ratings: 18 to 30 Vac Frequency: 50 Hz; 60Hz

Approvals:

Underwriters Laboratories, Inc. Listed: Report

MP466



Product Number	Heat Fan OnDelay	Heat Fan Off Delay	Cool Fan On Delay	Cool Fan Off Delay	Ambient Temperature Range (F)	Replaces
ST9103A1002	adj. 60, 90, 120, 150 (set at 150 sec) 50/60 Hz	adj. 60, 90, 120, 150 sec (set at 150 sec)	fixed 0 sec	fixed 0 sec	-40 F to +150 F	ST9103A1002

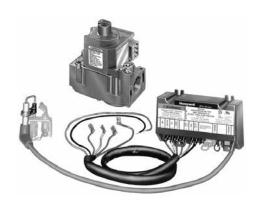
Y8610U Universal Retrofit Intermittent Pilot Gas Burner Ignition Systems

Complete kits converting conventional standing pilot system to intermittent pilot system. For use with 24 Vac gas-fired atmospheric furnaces, boiler and heating appliances.

- Y8610U kits are for use with natural or LP gas: provides 100 percent pilot gas shutoff if pilot fails to light; after 6-minute delay, trial for ignition is repeated.
- Ignition trial/delay sequence is repeated until the appliance lights or call for heat is removed.

Flame Sense: Single Rod Ignition Sequence:

Continuous trial for pilot ignition [no shut down or lockout] Ignition Source: Internal high voltage spark generator Ignition System Type: Intermittent Pilot



Product Number	Flame Failure Response Time (sec)	PrePurge	Description
Y8610U6006	0.8 sec. @ 1.0 microamp	None	Y-pack containing S8610U1003 and VR8304M with 1/2 inch by 3/4 inch inlet/outlet, flange kit, LP conversion kit and vent damper

Q314 Pilot Burner

Nonprimary-aerated, insert orifice type pilot burner for main burner ignition with Q340 or Q390 Thermocouple for Pilotstat safety control operation.

- Use with Q313 Thermopile Generator for 750 mV powerpile applications.
- Variety of mounting brackets available.
- Variety of tip styles to provide desired flame pattern.
- Interchangeable, color-coded orifice and inlet fittings can be ordered to convert between natural and LP gas.

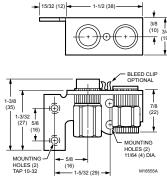


Type of Gas: Natural Aeration: Non-primary

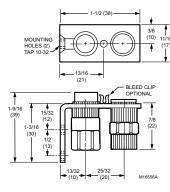
Approvals:

American Gas Association: IAS Certified File No. L2025001

Dimensions Diagram



Dimensions Diagram



Product Number	Compression Fitting Length	Compression Fitting Size	Mounting Bracket	Tip Style	Direction of Front Tip	Orifice	Includes
Q314A3547	_	1/4 in.	А	Single	(L) Left	BCR-18 (0.018 in.)	1/4 in. CC inlet fitting
Q314A4586	_	1/4 in.	В	Single	(F) Front	BCR-18 (0.018 in.)	1/4 in. CC inlet fitting; special mounting bracket with screws for converting "B" bracket to "A"; and LP Orifice
Q314A6094	_	1/4 in.	В	Single	(L) Left	BCR-18 (0.018 in.)	1/4 in. CC inlet fitting; special mounting bracket with screws for converting "B" bracket to "A"
Q314A6102	_	1/4 in.	В	Single	(K) Right	BCR-18	Special mounting bracket with screws to convert bracket from from "B" to "A"

S8610; Intermittent Pilot Module

Provide electronic control of intermittent pilot ignition systems used on gas-fired furnaces, boilers and other heating appliances.

- Provide ignition sequences, flame monitoring and safety shutoff for intermittent pilot central furnaces and heating appliances.
- Functional equivalent of S86, S860, and S90 modules. Include spark cable adapter to allow field replacement of S86, S860, and S90 without replacing existing spark cable.
- Include relay contacts for use with any intermittent pilot gas control string with maximum 1.0A pilot and 2.0A main valve rating; Honeywell VR8204 or VR8304 combination gas control recommended. S8670D is for use with natural or LP gas; modules provide 100 percent pilot gas shutoff and lockout if pilot fails to light.

Application: Provide electronic control of intermittent pilot ignition systems used on gas fired furnaces, boilers, and other heating appliances. **Dimensions, Approximate:** 3 15/16 in. high x 5 7/16 in. wide x 2 5/8 in. deep (102 mm high x 138 mm wide x 67 mm deep)

Type of Gas: Natural Electrical Ratings: 24 Vac Frequency: 60 Hz Flame Sense: Single Rod Ignition Sequence:

Continuous trial for pilot ignition [no shut down or lockout]

Ignition Source: Internal high voltage spark gener-

Ignition System Type: Intermittent Pilot

Maximum Valve Load @ 24 Vac (Amps): 1A Pilot, 2A Main @ 165 F;

1A Pilot, 1A Main @ 175 F

Typical Gas Control: VR8204, VR8304

Maximum Ambient Temperature: -40 F to +165 F (-40 C to +74 C)

Approvals:

Canadian Standards Association: Design Certified

Accessories:

394800-30 Ignition Cable Assembly **394801-30** Ignition Cable Assembly

Product Number	Flame Failure Response Time (sec)	Ignition Trial Time (sec)	Ignition Trials To Lockout	Lockout Timing	PrePurge	Includes
S8610H1004	0.8 sec. @ 1.0 mA flame current	1 sec.	1	15 sec. maximum	None	_

S8610U Universal Intermittent Pilot Module

Field service replacement for most Honeywell, Robertshaw, Johnson, and UTEC (HSC) Intermittent Pilot Ignition Modules. Provides electronic control of most intermittent pilot ignition systems used on gas-fired furnaces, boilers, and other heating appliances.

- Provides ignition sequence, flame monitoring and safety shutoff for intermittent pilot central furnaces and heating appliances.
- Provides 100 percent pilot gas shutoff if pilot fails to light; after 6-minute delay, trial for ignition is repeated. Ignition trial/delay sequence is repeated until the appliance lights or call for heat is removed.
- For use with Natural or LP gas.
- For use in single rod or dual rod/remote sense applications. Includes relay contacts for use with any intermittent pilot gas control string with maximum 1.0A pilot or 2.0A main valve rating; Honeywell VR8204, VR8304 or VR8345M combination gas control recommended.
- Functional equivalent of S86, S8600, S8610 and S90 modules.
- Includes spark cable adapters to allow field replacement of both Honeywell and competitive controls without replacing existing spark cable

Application: Provide electronic control of intermittent pilot ignition systems used on gas fired furnaces, boilers, and other heating appliances. **Dimensions, Approximate:** 3 15/16 in. high x 5 7/16 in. wide x 2 5/8 in. deep (102 mm high x 138 mm wide x 67 mm deep)

Type of Gas: Natural or LP Electrical Ratings: 24 Vac Frequency: 60 Hz Flame Sense: Single Rod or Two Rods

Ignition Sequence:Continuous retry, after trial

for ignition, pilot gas shuts off for 5 minutes, then

another trial for pilot ignition takes place

Ignition Source: Internal high voltage spark generator

Ignition System Type: Intermittent Pilot

Maximum Valve Load @ 24 Vac (Amps): 1A Pilot, 2A Main @ 165 F;

1A Pilot, 1A Main @ 175 F

Typical Gas Control: VR8204, VR8304 Typical Ignition Hardware: Q345

Maximum Ambient Temperature: -40 F to +165 F (-40 C to +74 C)

Approvals:

Canadian Standards Association: Design Certified

Accessories:

394800-30 Ignition Cable Assembly **394801-30** Ignition Cable Assembly

Product Number	Flame Failure Response Time (sec)	Ignition Trial Time (sec)	Between Trial Time (sec)	Ignition Trials To Lockout	Lockout Timing	PrePurge	Includes
S8610U1003	0.8 sec. @ 1.0 mA flame current	continuous retry	5 minute delay after failed trial for ignition.	continuous retry	90 sec. maximum	Up to 30 sec	Damper connection with automatic vent damper plug





S8910 Universal Hot Surface Ignition Module

Universal Hot Surface Ignition Module is designed to provide easy field replacement of a wide range of hot surface ignition modules manufactured by Honeywell, Robertshaw and White-Rodgers. The S8910U Module provides operating control of a direct ignition system using a 120 Vac hot surface igniter.

- Replaces many White-Rodgers, Robertshaw and Honeywell hot surface ignition models.
- For 120 Vac (up to 5.0A) surface igniter (Norton 201/271 or equivalent).
- For local (single rod) or remote (dual rod) rectification type flame sensing.
- Contains easy-to-use instructions plus the accessories required to adapt the existing hot surface ignition module.
- Provides one or three ignition trials (four-second or seven-second trials) per call for heat; prepurge of 32 seconds or less; up to 96 seconds between purge trial times.
- Temperature range is -40 to +175 F (-40 to +79 C).

Application: Provide electronic control of direct hot surface ignition systems used on gas fired furnaces, boilers, and other heating appliances.

Dimensions, Approximate: 5 1/4 in. high x 4 1/16 in. wide x 1 15/16

in. long (133 mm high x 103 mm wide x 49 mm deep) **Type of Gas:** Natural or LP

Electrical Ratings: 24 Vac Frequency: 60 Hz Flame Sense: Single Rod or Two Rods

Ignition Sequence: The

number of trials for ignition and trial time is determined by the selection tab. If a selection tab is not installed, the module will operate at four seconds trial time and one ignition trial.

Ignition Source: Line Voltage (120 VAC) Hot Surface Element (Norton

Model 201 or 270)

Ignition System Type: Direct Hot Surface Ignition Maximum Valve Load @ 24 Vac (Amps): 2A Typical Gas Control: VR8205, VR8305, VR8345

Typical Ignition Hardware: Norton 201, Norton 271, Q354

Maximum Ambient Temperature: -40 F to +175 F (-40 C to +79 C)

Approvals:

Canadian Standards Association: Design Certified

Product Number	Flame Failure Response Time (sec)	Ignition Trial Time (sec)	Between Trial Time (sec)	Ignition Trials To Lockout	Lockout Timing	PrePurge
S8910U1000	1.5 sec.	4 sec. or 7 sec.	(2) 96 sec 3 trial mode only	1 or 3	4 sec. or 7 sec.	32 sec.

S87 Direct Spark Ignition Module

Provide electronic control of direct spark ignition systems used on gas fire furnaces, boilers, and other heating appliances.

- Control ignition sequence and gas control operation.
- Generate high voltage potential for main burner ignition.
- Lockout after one trial for ignition if main burner fails to ignite.
- Reset from thermostat after lockout.
- Use modules (except S87C) with any combination gas control designed for direct spark applications and rated 2.0A or less.

Application: Provide electronic control of direct spark ignition systems used on gas fired furnaces, boilers, and other heating appliances. **Dimensions, Approximate:** 5 1/4 in. high x 4 1/16 in. wide x 1 15/16

in. long (133 mm high x 103 mm wide x 49 mm deep)

Type of Gas: Natural or LP Electrical Ratings: 24 Vac

Frequency: 60 Hz
Flame Sense: Single Rod

Ignition Sequence: Multiple trials for main burner ignition (then shut down and lockout) **Ignition Source:** Internal high voltage

spark generator

Ignition System Type: Direct Spark

Ignition

Maximum Valve Load @ 24 Vac (Amps):

2A

Typical Gas Control: VR8205, VR8305, VR8345

Typical Ignition Hardware: Q347A

Maximum Ambient Temperature: -40 F to +175 F (-40 C to +79 C)



Product Number	Flame Failure Reignition Time (sec)	Flame Failure Response Time (sec)	Ignition Trial Time (sec)	Ignition Trials To Lockout	Lockout Timing	PrePurge
S87C1014	0.8 sec. maximum	0.8 sec. @ 5.0 microamp	11 sec.	1	11 sec.	None

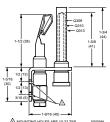
Q327 Pilot Burner

Primary-aerated, spud orifice-type pilot burner for main burner ignition with Q340 or Q390 Thermocouple for Pilotstat safety control operation.

- Use with Q313 Thermopile Generator for 750 mV powerpile applications.
- · Variety of mounting brackets available.
- Variety of tip styles to provide desired flame pattern.
- Interchangeable, color-coded orifice and inlet fittings can be ordered to convert between natural and LP gas.



Dimensions Diagram



Product Number	Compression Fitting Size	Mounting Bracket	Tip Style	Includes
Q327A1626	1/4 in.	В	Batwing	Natural gas orifice, lp gas orifice, 1/4 in. cc inlet fitting

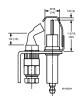
Q345 Igniter-Burner

Nonprimary-aerated combination pilot burner and ignitor. Used with the S86, S860, S8610, or S8670 in intermittent pilot systems.

 Includes pilot burner with bracket, ceramic-insulated Kanthal flame rod/spark igniter and ground strap.



Dimensions Diagram



Product Number	Compression Fitting Length	Mounting Bracket	Tip Style	Direction of Front Tip	Orifice	Includes
Q345A1305	1 1/4 in.	В	Single	(F) Front	BCR-18 (0.018 in.)	1/4 in. cc inlet fitting and mounting adapter
Q345A1313	1 1/4 in.	В	Single	(L) Left	BCR-18 (0.018 in.)	1/4 in. cc inlet fitting and mounting adapter
Q345A1321	1 1/4 in.	В	Single	(K) Right	BCR-18 (0.018 in.)	1/4 in. cc inlet fitting and mounting adapter

Q313 Replacement Thermopile Generators

Q313 Thermopile Generator contains multiple thermocouples connected in series to increase the millivoltage output. The power generated is sufficient to operate an automatic millivolt gas control system, independent of any outside power source.



Product Number	Lead Length (inch)	Connection Type	Resistance	Includes	Used With
Q313A1055	47 in.	Spade Terminals	2.90 ohm	1/2 in. thermopile attaching nut.	Q314, Q324, Q327, Q377, Q379, Q382 Pilot Burners
Q313A1170	35 in.	Spade Terminals	2.89 ohm	PG9 adapter (part no.393948)	Q314, Q324, Q327, Q377, Q379, Q382 Pilot Burners
Q313A1188	35 in.	Spade Terminals	2.89 ohm	push-in clip, 1/2 in. thermopile attaching nut.	Q314, Q324, Q327, Q377, Q379, Q382 Pilot Burners

Q340 Universal 30 mV Thermocouple

Thermocouples generate a thermoelectric current that senses a pilot flame on gas-fired heating systems. The pilot flame heats the tip of the thermocouple, producing a temperature differential between it and the base. This temperature difference generates a small amount of DC power, measured in millivolts.



Product Number	Lead Length (inch)	Connection	Description
Q340A1090	36 in.	11/32 32 Male Connector Nut	0.02 ohm

VR8345 Universal Electronic Ignition Combination Gas Control

Universal electronic ignition combination gas control for use with direct spark ignition, hot surface ignition or intermittent pilot ignition in 24 Vac, gas-fired appliances, with capacities from 30 to 415 cfh.

- Control includes manual valve, two automatic operators, pressure regulator, pilot adjustment, pilot plug and ignition adapter.
- Replaces virtually any IP, HSI, or DSI gas control.
- For use with natural or manufactured gas or LP gas.

- Includes converter kit to adapt from natural to LP gas.
- Internal inlet screen blocks contaminants in gas line from entering

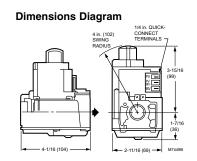
Type: Single Stage
Type of Gas: Natural

Body Pattern: Straight-through Capacity @ 1 in. p.d. 30,000 BTU/ hr minimum; 300,000 BTU/hr max-

imum

Mounting: 0 to 90 degrees in any direction from the upright position of the gas control knob, including vertically.





Product Number	Opening Characteristics (standard, step)	Inlet/Outlet Size (in.)	Pressure Regulator Setting	Ambient Temperature Range (F)	Includes
VR8345M4302	Standard	3/4 in. x 3/4 in.	3.5 in. wc	-40 F to +175 F	Two 3/4 in. x 1/2 in. NPT reducer bushings and one 1/2 in. x 3/8 in. NPT bushing.

VR8200 Continuous Pilot Dual Automatic Valve Combination Gas Controls

Combination gas controls for use in 24 Vac, gas-fired, standing pilot appliances with capacities from 20 to 200 cfh.

- Controls include manual valve, two automatic operators, servo pressure regulator and pilot adjustment.
- Provide two automatic valves.
- Solenoid-operated first automatic valve opens on thermostat call for heat; closes when call for heat ends.
- Diaphragm-operated second automatic valve opens under control of regulator; closes if gas or power supply is interrupted.
- Meet codes requiring dual safety shutoff
- Standard and slow opening natural gas models include natural to LP gas conversion kit; LP to natural gas conversion kit also available.

- Adjustable servo regulator effectively maintains almost constant gas output pressure under wide fluctuations in gas supply pressure.
- Compatible with ECO connector.

Type: Single Stage

Body Pattern: Straight-through Capacity @ 1 in. p.d. 20,000 BTU/hr minimum; 130,000 BTU/hr maximum

Ignition Type: Standing Pilot **Pressure Tapping:** 1/8 in. NPT with

plug

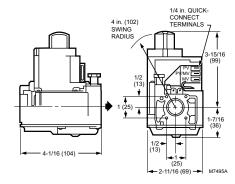
Electrical Ratings: 24 Vac

Pilot Gas Outlet: Compression fitting for

1/4 in. OD tubing

Mounting: 0 to 90 degrees in any direction from the upright position of the gas control knob, including vertically.





Product Number	Type of Gas	Opening Characteristics (standard, step)	Inlet/ Outlet Size (in.)	Pressure Regulator Setting	Ambient Temperature Range (F)	Includes
VR8200A2132	Natural	Standard	1/2 in. x 1/2 in.	3.5 in. wc	0 F to 175 F	1/2 in. x 3/8 in. reducer bushing; 39369014 bag assembly-3/4 in. straight flange with O ring, screws and wrench; Q340 (36 in.) thermocouple with adapters; and 393691 Natural to LP gas conversion kit.

VR8300 Continuous Pilot Dual Automatic Valve Combination Gas Control

Combination gas control for use in 24 Vac, gas-fired, standing pilot appliances with capacities from 30 to 300 cfh.

- Controls include safety shutoff, manual valve, two automatic operators, pressure regulator and pilot adjustment.
- · Compact size.
- Provide two automatic valves.
- Solenoid operated first automatic valve opens on thermostat call for heat; closes when call for heat ends.
- Diaphragm-operated second automatic valve opens under control of regulator; closes if gas or power supply is interrupted.
- Meets codes requiring dual safety shutoff.
- Standard and slow opening natural gas models include natural to LP gas conversion kit; LP to

natural gas conversion kit also available.

- Adjustable servo regulator effectively maintains almost constant gas output pressure under wide fluctuations in gas supply pressure.
- Compatible with ECO connector.

Type: Single Stage

Body Pattern: Straight through with integral tap-

ping; with flange

Capacity @ 1 in. p.d. 30,000 BTU/hr minimum;

190,000 BTU/hr maximum **Ignition Type:** Standing Pilot

Pressure Tapping: 1/8 in. NPT with plug

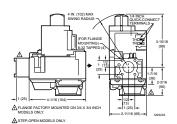
Electrical Ratings: 24 Vac

Mounting: 0 to 90 degrees in any direction from the upright position of the gas control knob,

including vertically.



Dimensions Diagram



Product Number	Type of Gas	Opening Characteristics (standard, step)	Inlet/ Outlet Size (in.)	Pressure Regulator Setting	Ambient Temperature Range (F)	Includes
VR8300A3500	Natural	Standard	1/2 in. x 3/4 in.	3.5 in. wc	0 F to 175 F	One 3/4 x 1/2 in. reducer bushing 393691 Natural to LP gas conversion kit. One 3/4 x
VR8300A3518	Natural	Standard	1/2 in. x 3/4 in.	3.5 in. wc	0 F to 175 F	1/2 in. reducer bushing 393691-14 bag assembly-3/4 in. straight flange with O ring, screws and wrench; 393200 ECO adapter; Q340 (36 in.) thermocouple with adapters; 393691 Natural to LP gas conversion kit.
VR8300A4508	Natural	Standard	3/4 in. x 3/4 in.	3.5 in. wc	0 F to 175 F	Two 3/4 x 1/2 in. reducer bushing 393691 Natural to LP gas conversion kit.
VR8300C4506	Natural	Step Opening	3/4 in. x 3/4 in.	Full Rate: 3.5 in. wc; Step Setting: 0.9 in. wc	0 F to 175 F	Two 3/4 x 1/2 in. reducer bushings

VR8205 Direct Ignition Dual Automatic Valve Combination Gas Controls

Combination gas controls for use with hot surface/direct spark systems in 24 Vac, gas-fired appliances with capacities from 20 to 200 cfh.

- Controls include manual valve, two automatic operators, and pressure regulator.
- Provide two automatic valves.
- Solenoid operated first automatic valve opens on thermostat call for heat; closes when call for heat ends.
- Diaphragm operated second automatic valve opens under control of the regulator; closes if gas or power supply is interrupted.
- · Meet codes requiring dual safety shutoff.
- Standard and slow opening natural gas

models include natural to LP gas conversion kit; LP to natural gas conversion kit also available.

Type of Gas: Natural

Body Pattern: Straight-through

Capacity @ 1 in. p.d. 20,000 BTU/hr mini-

mum; 150,000 BTU/hr maximum **Ignition Type:** Direct Ignition

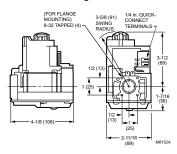
Pressure Tapping: 1/8 in. NPT with plug

Electrical Ratings: 24 Vac

Mounting: 0 to 90 degrees in any direction from the upright position of the gas control

knob, including vertically.





Product Number	Туре	Opening Characteristics (standard, step)	Inlet/ Outlet Size (in.)	Pressure Regulator Setting	Ambient Temperature Range (F)	Includes
VR8205A2024	Single Stage	Standard	1/2 in. x 1/2 in.	3.5 in. wc	0 F to 175 F	1/2 in. x 3/8 in. reducer bushing; 39369014 bag assembly-3/4 in. straight flange with O ring, screws and wrench; and 393691 Natural to LP gas conversion kit.

VR8305 Direct Ignition Dual Automatic Valve Combination Gas Control

Combination gas control for use with hot surface/direct spark systems in 24 Vac, gas-fired appliances, with capacities from 30 to 415 cfh.

- Controls include manual valve, two automatic operators, and pressure regulator.
- Use with S89C,E,F and S87 series 5 and later.
- Provide two automatic valves.
- Solenoid-operated first automatic valve opens on thermostat call for heat; closes when call for heat ends.
- Diaphragm-operated second automatic valve opens under control of regulator; closes if gas or power supply is interrupted.

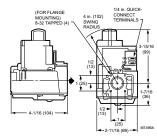
- Meet codes requiring dual safety shut-off.
- All adjustments, wiring connections and pilot outlet are accessible from top of control.
- Adjustable servo regulator effectively maintains almost constant gas output pressure under wide fluctuations in gas supply pressure.

Capacity @ 1 in. p.d. 30,000 BTU/hr minimum; 270,000 BTU/hr maximum Pressure Tapping: 1/8 in. NPT with plug

Electrical Ratings: 24 V Mounting: 0 to 90 degrees in any direction from the upright position of the gas control knob, including vertically.



Dimensions Diagram



Product Number	Type of Gas	Opening Characteristics (standard, step)	Inlet/ Outlet Size (in.)	Pressure Regulator Setting	Ambient Temperature Range (F)	Includes
VR8305M3506	Natural	Standard	1/2 in. x 3/4 in.	3.5 in. wc	-40 F to +175 F	393691 Natural to LP conversion kit; 390427 pipe bushing.

VR8204 Intermittent Pilot Dual Automatic Valve Combination Gas Controls

Combination gas controls for use in 24 Vac, gas-fired, intermittent pilot appliances with capacities from 20 to 200 cfh.

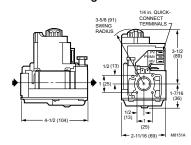
- Controls include manual valve, two automatic operators, servo pressure regulator and pilot adjustment.
- Use with S86F,H; S8600F,H and S8610 Control Modules.
- Provide two automatic valves.
- Solenoid operated first automatic valve opens on thermostat call for heat; closes when call for heat ends.
- Diaphragm operated second automatic valve opens under control of regulator; closes if gas or power supply is interrupted.
- All adjustments and wiring connections are accessible from top of control.
- ON-OFF lighting sequence.

Capacity @ 1 in. p.d. 20,000 BTU/hr minimum; 150,000 BTU/hr maximum

Electrical Ratings: 24 Vac

Mounting: 0 to 90 degrees in any direction from the upright position of the gas control knob, including vertically.





Product Number	Opening Characteristics (standard, step)	Inlet/ Outlet Size (in.)	Pressure Regulator Setting	Ambient Temperature Range (F)	Includes
VR8204A2076	Standard	1/2 in. x 1/2 in.	3.5 in. wc	0 F to 175 F	1/2 in. x 3/8 in. reducer bushing; 393691 Natural to LP gas conversion kit.
VR8204C1019	Step Opening	1/2 in. x 1/2 in.	Full Rate: 3.5 in. wc; Step Opening 0.9 in. wc	0 F to 175 F	_

VR8304 Intermittent Pilot Dual Automatic Valve Combination Gas Control

Combination gas control for use in 24 Vac, gas-fired, intermittent pilot appliances with capacities from 30 to 415 cfh.

- Controls include safety shutoff, manual valve, two automatic operators, pressure regulator and pilot adjustment.
- Use with S86F,H; S860D; S8600F,H; S8610 and S90A,B Control Modules.
- Provide two automatic valves. Solenoid operated first automatic valve opens on thermostat call for heat; closes when call for heat ends.
- Diaphragm-operated second automatic valve opens under control of regulator; closes if gas or power supply is interrupted.
- Adjustable servo regulator effectively maintains

almost constant gas output pressure under wide fluctuations in gas supply pressure.

- Compatible with ECO connector.
- ON-OFF lighting sequence.

Capacity @ 1 in. p.d. 30,000 BTU/hr minimum; 300,000 BTU/hr maximum

Electrical Ratings: 24 Vac

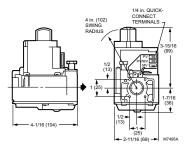
Pilot Gas Outlet: Compression fitting for 1/4 in.

OD tubing

Mounting: 0 to 90 degrees in any direction from the upright position of the gas control knob,

including vertically.





Product Number	Type of Gas	Туре	Opening Characteristics (standard, step)	Inlet/ Outlet Size (in.)	Pressure Regulator Setting	Ambient Temperature Range (F)	Includes
VR8304M4507	Natural	Single Stage	Standard	3/4 in. x 3/4 in.	3.5 in. wc	-40 F to +175 F	Two 3/4 in. x 1/2 in. reducer bushing; 393691 Natural to LP gas conversion kit.

V400 Line Voltage; V800 Low Voltage **Combination Gas Controls**

Used on gas fired standing pilot appliances with 30 mV thermocouple. These gas controls include a manual gas valve, safety shutoff, single millivoltage automatic operator, and pressure regulator, pilot gas filter and flow adjustment, pressure tapping, and thermocouple connector. V800 is used on 24V systems.

- Include pilot flow adjustment screw.
- Easy to install, adjust and service; all adjustments and connections are accessible from top of control.
- Add separate energy cutoff (ECO) where codes call for dual safety shutoff.

- · Complete safety shutoff on pilot flame failure.
- ECO connector for V800 models. Part No. 392451-1.

Type: Single Stage

Capacity @ 1 in. p.d. 295,000 BTU/hr minimum;

335,000 BTU/hr maximum Ignition Type: Standing Pilot Electrical Ratings: 120 Vac

Mounting: 0 to 90 degrees in any direction from the upright position of the gas control knob, including ver-





Product Number	Type of Gas	Opening Characteristics (standard, step)	Inlet/ Outlet Size (in.)	Pressure Regulator Setting	Ambient Temperature Range (F)	Includes
V400A1095	Natural	Standard	3/4 in. x 3/4 in.	3.5 in. wc	32 F to 175 F	Two 3/4 X 1/2 in; one 1/2 X 3/8 in. Reducer Bushings/Adapters
V800A1070	Natural or LP	Standard	3/4 in. x 3/4 in.	3.5 in. wc	32 F to 175 F	One 3/4 X 1/2 in. Reducer Bushings/Adapters
V800A1088	Natural or LP	Standard	3h/4 in. x 3/4 in.	3.5 in. wc	32 F to 175 F	Two 3/4 in. x 1/2 in.; one 1/2 in. x 3/8 in. Reducer Bushings/ Adapters
V800A1476	Natural or LP	Standard	1/2 in. x 3/4 in.	3.5 in. wc	32 F to 175 F	One 1/2 in. x 3/4 in. Reducer Bushing/Adapter

Pressure Regulator - Standard Opening

Servo gas pressure regulator for add-on or replacement use on Honeywell V400, V800, VR400, VR800 and VR8440 Combination gas controls. Utilizing the servo principle of operation, it controls burner manifold pressure by repositioning the main valve diaphragm.

•Interchangeable and adapt to all pipe sizes and capacities.

•Mount on top surface of control.

Installation and adjustment readily accomplished with a screwdriver.

Mounting: Top surface of combination gas control (two mounting screws and gasket).

Pressure Ratings: 1/2 psi (3.5 kPa) Temperature

Range: -40 F to +175 F (-40 C to +79 C)



Product Number	Type of Gas	Opening Characteristics	Pressure Regulator Setting
V5306B1009	Natural	Standard Opening	3.5 in. wc; adj. range 3-5 in. wc

VS820 Millivoltage Combination Gas Controls

These gas controls combine a Lite-Rite manual gas cock, safety shutoff Pilotstat assembly, millivoltage automatic valve operator, and optional gas pressure regulator. They require the use of a 750 mV PowerPile generator (thermopile). The generator, heated by the pilot burner flame, provides the electrical energy to operate the combination gas control. A millivoltage thermostat with suitable accessory controls completes the automatic control system for the heating appliance. Models equipped with the standard pressure regulator are identified by the suffix letter "A" WS820A. Suffix letter "C" (VS82OC) identifies models having step opening type regulators. Pressure regulators and operator are standardized and interchangeable on all models in the two capacity ranges - 225 and 335 cubic feet per hour.

- Include pilot flow adjustment screw.
- Easy to install, adjust and service; all adjustments and connections

are accessible from top of control.

- Add separate energy cutoff (ECO) where codes call for dual safety
- · Complete safety shutoff on pilot flame failure.
- ECO connector for V800 models. Part No. 392451-1.

Body Pattern: Straight-through. Multi-tapped with 1/2 in. right and left outlets plugged, except as noted. Electrical Ratings: 750 mV

Mounting: 0 to 90 degrees in any direction from the upright position of

the gas control knob, including vertically.



Product Number	Type of Gas	Inlet/Outlet Size (in.)	Pressure Regulator	Pressure Regulator Setting	Description
VS820A1054	Natural	3/4 in. NPT x 3/4 in. NPT with 1/2 in. NPT side outlets	Standard	3.5 in. wc Reg. Set/ 3-5" Adj. Range	3/4 in. NPT x 3/4 in. NPT PowerPile Millivolt Combination Gas Valve with 3.5 in. wc adjustable pressure regulator setting
VS820C1100	Natural	3/4 in. NPT x 3/4 in. NPT with 1/2 in. NPT side outlets	Step Opening	Step: 0.9 in. wc non- adjustable; Full rate: 3.5 in. wc, 3-5" adjustable	3/4 in. NPT x 3/4 in. NPT PowerPile Millivolt Combination Gas Valve with Step: 0.9 in. wc non-adjustable; Full rate: 3.5 in. wc, 3-5" adjustable pressure regulator setting

SV9502 SmartValve™ System

The SmartValve? System Controls provide easy field replacement of a wide range of SV9500, SV9501, SV9502 and SV9602 SmartValve™ System models. Gas appliance manufacturers use these models in many types of gas fired heating appliances including central furnaces, residential boilers, rooftop furnaces, commercial cooking appliances, and unit heaters. These controls provide intermittent pilot gas ignition sequencing, pilot flame sensing, and both pilot and main gas control functions in a single control. They are directly compatible with the Q3450 or Q3480 Intermittent Pilot burners used with the original controls on the appliance.

- Suitable for a wide range of gas-fired appliances including residential furnaces, roof-top furnaces, residential boilers, unit heaters, infrared heaters, space heaters and commercial cooking units.
- Replaces SV9500, SV9501 and SV9502 controls as noted below.
- Ignition sequence includes timed trial for ignition.

Body Pattern: Straight-through Pilot Gas Outlet: Yes Pressure Tapping: 1/8 in. - NPT

Electrical Ratings: 24 Vac Frequency: 50Hz; 60 Hz Flame Failure Response Time (sec): 1.6 sec @ 3 µA

Ignition Sequence: Intermittent Pilot

Ignition Source: Pilot

Ignition System Type: Intermittent Hot Surface Pilot Ignition

Ignition Trial Time (sec): 90 sec

Ignition Trials To Lockout: continuous retry

Pressure Ratings: 1/2 psi (3.45 kPa)

Ambient Temperature Range: -40 F to +175 F (-40 C to +79 C) Mounting: 0 to 90 degrees in any direction from the upright position of

the gas control knob, including vertically.



Product Number	Flame Sense	Type of Gas	Opening Characteristics (standard, step)	Inlet/ Outlet Size (in.)	Maximum Capacity (ft ³ /hr)	Minimum Capacity (ft ³ /hr)	Maximum Capacity at 1 in. P.D. (ft³/hr)	Pressure Regulator Setting	Pre- Purge
SV9502H2522	Electrode	Natural	Slow Opening	1/2 in. x 1/2 in.	200	20	150	3.2 in. wc	15 sec

L4081; L6081 Multiple Aquastat® Controllers

High limit, low limit and/or circulator controllers used to regulate boiler water temperature in gas- or oil-fired hydronic heating systems.

- An immersion type liquid-filled sensing element actuates two snap switches.
- · One switch operates as a high limit control.
- The other switch operates as a low limit and/or circulator control, depending on the model.
- Separate, easy-to-read, calibrated dial and setpoint adjustments for each switch.
- Differential adjustment on low limit or circulator switch.

- Single sensing element for easy installation.
- One SPST and one SPDT snap switches act independently at respective temperature settings.

Electrical Ratings (ignition): Transformer Load: 360 VA

Maximum Ambient Temperature: 150 F at switches; 265 F at sensing element

Operating Range, High Limit: 130 F to 240 F Operating Range, Low Limit: 110 F to 220 F

Mounting: Horizontal



Product Number	Application	Switching Action	Differential Temperature (F)	Minimum Ambient Temperature (F)	Insulation Depth	Spud Size (inch)	Includes
L4081B1047	High Limit and Circulator	SPST: High Limit & Circulator	High limit: 10 F fixed; low limit: 10-25 F adj.	_	1 1/2 in.	3/4 in 14 NPT	_
L6081A1010	High and	_	10 F fixed	-30 F	3 in.	3/4 in 14 NPT	3 in.
	Low limit						insertion well

L8148 Aquastat® Relay

Immersion-type controllers that combine high limit protection with switching relay control of burner and circulator motors.

- High limit opens burner circuit only.
- Include transformer and accessory terminals for adding a remote low limit controller.
- Requires a 24 Vac thermostat with heat anticipator set at 0.2A.
- TRADELINE models include well adapter, tube of heat conductive compound and range stops.

apillary Length: 4 1/2 in.

Insulation Depth: 1 1/2 in. to 3 in. less well.

Voltage: 120 Vac

Switching Action: SPST: High Limit &

Circulator

Maximum Ambient Temperature: 150 F Setpoint Temperature Range: 240 F Operating Range, High Limit: 120 F to 240 F Maximum Operating Pressure: Immersion

Well: 255 psi



	Electrical Ra	atings					
Product Number	(ALR)		(burner AFL)	(burner ALR)	(burner millivolt)	(circulator AFL)	(circulator ALR)
L8148A1017	_	_	Line Voltage: 7.4 A @ 120 Vac; 3.7 A @ 240 Vac	Line Voltage: 44.4 A @ 120 Vac; 22.7 A @ 240 Vac	0.25 A @ 1/4 to 12 Vdc	3.7 A @ 240 Vac 7.4 A @ 120 Vac	22.2 A @ 240 Vac 44.4 A @ 120 Vac
L8148E1265	0.25 at 0.25 to 12 Vdc	22.2A @ 240 Vac44.4A @ 120 Vac	Low Voltage: 0.8 A max. @ 24 Vac Line Voltage: 7.4 A @ 120 Vac; 3.7 A @ 240 Vac	Line Voltage: 44.4 A @ 120 Vac; 22.7 A @ 240 Vac	0.25 A @ 1/4 to 12 Vdc	3.7 A @ 240 Vac 7.4 A @ 120 Vac	22.7 A @ 240 Vac 44.4 A @ 120 Vac
L8148J1009		_	3.7 A @ 240 Vac 7.4 A @ 120 Vac	22.2 A @ 240 Vac 44.4 A @ 120 Vac	0.25 A @ 1/4 to 12 Vdc	3.7 A @ 240 Vac 7.4 A @ 120 Vac	22.2 A @ 240 Vac 44.4 A @ 120 Vac



L4006; L6006 Aquastat® Controller

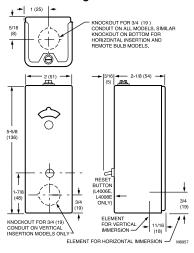
Aquastat® Controllers are immersion type devices for limiting or regulating the temperature of liquids in boilers, storage tanks, and other applications where temperature control is required.

- Totally enclosed Micro Switch? snap-acting switches operate on temperature rise to setpoint.
- Visible control point scale and external adjustment screw permit easy setting.
- Horizontal or vertical insertion of the sensing element.
- Direct or well immersion of the sensing element.
- · Models available for strap-on mounting.
- Remote bulb model may be used to sense air temperature in ducts and in outside air sensing applications.

Case Dimensions: 5 5/8 in. high x 2 in. wide x 2 1/8 in. deep

Bulb Size: 3/8 in. x 2 7/8 in. copper **Maximum Ambient Temperature:** 150 F **Operating Temperature Range:** 100 F to 240 F





Product Number	Application	Operating Temperature Range (F)	Differential Temperature (F)	Switching Action	Mounting	Insulation Depth (inch)	Spud Size (inch)	Includes
L4006A1678	High or Low	100 F to	5 F to 30	SPST, contacts	Horizontal	3 in.	3/4 in.	3 in.
	limit	240 F	F adj.	break on temperature rise.	or Vertical Mounting		NPT	insulation, stop factory-set at 240 F and heat- conductive compound.
L4006A1959	High or Low limit	40 F to 180 F	2 F fixed	SPST, contacts break on temperature rise.	Horizontal or Vertical Mounting	3 in.	3/4 in.	1 1/2 in. (38 mm) insulation and heat- conductive compound.
L4006E1067	High Limit; Manual Reset	130 F to 270 F	Manual Reset	SPST, contacts break on temperature rise.	Horizontal or Vertical Mounting	3 in.		insulation, stop factory-set at 250 F (121 C); well adapter and heat con- ductive compound.
L6006A1145	Circulator Control and High Limit or Low Limit	100 F to 240 F	5 F to 30 F adj.	SPDT	Horizontal	3 in.	_	Stop factory-set at 240F (116 C) and heat-conductive compound
L6006C1018	Circulator Control and High Limit or Low Limit	65 F to 200 F	5 F to 30 F adj.	SPDT	Horizontal or Vertical or Strap-on mounting	_		_

R8845U Universal Switching Relay

The R8845U Universal Switching Relay with 24 V transformer provides intermediate switching of line-and low-voltage devices from a line- or low-voltage controller and is typically applied in Hydronic heating systems.

- Replaceable socketed relays.
- Two troubleshooting LED.
- Push-to-test button.
- Replaceable transformer fuse.
- · Low-voltage rating for Powerpile applications.
- · Long-life DC relay drive control technology.
- Relay for use with external 24 Vac or 24 Vdc supply, with linevoltage control, or with internal 24 V transformer supply.
- One model replaces many competitor models.
- One model may replace many Honeywell models:R182A,B,C,J; R482A,B,C,J; R845; R882A,B,C,J and RA832.

Application: Provides intermediate switching of line and low voltage devices from a line or low voltage controller

Transformer Primary Rating: 120 Vac, 60 Hz

Transformer Secondary Rating: 24 Vac, 12 VA max., 9 VA available for external load. Secondary protected by replaceable 1A automotive fuse.

Thermostat Compatibility: Honeywell electromechanical and electronic 2- or 3-wire

Thermostat Heat Anticipator Setting: 0.12A Temperature Range: (Ambient) -20 F to +120 F (Ambient) -29 C to +49 C)

Operating Humidity Range (% RH): 0 to 90% RH, non-condensing

Replacement Parts: 32002190-001 Replacement Relays.

Replacement Fuse: use a 1 A automotive fuse.

Approvals:

Canadian Underwriters Laboratories, Inc. Listed: Guide No. XAPX7. Underwriters Laboratories, Inc. Listed: File No. E4436, Guide No. XAPX



Product	Electrical Connections (Control	Coil Ratings		Contact Electrical	Electrical Ratings Primary	Ratings:		
Number	Circuit)	Voltage	Current	120 Vac AFL	Voltage	Action	Includes	
R8845U1003	2 or 3-wire	24 Vac	0.4A	7.4A AFL, 44.4A ALR on each set of line-voltage contacts. Maximum connected load is 2000 VA.	120V; 60 Hz	Two SPST, plus PowerPile® rated low voltage SPST relay. (If normally closed contacts are needed, use RA889A).	Integral transformer, enclosure	

F52 Return Grille Electronic Air Cleaner

The F52F Return Grille Electronic Air Cleaner is wall or ceiling mounted in the main return air duct of a central forced air heating, cooling, or ventilation system. It captures a significant number of the airborne particles (0.5 microns and larger) from the air circulated through the cell(s).

- . Removes airborne particles from the air circulated through it.
- . Electronic cells can be washed easily.
- . Neon light shows that air cleaner is operating.
- . Wiring consists of simply connecting air cleaner to power source.
- . Solid state power supply is energized by an airflow switch; no interconnection to the fan system is required.
- . Solid state power supply is self-regulating and maintains peak efficiency during a wide range of cell dirt loading conditions.
- . Automatic interlock switch disconnects power when unit is opened.
- . Use with optional W8600F Electronic Air Cleaner Monitor (ordered separately) to monitor air cleaner performance.

25 1/8 (736) -23.1/8 (736) -7.2/16 (440)
31 (787) 3 142 (38 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
1000000UT FOR 18 INCH CONDUIT NOCKOUT FOR 18 INCH CONDUIT NOCKOUT FOR 18 INCH CONDUIT
(19) CONNECTOR ON BACK OF F52 3-36 1/2 INCH CONDUIT CONNECTOR ON BACK OF F52 (89) CONNECTOR

Product Number	Dimensions (in.)	Air Flow Max. Capacity (cfm)	Electrical Ratings
F52F1048	20 x 12-1/2	1000	120 Vac .4amps
			60Hz



R8888 Hydronic Circulator Zone Panel

Hydronic Circulator Zone Panel provides priority control relay switching for multizone hot water systems.

- Provide burner control and circulator control for up to 3 (R8888A) or 4 (R8888B) zones in hot water systems.
- For use in residential and light commercial applications.
- Zone One can be selected to give priority to indirect hot water tank.
- Zone 2 burner control can be disabled. The circulator can run without the burner to prevent short cycling of small capacity zones.
- Up to four panels (12 to 16 zones total) may be used in a system.
- The R8888 may be used in combination with the R8889 Hydronic Zone Valve Panels with Priority Control.
- Operates 120V motors up to 1/6 hp. 24V internal transformer provides power for low voltage control circuit.
- · Diagnostic LEDs for troubleshooting.
- · Socket-mounted and field-replaceable relays.
- · Clearly marked terminal designations for easy wiring.
- Compatible with Honeywell and competitive electronic thermostats.
- · Mount horizontally only.

Electrical Ratings:

Load Ratings: 4.4 AFL @ 120 Vac.

Locked Rotor: 26.4 ALR @ 120 Vac.

Horsepower: 1/6 hp. Secondary Circuit: 20 VA max. Anticipator Setting:

.15 A.

Electrical Connections:

Wire-clamp screw terminals

Voltage: 120 Vac

Operating Humidity Range (% RH): 0 to 90% RH, non-condensing

Operating Temperature Range: 40 F to 105 F (4 C to 41 C)

Knockouts: 1/2? conduit knockouts in side of case.

LEDs: Yes

Approvals:

Underwriters Laboratories, Inc. UL c/us Listed: File no. E4436.

Product Number	Application	Number of Zones	Color	Transformer
R8888A1007	Provides switching for up to 3 zones. Zone one can be field-configured as priority over the other zones.	3 Zone, Expandable	Gray enamel	Includes 24 Volt Transformer to provide power to low voltage circuit.
R8888B1005	Provides switching for up to 4 zones. Zone one can be field-configured as priority over the other zones.		Gray enamel	Includes 24 Volt Transformer to provide power to low voltage circuit.

R8889 Hydronic Zone Valve Panel with Priority Control

Hydronic Valve Zone Panel with Priority Control provides burner control and valve control for up to three (R8889A,C) or four (R8889B,D) zones in hot water systems.

- For use in residential and light commercial applications.
- Zone One can be selected to give priority to indirect hot water tank.
- Up to four panels may be wired together to provide 12 to 16 zones while maintaining priority zoning.
- The R8889 may be used in combination with the R8888 circulator panels.
- Operates 24 Vac zone valves, including Honeywell VC series and Taco valves.
- 24V internal transformer provides power for low voltage control circuit and valves.
- Diagnostic LEDs for troubleshooting.
- Socket-mounted and field-replaceable burner relays.
- Clearly marked terminal designations for easy wiring.
- Compatible with Honeywell and competitive electronic, electromechanical thermostats and Honeywell Aquastat Controls.
- Mount horizontally only.

Electrical Ratings:

Load Ratings: Valve: 24 Vac, 0.9 resistive. Total: 87 VA per panel (R8889A and R8889B). Anticipator Setting: 0.12 A. **Electrical Connections:** Captive wire-clamp screw terminals.

Voltage: 120 Vac

Operating Humidity Range (% RH): 0 to 90% RH, non-condensing Operating Temperature Range: -20 F to +100 F (-29 C to +38 C)

Knockouts: 1/2" conduit knockouts in side of case.

LEDs: Yes

Approvals:

Underwriters Laboratories, Inc. UL c/us Listed: File no. E4436.

Accessories

AT150A1007 Foot mounted, plate mounted, clamp mounted or panel mounted 120/208/240 Vac Transformer with 9 in. leadwires and metal end bells.

Replacement Parts:

AT87A1049 Foot mounted 120 Vac Transformer with 12 in. leadwires and energy limiting overload protection.

Product Number	Application	Number of Zones	Color	Transformer
R8889C1002	Provides switching for up to 3 zones. Zone one can be fieldconfigured as priority over the other zones.	3 Zone, Expandable	Gray enamel	Includes one 24 Volt Transformer to provide power to low voltage circuit.

RA889A Switching Relay

The RA889A Switching Relay with 24 V controller provides intermediate switching of line- and low-voltage devices from a line- or low-voltage controller and is typically applied in Hydronic heating systems.

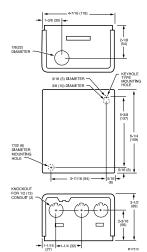
- · High load switching capability.
- Troubleshooting LED.
- Push-to-test button.
- Replaceable transformer fuse.
- Relay for use with external 24 Vac or 24 Vdc supply, with linevoltage control, or with internal 24 V transformer supply.
- One model replaces many Honeywell models.
- Secondary of transformer protected by replaceable 1A automotive fuse.

Application: For switching of line- and low-voltage devices from a lineor low-voltage controller. **Electrical Connections (main):** No. 8 captive wire clamp screw terminals.



Transformer Primary Rating: 120 Vac, 60 Hz Transformer Secondary Rating: 24 Vac, 12 VA Thermostat Compatibility: Honeywell electromechanical and electronic 2- or 3-wire

Temperature Range: (Ambient) -20 F to +120 F Replacement Parts: 32002190-001 Replacement Relays. Replacement Fuse: use a 1 A automotive fuse



Dimension Diagram

	Contact Electrical Ratings					
Product Number	Contacts Maximum Connected Loaded (120-240 Vac)	120 Vac	120 Vac ALR	Electrical Ratings: Primary Voltage	Switching Action	Description
RA889A1001	2000 VA	15A	30A	120V; 60 Hz	SPDT, plus PowerPile® rated low voltage SPST relay	Enclosed switching relay with internal transformer, SPDT line voltage relay, plus SPST low voltage relay with Powerpile rating. 120V/60Hz 15 AFL/30 ALR ratings one line voltage contacts.

RA832; R845 Hydronic Switching Relay

Provide intermediate switching of a line voltage device from a low voltage controller.

• Integral transformer provides low voltage power for control circuit.

Dimensions, Approximate: 5 1/4 in. high x 4 1/4 in. wide x 2 5/16

in. deep (133 mm high x 108 mm wide x 59 mm deep)

Coil Ratings (Voltage): 24 Vac Coil Ratings (Current): 0.4A

Transformer Primary Rating: 120 Vac, 50/60 Hz

Transformer Secondary Rating: 24 Vac

Thermostat Compatibility: Low voltage (Class 2) 2-wire

Electrical Rating: Maximum Input: 5.0W

Temperature Range: 115 F maximum ambient for 60 Hz. 105 F

Max. Ambient for 50 Hz.

Includes: Integral transformer, enclosure



Product Number	Electrical Connections (Control Circuit)	Electrical Ratings: Primary Voltage	Switching Action	Description
R845A1030	2-Wire	120V, 50/60 Hz	DPST; one pole line voltage, the other line or low voltage	Switching relay with internal transformer, provides DPST switching for hot water zone control systems, or SPST control of two separate loads.
RA832A1066	2-Wire	120V; 50/60 Hz	DPST; one pole line voltage, the other low voltage or millivoltage	Switching Relay with internal transformer, for switching two line voltage loads having a common power source.

V8043 Low Voltage Normally Closed Zone Valves

ON-OFF and two-way low voltage valves consist of an actuator and valve assembly for controlling the flow of hot water.

- Manual opener (on all models, except straightthrough, normally open valves) for valve operation on power failure; valve returns to automatic position when power is restored.
- All models may be installed without disassembling the valve.
- Compact construction for easy installation.
- Complete powerhead may be removed or replaced without breaking plumbing line connections or draining the system.
- Actuator motor may be replaced without removing the valve body or draining the system.
- Chilled water models available for cooling and heating applications.

Application: Hydronic Control

Type: 2 position

Body Pattern: Two-way, Straight-through

Valve Action: Spring Return

Voltage: 24V

Frequency: 50 Hz; 60 Hz Power Consumption: 7.7 VA Nominal Timing (sec, min): 15 sec De-energized Position: Normally Closed Static Pressure: 125 psi (862 kPa) Fluid Temperature Range: 50 F to 200 F

(10 C to 93 C)

Maximum Ambient Temperature: 125 F (52 C)

Materials

(Body): Brass

(Stem): Stainless Steel

(Seat): Brass

(Packing O-Ring): EPDM rubber (Ball Plug): Buna-N (NBR) Rubber Ball

Comments: Use this valve in closed loop hydronic systems that do not contain dissolved oxygen in system water, such as fresh water from frequent source of makeup water. Valve designed for cycling (not constantly powered on) applications.

Approvals:

Underwriters Laboratories, Inc. UL Component

Listed: File MH11286 Vol. 1

Replacement Parts:

802360JA 24V, 50/60 Hz Replacement motor.





Product	Pipe Size)	Connection		Maximum Closeoff	End	Electrical
Number	(inch)	DN	Туре	Capacity (Cv)	Pressure (psi)	Switch	Connections
V8043E1004	1/2 in.	DN15	Sweat	3.5 Cv	20 psi	SPST	18 in. leads
V8043E1012	3/4 in.	DN20	Sweat	3.5 Cv	20 psi	SPST	18 in. leads
V8043E1020	1 in.	DN25	Sweat	3.5 Cv	20 psi	SPST	18 in. leads
V8043E1061	3/4 in.	DN20	Sweat	8 Cv	8 psi	SPST	18 in. leads
V8043E1079	1 in.	DN25	Sweat	8 Cv	8 psi	SPST	18 in. leads
V8043F1036	3/4 in.	DN20	Sweat	3.5 Cv	20 psi	SPST	Terminal Block
V8043F1051	1 in.	DN25	Sweat	3.5 Cv	20 psi	SPST	Terminal Block

R8239 Fan Center

Include NEMA standard transformer for excellent voltage control. Provide low voltage control of line voltage fan motors and auxiliary circuits in heating, cooling or heating-cooling circuits.

- NEMA standard Type D transformer (included) powers low voltage control systems.
- Provide overload protection for transformer.
- Convenient connections for thermostat, and heating-cooling equipment wiring.
- Mount on standard 4 x 4 junction box.
- Can be mounted in any indoor location without additional enclosure.
- · Relay is easily replaced without disturbing wiring.
- Include relay enclosures.

Dimensions, Approximate: 4 1/2 in. high, 4 3/16 in. wide, 3 3/32 in. deep (114 mm high, 106 mm wide, 79 mm deep)

Electrical Ratings (W): 12 W maximum Coil Ratings (inrush): 20 VA maximum, 17 VA

Coil Ratings (sealed): 10 VA maximum, 9 VA nominal

Horsepower: 3/4 HP

Approvals:

Canadian Standards Association: Certified NEMA Standard: DC20-1992

Underwriters Laboratories, Inc. UL Listed



Product Number	Application	Voltage	Power Supply (Vac)	Power Supply (Secondary)	Switching Action	Includes
R8239A1052	For single-or two speed fan.	120 Vac	40 VA	26.5 V	SPDT	R8222B
R8239B1043	For system with F50 Electronic Air Cleaner humidifier and blower motor.	120 Vac	40 VA	26.5 V	DPDT	R8222D
R8239D1015	For single-speed fan and pilot duty circuit	120 Vac	40 VA	26.5 V	DPST (One Power	R8222U

R8285 Fan Center

Provides low voltage control of line voltage fan motors and auxiliary circuits in heating, cooling, or air conditioning systems.

- Transformer powers low voltage control systems and provides overload protection.
- Low voltage terminal board provides convenient connections for thermostat and heating/cooling equipment wiring.
- Mounts on standard 4 x 4 in. junction box.
- Relay is easily replaced without disturbing wiring.

Dimensions, Approximate: 4 3/16 in. high, 4 1/2 in. wide, 2 13/16 in. deep. (106 mm high, 114 mm wide, 71 mm deep)

Electrical Ratings (W): 11 W maximum

Approvals:

Canadian Standards Association: Certified: File No. LR95329-17

Underwriters Laboratories, Inc. UL Component Recognized; File No. E4436, Vol.15, Sec.1, Guide No.XAPX2



Product Number	Application	Horsepower	Voltage	Power Supply (Vac)	Power Supply (Secondary)	Switching Action	Includes
R8285A1048	For single-or two speed fan.	3/4 HP	120 Vac	40 VA	26.5 V	SPDT	R8222B
R8285B1053	For "Total Comfort" applications with electronic air cleaner, humidifier and blower motor.	3/4 HP	120 Vac; 208 Vac; 240 Vac	40 VA	26.5 V	DPDT	R8222D

L4064 Fan and Limit Controllers

For control of high limit and fan motor in all types of forced air heating systems.

- Three wiring terminal options available for easy installation.
- Push-in receptacles for stripped wire.
- Female receptacles for 1/4 in. male flag connectors.
- Field add-on screw terminals.
- Controls adapt to many competitive mounting holes in replacement applications.
- Available in a variety of fan and high limit setting ranges.
- L4064B,W models have manual fan switch that overrides fan control to keep fan running continuously.
- SUPER TRADELINE models include deluxe case with mounting adapters for easy installation and strain relief bushings to protect wiring from field abuse.

Application: Forced warm air heating systems

Operating Temperature Range: -40 F to +190 F

Maximum Ambient Temperature: Switch:

190F; Sensing Element: 350 F

Differential Temperature: High limit 25 F **High Limit Temperature Range:** 100 F to

250 F

Switching Action: Fan switch makes and high limit switch breaks on temperature rise.

Fan-Off Range: 50 F to 200 F Fan-Off Stop: 100 F Fan-On Stop: 125 F Electrical Rating Fan

Full Load: 14 A @ 120 Vac: 7 A @ 240 Vac Locked Rotor: 84 A @ 120 Vac:42 A

@ 240 Vac

Electrical Rating Limit

Full Load: 8 A @ 120 Vac; 4 A @ 240

Vac

Locked Rotor: 48 A @ 120 Vac; 24 A

@ 240 Vac

Pilot Duty: 2 A @ 24 Vac; 0.25 A @

0.25 to 12 Vdc

High Limit Stop: 200 F

Approvals:

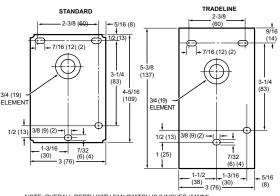
Canadian Standards Association: Certified: File No. LR1622 Underwriters Laboratories, Inc. Listed File MP466, Guide MBPR

Accessories:

129250AA Double wing mounting flange assembly for Fan and Limit Control L4064



Dimension Diagram



NOTE: OVERALL DEPTH WITH FAN SWITCH IS 2 INCHES (51MM);
MODELS LESS FAN SWITCH ARE 1-5/8 INCHES (41MM).

M23222

Product Number	Element Insertion Length (inch)	Fan-on Range (F)	Timing	Mounting	Comments
L4064B2210	11 1/2 in.	65 F to 215 F	_	Surface mounted	Turns fan on and off according to plenum temperature. With helical bimetal sensing element. High limit stop set at 200F. With manual fan switch. Small case and cover. Replaces L4064A,B,E.
L4064B2228	5 in.	65 F to 215 F	_	Surface mounted	Turns fan on and off according to plenum temperature. With helical bimetal sensing element. High limit stop set at 200F. With manual fan switch. Small case and cover. Replaces L4064A,B,E.
L4064B2236	8 in.	65 F to 215 F	_	Surface mounted	Turns fan on and off according to plenum temperature. With helical bimetal sensing element. High limit stop set at 200F. With manual fan switch. Small case and cover. Replaces L4064A,B,E.
L4064W1080	5 in.	20 to 90 sec. after call for heat	20 to 90 sec. after call for heat	Surface mounting or bracket (rigid or swivel)	Turns fan on and off according to plenum temperature. With helical bimetal sensing element. High limit stop set at 200F. Jumper in. With timed on fan feature and manual fan switch. Replaces L4064T, Y.
L4064W1098	8 in.	20 to 90 sec. after call for heat	20 to 90 sec. after call for heat	Surface mounting or bracket (rigid or swivel)	Turns fan on and off according to plenum temperature. With helical bimetal sensing element. High limit stop set at 200F (93 C). Jumper in. With timed on fan feature and manual fan switch. Replaces L4064T, Y.
L4064W1106	11 1/2 in.	20 to 90 sec. after call for heat	20 to 90 sec. after call for heat	Surface mounting or bracket (rigid or swivel)	Turns fan on and off according to plenum temperature. With helical bimetal sensing element. High limit stop set at 200F. Jumper in. With timed on fan feature and manual fan switch. Replaces L4064T, Y.

L4029 High Limit Controller

L4029E Reset Limit Control opens a line or low voltage circuit if the air temperature reaches a critical level at controller location. The primary usage of the L4029E is as a fire thermostat in the duct work of air conditioning and ventilating systems. If the circulated air reaches a temperature indicative of fire, the limit control shuts off the fan, preventing the fan from contributing to the spread of fire. It is also suitable for use with any warm air furnace to provide positive lockout of the burner in the event of fan failure.

Dimensions, Approximate: 3 3/4 in. high x 2 5/16 in. wide x 2 in. deep excluding element. (95 mm high x 59 mm wide x 51 mm deep excluding element.)

Maximum Ambient Temperature: Switch: 190F;

Sensing Element: 350 F(Switch: 88 C; Sensing Element: 177 C)Element Insertion Length: 3 in. (76 mm)Electrical Rating Limit:Full Load: 5 A @ 240 Vac; 10 A @ 120 Vac; 2 A @ 30 VacLocked Rotor: 30 A @ 240 Vac; 60 A @ 120 VacPilot Duty: 0.25 A @ 0.25 to 12 Vdc



- •Shuts off the fan when air temperature is indicative of fire.
- •Internal snap-acting switch actuated by a bimetalstrip inserted directly into the air stream responds rapidly to tem perature changes.
- •Requires manual reset.

Product Number	High Limit Stop	Comments		
L4029E1029	200 F	Normally closed SPST switch opens on temperature rise to the set point.		
		Switch must be manually reset to operate.		

R4222; R8222 General Purpose and R8228 Heavy Duty Switching Relays

Provide heavy duty switching for refrigeration and air conditioning equipment, appliances, vending machines and similar applications.

- Molded terminal numbers and circuit diagram on top of relay provide easy identification for wiring and checking system operation.
- Untaped coil assures cooler operation.
- Laminated magnet construction for higher efficiency.
- Base designed for easy replacement of competitive relays.
- Double quick-connect coil terminals.
- Plug compatible with Steveco 90-340 and Mars 90340.

Dimensions, Approximate: 1 7/8 in. high x 2 5/32 in. wide x 2 3/8 in. deep (48 mm high x 59 mm

wide x 60 mm deep.) **Frequency:** 50 Hz; 60 Hz

Temperature Rating: -20 F to +155 F

Pilot Duty Ratings:

Minimum: 3 VA @ 24 Vac, 120 Vac, & 480 Vac;

Maximum: 25 VA @ 24 Vac, 125 VA @ 120 Vac, 240 Vac, & 480 Vac; Resistive: 3 A @ 277 Vac (0.75 power factor);

Powerpile: (Normally Open Contacts Only) 0.25 A @ 0.25 to 12 Vdc

Approvals:

CE: Approved
Canadian Standards
Association: Approved
Underwriters Laboratories,
Inc. UL Component
Recognized

Accessories:

129384A Case and Cover Assembly





Product Number	Coil Ratings Voltage	Switching	Description
R4222D1013	120 V	DPDT	120 V General Purpose Relay with Dpdt switching
R4222D1021	208V; 240V	DPDT	208/240 V General Purpose Relay with Dpdt switching
R8222B1067	24 Vac	SPDT	24 V General Purpose Relay with Spdt switching
R8222D1014	24 Vac	DPDT	24 V General Purpose Relay with Dpdt switching

R8225 Fan Relay

Provide general purpose and heavy duty switching for refrigeration and air conditioning equipment, appliances, vending machines and similar applications.

- Molded terminal numbers and circuit diagram on top of relay provide easy identification for wiring and checking system operation.
- Untaped coil assures cooler operation.
- Laminated magnet construction for higher efficiency.
- Base designed for easy replacement of competitive relays.
- Double quick-connect coil terminals.
- Plug compatible with Steveco 90-340 and Mars 90340.

Dimensions, Approximate: 2 11/16 in. high x 2 1/2 in. wide x 3 7/16 in. deep (68 mm high x 64 mm wide x 87 mm deep)

Temperature Rating: 115 F (46 C)

Approvals:

Canadian Standards Association: Certified: File No. LR95329-1

Underwriters Laboratories, Inc. UL Listed: File No. E14480, Vol. 1, Sec. 3, Guide No. NLDX

Accessories:

129384A Case and Cover Assembly



	Electrical Ratings, Contacts		
	(Full Load)	(Locked Rotor)	(Resistive)
R8225A	N.O. 14.0A, N.C. 14.0A, Aux. 3.0A @ 120 Vac	N.O. 84.0 A, N.C. 84.0 A, Aux. 18.0 A @ 120 Vac	N.O. 16.0 A, N.C. 14.0 A, Aux. 3.0 A @ 120 Vac

Product Number	Coil Ratings Voltage	Switching	Description
R8225A1017	24 Vac	SPDT	24 V Fan Relay with Spdt switching

R8330 Electric Furnace Sequencer

One control switches a fan and up to three elements on and off in sequence.

- Isolated fan switch has positive interlock to assure fan is on when the element is on, and fan is off when the element is off.
- Replaces any of the ten models in our line and many competitive devices.
- Combination rating on the first element switch allows replacing devices having fan and first element controlled by the same switch without rewiring the furnace.
- Auxiliary switch controls a second R8330 in application with more than three elements.
- Cycles ON within two minutes, OFF within four minutes.
- Ten-second minimum delay between stages (makes sequence and break sequence.)

• Timings meet EEI-NEMA and ARI 280 Standards.

Dimensions, Approximate: 3 1/16 in. high x 4 13/16 in. wide x 2 11/32 in. deep (78 mm high x 122 mm wide x 60 mm deep.)
Coil Ratings Voltage: 24 Vac

Electrical Connections (main): terminals Temperature Rating: -20 F to +150 F (-29 C to +66 C)

Approvals:

Canadian Standards Association: Certified Underwriters Laboratories, Inc. UL Listed



Product	Electrical Ratings, Contacts	
Number	(Full Load)	(Locked Rotor)
R8330D1039	3/4 hp; 6.9 A @ 120 Vac, 208 Vac, 240 Vac 1/3 hp; 7.2 A @ 120 Vac; 4.9 A @ 277 Vac	41.4 A @ 120 Vac, 208 Vac, 240 Vac 1/3 hp; 43.2 a @ 120 Vac; 29.4 A @ 277 Vac 3/4 hp;

type D

allows for Direct, Horizontal, or Vertical Foot mounting.

Honeywell

Q633 Plate-Mounted Relay Receptacle

For installing R4222, R8222 and R4228, R8228 relays on junction boxes.

- Use with appropriate relay and AT72D1683 or AT72D1691 SUPER TRADELINE Transformer.
- · Includes relay receptacle, cover and eight leadwires.

Dimensions, Approximate: 4 in. x 4 in. plate (102 x102 mm plate)

Approvals: CE: Approved

Canadian Standards Association: Recognized

Underwriters Laboratories, Inc. UL Component Recognized

Product Number	Description
Q633A1007	Plate Mounted Relay Receptacle



AT20; AT40 NEMA Standard Universal Stripped-Down Transformer

Power a 24V control system; for direct mounting, or horizontal or vertical foot-mounting.

- Channel frame mounting feet and slots allow for the three mounting positions.
- · Color-coded leadwires for primary connections.
- · Overload protection provided.
- Energy limiting, meet NEMA DC20-1992 Standard. Marked NEMA Type D.
- Meet NEC Class 2 not wet, Class 3 wet and U.L. 1585 requirements.

x 2-3/16in. deep

· Mount within proper enclosure.

Temperature Rating: -20 F to +105 F

Frequency: 50 Hz; 60 Hz **Electrical Connections (main)**

(Primary): 9 in. color coded primary and

secondary leadwires

(Secondary): 9 in. color coded primary and

secondary leadwires

Approvals:

Canadian Standards Association:

Certified

Underwriters Laboratories, Inc. UL Component

Recognized.

	Dimensions,	Electrical F	Ratings			
Product Number	Approximate (inch)	Primary Voltage	Secondary Voltage	Output	Mounting	NEMA Rating
AT20A1123	2 in. high x 2 1/4 in. wide x 1 7/8 in. deep	120 Vac	26.5 V.O.C.	24 Vac at 19 VA	Channel Frame Mounting allows for Direct, Horizontal, or Vertical Foot mounting.	NEMA type B
AT40A1121	2-3/32 in, high x 2-5/8 in wide	120 Vac	26.5 V.O.C.	24 Vac at 40 VA	Channel Frame Mounting	NFMA



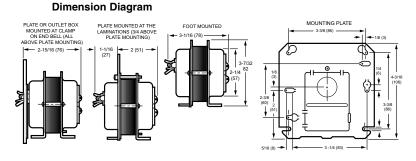
AT72 NEMA Standard Transformer

24V control circuit step-down transformer designed to power any 24V control system, including thermostats, gas valves and relays.

- Override protection provided.
- Color-coded leadwires for primary connections.
- Energy limiting, meets NEMA Standard DC20-1992.

- Transformer is marked NEMA Type D.
- Meets NEC Class 2 not wet, Class 3 wet and U.L. 1585 requirements.
- Mount within proper enclosure.

Temperature Rating: -20 F to +105 F





	Dimensions,	Electrical Ra	Electrical Ratings		
Product Number	Approximate (inch)	Primary Voltage	Secondary Voltage	Output	Mounting
AT72D1683	3 7/32 in. high x 2 7/32 in. wide x 3 1/16 in. deep	120 Vac	26.5 V.O.C.	24 Vac at 40 VA	Can be foot mounted, plate mounted on 4 x 4 in., 4 in. octagon, or 2 x 4 in. electrical boxes (transformer all above plate or 3/4 above plate); or clamp mounted via a junction box knockout.
AT72D1691	3 7/32 in. high x 2 7/32 in. wide x 3 1/16 in. deep	208 Vac, 240 Vac, with 40 VA output rating	26.5 V.O.C.	24 Vac at 40 VA	Can be foot mounted, plate mounted on 4 x 4 in., 4 in. octagon, or 2 x 4 in. electrical boxes (transformer all above plate or 3/4 above plate); or clamp mounted via a junction box knockout.

AT87 NEMA Standard Transformer

Used primarily for powering 24V air conditioning circuits. Can also be used in other applications that do not exceed the listed ratings.

- Meets NEC Class 2 not wet, Class 3 wet and UL 1585 requirements.
- Meets NEMA Standard DC20-1992.
- Transformer marked NEMA Type E.

- Overload protection provided.
- Color-coded leadwires for primary connections.

Temperature Rating: -20 F to +105 F

3-3/8 (86)	21/32 2-9/32 (58) 2-9/32 (58)	Dimension Diagram
2.38 (60) 114 (6) (106) (86) 3.38 (86) 3.16 (5)	1.1/4 + 21/32 - (17) - (17	3/16 (5) 1-3/4 1-3/4 (45) 2-7/32 (56) M166/33A



	Electrical Ratings				
Product Number	Primary Voltage	, , , , , , , , , , , , , , , , , , , ,		Mounting	Includes
AT87A1106	120 Vac, 208 Vac, 240 Vac	26.5 V.O.C.	24 Vac at 50 VA	Foot mounted or 4x4 in plate.	Built-in protection. Primary winding burnout.
AT87A1155	480 Vac	26.5 V.O.C.	24 Vac at 48 VA	Foot mounted	Energy limiting overload protection

AT88 Transformer

Powers 24 Vac air conditioning circuits and other applications that do not exceed the listed ratings.

- Meets NEC Class 2 not wet, Class 3 wet and U.L. 1585 requirements.
- · Overload protection provided.
- Color-coded leadwires for primary connections.

Electrical Connections (main) (Primary) (inch): 12 in. leadwires (Secondary) (inch): 12 in. leadwires

Temperature Rating: -20 F to +105 F (-29 C to +41 C)

Frequency: 50 Hz; 60 Hz



SIDE воттом PRIMARY 3-5/16 (84)-SECONDARY LEADWIRES LEADWIRES (2,3 OR 4) (19) 3/16 (19)2-3/16 I (56) (45) (45) **∢**2-11/32**→** (60)MOUNTING SCREW HOLES (4) **←** 2-23/32 M 994A

Approvals:

Canadian Standards Association: Certified

Dimension Diagram

Underwriters Laboratories, Inc. UL Component Recognized.

	Electrical Ratings	Electrical Ratings			
Product	Primary	Secondary			
Number	Voltage	Voltage	Output	Mounting	Includes
AT88A1005	120 Vac	26.5 V.O.C.	24 Vac at 75 VA	Foot mounted	Internally fused secondary for overload protection.
AT88A1021	208 Vac, 240 Vac	26.5 V.O.C.	24 Vac at 75 VA	Foot Mounted	Internally fused secondary for overload protection.

AT175F Circuit Breaker Transformer

Provide power to 24 Vac circuits in heating/cooling control systems. Intended for use in systems with predictable, uniform loads. Can be used in any application that does not exceed the listed ratings.

- Rated at 50 VA and 75 VA.
- Color-coded leadwires for primary connections and screw terminals for secondary connections, fixed 1/4 inch (6 mm) male quickconnects or color-coded leadwires for both primary and secondary, are standard.
- Meet NEC Class 2 requirements.
- Meet Underwriters Laboratories Inc. Standard UL 1585 and are identified. Class 2 not wet, Class 3 wet.

Temperature Rating: -20 F to +105 F (-29 C to +41 C)

Frequency: 60 Hz

Approvals: Canadian Standards Association: Certified: File No. LR95329-18



(69)

	Electrical Connections (main)			
	(Primary) (inch) (Secondary) (inch)			
AT175F	9 in. leadwires with all leadwires through conduit screw	9 in. leadwires with all leadwires thru conduit screw		

	Dimensions,	Electrical I	Electrical Ratings			
Product Number	Approximate (inch)	Primary Voltage	Secondary Voltage	Output	Mounting	Includes
AT175F1023	3 3/16 in. high x 2 3/16 in. wide x 3 15/16 in. deep	120 Vac, 208 Vac, 240 Vac	27.5 V.O.C.	24 Vac at 75 VA	Includes 1/2 14 NPSM conduit connector and lock nut for mounting on plate or panel (not included) with 7/8 in. knockout, and feet for surface mount.	Button for manually resetting the circuit breaker and metal end bells.



AT140; AT150A,B; AT175A General Purpose Transformer

Provide power to 24 Vac circuits in heating/cooling control systems. Intended for use in systems with predictable, uniform loads. Can be used in any application that does not exceed the listed ratings.

- Rated at 20VA, 40 VA, 50 VA, and 75 VA.
- Color-coded leadwires for primary connections and screw terminals for secondary connections, fixed 1/4 inch (6 mm) male quickconnects or color-coded leadwires for both primary and secondary, are standard
- Meet NEC Class 2 requirements.

Meet Underwriters Laboratories Inc. Standard UL 1585 and are identified. Class 2 not wet, Class 3 wet.

Temperature Rating: -20 F to +105 F

Frequency: 60 Hz

Approvals:

Canadian Standards Association: CSA Certified: A & B models. Underwriters Laboratories, Inc. UL Listed: A,C,F models. File # E14881











	Electrical Connections (main)		
	(Primary) (inch)	(Secondary) (inch)	
AT140A1000	9 in. leadwires	(2) screw terminals	
AT140A1018	9 in. leadwires	(2) screw terminals	
AT140B1214	9 in. leadwires	9 in. leadwires	
AT150A1007	9 in. leadwires	(2) screw terminals	
AT175A1008	9 in. leadwires	(2) screw terminals	

	Electrical Ratings				
Product Number	Primary Voltage	Secondary Voltage	Output	Mounting	Includes
AT140A1000	120 Vac	27 V.O.C.	24 Vac at 40 VA	Foot mounted, plate mounted on 2x4 in. or 4x4 in. outlet box, clamp mounted using outlet box knockout, or panel mounted	Metal end bells
AT140A1018	120 Vac, 208 Vac, 240 Vac	27 V.O.C.	24 Vac at 40 VA	Foot mounted, plate mounted on 2x4 in. or 4x4 in. outlet box, clamp mounted using outlet box knockout, or panel mounted	Metal end bells
AT140B1214	120 Vac, 208 Vac, 240 Vac	27 V.O.C.	24 Vac at 40 VA	Foot mounted	Plastic end caps
AT150A1007	120 Vac, 208 Vac, 240 Vac	27.5 V.O.C.	24 Vac at 50 VA	Foot mounted, plate mounted on 2x4 in. or 4x4 in. outlet box, clamp mounted using outlet box knockout, or panel mounted	Metal end bells
AT150B1237	120 Vac, 208 Vac 240 Vac	27.5 V.O.C.	24 Vac at 50 VA	Foot mounted 120/208/240 Vac Transformer with 9 in. lead wires and plastic end caps	Plastic end caps
AT175A1008	120 Vac, 208 Vac, 240 Vac	27.5 V.O.C.	24 Vac at 75 VA	Foot mounted, plate mounted on 2x4 in. or 4x4 in. outlet box, clamp mounted using outlet box knockout, or panel mounted	Metal end bells

AM-1 Series — Thermostatic Mixing Valve

The Honeywell AM-1 series accurately adjusts, maintains and limits the hot water temperature to a desired setting selected by the user. In domestic water applications it offers scalding protection and bacteria growth control. By installing a Honeywell AM-1 mixing valve and raising water heater storage temperature setting and limiting mixed outlet water temperature to safe temperature more usable hot water is available. In heating applications it provides comfort and protects the equipment.

- Dual purpose mixing or diverting valves.
- Constant water temperature under changing operating conditions.
- Anti-scald, anti-chill thermal shock protection.
- Temperature limit at any point.
- Nickel-plated brass construction, EPDM O-rings.
- All brass proportioning shuttle.
 Max. pressure: 150 psi
 Max temperature: 212 F

- Designed for easy maintenance and element replacement.
 Teflon® coated to prevent mineral build-up and extend life.
- Tamper evident design.
- Valve trapping not required.
- Union STD & C Models include check valves (hot/cold ports)
- Thermostrip included in STD & C Models for initial temperature setting



Replacement Parts:

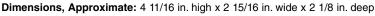
AM100-002RP AM Series standard element, spring and plug assembly

.	Pipe	Size		Connection Connects		
Product Number	(inch)	DN	Connection Type	Capacity (Cv)	Temperature Range (F)	ASSE
AM100C-UT-1	1/2 IN.	DN15	Union NPT	3.9	70 F to 120 F	1017
AM101-UT-1	3/4 in.	DN20	Union Npt	3.9	70 F to 145 F	1017
AM101C-UT-1	3/4 in.	DN20	Union NPT	3.9	80 F to 120 F	IAPMO (80 F - 120 F only)
AM102-UT-1	1 in.	DN25	Union NPT	3.9	100 F to 145 F	IAPMO (80 F - 120 F, 100 F - 145 F only)
AM102C-US-1	1 in.	DN25	Union Sweat	3.9	80 F to 120 F	IAPMO (80 F - 120 F, 100 F - 145 F only)
AM102C-UT-1	1 in.	DN25	Union NPT	3.9	70 F to 120 F	1017

H46 Humidity Controller

Provide automatic control of a humidifier or dehumidifier for dehumidification in air conditioning systems.

- Positive ON-OFF settings permit manual operation of controlled equipment.
- Impact-resistant, molded plastic cover mounts on wall.
- Fully enclosed, dust free, SPST, snap-acting switch.
- Sensing element of thin, moisture sensitive nylon ribbon provides reliable operation even when ambient temperature conditions change.



Mounting: Wall mounted

Temperature Range: 50 F to 125 F Differential: 4% to 6% RH Voltage: 24 Vac; 120 Vac; 240 Vac

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	Electrical Rat	Electrical Ratings							
	120 Vac			240 Vac					
	Full Load	Locked Rotor	Resistive	Full Load	Locked Rotor	Resistive			
H46	4.4 A	26.4 A	6.0 A	2.2 A	13.2 A	6.0 A			

Product Number	Application	Operating Humidity Range (% RH)	Color	Description
H46C1166	Dehumidification	20 to 80% RH	Premier White®	Wall mounted Dehumidistat
H46D1214	Humidification	10 to 60% RH	Premier White®	Wall mounted Humidistat
H46E1013	Dehumidification	20 to 80% RH	Beige	Dehumidistat with plug for window Air Conditioner or portable dehumidifier



T6031A Refrigeration Temperature Controller

Provide limit or temperature control in refrigerated areas where remote mounting of sensing element is required.

- Liquid-filled copper elements provide rapid sensing to control the compressor system.
- Control temperature in a duct, tank, freezer or cooler.
- Controller element can be directly immersed in the controlled medium.
- · Adjustable control setpoint.

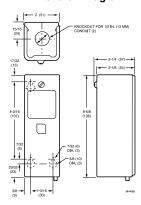
Application: Provides control of cooled or refrigerated space

Type: Remote bulb

Sensor Element: Copper bulb Voltage: 120 Vac



Dimension Diagram



				Temperature		
Product Number	Bulb Size (inch)	Capillary Length (ft)	Setting Range (F)	Differential (F)	Maximum Operating (F)	Switching
T6031A1029	3/8 in. diameter x 3 in. long	8 ft.	-30 F to +90 F	3.5 F to 16 F	125 F	1 SPDT
T6031A1060	3/8 in. diameter x 3 in. long	20 ft.	-30 F to +90 F	3.5 F to 16 F	125 F	1 SPDT

T675A, T678A Remote Bulb Controllers

Remote bulb thermostats regulate temperature of air or liquids in ducts, pipes, tanks and boilers.

- Suitable for applications requiring temperature control of air or liquids where controller must be placed outside the sensing area.
- Typical uses include control of dampers and valves in heating, cooling and heating-cooling systems.
- Fast response models operate approximately four times faster than standard models.
- Controller can be mounted in any position. Ambient temperature compensation provides good temperature control.

Type: Remote bul

Dimensions, Approximate: 5 5/8 in. high x 2 in. wide x 2 5/8 in deep **Voltage:** 120 Vac or 240 Vac or 277 Vac



		Tem	perature							
Product Number	Setpoint Range (F)	Differ- ential (F)	Maximum Operating (F)	Interstage Differential (F)	Capillary Length (ft)	Bulb Size (inch)	Output	Sensor Element	Includes	Comments
T675A1508	0 F to 100 F	3 F to 10 F	125 F	_	5 ft	1/2 in. x 4 3/16 in.	1 Spdt	Copper bulb	107324A Duct Bulb holder	_
T675A1540	55 F to 175 F	3.6 F to 12 F	200 F	_	5 ft	1/2 in. x 3 9/16 in.	1 Spdt	Copper bulb	107324A Duct Bulb holder	_
T675A1565	0 F to 100 F	3 F to 10 F	125 F	_	20 ft.	1/2 in. x 4 3/16 in.	1 Spdt	Copper bulb	107324A Duct Bulb holder	_
T675A1706	0 F to 100 F	3 F to 10 F	125 F	_	5 ft	coil 1 1/2 in. diameter x 5 in. coil	1 Spdt	Fast response capillary	131524A duct bulb holder	Fast response model
T678A1361	55 F to 175 F	3.6 F fixed	200 F	3.6 F to 12 F adj.	20 ft.	1/2 in. x 3 9/16 in.	2 SPDT switch contacts	Copper bulb	_	_

T678B Outdoor Reset Dual Bulb Temperature Controller

Automatic outdoor reset controllers for air or liquid.

. Raises heating medium control point automatically as outdoor

temperature falls.

. One remote element senses heating medium, the other senses

outdoor air temperature.

. T991 has 135 ohm potentiometer for proportional heating control.

Type: Remote bulb

Application: Automatic reset based on outdoor tem-

perature

Dimensions, Approximate: 5 5/8 in. high x 2 in. wide x

2 5/8 in deep

(143 mm high x 51 mm wide x 67 mm deep)

Bulb Size: 1/2 in. x 4 in. (13 mm dia. x 102 mm long)

Voltage: 120 Vac or 240 Vac Frequency: 60 Hz, 50 Hz Reset Ratio: 1.0 to 1.0 Sensor Element: Copper Bulb

Number of Sensors: 2

Maximum Operating Temperature: 125 F (52 C) Setpoint Temperature Range: 70 F to 140 F (21 C to

60 C)



Product Number	Setpoint	Temperature Maximum Operating (F)	Throttling Range	Capillary Length (ft)	Bulb Size (inch)	Analog Output	Sensor Element	Comments
T678B1006	Adjustable	265 F	3 F to 30 F	Indoor 10'	1/2 in. diameter		Copper	_
				Outdoor 30'	x 4 3/16 in. long		bulb holder	

T991A Proportional Temperature Controller

For modulating control of water or air temperature in ducts, tanks and similar applications.

- Fast response models (for duct mounting) have coiled sensing element giving at least four times faster response than standard models.
- · Ambient temperature compensated for the case and tubing.
- Sensing element capillary tubing allows remote mounting of sensing element.
- Setpoint may be read and adjusted through cover.
- Throttling dial inside case adjusts proportional throttling range.

Dimensions, Approximate: 5 5/8 in. high x 2 in. wide x 2 1/4 in. deep

Color: Grav

Voltage: 24 Vac to 30 Vac Frequency: 50 Hz; 60 Hz Output Type: analog Number of Sensors: 1

Maximum Operating Temperature:

125 F

Throttling Range: 3 F to 30 F



	Temperature								
Product Number	Setpoint Range (F)	Maximum Operating (F)	Throttling Range	Capillary Length (ft)	Bulb Size (inch)	Analog Output	Sensor Element	Includes	Comments
T991A1426	0 F to 100 F	125 F	3 F to 30 F	5 ft	1/2 in. diameter x 4 3/16 in. long	One 135 Ohm Potentiometer	Copper bulb holder	107324A Duct Bulb	_

H205 Enthalpy Controller

Basic enthalpy controller used with Honeywell legacy systems

- Senses total heat content (temperature and humidity) of outdoor air
- Mounts in any position in outdoor air duct.
- Controls amount of outside air brought into system with respect to total heat content (or enthalpy) of outside air.
- Combines temperature and humidity sensors into a single device.
- Nylon humidity sensor.
- Liquid-filled bulb temperature sensing element, mounted on back of control.

Dimensions, Approximate: 5 1/4 in. high x 3 1/16 in. wide x 1 3/16 in. deep

Contact Ratings: Terminals 1 and 2: 50VA at 24Vac. Terminals 2 and 3: 100mA minimum to 250mA maximum at



Product Number	Description	Comments	Used With
H205A1012	Senses total heat content (temperature and relative humidity) of outdoor air.	Includes case and cover, mounting plate, adjustable knob and scale	W859F

24Vac.

Q5001 Valve Linkage for Modutrol IV Motors

The Q5001 Valve Linkage connects a Modutrol® Motor to a 2- or 3-way valve. It is used primarily on V5011 or V5013 steam and water valves.

- Q5001 Valve Linkage is applicable to 2-Way or 3-Way valves in modulating or two-position service.
- Linkage requires no adjustment when used with Honeywell valves and Modutrol IV® Motors.
- Q5001 Valve Linkage replaces Q601 and Q618 Valve Linkages.
- Linkage mounts directly to the valve bonnet; motor mounts to linkage bracket.
- · Easy-to-read position indicator.
- Valve stem lift height cam selectable.
- Overtravel permits tight close-off without excessive motor strain.
- Available brackets make linkages adaptable to many valve bodies.
- Models available with 80 lb, 160 lb, and 320 lb stem force.
- Reversible cams on the Q5001 allow field selection of normally open or normally closed valve operation.
- All models have anti-spin.

Linkage Type: Valve

Mounting: Linkage mounts directly to the valve bonnet; motor mounts on linkage bracket.

Used with Actuator: Modutrol

Motor

Stem Force Rating: 80 or 160 lbf **Ambient Temperature Range:**

-40 F to +150 F

Accessories:

220829BCQ1 Barber-Colman

Valve Adapter Kit

220829JCQ1 Johnson Control

Valve Adapter Kit

220829LGQ1 Landis and Gyr Powers Valve Adapter Kit

Powers valve Adapter Kil

220829LGQ2 Landis and Gyr

Powers Valve Adapter Kit

220829LGQ3 Landis and Gyr Powers Valve Adapter Kit

Replacement Parts:

220845/0767 Retainer button for Q5001

Product Number	Bonnet Size (in.)	Stroke	Description	Includes	Used With
Q5001D1000	1 3/8 in.	3/4 in.	Valve Linkage for Mod III and Mod IV motors with 80 or 160 lb stem force	1 3/8 in. valve bracket and Anti spin clip	V5011/V5013; Modutrol IV Motors
Q5001D1018	1 3/8 in.	3/4 in.	Valve Linkage for Mod III and Mod IV motors with 160 or 320 lb stem force	1 3/8 in. valve bracket and Anti spin clip	V5011/V5013; Modutrol IV Motors
Q5001D1026	1 3/8 in.	1 1/2 in.	Valve Linkage for Mod III and Mod IV motors with 160 or 320 lb stem force	1 7/8 in. valve bracket and Anti spin clip	V5011/V5013; Modutrol IV Motors

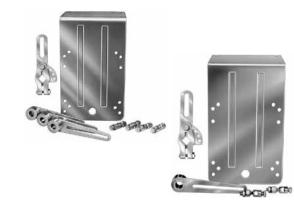
Q605 Damper Linkage

Connect Modutrol® motor to standard damper or set of dampers to provide control of duct airflow.

- Adjustable to any degree of damper opening. Include ball joints, motor crank arm and damper arm for 1/2 in. (13 mm) diameter shaft.
- 27520 pushrod must be ordered separately.

Linkage Type: Damper

Mounting: Mount motor externally on duct **Used with Actuator:** Modutrol Motor



Product Number	Shaft Dimensions	Description	Includes
Q605A1070	1/2 in.	Damper-Linkage with 1/2 inch shaft- Connects Modutrol	Motor bracket, damper arm, motor
		motor to water or steam valve	crankarm, and 2 ball joints
Q605E1050	_	Damper-Linkage including Damper arm, motor crankarm, and	Damper arm, motor crankarm,
		2 ball joints- Connects Modutrol motor to water or steam valve.	and 2 ball joints



M6184 Floating Modutrol IV™ Series 2 Motors

These Series 61 Modutrol IV Motors are non-spring return floating control motors. Use these motors with controllers that provide a switched spdt or floating output to operate dampers or valves.

- Replaces M644, and M944B,E,G,H,J,K,R,S Motors.
- Integral junction box provides NEMA 3 weather protection.
- Adapter bracket for matching shaft height of older motors is available.
- Motors have field adjustable stroke (90° to 160°).
- Nominal timing standard of 30 seconds (90° stroke), and 60 seconds (180° stroke). Other timings available.
- All models have dual shafts (slotted and tapped on both ends).
- All models have auxiliary switch cams.
- Fixed torque throughout the entire voltage range.
- Motors are designed for either normally open or normally closed valves and dampers.

Application Type: ElectricFail Safe

Mode: Non-Spring Return Control Signal: Floating External Auxiliary Switches

Available: Yes Feedback: No

Electrical Connections: Quick-

connect terminals

Frequency: 60 Hz, 50 Hz Mounting: Foot mounted Motor Shafts: Dual-ended shaft

Shaft Shape: square Shaft Dimensions: 0.375 in.

Deadweight Load on Shaft (Either End): 200 lbs. Deadweight Load (Combined on both Shafts): 300 lbs.

Product Number	Torque/Force (lb-in., lb)	Voltage	Timing Nominal Timing (sec)	Internal Auxiliary Switch	Stroke	Shaft Rotation (upon control signal increase)	Includes
M6184D1035	150 lb-in.	24V	30-60 sec	0	Adjustable;	Dependent on wiring	_
					90° to 160°	(normally closed)	

M8185 Two-Position Modutrol IV™ Series 2 Motors

The Series 41 and Series 81 Modutrol IV Motors are 2-position (line- and low- voltage control, respectively) spring-return motors. They are used to operate dampers or valves in applications where it is necessary or desirable to have the controlled element return to the starting position in the event of power failure or interruption.

- Replaces M445, M845 and M865 motors.
- Models rated for 60 lb.-in. torque.
- Fixed torque throughout the entire voltage range.
- Integral spring return returns motor to normal position when power is interrupted.
- · Quick-connect terminals are standard.
- Adapter bracket for matching shaft height of older motors is available.
- Motors have field adjustable stroke (90° to 160°).
- Motors are designed for either normally open or normally closed valves and dampers.
- All models have auxiliary switch cams.
- Motors can operate valve linkages from the power end or auxiliary end shafts for normally closed or normally open valve applications.
- All models have dual shafts (slotted and tapped on both ends).
- Nominal timing standard of 30 seconds (90° stroke), and 60 seconds (160° stroke).

Application Type: Electric Fail Safe Mode: Spring Return Control Signal: Two position, SPST External Auxiliary Switches

Available: Yes

Electrical Connections: Quick-connect terminals Mounting: Foot mounted Motor Shafts: Dual-ended shaft

Shaft Shape: square Shaft Dimensions: 0.375 in. Deadweight Load on Shaft (Either

End): 200 lbs.

Deadweight Load (Combined on both Shafts): 300 lbs.



Product Number	Torque/Force (lb-in., lb)	Voltage	Timing Nominal Timing (sec)	Internal Auxiliary Switch	Stroke	Shaft Rotation (upon control signal increase)	Includes
M8185D1006	60 lb-in.	24V	30-60 sec	0	Adjustable; 90° to 160°	Clockwise (as viewed from power end) (normally closed)	_

Q209 Manual Potentiometer for Modutrol Motors

Used to limit minimum position of a proportioning Modutrol motor.

- Mount directly in motor.
- All wiring is accomplished within motor wiring compartment.
- Color-coded leadwires.

Application Type: Electro-mechanical

Dimensions, Approximate: 3 1/4 in. high x 3 3/8 in.

wide x 3 7/8 in. deep

Control Signal: SPST, On/off switch Electrical Connections: Screw terminals Mounting: Internal mount to Modutrol IV Motors



Product Number	Includes	Used With
Q209A1022	150 ohm Potentiometer, leadwires and bracket	M744, M745, M941, M944, M945, M954, M955
Q209E1010	150 ohm Potentiometer, factory mounted on a wring cover box	_
Q209F1001	150 ohm Potentiometer, internally mounted. Plugs into quick connect terminals on the motor	
Q209F1019	150 ohm Potentiometer, internally mounted. Plugs into quick connect terminals on the motor	_

M436; M836 Damper Motors

Spring return motors for two-position back draft, outdoor air changeover, zone, or minimum position damper control.

- Operate outdoor air dampers for combustion or makeup air in residential and light industrial applications.
- Operate changeover dampers for heating and cooling systems.
- Operate minimum position dampers for ventilation and similar applications.
- Include internal SPDT switch for controlling auxiliary equipment, additional motors, or to provide a burner interlock switch.
- Spring returns motor to start position on power failure.
- Drive shafts located on both sides of motor.
- Adjustable auxiliary switch for cascading motors or operating auxiliary equipment.

Dimensions, Approximate: 4 1/2 in. high x 4 5/8 in. wide x 3 3/4 in. deep Fail Safe Mode: Spring Return Control Signal: Two position, SPST Internal Auxiliary Switch: 1 External Auxiliary Switches Available: Yes

Torque Rating, Breakaway: 30 lb-in.



Product	Torque Rating			- J		1 3 1		Nominal F (watts)	Power		Used
Number	(lb-in.)	Voltage	(sec)	Nominal (sec)	Opening	Holding	Opening	Holding	Includes	With	
M436A1116	20 lb-in.	120 Vac	40 sec	Open: 30 sec	0.37 A	0.12 A	28 W	8.5 W	_	_	
M836A1042	20 lb-in.	24 Vac	40 sec	Open: 30 sec	1.85 A	0.6 A	28 W	8.5 W	_	_	
M836B1033	15 lb-in.	24 Vac	40 sec	Open: 25 sec	1.34 A	0.73 A	20.3 W	11.2 W	_	_	

M835 Two-Position Zone Damper Actuator

Two-Position Zone Motor, used with two-wire, 24-volt room thermostat or other controller for two position damper control.

- Controls zone or changeover damper in heating and air conditioning systems, and control gates on feeders.
- SPST end switch makes within 20 sec of full open, breaks within 20 sec after start of closing stroke.

Fail Safe Mode: Spring Return
Control Signal: Two position, SPST
External Auxiliary Switches Available: No
Torque Rating, Breakaway: 30 lb-in.
Electrical Connections: Lead wire in con-

duit box



Dimensions, Approximate: 5 1/2 in. high x 4 1/4 in. wide x 2 5/8 in. D

Product Number	Torque Rating (lb-in.)	Voltage	Run Time (Maximum (sec))	Nominal Power (watts) Opening Holding	
M835A1051	4 lb-in.	24 Vac	Open: 80 sec, Close: 160 sec	27 W	8.5 W

V5011N Two-way Globe Valves

Used for two-position or modulating control of steam and water and glycol solutions (to 50 percent concentration) in heating or cooling systems.

- Sizes range from 2-1/2 to 3 inches.
- · Spring-loaded, self-adjusting packing.
- Stainless steel stem prevents corrosion
- Valve designs provide equal percentage characteristics of flow for close control of water, and linear characteristic of flow for close control of steam.
- Valves utilize direct mounting valve actuators or Q5020 linkages with Direct Coupled Actuators or Pneumatic Valve Actuators to operate the valve.

Type of Control: Pneumatic; Electric

Body Pattern: Two-way

Controlled Medium: Water w/max of

50% Glycol

Leakage rate (%): 0.05% of Cv

Stem Travel: 3/4 in.

Connection Type: Female NPT

Ambient Temperature Range: 36 F to

Ambient Temperature Range: 36 F to

248 F water

Maximum Differential Pressure: 240

psi

Maximum Differential for Quiet Water

Service: 20 psid



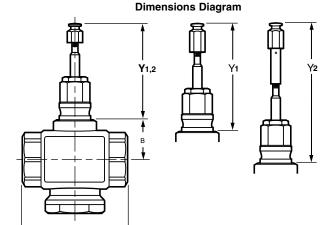
Materials

(Body): Red Brass (Stem): Stainless Steel (Cartridge): Brass (Packing): Teflon

Approvals: CRN Number:

0C0861.9087YTN/0C0861.99

ANSI Body class: 150



VALVE	Α	В
SIZE (IN)	in.	in.
1/2	3-1/4	1-9/16
3/4		
1	4-1/16	
1-1/4	4-3/16	
1-1/2	4-3/4	1-13/16
2	5-1/4	

	VALVE	Y1 in.	Y2 ^a in.
1	V5011N1XXX	3-1/2	5-1/4

aY2 WITH STEM EXTENSION FOR MP953C,E (8 IN. ONLY)

	Pipe				Materials		Maximum	
Product Number	Size (inch)	Valve Action	Flow Characteristic	Capacity (Cv)	(Seat)	(Plug/Ball/ Disc)	Operating Pressure (psi)	Used With
V5011N1065	1 in.	Stem down to close	Equal Percentage	11.7 Cv	Stainless Steel	Brass	240 psi	ML6984/ML7984; Q5020/ DCA; Q5001/Modutrol IV Motor; MP953; ML6420,21A,25; ML7420/ ML7421A/ML7425
V5011N1073	1 1/4 in.	Stem down to close	Equal Percentage	18.7 Cv	Stainless Steel	Brass	240 psi	Q5020/DCA; ML6984/ ML7984; Q5001/Modutrol IV Motor; MP953; ML7420/ML7421A/ ML7425; ML6420,21A,25
V5011N1081	1 1/2 in.	Stem down to close	Equal Percentage	29.3 Cv	Stainless Steel	Brass	240 psi	ML6984/ML7984; Q5020/ DCA; Q5001/Modutrol IV Motor; MP953; ML6420,21A,25; ML7420/ ML7421A/ML7425
V5011N1099	2 in.	Stem down to close	Equal Percentage	46.8 Cv	Stainless Steel	Brass	240 psi	Q5020/DCA; ML6984/ ML7984; Q5001/Modutrol IV Motor; MP953; ML7420/ML7421A/ ML7425; ML6420,21A,25

V5013N Three-Way Threaded Globe Valves

The V5013N is a three-way threaded globe valve that controls hot water, cold water, and glycol solutions (up to 50 percent concentration) in heating or cooling HVAC applications. The valves are used for mixing service to direct flow from one or two inlets to a common outlet in two-position or modulating control

- Red brass body with NPT-threaded connections.
- Stainless steel stem and brass plug.
- · Low seat leakage rating.

systems.

- · Spring-loaded, self adjusting packing.
- 50:1 rangeability per VDI/VDE 2173.
- Constant total flow throughout full stem travel.
- · Accurate positioning to ensure state-ofthe-art temperature control.
- Sizes range from 1/2 inch to 2 inches.
- Suitable for pneumatic or electric/electronic actuation.
- · Repack and rebuild kits available for field servicing.

Type of Control: Electric; Pneumatic

Pattern: Three-way



Controlled Medium: Water w/ max of 50% Glycol

Leakage rate (%): 0.05% of Cv

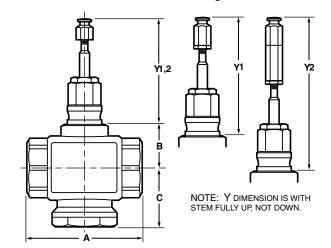
Stem Travel: 3/4 in.

Connection Type: Female NPT Ambient Temperature Range: 36 F to 248 F water

Maximum Operating Pressure:

240 psi

Maximum Differential Pressure: 240 psi **Maximum Differential for** Quiet Water Service: 20 psid



VALVE	Α	В	С	Y 1	Y 2 ^a
SIZE				STE	M UP
1/2 (15)	3-1/4	1-9/16	2-9/16	4.0/4.0	5 45/40
3/4 (20)	3-1/4	1-9/16	2-9/16	4-3/16	5-15/16
1 (25)	4-1/16	1-9/16	2-5/8		
1-1/4 (32)	4-3/16	1-9/16	2-7/8		
1-1/2 (40)	4-3/4	1-13/16	3		
2 (50)	5-1/4	1-13/16	3-5/16		

Y2 WITH STEM EXTENSION FOR MP953C,E (8 IN. ONLY)

Product Number	Pipe Size (inch)	Valve Action	Flow Characteristic	Capacity (Cv)	Materials (Seat)	Used With
V5013N1063	1 in.	Mixing	Linear (B-AB) Equal Percentage (A-AB)	11.7 Cv	Integral Brass	Q5020/DCA; ML6984/ML7984; Q5001/ Modutrol IV Motor; ML6420,21A,25; ML7420/ ML7421A/ML7425
V5013N1071	1 1/4 in.	Mixing	Linear (B-AB) Equal Percentage (A-AB)	18.7 Cv	Brass	ML6984/ML7984; Q5020/DCA; Q5001/ Modutrol IV Motor; ML7420/ML7421A/ ML7425; ML6420,21A,25
V5013N1097	2 in.	Mixing	Linear (B-AB) Equal Percentage (A-AB)	46.8 Cv	Brass	ML6984/ML7984; Q5020/DCA; Q5001/ Modutrol IV Motor; ML7420/ML7421A/ ML7425; ML6420,21A,25

R7247; R7249; Flame Amplifiers

Solid state plug-in units respond to flame detector signal and indicate presence of flame.

 Use with BC7000; R4140; R4075C,D,E; R4138C,D Flame Safeguard controls and appropriate flame detector and FSP5075A1, FSP5075A3 Flame Amplifier Modules.



Product Number	Flame Failure Response Time (sec)	Self Checking	Use With Flame Sensor	Use With Primary Safety Control	Comments
R7247A1005	2 to 4 sec	None (standard)	Gas, oil, coal: Ultraviolet Flame Sensor C7012A, C	R4140; BC7000; R4075C,D,E; R4138C,D; FSP5075	Color: Green
R7249A1003	2 to 4 sec	None (standard)	Gas, oil, coal: Ultraviolet (Minipeeper) C7027, C7035	R4140; BC7000; R4075C,D,E; R4138C,D; FSP5075	Color: Purple

R7289, R7290 Flame Safeguard Amplifiers

Solid state, plug-in units allow use of rectification or ultraviolet flame detection.

Use with R4795A,D Flame Safeguard primary controls and appropriate flame detector.

Product Number	Flame Failure Response Time (sec)	Self Checking	Use With Flame Sensor	Use With Primary Safety Control	Comments
R7289A1004	2 to 4 sec	None (standard)	Gas: Rectifying Flame Rods C7004, C7005, C7007, C7008, C7009, Q179. Gas, oil, coal: Ultraviolet Flame Sensor C7012A, C	R4795A, D	Color: Green
R7290A1001	2 to 4 sec	None (standard)	Gas, oil, coal: Ultraviolet (Minipeeper) C7027, C7035	R4795A, D	Color: Purple

C7027 Minipeeper Ultraviolet Flame Detector

Compact flame detector for use with flame safeguard controls with ultraviolet amplifiers.

- Use on Honeywell Flame Safeguard primary safety controls and burners requiring ultraviolet flame detection.
- C7027 mounts on a 1/2 in. sighting pipe by using an integral collar.
- Detectors can be wired in parallel for difficult sighting applications.
- C7027 seals against pressures as high as 5 psi when correctly installed.
- C7044 mounts with a two screw bracket.
- The C7044 UV sensor tube is enclosed in a stainless steel housing.
- C7044 has the capability of side or end viewing in flame monitoring applications.

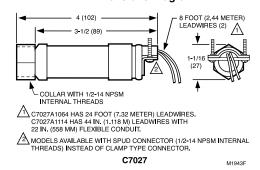
Description: Ultraviolet, Minipeeper **Application:** Coal fired burners; Gas fired burners; Oil fired burners

Mounting: Integral nut for 1/2 in. sight-

Ambient Temperature Range: 0 F to 215 F

Used With: Flame Amplifiers: R7249A, B, R7849A, B, R7749B, R7259, R7290





Product Number	Lead Length (inch)	Mounting	Ambient Temperature Range (F)	Includes
C7027A1023	96 in.	Integral nut for 1/2 in. sighting pipe.	0 F to 215 F	_
C7027A1031	96 in.	Integral nut for 1/2 in. sighting pipe.	-40 F to 215 F	_

V48A; V88A Diaphragm Gas Valves

Solenoid-operated diaphragm valves provide slow opening and fast closing for controlling fuel gases.

- Close firmly with diaphragm that is both weight and spring loaded.
- Close on power failure; recommended for final shutoff service.
- Set opening time with various sized bleed orifices or adjustable bleed valve.
- Use with LP, natural or manufactured gases.
- Made with cast aluminum in straightthrough valve pattern.
- Optional valve position indicator available for 1-1/4 in. and larger valves.

Type of Gas: Manufactured; LP; Natural **Body Pattern:** Straight-through

Electrical Connections: 6 in. Leadwires

Ground Terminal: Yes **Tapping:** 1/8-27 NPT

Pressure Ratings: 1/2 psi

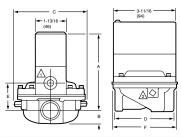


Prequency: 60 Hz Power Consumption: 9 W; 15 VA max Mounting: Upright (horizontal) Bleed Tapping: 1/8-27 NPT

Valve Opening Time: 5 sec max

Operating Temperature Range: 32 F to

125 F Materials (Body): Aluminum



VALVE	APPROXIMATE DIMENSIONS								
SIZE	Α	В	С	D	E	F			
(IN.)	IN.	IN.	IN.	IN.	IN.	IN.			
3/4	4-11/16	3/4	4-5/8	3-1/2	1-5/8	3-13/16			
1	5-1/16	1	5	3-11/16	2-1/16	4-5/16			
1-1/4	5-9/16	1-1/4	5-7/8	5-5/16	2-3/8	5-5/16			
1-1/2	5-9/16	1-1/4	5-7/8	5-5/16	2-3/8	5-5/16			
2	6-15/16	2-1/4	9-1/2	8-3/8	3-9/16	5-5/16			
2-1/2	6-15/16	2-1/4	9-1/2	8-3/8	3-9/16	9-5/16			
3	6-15/16	2-1/4	9-1/2	8-3/8	3-9/16	9-5/16			

A BLEED TAPPING: 1/8-27 NPT OR 1/8-28 BSP F

PILOT TAPING (2): 1/8-27 NPT FOR 3/4 THROUGH 1-1/2 IN. SIZES, 1/4-18 NPT FOR 2 THROUGH 3 IN. SIZES; 0R 1/8-28 BSP. PL FOR 1 THROUGH 1-1/2 IN. SIZES, 1/4-19 BSP.PL FOR 2 THROUGH 1-1/2 IN. SIZES, 1/4-19 BSP.PL FOR 2 THROUG

8	4	8	7	

Product Number	Pipe Size (inch)	Capacity (cfh)	Valve Closing Time	Current (max amps at rated Vac/Hz)	Voltage	Comments
V48A2151	3/4 in.	668 cfh	1 sec max	0.12 amps	120 Vac	_
V48A2169	1 in.	1021 cfh	1 sec max	0.12 amps	120 Vac	
V48A2177	1 1/4 in.	2100 cfh	1 sec max	0.12 amps	120 Vac	_
V48A2185	1 1/2 in.	2400 cfh	1 sec max	0.12 amps	120 Vac	_
V48A2243	2 in.	4178 cfh	2 sec max	0.12 amps	120 Vac	_
V48A2250	2 1/2 in.	5100 cfh	2 sec max	0.12 amps	120 Vac	
V88A1618	1 in.	1021 cfh	1 sec max	0.62 amps	24 Vac	_
V88A1626	1 1/4 in.	2100 cfh	1 sec max	0.62 amps	24 Vac	_
V88A1634	1 1/2 in.	2400 cfh	1 sec max	0.62 amps	24 Vac	_
V88A1659	3/4 in.	668 cfh	1 sec max	0.62 amps	24 Vac	_
V88A1709	2 in.	4178 cfh	2 sec max	0.62 amps	24 Vac	

V5055 Industrial Gas Valves

Safety shutoff valves used with V4055, V4062 and V9055 fluid power actuators to control gas flow to commercial and industrial burners.

- · Use with natural or LP gases.
- Mount directly in gas supply line.
- Include 1/4 in. NPT upstream and downstream taps and plug.
- V5055 normally closed valves are rated for final shutoff service safety shutoff.
- V5055A,C Valves are for On-Off service.





Product Number	Pipe Size (inch)	Capacity (cfh)	Maximum Operating Pressure Differntial	Description
V5055A1004	1 in.	960 cfh	5 psi	1 in. NPT industrial gas valve with on-off safety
V5055A1012	1-1/4 in.	1406 cfh	5 psi	1-1/4 in. NPT industrial gas valve with on-off safety
V5055A1020	1-1/2 in.	1717 cfh	5 psi	1-1/2 in. NPT industrial gas valve with on-off safety
V5055A1038	2 in.	3620 cfh	5 psi	2 in. NPT industrial gas valve with on-off safety
V5055C1000	2 in.	3620 cfh	5 psi	2 in. NPT industrial gas valve with on-off safety shut off with double seat
V5055C1018	2-1/2 in.	4250 cfh	5 psi	2-1/2 in. NPT industrial gas valve with on-off safety shut off with double seat
V5055C1026	3 in.	5230 cfh	5 psi	2 in. NPT industrial gas valve with on-off safety shut off with double seat

V4055A,B,D,E On-Off Fluid Power Gas Valve Actuator

Use with V5055 Valve to control gas supply to commercial and industrial burners.

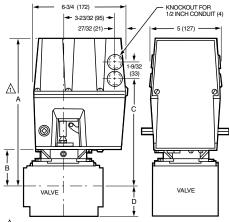
- Use where smooth light off is important.
- One-second maximum closing time.
- Always displays the valve position, when open a red indicator appears and closed a yellow indicator appears.
- Mount in any position directly to valve bonnet with three setscrews.
- Provide final safety shutoff service when used with V5055 valve.

Temperature Range: -40 F to +150 F Frequency: 60 Hz

Used With: V5055;V5097 Gas Valves



Dimensions Diagram



ALLOW 4 INCH (102 MM) CLEARANCE FOR ACTUATOR REMOVAL. M17755A

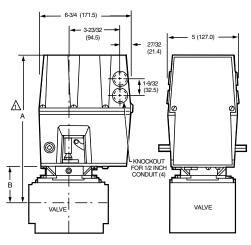
	Into	Internal	Proof of Closure	Timing	Timing			
Product Number	Electrical Ratings	Auxiliary Switch	Auxiliary Switch	(Opening)	(Closing) < 1 sec	Operating Pressure (psi)	Damper Shaft	Description
V4055A1098	110 Vac; 120 Vac	No	No	13 sec	Yes	5 psi	Yes	ON-OFF actuator. Normally used with V5055/V5907A,B valve bodies. Low pressure.
V4055D1019	120 Vac	No	Yes	13 sec	Yes	5 psi	Yes	ON-OFF actuator. Normally used with Proof of Closure V5055/V5907C valve bodies. Low pressure.

V4062 Off-Lo-Hi Fluid Power Gas Valve Actuators

Control gas supply for commercial and industrial burners. Valve opens to low fire position when power is applied; valve opens all the way on demand.

- Provide final safety shutoff service when used with V5055 valve.
- One-second maximum closing time.
- Continuously displays the valve position with a red indicator when open and a yellow indicator when closed.
- Mount in any position directly to valve bonnet with three setscrews.
- Use with Q5055A Adapter Assembly to replace ITT General V710 gas valves.





		Internal	Proof of Timing				
Product Number	Electrical Ratings	Auxiliary Switch	Auxiliary Switch	(Opening)	(Closing) < 1 sec	Damper Shaft	Description
V4062A1131	120 Vac	No	No	13 sec	Yes	Yes	HI-LO-OFF actuator for use with V5055B and V5097B valve bodies. Low pressure.
V4062D1002	120 Vac	No	Yes	26 sec	Yes	Yes	HI-LO-OFF actuator for use with V5055C and V5097C valve bodies. Low pressure.

V4046C; V8046C Pilot Gas Valves

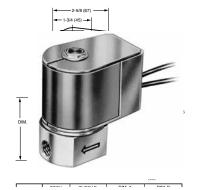
Provide on-off control of natural, LP and manufactured gases to pilot burners in industrial and commercial applications.

- Magnetically operated, normally closed.
- On power failure, valve closes in one second maximum.
- Use in any position, directly in pipe line or on support bracket.
- Replace the solenoid coil without removing the valve body.
- Straight-through valve patter

Type of Gas: Air, natural, manufactured, and LP

Dimensions, Approximate: 2 3/4 in. high x 2 5/8 in. wide x 1 5/8 in. deep

Body Pattern: Straight-through **Valve Opening/Closing Time:** 1 sec max



Product Number	Pipe Size (inch)	Capacity (cfh)	Pressure Ratings (psi)	Voltage	Description
V4046C1005	1/8 in.	20 cfh	10 psi	110 Vac; 120 Vac	Solenoid Pilot Gas Valve, 1/8 in. NPT pipe size
V4046C1021	1/4 in.	20 cfh	10 psi	110 Vac; 120 Vac	Solenoid Pilot Gas Valve, 1/4 in. NPT pipe size
V4046C1047	1/4 in.	55 cfh	10 psi	110 Vac; 120 Vac	Solenoid Pilot Gas Valve, 1/4 in. NPT pipe size
V4046C1054	3/8 in.	67 cfh	10 psi	110 Vac; 120 Vac	Solenoid Pilot Gas Valve, 3/8 in. NPT pipe size

V4295; V8295 Solenoid Gas Valves

V4295A/V8295A are normally closed and V4295S/V8295S are normally open (vent) solenoid gas valve. Suitable for use on furnaces, ovens, atmospheric burners, commercial water heaters, roof-top make-up air units, power burners, and commercial/ industrial boilers.

- V8295A,S are used with 24 Vac controllers.
- V4295A,S are used with 120 Vac controllers.
- Positive close off of gas flow when de-energized.
- High valve spring force allows up to 0.7 psi back pressure at valve seat.
- No inlet pressure influence at valve seat.
- Inlet pressure changes do not affect ability to close valve.
- Low operating noise.
- Low rush-in current.
- Upstream and downstream taps allows tapping and testing pressure points.

Type of Gas: Air, natural, manufactured, mixed, and LP

Dimensions, Approximate: 4 7/16 in. high x 2 7/8 in. wide x 2 3/16

aeep

Body Pattern: Straight-through, non-offset **Electrical Connections:** screw terminal connections **Inlet/Outlet Pressure Tapping:** 1/4 in. NPT

Frequency: 50 Hz; 60 Hz Mounting: Vertical to 90 degrees from vertical

Valve Opening Time: less than 1

sec

Valve Closing Time: less than 1

sec

Operating Temperature Range:

-40 F to +140 F

Materials

(Body): Die-cast aluminum

Approvals:

Canadian Standards Association:

Certificate No. 158158-1154280, Guide No. C3371-03, 04, 83 Control Safety Devices: Acceptable

Factory Mutual: Approved: Report No. J.I.OD6A2.AF

Industrial Risk Insurers: Acceptable

Underwriters Laboratories, Inc. Listed: File No. MH18476, V1, S1 -

Guide No. YIOZ



Product Number	Pipe Size (inch)	Capacity (cfh)	Pressure Ratings (psi)	Current (max amps at rated Vac/Hz)	Voltage
V4295A1049	1 1/4 in.	1450 cfh	2 psi	0.340 amps	120 Vac
V4295A1056	1 1/2 in.	2190 cfh	2 psi	0.300 amps	120 Vac
V4295A1064	2 in.	3465 cfh	2 psi	0.525 amps	120 Vac
V4295A1072	2 1/2 in.	5070 cfh	2 psi	0.575 amps	120 Vac

L91 Proportional Pressuretrol® Controllers

Modulating pressure operating control for regulation of liquid or air and other non-corrosive gases.

- Use with steam, air, noncombustible gases, or other fluids noncorrosive to the brass or phos-bronze (300 psi models) bellows.
- Do NOT use with combustible mediums or any medium chemically harmful to phos-bronze bellows (10-300 psi models) or brass bellows (all other pressure range models).
- 14026 Siphon Loop included with the models for 10 to 300 psi

Application: Modulating pressure control for regulation

of liquid, air, or other non-corrosive gases.

Dimensions, Approximate: 6 7/8 in. high x 4 1/2 in.

wide x 2 7/8 in. deep

Mounting: optional surface mount through back of case Pipe Connections, Main or High Pressure: 1/4 in.

NPT external thread

Electrical Connections: Screw terminals

Sensor Element: Brass bellows Switch Operation: Modulating Temperature Range: 32 F to 150 F



	Product Number	Operating Pressure Range (psi)	Maximum Sustained Operating Pressure	Pressure Differential (psi)	Modulating Output	Includes
ľ	L91B1035	0 to 15 psi	25 psi	1.5 to 12 psi	Single potentiometer, 140 ohms	_
ľ	L91D1015	0 to 15 psi	25 psi	1.5 to 12 psi	Dual potentiometer, 140 ohms	_

L608 Vaporstat® Controllers

Provide operating control and automatic high limit protection for vapor heating systems with pressures up to 4 psi (8 kPa).

- Stainless steel diaphragm for use with liquids, air, noncombustible gases, ammonia, oxygen, distilled water and similar media.
- Provide dustproof, trouble-free mercury switching.
- Clear plastic cover allows observation of the pressure settings, leveling indicator and switch action.
- Include 14026 Siphon Loop.
- Integral plumb bob for accurate leveling at installation.
- Mount using hexagonal fitting with 1/4 in. NPT internal threads for direct mounting to the 14026 Steam Trap (siphon loop), which is included.

Application: Provide operating control and automatic limit protection for pressure systems

with pressures up to 4 psi

Mounting: 1/4 in. NPT internal thread or sur-

face mount through back of case

Pipe Connections, Main or High Pressure:

1/4 in. NPT internal thread

Electrical Connections: Screw terminals **Sensor Element:** Stainless Steel diaphragm

Differential Type: Subtractive Switch Operation: Auto recycle Temperature Range: -35 F to +150 F

Includes: Siphon Loop



Product Number	Operating Pressure Range	Pressure Differential	Switching Action
L608A1046	0 to 16 oz/in²	4 to 16 oz/in²	SPDT break R-B, make R-W on pressure rise
L608A1053	0 to 4 psi	4 to 16 oz/in²	SPDT break R-B, make R-W on pressure rise

L404F Pressuretrol® Controllers

Provide operating control with automatic limit protection for pressure systems up to 300 psi (2068 kPa).•Use with steam, air, noncombustible gases, or fluids non-corrosive to pressure sensing element.

- •Models have snap-acting switching to open or close a circuit on pressure rise.
- Have adjustable differentials.
- •Adjustments are made by screws on top of case.
- •Mount using 1/4 inch -18 NPT internal pipe threads or surface mount through base of case.
- •Ground screw terminal.



Product Number	Operating Pressure	Maximum Sustained Operating Pressure	Pressure Differential (psi)	Switching Action	Mounting
L404F1060	2 to 15 psi	25 psi	2 to 6 psi	SPDT snap action, make R-W, break R-B on pressure rise	1/4" NPT

Honeywell

L408J Vaporstat® Controllers

Provide operating control and automatic high limit protection for vapor heating systems with pressures up to 4 psi (8 kPa). All models have Microswitch snap switches to open or close a circuit on a pressure rise.

•Stainless steel diaphragm for use with liquids, air, noncombustible gases, ammonia, oxygen, distilled water and similar media.

- Provide SPDT switching.
- •Clear plastic cover allows observation of the pressure settings.
- •Mount using hexagonal fitting with 1/4 in. NPT internal threads for direct mounting to the 14026 (steel) or 50024585-001 (brass) Steam Trap (siphon loop).
- •Ground Screw terminal.



Product Number	Operating Pressure	Pressure Differential (psi)	Switching Action
L408J1009	0 to 16oz	0 to 16oz	SPDT make R-W, break R-B on pressure rise.
L408J1017	0 to 4 psi	0 to 16oz	SPDT make R-W, break R-B on pressure rise.

PA404 Pressuretrol Controller

The PA404 is a series 40 (2-wire, SPST) pressuretrol controller for

use in 24, 120, 240 or 277 volt control circuits or in self powered

(millivoltage) applications.

. The PA404A is a pressure actuated high limit, safety control for

steam heating boilers; it breaks an electrical circuit to shut down the

burner if steam pressure rises above a safe level. . The PA404B is used with suspension-type unit

heaters to make the fan circuit when a pressure rise indicates the

presence of steam.

- . Each model contains an SPST Mirco Switch. snap-acting switch.
- . Sensitive pressure-actuated diaphragm expands or contracts with

pressure variations, moving a lever mechanism which operates the snap switch.

- . A screw on top of the case allows set point adjustment without removing the cover.
- . Differential is adjusted by means of a dial located inside the case.



Product Number	Application	Adjustable Operating Pressure Range	Maximum Operating Pressure	Switching action	Switch
PA404A1033	Steam boilers	.5 psi to 9 psi	20 psi	Breaks at set point on pressure fall. Makes at set point pres. rise	SPST
PA404B1023	Steam unit heaters	.5 psi to 9 psi	20 psi	Breaks at set point on pressure fall. Makes at set point pres. rise	SPST

RA890F Protectorelay® Primary Control

Primary control provides solid state, electronic flame safeguard protection for industrial and commercial single or dual fuel burners.

- Uses rectification principle of electronic flame detection.
- Replaces RA890E in most applications.
- Mounts on same Q270A1024 Subbase.
- Recycles if flame signal lost while in Run. Failure to establish pilot results in a lockout.
- Safe-start check prevents start-up if flame-simulating failure occurs in flame detector circuit.
- Includes built-in protection against ignition crossover in flame rod systems.
- Includes SPDT alarm contacts.
- Solid state circuitry.
- Mounts and removes easily through use of captive mounting screws.

• Mounting base is made of strong thermoplastic.

Application: Either a line or low voltage controller can be used **Dimensions, Approximate:** 5 in.

high x 5 in. wide x 4 3/4 in. deep (including subbase) **Frequency:** 50 Hz; 60 Hz

Temperature Range: 50 Hz models

-20 F to +105 F; 60 Hz models -20 F to +115 F

Alarm Relay Switching: SPDT



Product Number	Voltage	Flame Failure Response Time (sec)	Safety Switch Timing	Description
RA890F1288	120 Vac	3.0 sec	15 seconds	Rectification, with alarm contacts
RA890F1338	120 Vac	0.8 sec	30 seconds	Rectification, with alarm contacts

Honeywell

R4795 Primary Control with Purge

Provide solid state, electronic flame safeguard protection for commercial and industrial single or dual fuel burners.

- •Use with rectification or ultraviolet type flame detectors depending on the interchangeable, plug-in amplifier being used.
- •Recycle after flame failure in attempt to re-establish pilot before lockout.
- •Include manual push-to-reset safety switch in a dust-resistant enclosure.
- •Includes SPDT alarm contacts.

Application: Primary Control

Dimensions, Approximate: 5 in. high x 5 in. wide x 4 3/4 in. deep (including subbase) (127 mm high

x 127 mm wide x 121 mm deep)

Electrical Connections: Alarm contacts: male quick connect terminals.

Frequency: 50 Hz; 60 Hz

Temperature Range: -20 F to +105 F @ 50 Hz; -20 F to +115 F @ 60 Hz (-29 C to +40 C @ 50

Hz; -29 C to +46 C @ 60 Hz)



Product Number	Voltage	Purging Time	Alarm Relay	Safety Switch Timing	Includes
R4795A1016	120 Vac	Determined by Timer	SPDT	15 sec nominal	Female quick Connects

R7795 Primary Controls

Provide solid state, electronic flame safeguard protection for commercial and industrial single or dual fuel burners

- Include flame signal amplifiers that are color-coded: purple for ultraviolet and green for rectification.
- •Require a plug-in prepurge timer of 1.5, 7, 10, 30, 60, or 90 seconds.
- •Mount on a Q795A Wiring subbase with two captive screws.
- Include line voltage airflow switch to prove airflow from the start of prepurge through the run period.

•Prevent start-up with lockout if flame or a flame simulating failure exists,

Application: Provides Flameout Protection plus Automatic control of Commercial and Industrial Gas and Oil BurnersDimensions, Approximate: 5 in. high x 5 in wide x 5 1/4 in. deep. (127 mm high x 127 mm wide x 133.5 mm deep) Electrical Connections: Terminals in Q795 Wiring SubbaseFrequency: 50 Hz; 60 HzTemperature Range: -40 F to +135 F (-40 C to +57 C)



Product Number	Voltage	Flame Failure	Purging Time	Safety Switch Timing	Description
R7795C1007	120 Vac.	3 sec. nom.	10 psi	110 Vac; 120 Vac	Solenoid Pilot Gas Valve, 1/8 in. NPT pipe size
R7795D1005	1/4 in.	20 cfh	10 psi	110 Vac; 120 Vac	Solenoid Pilot Gas Valve, 1/4 in. NPT pipe size



BASO Automatic Pilot Valves

Description

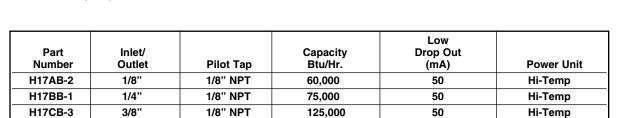
The H17 is a replacement automatic pilot valve particularly adaptable to small appliances. Gas will flow to both main and pilot burners when reset button is depressed. Pilot gas taken from main line within control. The control shuts off both main and pilot gases.

Specifications

- High temperature option allows use in valve surface temperatures up to 300°F
- Maximum inlet pressure is 1/2 psig
- Use K15, K16, or K19 thermocouple

Features

- 100% shutoff
- · Compact designApplications
- Small appliances such as room heaters, salamanders, and refrigerators
- Pilot line safety duty



BASOTROL Automatic Gas Valves

Description

The H91 Series are 2-wire, electrically-operated shutoff valves that automatically open and close on a demand signal from a thermostat or other controlling device. These valves can be used for all gas-fired appliances with a maximum operating pressure of 1/2 psi.

Specifications

- Silent operation
- Universal replacement

Features

- Maximum inlet pressure is 1/2 psig
- Maximum surface temperature is 175°F

Part Number	Inlet/ Outlet	Capacity Btu/Hr.	VAC 60Hz	AMP Rating	Electrical Connection
H91MA-4	1" NPT	505,000	120	0.08	30" in leads
H91MG-8	1" NPT	505,000	25	0.4	1/4" male spade
H91RA-4	3/4"NPT	325,000	120	0.05	30" in leads
H91RG-1	3/4"NPT	325,000	25	0.3	1/4" male spade
H91WG-1	1/4"cc	42,000	25	0.3	1/4" male spade







BASO Pilot Switches

Description

The L62 Series BASO Pilot Switches are for use on all gas-fired, standing pilot equipment that requires main burner shutoff when the pilot is extinguished. Typical applications include domestic central heating and commercial space heating appliances, as well as industrial processing equipment (e.g., die-casting machines, degreasers).



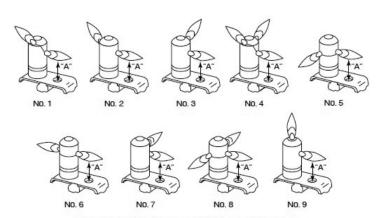
The L62GB-3 replaces L62EA models. A universal mounting bracket is included with L62GB-3 to permit replacing competitive makes.

Part Number	Inlet/ Outlet	Pilot Tap	Capacity Btu/Hr.	Low Drop Out (mA)	Power Unit
H17AB-2	1/8"	1/8" NPT	60,000	50	Hi-Temp
H17BB-1	1/4"	1/8" NPT	75,000	50	Hi-Temp
H17CB-3	3/8"	1/8" NPT	125,000	50	Hi-Temp

Combination Type Pilot Burner

Description

The J990MDA-2 is a universal replacement pilot burner for J12(-)DDA, J13(-)DDA (D12 and D13) types with No. 9 tip arrangements. Assembly contains two inlet fittings and necessary parts. The J991MDA-2 through J999MDA-2 models are universal replacement pilot burners for J10(-)DDA, J11(-)DDA (D10 and D11) types. The pilot burners are individually packed in a plastic bag, 10 bags per carton.



J Series Combination Type Pilot Burner Tip Positions

Part Number	Tip Position	Natural Gas Orifice	LP Gas Orifice	"A" Dimension
J991MDA-2	1	Y90AA-3223	Y90AA-4212	0.850 in
J992MDA-2	2	Y90AA-3223	Y90AA-4213	0.850 in
J994MDA-2	4	Y90AA-3225	Y90AA-4214	0.850 in
J995MDA-2	5	Y90AA-3221	Y90AA-4211	0.850 in
J997MDA-2	7	Y90AA-3221	Y90AA-4211	0.850 in
J998MDA-2	8	Y90AA-3223	Y90AA-4212	0.850 in
J999MDA-2	9	Y90AA-3223	Y90AA-4212	0.850 in



MIZER™ Retrofit Gas Control System

Description

The Q15 system uses a solid-state ignition control to light a pilot burner by a spark. Pilot gas is ignited and burns during each running cycle (intermittent pilot). This system permits the main gas valve to open only when the pilot burner is proven to be lit. The Q15 can be used with all gas burning equipment that uses a proven pilot. With its fast response to loss of flame, the Q15 is ideal for power vent or gravity vent equipment..

Features

- Saves gas energy because the pilot is on only during running cycle; no need to shut off pilot during summer air conditioning season
- Redundant gas valve

- Flame detection system provides long life due to solid-state components
- Fast response-control recycles within 0.8 second from loss of flame
- Eliminates most purge requirements
- Fully automatic operation on demand for heat
- AGA design certified

Applications

Q15HAA-1 can be used if:

- Natural gas only application
- Not power burner application
- Less than 200,000 Btu application
- No prepurge or postpurge times



Y63, Y64, Y65 Series Transformers

Description

The series Y63, Y64, Y65, Y66, and Y69 transformers handle 24 VAC power requirements from 40 VA through 300 VA. These transformers are designed for use with digital controllers, gas controls, ignition systems, motor actuators, staging controls, and most other 24 VAC Heating, Ventilating, Air Conditioning (HVAC) and Refrigeration control systems.

Features

- split-bobbin design provides best primary/secondary isolation
- multitap primaries reduce stocking requirements and offer application flexibility
- choice of plate, foot, or conduit hub mounting provides mounting flexibility
- choice of primary voltages meets a wide range of power requirements from 24 VAC through 480 VAC
- color-coded lead wires for simplicity and standardization
- built-in circuit breakers allow for easy reset, and avoid the replacement cost after a burnout (Y63, Y64)

Part Number	Primary Voltage VAC	Secondary Voltage VAC	Primary Connection	Second Connection	Mounting		
	40 VA Capacity Transformers with Energy Limiting Type Overload Protection						
Y65T31-0	120/208/240	24	Male Fitting	Three screw terminals	Foot		
			8 in. primary leads	(one is blind)	4 in. x 4 in. plate*		
		50 VA C	apacity Transformers	with Circuit Breakers			
Y63T31-0	120/208/240	24	Male Fitting	Three screw terminals	Foot		
			8 in. primary leads	(one is blind)	4 in. x 4 in. plate*		
	92 VA Capacity Transformers with Circuit Breakers						
Y64T22-0	120/208/240	24	End Bell Hole	End Bell Hole			
			8 in. primary leads	8 in. secondary leads	Plate		

^{*4} in. x 4 in. plate and nut packed with transformer





F61 Series

Flow Switch (Standard Flow Rate - SPDT)

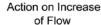
Description

The F61 Series Flow Switches are Single-Pole, Double-Throw (SPDT) flow switches used on fluid lines carrying water, ethylene glycol, or other fluids not classified as hazardous. They can be wired to energize one device and de-energize another device powered from the same source when fluid flow either exceeds or drops below the set flow rate.

Features

- stainless steel paddle has three segments for use in pipes from 1 in. to 3 in. (25 mm to 75 mm) diameter
- paddle segments can be removed or trimmed as needed
- F61KB-11 and F61MB-1 include a 6 in. (152 mm) paddle for pipes 4 in. to 6 in. (102 mm to 152 mm)
- gold-plated contacts on F61MG-1 reduce intermittent contact problems in lowvoltage and low-current circuits

Series F61





Applications

- use on lines carrying water or ethylene glycol
- not for use with hazardous fluids or in hazardous atmospheres

Replacement Kits

	Code Number	Description
١	KIT21A-600	Stainless Steel 3-piece Paddle (3 in., 2 in., and 1 in. Segments)
ı	KIT21A-601	Stainless Steel 6 in. Paddle

Selection Chart

Code Number	Enclosure	Bellows	Paddle
F61KB-11	NEMA 1	Phosphor Bronze	Stainless Steel; 3-piece Paddle (3 in., 2 in., and 1 in. Segments) Installed; 6 in. Paddle Supplied Uninstalled

P47 Series

Steam Pressure Limit Control

Description

The P47 controls are available with SPST, DPST, or 4-wire, two-circuit contacts for line voltage or low voltage. The pressure connector is 1/4 in. male NPT (0-15 psig only) or 1/4 in. female NPT (for all other ranges).

Features

- long-life contact structure with high contact force
- easy-to-adjust single sight set scales show both cut-in and cut-out settings

Applications

P47 steam pressure controls are designed for high limit or operating control applications. A typical use is as a limit control on steam heating systems. Models that close on a pressure increase are used on steam unit heaters to avoid blower operation when steam pressure is below the point required for adequate heating. The P47 can be used with steam, water, air, or noncombustible gases that do not harm iron or copper.

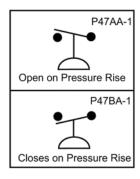
Accessories

The Part No. TBG16A-600R Siphon is supplied with all controls except models with 0 to 15 psig range.

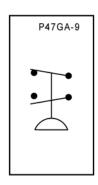
Code	Number	Range	Diff psi		Max	
Number	of Poles		Min	Max	Overpressure psig	
CONTACTS OPEN ON RISE – AUTOMATIC RESET						
P47AA-1C	1	0 to 15 psig	2	8	50	



P47AA-1



SPST



4-wire, 2-circuit Action on Pressure Rise



A350A/B Series

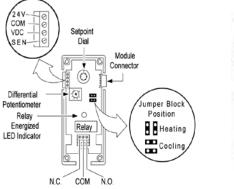
Electronic On/Off Temperature Control

Description

The A350A/B Series are On/Off temperature controls with a SPDT relay output and LED indication. These controls are used in conjunction with the A99B Series (PTC silicon) Temperature Sensors. Two basic models cover a temperature range of -30 to 250°F with an adjustable differential of 1 to 30F°. A350A controls incorporate Fahrenheit scales; the A350B models have Celsius scales. The S350 Stage, D350 Display, and Y350R Power Modules can be used with the A350A/B.

Features

- field selectable heat/cool mode
- · adjustable setpoint and differential
- · surface or DIN rail mounting
- · LED indication of relay status
- 5-pin connectors eliminate wiring between modules





Selection Chart

Code Number	Output	Range	Adj. Diff.	Offset	Sensor (Included)
A350AA-1C	SPDT Relay	-30 to 130°F	1 to 30F°	1 to 30F°	A99BC-25C
A350AA-2C	SPDT Relay	90 to 250°F	1 to 30F°	1 to 30F°	A99BC-25C

A350R

Electronic Temperature Reset Control (With Relay)

Description

The A350R Reset Controller is designed to raise or lower the setpoint of supply water temperature based upon a proportionate drop or rise in temperature at the master (outdoor) sensor. The control output is a single-pole, single-throw (SPST) normally open relay with light-emitting diode (LED) indication. The adjustable differential enables the user to match the amount of control (maximum to minimum) required for a given application. An adjustable reset ratio adapts to a variety of weather zones and to the specific heat loss characteristics of most buildings. As with all System 350 products, the A350R is housed in a NEMA 1, high-impact plastic enclosure. The modular design provides easy, plug-together connections for quick installation and future expandability.

Features

- modular design enables stage, display, and transformer modules to be purchased and installed as necessary
- adjustable master reset setpoint (M.R.S.) enables the user to select a master (outdoor) sensor temperature starting point for the supply reset ramp
- adjustable minimum and maximum supply temperature permits compliance with equipment manufacturer's specifications
- selectable warm weather shutdown temperature saves energy by disabling equipment when the master sensor temperature rises to a point where heating is no longer required
- adjustable setback temperature saves energy by lowering the supply temperature setpoint at night or during unoccupied periods



A350R

Code Number	Item	Description		
A350RS-1C	A350R Temperature Reset Control	Dual Scale		
		(packaged with A99BB-300C,A99BC-3000C and A99BC-25C sensors)		
D350AA-1C	Display Module	Fahrenheit Scale		
S350AA-1C	On-Off Stage Module	Fahrenheit Scale		
Y350R-1C	Power Module	120/240 VAC, 50/60 Hz input; rectified 24V Class 2 output		
WEL11A-601R	Immersion Well	For liquid sensing applications		
BKT287-1R	DIN Rail Sections	35 x 7.5 mm, 12 in./0.305 m long		
BKT287-2R	DIN Rail Sections	35 x 7.5 mm, 36 in./0.914 m long		
PLT344-1R	DIN Rail End Clamps	Two end clamps		



G600, G670

Ignition Control Replacement Parts

Description

G600/G670/G770/G775 ignition controls are reliable, proven circuitry replacements for G60, G65, G66, G67, G770, G775, and CSA controls. In most cases the replacement controls have mounting configurations identical to the original device. Replacement controls feature precision timing for lockout models.

Note: G600/G670 ignition control replacement parts must be used only for field replacement of existing equipment. These replacement parts must not be used for new field applications.

Orders for pilots, sensors, and cables must be placed through the original equipment manufacturer. For units not listed, contact the original equipment manufacturer.







G600AX-1 with Mounting Bracket

Selection Chart (Replacement Ignition Controls)

Code Number 100% Lockout		Damper Plug	Remarks
G600AX-1	No	Yes	24 VAC, Terminal Board Wiring
G600LX-1	G600LX-1 25 Seconds		24 VAC, Terminal Board Wiring
G670AW-1	G670AW-1 No		24 VAC, 1/4 in. Spade Wiring Connections

G779

Universal Replacement Intermittent Pilot Ignition Control

Description

The G779 Universal Replacement Intermittent Pilot Ignition Control replaces many existing intermittent pilot controls made by various manufacturers. It is a safety control designed for indirect burner ignition and supervision. The G779 can be used with all gas-fired appliances with a maximum firing rate of 400,000 Btu/hr.

Applications

The G779 replaces existing intermittent pilot ignition controls with the following specifications:

- flame detection using flame rectification technology (ability of a flame to conduct and rectify current)
- integral or remote flame sensing
- non-100% lockout, 100% lockout, or 100% shutoff with continuous retry
- trial for ignition period greater than or equal to 25 seconds
- prepurge period less than 1 second
- pilot burners with flow rates of 1,500 Btu/hr or less
- operating with or without vent dampers

The G779 is not designed to replace ignition controls with the following specifications:

- pilot flame detection by any means other than flame rectification
- trial for ignition period of less than 25 seconds
- prepurge period greater than or equal to 1 second
- · standing pilot applications



Specifications

G779 Universal Replacement Intermittent Pilot Ignition Control					
Operating Voltage	24 VAC at 50/60 Hz				
Operating Temperature	-40° to 160° F				
Humidity Rating	95% RH @ maximum operating temperature non-condensing				
Number of Trials Before 100% Shutoff	One				
Trial Time for Ignition	25 seconds				
Retry Delay Period	5 minutes				
Recommended Spark Gap	0.125 inch maximum				
Means of Flame Detection	Flame rectification				
Flame Failure Response Time	0.8 seconds				
Wiring Connections	Spark: Spike				
Control: 1/4 inch male spade					
Type of Gas	Natural, Liquified Petroleum (LP), manufactured, mixed or LP gas-air mix				



K15 Series

Standard BASO® Thermocouple

K15DS

K15WS

Description

The K15 Series Thermocouples are designed for use in standing pilot ignition systems. They are used primarily with BASO brand automatic pilot controls and pilot burners.

K15DS models are standard thermocouples. K15FS models are snap-in thermocouples that allow for fast, easy assembly. The K15WS model is a wholesale thermocouple that is supplied with additional fittings.

Selection Chart

Code Number	Length (in.)
K15DS-24	24
K15DS-36	36
K15FS-36	36
K15WS-48	48



K16 Series

"Husky™" High Performance Thermocouple

Description

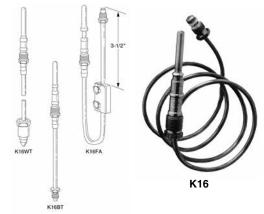
The K16 Series are heavy-duty, high performance thermocouples that provide high output for residential, commercial, and industrial applications. The "Husky" is a replacement for BASO 17D, 50, 58D, 87D, 88D, 97D, 107D, and K15DA thermocouples. The K16 is packed with adapters to allow the necessary replacement.

K16BT models are standard thermocouples. K16FA models have junction block leads. K16RA models are nickel plated thermocouples.

K16WT models are wholesale thermocouples that are suppied with additional fittings.

Selection Chart

Code Number	Length (in.)	Code Number	Length (in.)
K16BT-30	30	K16RA-48	48
K16BT-36	36	K16RA-60	60
K16FA-18	18	K16RA-72	72
K16FA-36	36	K16WT-48	48
K16RA-24	24	K16WT-60	60
K16RA-36	36	K16WT-72	72



K19 Series

"Super Slim Jim™" Universal Replacement Thermocouple

Description

K19AT thermocouples are designed for use with all Series "G" and "H" BASO valves, Basoids, and Basotrols with automatic pilot valves. The K19 is also interchangeable with thermocouples used with automatic pilot valves made by other control manufacturers whose power unit connector is similar to the BASO Series.

Kit Contains

The K19 contains a snap ring, adapter, and adapter bushing. These items help provide proper mounting and positioning of the thermocouple to the pilot burner tip.

Applications

Replaces: White-Rodgers 21H02E, Honeywell® Q34A, ITT/General 2500G, 3000MG; Robertshaw® A1910.

Code Number	Length (in.)
K19AT-48	48
K19AT-60	60
K19AT-72	72



K19



A419 Series

Electronic Temperature Controls with NEMA 1 Watertight Enclosures

Description

The A419 series controls are single-stage, electronic temperature controls with a Single Pole, Double Throw output relay. They feature a lockable front-panel touchpad for setup and adjustment, and a Liquid Crystal Display for viewing the temperature and status of other functions. A Light-Emitting Diode indicates the controls' output relay (On/Off) status. The A419 controls are available in 24 VAC or 120/240 VAC models.

The A419 controls have heating and cooling modes, adjustable setpoint and differential, an adjustable anti-short cycle delay, and a temperature offset (setback) function. The setpoint range is -30 to 212°F (-34 to 100°C). The controls feature remote sensing capability and interchangeable sensors. The A419 controls are available in either NEMA 1, high-impact plastic enclosure suitable for surface or DIN rail mounting or NEMA 4X Watertight surface-mount enclosures.

Features

 easy-to-read LCD displays the sensed temperature and control-function status clearly and custom icons on the display indicate the control and system status at a glance

- the 30° (F° or C°) temperature differential adjustment range allows precise (1F° or C°) temperature differential settings that are much tighter than electromechanical controls
- the Adjustable Anti-Short Cycle Delay (0 to 12 Minutes in 1-Minute Increments) ensures that the output relay remains off for a user-set time delay, and helps avoid hard starts, nuisance overload outages, and unnecessary equipment wear
- the Temperature Offset Function shifts the cut-in and cut-in setpoints by an adjustable offset when a user-installed, external switch closes the A419 control's binary input circuit
- the high-impact thermoplastic type NEMA 1 allows surface or snap-fit DIN rail mount; the Noryl® high-impact thermoplastic type NEMA 4X enclosures allow watertight surface mount
- lockable front-panel touchpad allows easy set up and adjustment of the A419 control setpoint, differential, and other functions; a concealed jumper locks the touchpad, and deters unauthorized adjustment of the control settings
- low- and line-voltage models provides options for almost any refrigeration or HVAC control-voltage application



A419 Control and Sensor

Selection Chart

Code Number	Item	Description			
A419ABC-1C	Line Voltage, NEMA 1 Enclosure A419 Series Electronic	Supply Voltage: 120 or 240 VAC			
	Temperature Control with Display, A99 Sensor Included	Range: -30 to 212°F			
		Differential: 1 to 30F°			
Accessories					
BKT287-1R	Accessory Mounting Hardware	12 in. long DIN Rail			
PLT344-1R	Accessory Mounting Hardware	Two End Clamps for DIN Rail Mounting			
WEL11A-601R	Immersion Well	Immersion Well for applying sensor in fluid applications			

Specifications and Electrical Ratings

Setpoint Range		-30 to 212°F					
Differential Range		1 to 30F°					
Supply Voltage		120 or 240 VAC, 60 Hz: A419ABC-1 (NEMA 1 Enclosure Model)					
Power Consumption		1.8 VA Maximum					
	120/240 VAC models:	A419ABC-1 (NEMA 1 Enclosure)					
	Applied Voltage:	120VAC 208VAC 240VAC					
	Horsepower N.O. (N.C.):	1 (0.25) hp 1 (0.33) hp 1 (0.5) hp					
	Full Load Amperes N.O. (N.C.):	16 (5.8) A 9.2 (4.0) A 8.0 (4.9) A					
Output Relay Contacts	Locked Rotor Amperes N.O. (N.C.):	96 (34.8) A 55.2 (24) A 48 (29.4) A					
Electrical Ratings	Non-inductive Amperes N.O. (N.C.):	15 (10) A 10 (10) A 10 (10) A					
	Pilot Duty:	125 VA (N.O. contacts) @ 24 to 240 VAC					
		125 VA (N.C. contacts) @ 120 to 240 VAC					
		50 VA (N.C. contacts) @ 24 VAC					
Sensor Type		A99BB Type PTC Sensor (See attached Selection Chart)					
Control Ambient		Operating: -30 to 140°F					
Temperature		Shipping: -40 to 185°F					
Ambient Humidity		0 to 95% RH Noncondensing; Maximum Dew Point: 85°F					
Control Material	Case and Cover:	NEMA 1 High-impact Thermoplastic					
		Noryl® Thermoplastic					



A19 Series

Remote Bulb Control

Description

The A19 Series are single-stage temperature controls that incorporate environmentally friendly liquid-filled sensing elements.

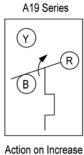
Features

- wide temperature ranges available
- constant differential throughout the entire range
- compact enclosure
- fixed or adjustable differential available
- · variety of sensing element styles
- unaffected by cross-ambient conditions



The A19 is suitable for temperature control in heating, ventilating, air conditioning, and refrigeration.





Action on Increase of Temperature

Code Number	Switch Action	Range °F	Bulb and Capillary	Bulb Well No. (order separately)	Range Adjuster	Max Bulb Temp °F
A19ABC24	SPDT	-30 to 100	3/8 in. x 4 in. copper 8 ft. Cap.	WEL14A-602	Convertible	140
A19ABC36	SPDT	-30 to 100	3/8 in. x 4 in. copper 8 ft. Cap.	WEL14A-602	Convertible	140

A19 Series

High Range Temperature Control

Description

The A19 Series controls are single stage temperature controls that incorporate liquidfilled sensing elements.

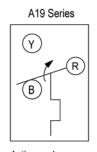
Features

- wide temperature ranges available
- constant differential throughout the entire range
- SPST or SPDT snap-acting switches
- fixed or adjustable differential available
- unaffected by barometric pressure changes
- unaffected by cross-ambient conditions
- compact enclosure
- variety of sensing element styles

Applications

The A19s are suitable for temperature control in heating, ventilating, and refrigeration applications.





Action on Increase of Temperature

Code	Switch	Range	Bulb and	Bulb Well No.	Range	Max Bulb
Number	Action	°F	Capillary	(order separately)	Adjuster	Temp °F
A19AAC-9	SPDT	100 to 240	3/8 in. x 3-1/2 in. copper 6 ft. Cap. (a)	WEL14A-602R	Screwdriver slot Visible Scale	290



P20 Series

Air Conditioning/Pressure Cutout Control

Description

The P20 Series are field replacement high and low pressure controls for non-corrosive refrigerants. They include a dust-tight contact unit with quick connect connectors, and a 36 in. capillary with 1/4 in. sweat section. The set point is screwdriver adjustable.

Features

- · accurate repeatability
- compact size
- trip-free manual reset

Accessories

• mounting bracket supplied on all models

Applications

- air conditioning high/low pressure control
- · refrigeration high/low pressure control
- head pressure control



P20DB-1

Selection Chart

Code	Maximum Temperature	Switch Range Action psig	Pango	Differential	Factory Setting – psig		Max Bellows
Number			psi	Opens	Closes	Pressure psig	
P20BB-1C ^(a)		Open On Fall	7 to 150	Manual Reset	40	Lockout Man. Reset	250
P20DB-1C ^(b)	140°F	Open On Rise	100 to 425	Manual Reset	400	Lockout Man. Reset	450
P20EB-1C ^(c)		SPDT	7 to 150	30 Fixed	40	70	250
P20EB-2C ^(d)		SPDT	100 to 425 (690 to 2930)	75 Fixed	400	324	450

- (a) Replaces Ranco G20-4412; Robertshaw 3126-216, 3160-212
- (b) Replaces Ranco G23-5253; Robertshaw 3127-220, 3161-205; Honeywell P430X-1250, 1268, 1292, 1300
- (c) Replaces Ranco G20-4050; Robertshaw 3126-116, 3160-012, 3160-014; Honeywell P431X-1092, 1100
- (d) Replaces Ranco G23-5052; Robertshaw 3127-140, 3127-414, 3161-009; Honeywell P430X, 1235, 1243, 1276, 1284

A72 Series

Cooling Tower or Evaporative Condenser Controls (Single Stage Temperature Control With Outdoor Enclosure)

Description

The A72AE and A72CE are wide range temperature controls with heavy duty DPST contacts and neoprene coated sensing elements.

Features

• open/close high models available

 control of cooling tower fans; motorized valves or solenoid operated valves

Specifications

- ambient temperature limits: -65 to 150°F
- maximum bulb temperature: 170°F



Applications

Code	Switch	Range	Diff	Bulb and
Number	Action	°F	F°	Capillary
A72AE-1C	DPST Close High	25 to 90	4 to 25	11/16 in. x 6 3/4 in. 6 ft Cap.



P28 Series

Lube Oil Pressure Cutout Control (With Time Delay)

Description

The P28 series provides dependable shutdown on pressure of lubricated refrigeration compressors by sensing low lube oil pressure. A built-in time delay switch, accurately compensated for ambient temperature, allows for pressure pick up on start and avoids nuisance shutdowns on pressure drops of short duration during the running cycle.

Features

- · direct-reading scale indication
- · adjustable set point
- trip-free manual reset
- replacement timing relays available
- dust-protected switch

Accessories

- all models listed on this page include a universal mounting bracket
- replacement timing relays -see ordering table on next page

Applications

- Semi-hermetic Compressors
- The P28 control measures pressure available to circulate oil though the lubrication system. (Net oil pressure is the difference between oil gauge and crankcase pressure.)

Specifications

• maximum bellows pressure is 180 psig



P28

Selection Chart

Code Number	Time Delay	Heater Circuit VAC	Type of Reset	Range psig	Refrigerant (R)	Pressure Connection
P28AA-17 (a)	120 sec	120 / 240	Manual	8 to 70	Non-Corrosive (b)	36 in. Cap. with 1/4 in. Flare Nut

⁽a) Replaces Ranco P30-3801

P45 Series

Lube Oil Pressure Cutout Control (With Time Delay)

Description

The P45 control provides dependable, low lube oil pressure protection for refrigeration compressors. The factory set pressure setting provides operation to the compressor manufacturer's specification. A built-in time delay relay, compensated for ambient temperature, allows for pressure pick-up on start and avoids nuisance shutdowns on short duration pressure losses during the running cycle.

Features

- universal mounting
- trip-free manual reset
- · ambient compensated time delay

Accessories

These controls are supplied without mounting brackets. If brackets are required, order kit number BKT38A-600R, which contains five 271-51 angle mounting brackets with screws.

Applications

- Semi-hermetic Compressors
- The P45 control measures net oil pressure available to circulate oil through the lubrication system. (Net oil pressure is the difference between oil pump pressure and the crank case pressure.)

Specifications

• for all non-corrosive refrigerants.



P45NCA

Code	Time	Heater Circuit	Type of	Range	Max. Bellows	Factory	Pressure
Number	Delay	VAC	Reset	psig	Pressure psig	Setting psig	Connection
P45NCA-12C	120 sec Relay is not field replaceable	120 / 240	Manual	7	425	9*	36 in. Cap. with 1/4 in. Flare Nut

^{*} Switch differential is approximately 5 psi. Time delay relay energizes at 9 psi pressure difference, de-energizes at 14 psi difference.

⁽b) Non-corrosive refrigerants include R-12, R-22, R-134A, R-500, R-502 (R)



P70 Series

Single Pole Low Pressure Control

Description

This P70 Series of controls employs a set of switch contacts that are opened and closed by the movement of pressure actuated bellows. The load-carrying contacts provide direct control of AC motors within the control rating. Note the electrical rating chart for specific models. These controls are available with either close high—open low, open high—close low, or SPDT contact action.

Features

- full adjustability through all pressure ranges
- minimum differential
- long life contact structure...no bounce on make

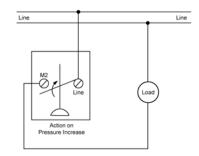
Accessories

· includes a universal mounting bracket.

Applications

- air conditioning and refrigeration applications
- control of air, water, and oil pressure





P70AB-2

P70 Wiring Diagram

Selection Chart

Code Number	Switch Action	Range psig	Differential psi	Pressure Connector	Limited Knob Adjustment	Max. Bellows Overrun Pressure psig
		MICRO	-SET™ FOR R-12,	R-22, R134A, R-500,	R-502 (R)	
P70AB-12 Close High		12 in. to 80	Min 5	36 in. Cap. with	Cut-out*	525
	Open Low		Max 35	1/4 in. Flare Nut		
		"ALL R	ANGE" FOR R-12,	R-22, R134A, R-500,	R-502 (R)	
P70AB-2C Close High		20 in. to 100	Min 7	36 in. Cap. with	Cut-out*	325
	Open Low		Max 50	1/4 in. Flare Nut		

^{*} Adjusting knob supplied on differential (cut-out setting) to limit adjustments to 5 psi above or below normal setting.

P70 Series

Single Pole High Pressure Control

Description

This P70 Series of controls employs a set of switch contacts that are opened and closed by the movement of pressure actuated bellows. The load-carrying contacts provide direct control of AC motors within the control rating. These controls are available with either close high—open low, open high—close low, or SPDT contact action.

Features

- full adjustability through all pressure ranges
- minimum differential
- long life contact structure, no bounce on make; manual reset models are "trip-free"

Accessories

• includes a universal mounting bracket

Applications

- air conditioning and refrigeration applications
- control of air, water, and oil pressure



P70CA-2 Universal Mounting Bracket Included

Code Number	Switch Action	Range psig	Differential psi	Pressure Connector	Limited Knob Adjustment	Max. Bellows Overrun Pressure psig						
HEAD PRESSURE FAN CYCLING FOR R-12, R-22, R134A, R-500, R-502 (R)												
P70AA-2 Close High		0 to 150	Min 12	36 in. Cap. with	None	525						
	Open Low		Max 70	1/4 in. Flare Nut								
		"ALL R	ANGE" FOR R-12,	R-22, R134A, R-500,	R-502 (R)							
P70CA-3C	Close High	50 to 500	Min 60	36 in. Cap. with	None	525						
	Open Low		Max 150	1/4 in. Flare Nut								



P70 Series

Single Pole Dual Pressure Control

Description

This P70 Series of dual pressure controls employs a SPST switch, that is opened when either high pressure or low pressure beyond the control settings is sensed at the control's two bellows sensing elements. The loadcarrying contacts provide direct control of AC motors within the control's rating. These controls provide close high—open low (low pressure) or open high—close low (high pressure) contact action.

Features

- full adjustability through all pressure ranges
- minimum differential
- long life contact structure...no bounce on make
- manual reset models are "trip-free"

Accessories

• includes a universal mounting bracket.

Applications

- air conditioning and refrigeration applications
- · control of air, water, and oil pressure



P70LB-1 Universal Mounting Bracket Included

Selection Chart

		Low Pressu	ıre psig	Hig	h Pressure psig	_	Limited	Maximum			
Code Number	Code Switch umber Action Range Diff		Diff	Range	Diff (Non-Adj)	Pressure Connector	Knob Adjustment	Over-pressure psig			
	MICRO-SET™ FOR R-12, R-22, R-134A, R-500, R-502 (R)										
P70LB-6C (a)	SPST	12 in. to 80	Min 5 Max 35	100 to 500	65 psi at < 300 psig 75 psi at 300-400 psig 95 psi at > 400 psig	36 in. Cap. with 1/4 in. Flare Nut	Cut-out (b)	325 Low 525 High			
			"ALL RA	NGE" FOR R	-12, R-22, R134A, R-500,	R-502 (R)					
P70LB-1C ^(c)	SPST	20 in. to 100	Min 7 Max 50	100 to 500	65 psi at < 300 psig 75 psi at 300-400 psig 95 psi at > 400 psig	36 in. Cap. with 1/4 in. Flare Nut	Cut-out (b)	325 Low 525 High			

⁽a) Replaces Ranco 012-1505, 012-1506, 012-1554

P72 Series

Two Pole High Pressure Control

Description

The P72 Series of controls employs a set of DPST contacts that are opened and closed by the pressure actuated bellows. The heavy duty load-carrying contacts provide direct control of motors having integral line-interrupting overload protectors up to three horsepower. See Electrical Ratings below. Starter is unnecessary. Primarily used on air-conditioning and refrigeration applications but also used to control air, water, glycol, and lube oil pressure.

Features

- full adjustability for all non-corrosive refrigerant pressure applications
- adjustable differential meets the most demanding applications
- direct reading scale

Accessories

• includes a universal mounting bracket

Application Advantages

- control of polyphase motors without use of magnetic starters where protection against overloading and single phasing is otherwise provided
- two separate control circuits necessary for the control of multiple systems
- one set of contacts break the "hot" line when wired as a two pole switch in single phase circuits
- · control of two separate load circuits
- · automatic control of heavy electrical loads



P72CA-2

Code Number	Switch Action	Range psig	Differential psi	Pressure Connector	Max. Bellows Overpressure psig							
HEAD PRESSURE FAN CYCLING FOR R-12, R-22, R-134A, R-500, R-502 (R)												
	DPST											
P72AA-27C*	Close High Open Low	100 to 400	Min 35 Max 200	36 in. Cap. with 1/4 in. Flare Nut	475							

^{*} Replaces Ranco 020-7006.

⁽b) Adjusting knob supplied on differential (low side cutout setting) to limit adjustment 5 psi (34 kPa) above or below setting.

⁽c) Replaces Ranco 012-1549



P72 Series

Two Pole Dual Pressure Control

Description

The P72 Series of controls employs a DPST switch, which is opened when either the high or low pressure beyond the control settings is sensed at the control's two bellows sensing elements. The heavy duty load-carrying contacts provide direct control of motors having integral line-interrupting overload protectors up to three horsepower. See Electrical Ratings below. Starter is unnecessary. Primarily used on air-conditioning and refrigeration applications but also used to control air, water, glycol, and lube oil pressure.

Features

- full adjustability for all non-corrosive refrigerant pressure applications
- adjustable differential meets the most demanding applications
- direct reading scale

Application Advantages

- control of polyphase motors without use of magnetic starters where protection against overloading and single phasing is otherwise provided
- two separate control circuits necessary for the control of multiple systems
- one set of contacts break the "hot" line when wired as a two pole switch in single phase circuits
- · control of two separate load circuits
- automatic control of heavy electrical loads



Selection Chart

		Low Pressu	ıre psig	Hig	h Pressure psig		Limited	Maximum						
Code Number	Switch Action	Range	Diff	Range	Diff (Non-Adj)	Pressure Connector	Knob Adjustment	Over-pressure psig						
	ALL-RANGE FOR R-12, R-22, R134A, R-500, R-502 (R)													
P72MA-1	DPST	20 in. to 100	Min 7 Max 50	100 to 500	Lockout (Requires Manual Reset)	36 in. Cap. with 1/4 in. Flare Nut	None	325 Low 525 High						

V46 Series

Pressure Actuated Water Regulating Valve

Description

The V46 is a pressure actuated, modulating valve that is suitable for use either on closed or open systems. Direct acting valves open on pressure increase. This type of valve is primarily used to regulate the flow of water or glycol to a water cooled condenser on a refrigeration system.

Features

- no close fitting or sliding parts in water passages
- minimizes chatter or water hammer
- free movement of all parts provides smooth pressure modulation
- refrigerant adjustment is not affected by water pressure
- withstands high hydraulic shock without damage

- range spring does not come in contact with cooling water
- · easy manual flushing, if required
- 3/8, 1/2, and 3/4 in. valves may be disassembled and reassembled without detaching from the refrigeration system or without pumping down

Applications

- Modulate flow of water or glycol to a water cooled condenser on a refrigeration system.
 Examples include:
- ice machines
- computer room air conditioning units
- ice cream machines
- refrigeration cases



V46AA-1

V46AB-1

Kit Number	Water Valve Size (in.)
KIT14A-612*	1-1/2
KIT14A-613*	2
KIT14A-614*	2-1/2

^{*} For commercial valves only

Code Number	Pipe Size (In.)	Inlet and Outlet	Opening Point Range – psig	Pressure Element Style	Replacement Power Elements	
		COMMERC	AL TYPE, STAND	ARD FLOW - NON C	CORROSIVE REFI	RIGERANTS (R)
V46AA-1C	3/8 NPT				STT14A-600R	SEP91A-600R and SEC99AA-36C*
V46AB-1C	1/2 NPT		70 to 260	30 in Capillary	STT15A-602R	SEP91A-602R and SEC99AA-36C*
V46AC-1C	3/4 NPT	Threaded	Max 35	1/4 in. Flare Nut	STT16A-601R	SEP91A-601R and SEC99AA-36C*
V46AD-1C	1 NPT			(Style 45)	STT17A-609R	SEP91A-603R and SEC99AA-36C*
V46AE-1C	1 1/4 NPT				STT17A-610R	SEP9TA-603R and SEC99AA-36C

^{*} Replacement element suppplied with 1/4 in. male SAE connector. Order SEC99AA capillary kit with 2 flare nuts separately, if needed.

90 SERIES "PREMIUM" THERMOSTATS

Residential and Commercial – Single Stage, Multi-Stage and Heat Pump Applications. 90 Series Thermostats are the Ultimate for Comfort, Convenience and Performance. No Additional Subbases Required

FEATURES

- Automatic heat/cool system changeover.
- Fossil fuel or electric heat compatible.
- Large Comfort-View™ luminescent display and the industry's first lighted keypad.
- · Permanent program memory.
- Configuration menu allows keypad selection of options, no additional subbases required.
- Selectable Energy Management Recovery.
- Onboard system and thermostat diagnostics.
- Single stage models accept 1 remote indoor sensor, staging models accept up to 3 indoor sensors and offer temperature averaging or weighted average by sensor location and program time.
- Meets Energy Star specifications (except 1F96-344 and 1F93-380).



Electrical Rating Single Stage mV to 30 VAC, NEC Class II, 50/60 Hz or DC

Electrical Rating Staging 20 to 30 VAC, NEC Class II

Terminal Load................... 1.5 A per terminal,

2.5 A maximum all terminals combined

Setpoint Range. 45 to 99°F (7 to 37°C)

Rated Differential Staging...... Heat 0.5 to 1.5°F Cool 0.5 to 2.2°F

Shipping Temperature Range..... -4 to 150°F (-20 to 65°C)
Dimensions..... 4-1/8"H x 6-7/8"W x 1-3/8"D



97 Series



95 Series



F145-1328 Indoor Remote Sensor



F145-1378 Outdoor Remote Sensor

STAGING THERMOSTATS

Stages	s	Program	MODEL	-	Appli	catio	on	Performance Features C				Comf	Comfort & Convenience			Terminals				
Heat	Cool			Multi-Stage	Heat Pump	Gas/Oil/Electric	Millivolt	Auto Changeover	Energy Mgt. Recovery	Programmable Fan	Keypad Lockout	Indoor Remote Sensor	Outdoor Remote Sensor	Power Source	Energy Star	Lighted Display	Lighted Keypad	Memory Type	Super Cap	
MS 3	2	7-day	1F97-371	X		x		Х	Х	Х	х	3	1	Н	х	1	х	2	х	R,C,G,Y1,Y2,W1, W2,W3,O,B,L,PH, SA,SB,SC,OT

SINGLE STAGE THERMOSTATS

ſ	1	1	7-day	1F97-1277	X(1)	X	Х	Х	Х	Х	Х	1	P/S	Χ	1	2	RC,RH,W,Y,G,
			5+1+1		` '												O,B,W/E,L,6,S

MS = Multi-Stage B = Battery Power

HP = Heat Pump H= Hardwired (Requires Common)

① Comfort View™ H/B = Hardwired or Battery option
② Permanent P/S = Power Stealing with Battery Back-Up

(1) = Single Stage Heat Pump

80 SERIES THERMOSTATS

Residential and Light Commercial – Single Stage, Multi-Stage and Heat Pump Applications. 80 Series Standard Thermostats are Packed with Premium Features. No Other Thermostat Series Offers More Value for the Money

FEATURES

- Choice of battery powered, dual power or hardwired models.
- Fossil fuel or electric heat compatible.
- 60% larger LCD with backlight.
- Permanent program retention during power loss.
- Configuration menu allows keypad selection of options.
- Selectable Celsius or Fahrenheit temperature display.
- Selectable Energy Management Recovery.

SPECIFICATIONS

Electrical Rating Single Stage:

Dual Power or Battery Power Model MV to 30 VAC, NEC Class II, 50/60 Hz or DC

Electrical Rating Staging 20 to 30 VAC, NEC Class II

Terminal Load 1.0 A per terminal,

1.5A maximum all terminals combined

Cool 1.2°F

Rated Differential (Multi-Stage) Heat 0.6° or 1.5°F

Cool 1.2°F

Rated Differential (Heat Pump) ... Heat & Cool 0.75° or 1.2°F
Operating Ambient ... 32 to +105°F (0 to +41°C)
Operating Humidity ... 90% non-condensing max.
Shipping Temperature Range .-4 to +150°F (-20 to +65°C)
Dimensions Thermostat ... 3 3/4"H x 6"W x 1-1/4"D



1F80-361



1F86-0244

STAGING THERMOSTATS

Stages	S	Program	MODEL	-	Application					Perfo	rman	e Fea	tures			Comf	ort & C	onvenie	ence	Terminals
Heat	Cool			Multi-Stage	Heat Pump	Gas/Oil/Electric	Millivolt	Auto Changeover	Energy Mgt. Recovery	Programmable Fan	Keypad Lockout	Indoor Remote Sensor	Outdoor Remote Sensor	Power Source	Energy Star	Lighted Display	Lighted Keypad	Memory Type	Super Cap	
2	2	5+1+1 day	1F81-261	X		Х	Х		Х					H/B	Х	Х		1		R,C,Y,Y2,W,W2,G
2	2	Ø	1F83-261	Х		Х	Х							H/B		Χ		1		R,C,Y,Y2,W,W2,G

SINGLE STAGE THERMOSTATS

1	1	5+1+1 day	1F80-361	X(1)	Х	х	Х			H/B	Х	Х	1	RC,RH,C,W,Y, G,O,B
1	1	Ø	1F86-0244	X(1)	Х					H/B		Х	1	R,C,Y,W,G, O,B

MS = Multi-Stage B = Battery Power

HP = Heat Pump

① Comfort View[™]

② Permanent

H= Hardwired (Requires Common)

H/B = Hardwired or Battery option

P/S = Power Stealing with Battery Back-Up

(1) = Single Stage Heat Pump

70 SERIES THERMOSTATS

Residential Single Stage, Multi-Stage and Heat Pump Applications. 70 Series are the Perfect Upgrade from Mechanical Thermostats. Covers Wall Marks Left by Most Mechanical Thermostats Without the Need for an Extra Wall Plate.

FEATURES

- Fossil fuel or electric heat compatible.
- Large LCD with backlight.
- Selectable Celsius or Fahrenheit temperature display.
- Includes B/O terminals.
- · Electronic accuracy.



1E78-144

Stage	s	Program	MODEL	P	Appli	icati	on			Perfo	rman	ce Fea	tures			Comf	ort & C	onveni	ence	Terminals
Heat	Cool			Multi-Stage	Heat Pump	Gas/Oil/Electric	Millivolt	Auto Changeover	Energy Mgt. Recovery	Programmable Fan	Keypad Lockout	Indoor Remote Sensor	Outdoor Remote Sensor	Power Source	Energy Star	Lighted Display	Lighted Keypad	Memory Type	Super Cap	
1	1	5+2	1E78-151		Х	х	Χ		Х					В	Х	Х		В		Rc,Rh,W,Y,G,O,B
1	1	Ø	1E78-144		Х	Х	Χ							В		Х		В		Rc,Rh,W,Y,G,O,B
1	Ø	Ø	1E78-140			Х	Х							В		Х		В		Rh,W

SINGLE STAGE LOW VOLTAGE THERMOSTATS

HEATING/COOLING AND COOLING ONLY — WITH SELECTOR SWITCHES

Reliable Performance Combined With Thin-Profile Subbase Mounting Plate. Entire Unit Only Extends 1-5/8" From Wall

FEATURES

- Dustproof sealed mercury cells or snap-action contacts with dust cover.
- Classic White or Beige color.
- Positive contact snap-switches on subbase.
- Bi-Metal thermometer.
- Heating and cooling anticipators provide narrow differential control of room temperature.

SPECIFICATIONS

Anticipation, Heating Adjustable from 0.15 to 1.2 Amps

Anticipation, Cooling. Fixed
Differential, Heating 1°F
Differential, Cooling 1.5°F

Dimensions...... 3-1/4"H x 4-1/2"W x 1-5/8"D including subbase

Electrical Rating 30 VAC maximum, NEC Class II



1F56-444



1E56W-444

Model Number	Typical Application	Color	Stages Heat/Cool	System Switch	Fan Switch	Contacts	Anticipation Heat/Cool	Range	Shape	Terminals
1E56-301	Heat/Cool	Beige	1/1	Heat-Off-Cool	Auto-On	Mercury Cell	Adjustable/Fixed	50-90°F	Vertical	4, RC, W, Y, G
1E56W-444	Universal Style Fossil Fuel or ②	Classic White	1/1	Universal Design Heat-Off-Cool	Auto-On	Mercury Cell	Adjustable/Fixed	50-90°F	Vertical	RC, RH, W, Y, G, O, B, A
1F56-301	Heat/Cool	Beige	1/1	Heat-Off-Cool	Auto-On	Mercury Cell	Adjustable/Fixed	50-90°F	Horizontal	RH, RC, W, Y, G
1F56W-444	Universal Style Fossil Fuel or ②	Classic White	1/1	Heat-Off-Cool	Auto-On	Mercury Cell	Adjustable/Fixed	50-90°F	Horizontal	RC, RH, W, Y, G, O, B, A

SINGLE STAGE LOW VOLTAGE THERMOSTATS

VERTICAL THERMOSTATS WITH MERCURY CELL SWITCH

Vertical Thermostat Model For Control Of Low Voltage Heating, Cooling And Zoning Installations

FEATURES

- Sealed mercury cells provide long life and protection against dirt and moisture.
- Heating and cooling anticipators provide narrow differential control of room temperature.
- Snap-on cover, except as noted ?.
- Classic White or Beige color.

SPECIFICATIONS

Anticipation, Heating Adjustable from 0.15 to 1.0 amps

(except millivolt models)



1E30-910

Model Number	Typical Application	Color	Stages Heat/Cool	System Switch	Fan Switch	Contacts	Anticipation Heat/Cool	Range	Shape	Terminals
1E30-373	Heat Only	Beige	1	None	None ①	Mercury Cell	Adjustable	40-75°F ②	Vertical	2 Unmarked
										Terminals Open on Rise
1E35-910	3 Wire Zone Valve Heat Only	Beige	1	None	None	Mercury Cell	Fixed	50-90°F	Vertical	4, 5, 6

- ① Order S23-6 Subbase for Fan On/Fan Auto switching. Terminals R, W and G
- 2 Meets HUD specifications and includes locking cover.

SINGLE STAGE LOW VOLTAGE THERMOSTATS

HORIZONTAL THERMOSTATS WITH MERCURY CELL SWITCH

Horizontal Thermostat Model For Control Of Low Voltage Heating, Cooling, Heating/Cooling And Zoning Installations

FEATURES

- Sealed mercury cells provide long life by protecting against dirt and moisture.
- Heating and/or cooling anticipators provide narrow differential control of room temperature.
- Beige or Classic White color.

1F35-910

SPECIFICATIONS

Anticipation, Heating Adjustable from 0.15 to 1.0 Amps

(except millivolt models)

Anticipation, Cooling. Fixed
Differential, Heating 1°F
Differential, Cooling 1.5°F
Differential, Millivolt Heating 1°F

Model Number	Typical Application	Color	Stages Heat/Cool	System Switch	Fan Switch	Contacts	Anticipation Heat/Cool	Range	Shape	Terminals
1F35-910	3-Wire Zone	Beige	1	None	None	Mercury Cells	Fixed	50-90°F	Horizontal	R5, Y6, 4

SINGLE STAGE LOW VOLTAGE THERMOSTATS

THERMOSTATS WITH SNAP-ACTION SWITCH

For Low Voltage Heating, Cooling And Zoning Installations Where a Snap-Action Control Is Desired

FEATURES

- Snap-Action contacts with dust cover.
- Not affected by jarring or vibrations.
- Ideal for mobile home use.
- Heating and cooling anticipators provide narrow differential control of room temperature.
- Beige or Classic White color.

1D30-316

SPECIFICATIONS

Anticipation, Heating Adjustable from 0.15 to 1.0 Amps

Anticipation, Cooling. Fixed
Differential, Heating 1°F
Differential, Cooling 1.5°F

Dimensions, Horizontal 2-3/4"H x 4-1/2"W x 1-1/2"D Dimensions, Vertical 4-1/2"H x 2-3/4"W x 1-1/2"D Electrical Rating 30 VAC maximum, NEC Class II

Model Number	Typical Application	Color	Stages Heat/Cool	System Switch	Fan Switch	Contacts	Anticipation Heat/Cool	Range	Shape	Terminals
1D30-316	Heat Only	Beige	1	None	None	Snap-Action	Adjustable	50 to 90°F	Horizontal	2 Unmarked Terminals, Open on Rise

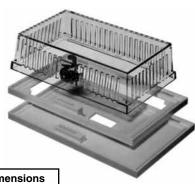
THERMOSTAT GUARDS - PLASTIC

These Durable Thermostat Guards are Designed for use in Offices, Churches, Restaurants and Other Public Areas to Prevent Adjustment of the Temperature by Unauthorized Personnel

FEATURES

- Each model furnished with one key and can be mounted vertically or horizontally.
- Clear plastic models for applications that need the thermostat visible.
- · Opaque plastic models for applications that require the thermostat be kept hidden from view.
- Each model furnished with a ring and/or solid wall mounting plate.

Model		Horizontal (I	Ring) Inside I	Dimensions	Horizontal (Solid) Inside [Dimensions
Number	Description	Length	Height	Depth	Length	Height	Depth
F29-0231	Clear Plastic	7-1/16"	4-1/8"	2-1/4"	7-5/8"	4-1/4"	2-1/8"



F29-0231

THERMOSTAT GUARDS - METAL

These Durable Metal Guards are Designed for Government, Military, Industrial and Educational Applications to Prevent Adjustment of the Temperature by Unauthorized Personnel

FEATURES

- Model F29-0220 and F29-0222 fit ALL White-Rodgers Thermostats.
- Each model furnished with one key and can be mounted vertically or horizontally.
- Tamper-resistant design. 18 gauge cover, 22 gauge frame.
- Beige enamel finish over heavy-duty steel enclosure.
- Models available in a ring or solid base.

Model		Horizontal (I	Ring) Inside I	Dimensions	
Number	Description	Length	Height	Depth	Comments
F29-0220	Solid base	7-1/8"	4-5/8"	3-1/4"	-



F29-0222



LINE VOLTAGE, LOCKED CASE AND LIMITED OR LOCKED SETTING THERMOSTAT FOR HEATING

For Installations where Heavy Duty Thermostats with Tamperproof Features are Required. Ideal for Control of Infra-Red Heater Installations

FEATURES

- "Limited maximum setting" internally adjustable stop prevents movement above desired setting.
- Tamperproof case with locking screw and special key (included). Heavy gauge steel case Mounts on vertical 2" x 4" junction box or flush to wall.
- Hydraulic action element Unaffected by motion No leveling required.
- "ON" position can be used to operate fan during summer. (Contact will open and stop fan if ambient reaches 120°F/49°C).

SPECIFICATIONS

Dimensions..... 6"H x 2-3/4"W x 2-1/2"D

Finish Grey color



176-6

Model				Full Electrical	Motor (Full I		Resis (Non-Ind	
Number	Range	Differential	Action	Rating	120 VAC	240 VAC	120 VAC	240 VAC
176-6	40 to 80°F	Fixed 3°F	Open on Rise	FG	14.0A	7.0A	25.0A	22.0A

LINE VOLTAGE THERMOSTAT FOR HEATING

For Control of Most Line Voltage Heating Applications without use of Relays or Motor Starters

FEATURES

- "Summer" dial position (152 model) that closes contacts to operate unit heater fan.
- Heavy gauge steel case Mounts on vertical 2" x 4" box or flush to wall.
- \bullet Hydraulic action element Unaffected by motion No leveling required.
- Dustproof case.

SPECIFICATIONS

Dimensions..... 6" H x 2-3/4" W x 2-1/2" D

Finish Grey color

Agency U.L. listed and C.S.A. certified



152-9

Model				Full Electrical	Motor (Full I		(N	Resistive on-Inductive	=)
Number	Range	Differential	Action	Rating	120 VAC	240 VAC	120 VAC	240 VAC	277 VAC
152-9	55 to 85°F	Fixed 2°F	Open on Rise	FG	14.0A	7.0A	25.0A	22.0A	18.0A

36C CYCLE PILOT GAS VALVES

With Redundant Pilot Solenoid Main Gas Regulator, Integral Gas Pressure Switch and Electrical Connection on the Gas Valve for Mercury Flame Sensor Connection

SPECIFICATIONS

Electrical Rating 0.6 amps End to End Dimensions 3-15/16"

Ambient Operating Range -40 to +175°F (-40 to 79°C)

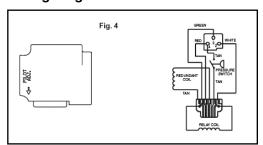
		Drop Capacity U/HR		e of Regulation U/HR
Pipe Size	AGA STD. NAT GAS 1000 BTU/CU. FT.	LP GAS 2500 BTU/CU. FT.	AGA STD. NAT GAS 1000 BTU/CU. FT.	LP GAS 2500 BTU/CU. FT.
1/2 X 3/8	100,000	162,000	15,000-100,000	15,000-162,000
1/2 X 1/2	230,000	372,600	30,000-290,000	30,000-469,000
1/2 X 3/4	230,000	372,600	30,000-290,000	30,000-469,000
3/4 X 3/4	280,000	453,600	50,000-400,000	50,000-648,000

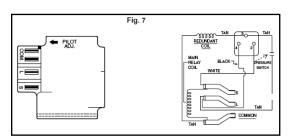


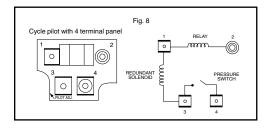
36C Series

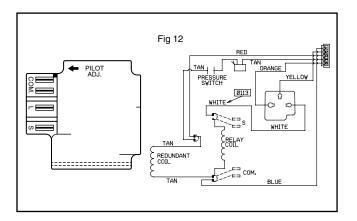
Model Number	Coi Voltage	Gas Type	Pipe Size	Opening Characteristic	Regulator Setting	Regulator Adjustment Range	Convertible Nat./LP	LP Conversion Kit Included	Line Interrupter	Flow Direction	Reducer Bushing Kit	Inlet Pressure Tap	Side Taps	Internal Wiring See Figure
36C84-413	24 VAC	Natural	3/4 x 3/4	Fast Open	3.5"	2.5"-5.0"	Yes	Yes	No	Str. Thru	Yes	Yes	No	12
36C84-423	24 VAC	Natural	3/4 x 3/4	Fast Open	3.5"	2.5"-5.0"	No	No	No	Str. Thru	No	Yes	No	14
36C84-426	24 VAC	Natural	3/4 x 3/4	Fast Open	3.5"	2.5"-5.0"	No	No	No	Str. Thru	Yes	No	No	4
36C84-445	24 VAC	Natural	3/4 x 3/4	Fast Open	3.5"	2.5"-5.0"	Yes	Yes	No	Str. Thru	Yes	Yes	No	8
36C84-912	24 VAC	Natural	3/4 x 3/4	Fast Open	3.5"	2.5"-5.0"	Yes	Yes	No	Str. Thru	Yes	Yes	No	7
36C84-921	24 VAC	Natural	3/4 x 3/4	Fast Open	3.5"	2.5"-5.0"	Yes	Yes	No	Str. Thru	Yes	Yes	No	7
36C84-923	24 VAC	Natural	3/4 x 3/4	Fast Open	3.5"	2.5"-5.0"	No	No	No	Str. Thru	No	Yes	No	14

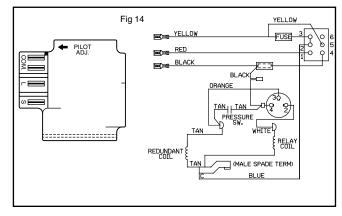
Wiring Diagrams











36E REDUNDANT GAS VALVE

Compact Multifunction Valves Designed to Meet the Requirements for use with All Types of Intermittent Ignition Systems (Cycle-Pilot, Proven Pilot, Direct Spark Ignition and Hot Surface Ignition)

FEATURES

- Poppet style manual valve (capable of withstanding high inlet pressures).
- Conical inlet and outlet screens protected from pipe damage.
- Direct acting solenoid valve with high sealing force.
- Controlled gasket clinch between castings to withstand high inlet pressures.
- May be mounted horizontal, vertical and 90° from horizontal.

SPECIFICATIONS

Electrical Rating 0.54 amps

Regulator Adjustment Range Natural gas, 2.5 to 5.0" W.C.

L.P. gas, 7.5 to 12.0" W.C.

Maximum Pressure Rating 1/2 PSI (14.0" W.C.)

Ambient Operating Range -40 to +175°F (-40 to +79°C)

Agency A.G.A. and C.G.A. design certified





Model Number	Coil Voltage	Inlet-Outlet Size	Electrical Connection (see Fig #)	Regulator Setting	Step Opening	Gas Type	System Usage	Reducer Bushing Kit	Inlet Pressure Tap	Side Taps
36E36-304①	24 VAC, 60 Hz	1/2" x 3/4"	2	3.5" W.C.	Fast Open, No Step	Natural & L.P.	Proven Pilot, HSI and DSI	Yes	Yes	Yes
36E38-301①	24 VAC, 60 Hz	1/2" x 3/4"	2	3.5" W.C.	1.2" W.C.	Natural	Proven Pilot, HSI and DSI	Yes	Yes	Yes
36E38-302①	24 VAC, 60 Hz	1/2" x 3/4"	2	10.0" W.C.	2.5" W.C.	L.P.	Proven Pilot, HSI and DSI	Yes	Yes	Yes
36E86-302	24 VAC, 60 Hz	1/2" x 3/4"	5	3.5" W.C.	Fast Open	Natural	Cycle-Pilot	Yes	No	Yes
36E93-304	24 VAC, 60 Hz	1/2" x 3/4"	6	3.5" W.C.	Slow Open, No Step	Natural	Proven Pilot with pressure switch	No	Yes	No
36E98-304	24 VAC, 60 Hz	1/2" x 3/4"	2	3.5" W.C.	Slow Open, No Step	Natural	Proven Pilot HSI and DSI	Yes	Yes	Yes

36H SERIES GAS VALVES

The 36H Combination Gas Control Valve is a Versatile Multifunction Control Designed to Meet the Requirements for Use with Intermittent Ignition Systems (Direct Ignition, Proven Pilot). The 36H Valve is Our Highest Capacity Combination Gas Valve

FEATURES

- Adjustable regulator.
- Quiet operation redundant design.
- Inlet/outlet screens.
- Tamper resistant screws.

SPECIFICATIONS

Type of Gas Natural or LP (conversion kit included)

Ambient Operating Range -40 to +175°F (-40 to 79°C)

Maximum Pressure Rating...... 1/2 PSI (14.0" W.C.)



36H33-412

Model Number	Coi Voltage	Gas Type	Pipe Size	Opening Characteristic	Regulator Setting	Regulator Adjustment Range	Convertible Nat./LP	LP Conversion Kit Included	Flow Direction	Bushing Kit	Reducer Pressure Tap	Inlet Side Taps
36H33-412	24 VAC	Nat/LP	3/4 x 3/4	Slow	3.5"	2.5"-5.0"	Yes	Yes	Str. Thru	Yes	No	No



36J SERIES GAS VALVES

The 36J is a combination gas control valve designed for use with non-piloted intermittent ignition systems. The control is designed to meet today's maximum capacity, smaller size and high efficienct gas systems.

FEATURES

- Inlet and outlet screens.
- Quiet redundant.
- Built-in pressure tap.
- Quick-connect terminals (1/4").

SPECIFICATIONS

Electrical Rating Single stage 24V, 50 / 60Hz at .3A

..... Two stage at .43A

Swing Radius 2.75"

Agency C.S.A. approved



36J24-214

Model Number	Coi Voltage	Gas Type	Pipe Size	Opening Characteristic	Regulator Setting	Regulator Adjustment Range	Convertible Nat./LP	LP Conversion Kit Included	Flow Direction	Bushing Kit	Reducer Pressure Tap	Inlet Side Taps
36J24-214	24 VAC	Nat/LP	1/2x1/2	Slow	3.5"	2.5"-5.0"	Yes	Yes	Str. Thru	Yes	No	No

50E47-843 NON-INTEGRATED HSI IGNITION MODULE

The Universal 50E47-843 Replaces White-Rodgers 50E47 Modules and Many Competitive Silicon Carbide, Non-Integrated Modules. Includes a Complete Module Cross Reference and Program Keys for Fast and Accurate Replacement.

FEATURES

- Program keys for multiple timing selections.
- Tri-colored LED indicator for diagnostics.
- Direct and indirect flame sense compatible.
- Universal design for maximum versatility.

SPECIFICATIONS

Ambient Operating Range -40 to +175°F (-40 to 79°C) Maximum Pressure Rating 1/2 PSI (14.0" W.C.)

Agency 24 VAC



50E47-843 Replaces:

0050050	50D47-160	50E47-120	50F47-101	780-910	HS780-17NR-312A	HS780-34PL-106A	S89C1004
025-25436-000	50D47-161	50E47-130	50F47-140	832-002	HS780-17PL-106A	HS780-34PL-108A	S89C1012
02525436700	50D47-170	50E47-140	50F47-160	832-005	HS780-17PL-108A	HS780-34PL-304A	S89C1046
025-25436-700	50D47-20	50E47-150	50F47-40	833-002	HS780-17PL-304A	HS780-34PL-306A	S89C1079
1001346	50D47-260	50E47-160	50F47-60	995395	HS780-17PL-306A	HS780-34PL-308A	S89C1087
10376732	50D47-270	50E47-161	50G47-1	99796380	HS780-17PL-308A	HS780-34PR-106A	S89C1103
120-08027	50D47-40	50E47-170	50G47-130	99905232	HS780-17PR-104A	HS780-34PR-108A	S89D1002
1300-4928	50D47-50	50E47-20	50G47-140	C6411102	HS780-17PR-108A	HS780-34PR-304A	S89G1005
1380694	50D47-60	50E47-260	50G47-150	CNT03776	HS780-17PR-306A	HS780-34PR-306A	S89G1013
2076-0184	50D47-70	50E47-30	50G47-160	CNT03794	HS780-34NL-106A	HS780-34PR-308A	S89G1021
350760	50D47-905	50E47-40	50G47-40	HS780-17NL-104A	HS780-34NL-108A	S8610U1000	S89G1047
3591-1306	50D47-915	50E47-50	50G47-60	HS780-17NL-106A	HS780-34NL-304A	S890C1007	S89H1003
3XA74	50D47-925	50E47-560	6279527	HS780-17NL-108A	HS780-34NL-306A	S890D1006	S89H1011
4CZ50	50D47-935	50E47-60	780-780	HS780-17NL-304A	HS780-34NL-308A	S890G1003	S89H1029
4E954	50D47-945	50E47-70	780-783	HS780-17NL-306A	HS780-34NL-312A	S890G1011	S89J1008
4E955	50D47-955	50E47-841	780-784	HS780-17NL-308A	HS780-34NR-104A	S890G1029	X13130437070
4E956	50D47-965	50E47-843	780-785	HS780-17NR-104A	HS780-34NR-106A	S890G1037	X13130437080
50D47-1	50D47-975	50E47-850	780-786	HS780-17NR-106A	HS780-34NR-304A	S890H1002	X324601
50D47-101	50E47-1	50E47-851	780-787	HS780-17NR-108A	HS780-34NR-306A	S890H1010	TO STATE OF THE ST
50D47-120	50E47-10	50E47-860	780-788	HS780-17NR-304A	HS780-34NR-308A	S890H1028	į.
50D47-140	50E47-101	50E47-861	780-789	HS780-17NR-306A	HS780-34NR-312A	S8910U	
50D47-150	50E47-110	50E47-870	780-790	HS780-17NR-308A	HS780-34PL-104A	S8910U1000	

764 SERIES THERMOCOUPLE OPERATED GAS PILOT SAFETY/GAS FIREPLACE VALVES

Non-Regulated, Safe Lighting, In Line Appliance Control with 100% Shut Off. Do Not Use on Unvented Applications

FEATURES

- Redesigned to include 100 PSI protection, inlet screen and inlet pipe stop.
- Optional rear inlet tapped and plugged.
- May be mounted horizontal, vertical and 90° from horizontal (multipoise).
- Valves have adjusted pilot pressure and manual shut-off valve.
- Functional replacement for Jade Controls J-100 gas valve.

SPECIFICATIONS

Electrical Rating 20 to 30 mV (Thermocouple)

Regulator Adjustment Range Non-regulated Maximum Pressure Rating 1/2 PSI (14.0" W.C.)

Ambient Operating Range 32 to 175°F

Swing Radius 2.5"

Agency A.G.A. and C.G.A. design certified

	Model Number	Coil Voltage	Inlet-Outlet Size	Capacity A.G.A. Standard Gas	Electrical Connection
ı	764-742	20 to 30 mV	1/2" x 1/2"	142,000	Thermocouple



764-702

PILOT RELITE CONTROL: MODEL 5059

Generates Spark Until a Pilot Flame is Sensed

FEATURES

- Generates spark pulse until flame is sensed through spark electrode.
- Begins sparking immediately if flame extinguishes.
- Rugged solid state module design.
- Available in 24 and 120 volt input.
- · Spark plug or spike output configurations available.

SPECIFICATIONS

Model	Input	Electrical	Description
Number	Voltage	Rating	
5059-23	24 VAC	0.03 amps	Spark plug and 1/4" spade connectors



5059-23 Pilot Relite Control

IGNITION ELECTRODE ASSEMBLIES

Use Type 760-56 to Replace Cycle-Pilot® Ignition Electrodes and Cable Assemblies

Model Number	Description
760-56	24" lead with slip on bracket. Also includes perforated mounting strap for varying applications
760-310	Same as 760-56 except with universal mounting bracket



MODEL 24A50 ELECTRIC HEAT SEQUENCERS

Provide Highly Versatile Circuitry on Electric Furnaces, Duct Heaters, Heat Pump, Auxiliary Heaters and Other Electric Heating Equipment

FEATURES

- Complete line with fewest number of components for maximum economy.
- Multi-poise mounting.
- · Staging capability.
- · Easily accessible dual tab terminals.
- Ambient compensated.
- Quiet, snap-acting "E-Blade" main switches.

SPECIFICATIONS

Auxiliary Switches Low voltage – SPST to pull in additional sequencers

Bimetal Heater Input – 24 VAC, 60 Hz Current draw – .16 Amps



				APPRO	KIMATE T	IMING (SE	CONDS)		
			ON T	imes			OFF '	Times	
Model	Number of	Main	Main	Main	Aux.	Main	Main	Main	Aux.
Number	Switches	SW1	SW2	SW3	SW	SW1	SW2	SW3	SW
24A51-6	1 Main	18	-	-	-	93	-	-	-
24A53-1	3 Main	18	18	18	_	93	93	60	_
24A55-1	2 Main + 1 Aux.	35	35	_	35	30	30	_	28
24A56-1	3 Main + 1 Aux.	18	18	18	18	93	93	60	55
24A56-101	3 Main + 1 Aux.	18	35	40	40	93	63	58	53

MODEL 24A34 ELECTRIC HEAT SEQUENCERS

Direct Replacement for Most Fan/Heat Sequencing Functions. Terminal Markings are Equivalent to Competitive Types

FEATURES

- Replaces Honeywell, MARS, TOD, GEMLINE, Klixon (Texas Instruments).
- 24V input control.
- · Multi-poise mounting.
- Any contacts (except M1 & M2) can be used as auxiliary contacts.
- Double quick-connect terminals for combination loads.

SPECIFICATIONS

Ambient Temperature Rating -50 to +165 $^{\circ}$ F

Agency U.L. component recognized



24A34-3

COMBINED LOAD RATING TABLE (ALL MODELS)

Model				Ti	mings – (ON			Ti	mings – C	FF	
Number	Timings	Switches	M1-M2	M3-M4	M5-M6	M7-M8	M9-M10	M1-M2	M3-M4	M5-M6	M7-M8	M9-M10
24A34-1	1	1	1-20	-	_	_	-	40-110	-	-	_	-
24A34-2	1	1	-	-	30-90	_	-	-	-	1-30	_	-
24A34-3 ①	1	2	1-20	1-20	_	_	-	40-110	40-110	-	_	-
24A34-4	1	2	-	-	30-90	30-90	-	-	-	1-30	1-30	-
24A34-5 ①	2	3	1-110	1-110	1-110	_	-	1-110	1-110	1-110	_	-
24A34-6 ①	2	4	1-110	1-110	1-110	1-110	-	1-110	1-110	1-110 🗸	1-110	-
24A34-14①②	4	5	1-160	1-160	1-160	1-160	1-160	1-160	1-160	1-160	1-160	1-160

TABLE NOTES:

- ① M1-M2 and M3-M4 are always first switches to turn ON and last to turn OFF. All other switches are random ON and random OFF
- 2 24A34-14 Switch contacts designated F₁ F₂ instead of M₁ M₂
- ◆ These contacts switch simultaneously





MERCURY FLAME SENSORS

Prevent Gas Flow to Main Burner if Pilot Flame is Not Burning or Is Insufficient to Properly Ignite Main Burner

FEATURES

- These sensors combine a rugged Snap-Action switch and powerful mercury actuated thermal element.
- May be used with natural, manufactured or mixed gases and with LP gases where means are provided for obtaining automatic pilot gas shut-off.
- Switch may be conveniently mounted in any position.
- Cover is easily removed, making switch terminals readily accessible.
- No button to depress Sensors are recycling type which require relighting or possible restoration of proper gas pressure to return to operation.

SPECIFICATION	IS
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Timing	Contacts close approximately 60 seconds
	after pilot is ignited; open approximately
	40 seconds after flame is extinguished
Agency	U.L. recognized and C.S.A. certified,
	A.G.A. design certified & C.G.A. certified
Dimensions	2-3/4"H x 2-1/16" W x 1-7/8"D

Model Element			Electrical Rating	
Number		120 VAC	240 VAC	30 VAC
3046-5	48"	125 VA	125 VA	90 VA



3046-5

PLUG-IN TYPE MERCURY FLAME SENSORS

Designed for use with White-Rodgers Diaphragm, "Cushioned Power" or "Silent Knight" Gas Valves having Plug-In Receptacle

FEATURES

- Plug-in feature requires no additional electrical connections or mounting devices.
- Sensor combines a rugged Snap-Action SPDT switch and powerful mercury actuated thermal element.
- May be used with natural, manufactured or mixed gases and with LP gases where means are provided for obtaining automatic pilot gas shut-off.
- No button to depress Sensors are recycling type which require relighting or possible restoration of proper gas pressure to return to operation.
- The SPDT switch can energize ignitor circuit to relight pilot (as with roof top units).

SPECIFICATIONS

SI LOII IOATIONS	
Timing	Contacts close approximately 60 seconds
	after pilot is ignited; open approximately
	40 seconds after flame is extinguished
Agency	U.L. recognized, A.G.A. design certified and C.G.A. certified



30A46-5

Model	Element				
Number	Length	120 VAC	240 VAC	30 VAC	Comments
30A46-5	48"	125 VA	125 VA	90 VA	stud mount element



MERCURY FLAME SENSORS

For Proving Pilot Flame and Controlling Main Valve in Cycle Pilot Applications

FEATURES

- Bulb styles are designed to fit with various OEM applications.
- See Cross Reference to OEM control type numbers on next page.
- Adapter fittings to allow use of these mercury flame sensors with competitive burners are packed with controls identified with ①

SPECIFICATIONS

Agency A.G.A. design certified and C.G.A. certified

Maximum temperature 1450°F at bulb tip

Model Number	Element Length	Panel Type	Bulb Style	Description
3049-5	48"	В	#3	Stud mount bulb
3049-18	33"	D	#7	_
3049-64 ①	48"	D	#19	Replaces bulb styles #9 or #13
3049-115 ①	48"	D	#20	Replaces bulb styles #17 or #18
3098-134 ①	48"	E	#19	Replaces bulb styles #9 or #13
3098-156 ①	48"	E	#20	Replaces bulb styles #17 or #18

① Includes adapter fittings.



3049-64

FLUSH MOUNT FAN OR LIMIT CONTROLS/ATTIC FAN CONTROL

Ideal for Replacement of Similar Type Controls

FEATURES

- For use where space is limited.
- Small bimetal sensing element.
- · Snap-Action switch.
- Fan control has adjustable range with direct reading temperature dial.

SPECIFICATIONS

Dimensions for 757 1"H x 3"W x 1-1/4"D



757-1

ſ	Model				Switch	Motor Rating – Full Load		Pilot
١	Number	Description	Range	Differential	Action	120 VAC	240 VAC	Duty
	757-1	Fan	70 to 160°F ①	Fixed 25°F	Close on Rise	8.0 A	4.0 A	125 VA

① Cut-in setting (cut-out is cut-in setting minus the differential)

ADJUSTABLE SNAP DISC FAN & LIMIT CONTROLS

Adjustable Snap Disc Thermostat Allows You to Set the Temperature Set Point to Match Your Specific Needs Which Simplifies Inventory

FEATURES

- 1/4" quick connect terminals are standard.
- Reduces inventory while providing coverage for a wide range of temperature applications.
- Replaces the majority of fixed disc thermostats now on heating equipment and various appliances.
- 2 adjustable fan control models replace 7 fixed snap disc models.
- 5 adjustable limit control models replace 10 fixed snap disc models.

SPECIFICATIONS

ELECTRICAL RATINGS

	Resistive	Motor Ratin		
VAC	(Non-Inductive)	Full Load	Locked Rotor	Pilot Duty
120	25.0A	14.0A	72.0A	125 VA
240	25.0A	10.0A	60.0A	125 VA



3F05-1



3L05-1

Model	Temperature		Switch			Therm-	O-Disc
Number	Range	Differential	Action	Function	Accessories	Style	Type
3F05-1	90 to 130°F	20°F	SPST	Fan Controls	Includes thermostat	74T12	310708
3F05-2	140 to 180°F	20°F	SPST	(Close on Rise)	and tab-to-screw	74T12	310709
3L05-1	135 to 175°F	40°F	SPST	Limit Controls	terminals.	74T11	310710
3L05-2	175 to 215°F	40°F	SPST	(Open on Rise)		74T11	310711
3L05-3	210 to 250°F	40°F	SPST			74T11	310712
3L05-10	135 to 175°F	20°F	SPST			74T11	310724

SNAP DISC FAN CONTROLS

For Regulation of Fan or Blower Control

FEATURES

- Designed for quick on-job replacement.
- \bullet Easy to remember type numbers "L" for Limit "F" for Fan.
- Last three numbers indicate cut-out temperatures on limits and cut-in temperatures on fan controls.
- Mounting holes match standard ?" snap discs.
- Tab-to-screw terminal adapters furnished.

SPECIFICATIONS

Maximum ambient 350°F





ELECTRICAL RATINGS

		Motor Rating (Full Load)		Resistive (No	n-Inductive)	Pilot Duty
ı	Model	120VAC	240VAC	120/240VAC	277VAC	120/240/277VAC
3F0	01, 3F02	10.0A	5.0A	25.0A	21.6A	125 VA

FAN CONTROLS

Model	Fixed Temperature Setti		Switch	Therm	-O-Disc
Number	Cut-in	Cut-out	Action	Style	Type
3F01-120	120°F	110°F	Close on Rise	60T12	610046
3F01-130	130°F	115°F	Close on Rise	60T12	610047
3F01-140	140°F	120°F	Close on Rise	60T12	610049
3F01-150	150°F	130°F	Close on Rise	60T12	610050
3F01-160	160°F	140°F	Close on Rise	60T12	610064



SNAP DISC FAN OR LIMIT CONTROLS

For Regulation of Fan, Blower or High Limit Safety Control

SPECIFICATIONS

ELECTRICAL RATING (AC)

	Motor Rating (Full Load)		Resistive (No	n-Inductive)	Pilot Duty
For Model #	120VAC	240VAC	120/240VAC	277VAC	120/240/277VAC
3L01	10.0A	5.0A	25.0A	21.6A	125 VA
3L02	10.0A	5.0A	25.0A	21.6A	125 VA
3L03: 1 & 2 Close on Rise	5.8A	2.9A	_	_	125 VA
3L03: 1 & 3 Open on Rise	10.0A	5.0A	25.0A	21.6A	125 VA





3L01-180

LIMIT CONTROLS

Model	Fixed Temperature Settings		Switch	Therm	Therm-O-Disc	
Number	Cut-in	Cut-out	Action	Style	Type	
3L01-120	110°F	120°F	Open on Rise	60T11	610000	
3L01-140	100°F	140°F	Open on Rise	60T11	610006	
3L01-150	110°F	150°F	Open on Rise	60T11	610009	
3L01-165	125°F	165°F	Open on Rise	60T11	610069	
3L01-180	140°F	180°F	Open on Rise	60T11	610013	
3L01-190	150°F	190°F	Open on Rise	60T11	610015	
3L01-200	160°F	200°F	Open on Rise	60T11	610016	
3L01-230	190°F	230°F	Open on Rise	60T11	610021	
3L01-300	250°F	300°F	Open on Rise	60T11	610026	

LIMIT CONTROLS — MANUAL RESET

Model	lodel Fixed Temperatu		Switch	Therm	-O-Disc
Number	Cut-in	Cut-out	Action	Style	Type
3L02-160	Manual	160°F	Open on Rise	60T15	330534
3L02-180	Reset	180°F	Open on Rise	60T15	330536
3L02-190	neset	190°F	Open on Rise	60T15	330537







SPDT CONTROLS

	F	ixed Temper	ature Settir				
Model	Termina	al 1 & 3 Terminal 1 & 2		Switch	Therm-O-Disc		
Number	Cut-in	Cut-out	Cut-in	Cut-out	Action	Style	Туре
3L03-140	140°F	120°F	140°F	120°F	SPDT	60T13	611015
3L03-190	190°F	170°F	190°F	170°F	SPDT	60T13	611014





3L03-140

BEARINGS

Sizes and Styles for Replacements in Most Heating & Air-Conditioning Units. All Bearings are of the Highest Quality Available as Supplied by Well-Known Bearing Manufacturers

FEATURES

- High quality.
- · Long service life.
- · Choose from 3 styles.

NOTE: The outside diameter of the resilient retainer and the bore size of the bearing will determine the replacement required. To assist, these dimensions are shown in the tables below. When sleeve bearing (oil or sealed type) replacement is made, always replace both bearings and shaft. Bearings wear and shaft scoring almost always occur together. Without a new shaft, early failure is likely.

Model		Di	imensions	Bearing
Number	To Replace	Bore Size	Outside Diameter	Description
M90-103	Brundage	3/4"	2-1/16"	Oil
M90-105	Brundage	1"	2-1/16"	Oil
M90-120	Lau	3/4"	1-13/16"	Sealed
M90-122	Brundage	1"	2-1/16"	Sealed





SEALED TYPE BEARINGS WITH INSULATOR Sealed Bronze

CLASS 2 TRANSFORMERS – ENERGY LIMITING

Various Standard Configurations of Step Down Transformers Designed to Power 24V AC Control Systems

FEATURES

- Energy limiting design, unaffected by momentary short circuit.
- Continued short circuit of secondary will cause primary winding to open in 1 to 2 minutes without creating a fire hazard.
- Maximum ambient temperature is 150°F.

SKELETON TYPE WITH VERTICAL & HORIZONTAL CHANNEL FRAMES FOR MOUNTING

Model	Primary to	Output	Terminations		
Number	umber Secondary Voltages		Line	Load	
S84Z-401	120/208/240v to 25v 60Hz	40 VA	12" leads	12" leads	

UNIVERSAL MOUNTED TYPES (Plate, Foot or Hub Mount)

ĺ	Model	Primary to	Output	Terminations		
ı	Number Secondary Voltages		Rating	Line	Load	
ı	S84-Z90	120/208/240v to 25v 60Hz	40 VA	10" leads	Screw terminals	

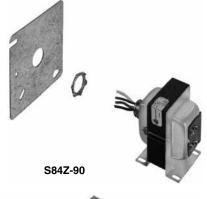
PLATE MOUNTED TYPES

Model	Primary to	Output	Term	inations
Number	Secondary Voltages	Rating	Line	Load
S84A-410*	120v to 25v 60Hz	40 VA	10" leads	Screw terminals

^{*}Transformer recessed in plate and U.L. recognized.



S84Z-401





S84A-410

FAN CONTROL CENTER

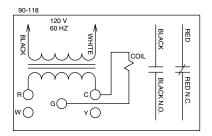
Transformer and Relay Combination for Easy Installation on a 4"x 4"Junction Box

FEATURES

- · Line voltage connections pre-wired.
- Energy limiting class II transformer design.
- Color coded pre-stripped leads.
- · Low voltage connections on terminal board.



90-118E U.L. Recognized



Note: Record the lead wire color with it's corresponding terminal for future reference. Unused transformer input leads must be insulated.

REPLACEMENT RELAY FOR FAN CONTROL CENTER

Model Number	Replaces Relay On	Description
90-340	90-112, 90-113, 90-117	DPDT Universal
	90-118E, 90-119, 90-130 Plug-in Relay	

			Transformer						Contact Ratings			
Model	Mars		Prim	ary	Secondary			120 VAC (amps)		240 VAC (amps)		
Number	Number	Voltage	Hz	Connections	Voltage	VA	Connections	Relay	Full Load	Locked Rotor	Full Load	Locked Rotor
90-118E	24012	120	60	Color coded leads, pre- stripped	24V	40	Terminal board with 5 screw terminals	SPNO/ SPNC	13.8	82.8	6.9	41.4
90-119	24022	208/240	50/60	Color coded leads, pre-	24V	40	Terminal board with 5 screw stripped terminals	SPDT	13.8	82.8	6.9	41.4

2 POLE SWITCHING RELAY

A Two Pole Double Throw Semi-Enclosed Relay 90-340 Fits Fan Control Centers 90-112, 90-113, 90-118E and 90-119

SPECIFICATIONS

Temperature Range -40°F to 130°F

Electrical Life (rated load) 100,000 operations, 6 operations/min. Load test making

inrush ratings (0.4 to 0.5 P.F.); breaking 100% continuous

rating (0.65 to 0.8 P.F.)

Outline Drawings See page 197

Weight (approximate) 6 oz

Agency U.L. file number E12139

C.S.A. file number LR13360

Coils, Termination 1/4" Quick Connect

110% maximum safe operate

Coils, Duty Cycle Continuous



TWO POLE DOUBLE THROW (2PDT) Fits Receptacles

Model	Coil Voltage	Terminals	Terminals	COIL DATA			
Number	(50/60 Hz)	1-2-3	4-5-6	DC Res.	MA	Nom. VA	Inrush VA
90-340	24	Power	Power	17.5	334	9.5	22
90-341	115/120	Power	Power	420	66	9.5	22
90-342	208/240	Power	Power	1600	38	9.5	22



1 POLE DEFINITE PURPOSE CONTACTOR

Straight-Through Wiring, Replaces 11/2 Pole Devices Used Primarily in Residential Central Air Conditioning

FEATURES

- Replaces many Type 117 contactors used by OEM's.
- Universal style mounting bracket fits existing mounting holes.
- Screw terminals and 1/4" guick connect terminals for easy installation.

SPECIFICATIONS

Temperature Range -40°F to 150°F

Mechanical Life (no load)..... Conforms to UL and ARI specifications

Weight (approximate) 7 oz

Agency U.L. file number E75492

C.S.A. file number LR49538

Coils Frequency 50/60 Hz
Coil Insulation Class B (130°C)

110% maximum safe operate

Duty Cycle Continuous

40 Amp Model (with cover)



Approximate Overall Dimensions 3-1/4" x 2" x 2-1/2"

COIL DATA

Model Number		Voltage	Res DC	Current	Nominal	Max. Inrush	
* 30 Amp	** 40 Amp	AC	OHMS	MA	VA	VA	
94-388	94-394	24	16.5	208	5	20	
94-389	94-395	120	420	42	5	20	

^{* 30} amp models have no cover on top as in line drawing below

2 POLE DEFINITE PURPOSE CONTACTOR

Designed for Air Conditioning and Heating Equipment

FEATURES

- Low VA coil for cooler operation and increased life.
- Quiet operation.
- Universal style mounting bracket fits existing mounting holes.
- Double break contacts ensure positive make and break.
- Screw terminals or pressure connectors and double 1/4" quick connects provided on all models for easy installation.

SPECIFICATIONS

Insulating Material Contact block and carrier are high quality electrical-grade

thermosetting resin

Temperature Range -40°F to 150°F

Weight (approximate) 9.5 oz

Agency U.L. file number E75492

C.S.A. file number LR49598

 Coils Frequency
 50/60 Hz

 Coil Insulation
 Class B (130°C)

Termination. Pressure Connectors and Double 1/4" Q.C.

Duty Cycle Continuous

COIL DATA

Model Number		Voltage Res DC		Current	Nominal	Max. Inrush
30 Amp	40 Amp	AC	OHMS	MA	VA	VA
90-244	90-247	24	11	250	6	32
90-245		120	224	50	6	32
90-246		208/240	997	25	6	32

40 Amp Model (with cover)



Approximate Overall Dimensions 3-1/4" x 2" x 2-5/8"

^{** 40} amp models have cover on top as in picture above

3 POLE CONTACTOR

Designed for Central Air Conditioning and Heating Equipment

FEATURES

- · Any position mounting.
- Interchangeable mounting plate.
- · Low wattage coil.
- Double break contacts ensure positive make and break.

SPECIFICATIONS

Insulating Material Contact block and carrier are high quality

electrical-grade thermosetting resin

Temperature Range -40°F to 150°F

Weight (approximate) 16 oz

Agency U.L. file number E75492

C.S.A. file number LR49598

 Coils Frequency
 50/60 Hz

 Coil Insulation
 Class B (130°C)

24 through 208/240 Volts AC

Termination. Pressure connector and Double 1/4" Q.C.

110% maximum safe operate

Duty Cycle Continuous

40 Amp with Cover



Approximate Overall Dimensions 3-3/4" x 2-3/8" x 3"

COIL DATA

N	Model Number		Coil Voltage AC Res DC		Current	Nominal	Max. Inrush	
25 Amp	30 Amp	40 Amp	(60 Hz)	OHMS	MA	VA	VA	
90-160	90-163	90-170	24	7.2	187	4.5	52	
90-161	90-164	90-171	120	180	37	4.5	52	
90-162	90-165	90-172	208/240	720	19	4.5	52	

3 POLE HEAVY DUTY CONTACTORS

FEATURES

- · Interchangeable mounting.
- Double break contacts.
- · Box lugs and dual quick connect terminals.

SPECIFICATIONS

 Coils, Voltages A.C.
 24 through 240

 Coils, Frequency
 50/60 Hz

Coils, Termination Single or Double 1/4" Q.C.

Contacts, Pole Form. 3 PNO

Contacts, Material Silver cadmium oxide (50-90 amp)
Contacts, Termination Box lugs and dual quick connect
Agency U.L. recognized, CSA listed



Approximate Overall Dimensions 3-3/4" x 2-5/8" x 3-1/2" (92-459 thru 92-465)

COIL DATA

50 Amp.	60 Amp.	Voltage A.C.	Res. D.C. OHMS	Current Ma.	Nominal VA	Max. Inrush VA
92-459	92-463	24	2.4	580	14	135
92-460		120	45.5	117	14	135
92-461	90-465	208/240	280	50	14	135

75 Amp.	90 Amp.	Voltage A.C.	Res. D.C. OHMS	Current Ma.	Nominal VA	Max. Inrush VA
92-468		120	15.5	225	27	240
92-469		208/240	63.5	112	27	240

PONTENTIAL RELAY

Unmatched Versatility

FEATURES

- Replaces thousands of OEM models.
- Universal break-off bracket for mounting flexibility.
- Guide to replace GE, RBM and other Steveco 90-#s included with each relay.

SPECIFICATIONS

Temperature Range -40°F to 130°F

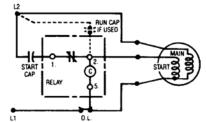
Weight (approximate) 6.5 oz each

Agency U.L. file number SA1984

C.S.A. file number LR13360



90-63



MOTOR START APPLICATION PRO PAC

Model	Mars	Continuous Coil	Pic	k-up	Drop Out	Coil Data			
Number	Number	Voltage	Min.	Max.	Max.	DC Res.	MA	Nom. VA	Inrush VA
90-63	19002	170	140	153	65	1,399	29.0	5	10
90-65	19004	336	171	184	90	5,180	15.0	5	10
90-68	19007	495	323	352	135	11,950	10.0	5	10

ENCLOSED FAN RELAY

Used for Switching Single or Two Speed Fan Motors, Solenoids, Relays, Resistive Loads and General Purpose Switching

FEATURES

- Compact, totally enclosed design.
- For heating and cooling applications and general switching.
- Quiet, reliable and economical.

Approximate Overall Dimensions 2-3/8" x 1-5/8" x 1-1/2"

SPECIFICATIONS

Temperature Range -40°F to 150°F

..... Load test making inrush rating (0.4 to 0.5 P.F.);

breaking 100% continuous rating (0.64 to 0.8

P.F.)

Weight (approximate) 2.5 oz

Agency U.L. file number E12139 or E22381

C.S.A. file number LR13360

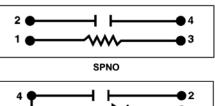
Coils, Termination 1/4" Quick Connect

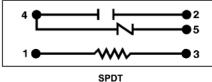
Coils, Operate 85% of nominal coil voltage;

110% maximum safe operate

Coils, Duty Cycle Continuous

WIRING DIAGRAMS





SINGLE POLE NORMALLY OPEN (SPNO), SINGLE POLE DOUBLE THROW (SPDT)

Model Number			Res DC	Coil Data		
		Coil Voltage AC		Nom. Current	Nominal	Inrush
SPNO	SPDT	(50/60 Hz)	OHMS	MA	VA Sealed	VA
90-290Q	90-293Q	24	90	125	3	4
	90-294Q	120	2,000	25	3	4
	90-295Q	240	7,000	12.5	3	4

M WHITE-RODGERS

HEAVY DUTY ENCLOSED FAN RELAY

Heavy-Duty General Purpose Relay Operates in Any Position

FEATURES

- Compact, totally enclosed design.
- · For heating and cooling applications and general switching.
- · Quiet, reliable and economical.

SPECIFICATIONS

Temperature Range -40°F to 150°F

Mechanical Life (no load)........... 1,000,000 operations, 120 operations/min. Electrical Life (rated load) 100,000 operations, 6 operations/min. Load test

making inrush rating (0.4 to 0.5 P.F.); breaking 100% continuous rating (0.65 to 0.8 P.F.)

Weight (approximate) 2.3 oz

Agency U.L. file number E12139 or E22381

C.S.A. file number LR13360

Coils, Frequency 50/60 Hz Coils, Insulation Class B

Coils, Termination 1/4" Quick Connect

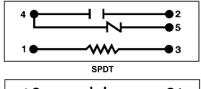
Coils, Operate 85% of nominal coil voltage; 110% maximum safe operate

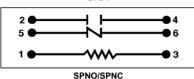
Coils, Duty Cycle Continuous



Totally Enclosed Relay Operates in Any Position Isolated Coil and Mounting Bracket

WIRING DIAGRAMS





SINGLE POLE NORMALLY OPEN, SINGLE POLE DOUBLE THROW (SPDT) ISOLATED CONTACTS (SPNO/SPNC)

				Coil D	ata	
Model Number		Coil Voltage AC	Res DC	Nom. Current	Nominal	Inrush
SPDT	SPNO/SPNC	(50/60 Hz)	OHMS	MA	VA Sealed	VA
90-370	90-380	24	77	125	3	4

SWITCHING RELAY ADD-A-RELAY ENCLOSED SWITCHING

Base with a Bushing, Locknuts and Position Locking Plate to Mount this Relay in Standard Electric Box with 1/2" "Knock Out". Relay has Double Break Silver Alloy Contacts and is Completely Enclosed. Operates in Any Position

SPECIFICATIONS

Temperature Range -40°F to 130°F

Mechanical Life (no load)...... 500,000 operations, 60 operations/min. Electrical Life (rated load) 100,000 operations, 6 operations/min.

Weight (approximate) 6.5 oz

Agency U.L. file number E12139

C.S.A. file number LR13360

Coils, Frequency 50/60 Hz Coils, Insulation Class B

110% maximum safe operate

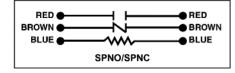
Coils, Duty Cycle Continuous

Model	Coil Voltage	Coil Data					
Number	(60 Hz.)	DC Res.	MA	Nom. VA	Inrush VA		
90-123	24	45.7	167	4	8		
90-124	120	761	33	4	8		





Approximate Overall Dimensions 2-45/64" x 2-38/64" x 3-6/64"



OLD Model Number	NEW Model Number
90-120	90-123
90-121	90-124

WHITE-RODGERS

HYDRONIC ZONE VALVES

Two Types of Valves, 2-Wire or 3-Wire, for Zoning Hydronic Systems up to 50 PSI

FEATURES

- · Quiet operation.
- Valve stem made of stainless steel.
- Automatic recycling manual operator shows valve position at all times.
- Built-in auxiliary contacts to control burner or circulator relay.
- Motor can be removed from valve assembly without draining system.

SPECIFICATIONS

Electric rating of auxiliary switch 2.0A at 24VAC Four zone valves operate with one 40 VA transfor1311-102 mer

DO NOT CHANGE VALVE ASSEMBLY WITHOUT DRAINING BOILER OR WHILE BOILER WATER IS HOT. FAILURE TO RELIEVE WATER PRESSURE OR WAIT UNTIL WATER COOLS COULD RESULT IN SCALDING INJURIES



1311-102

3-WIRE, 24V VALVES WITH SCREW TERMINAL WIRING PANEL AND AUXILIARY SWITCH

Model Number	Tubing Size (I.D.)	24VAC Thermostat Circuit Rating	Time Cycle	Maximum Differential Across Valve	Maximum Water Temp.	Maximum System Pressure
1311-102	3/4"	0.4A ①	Open: 45 seconds Close: 45 seconds	15 PSI	240°F	50 PSI
1311-103	1"	0.4A ①	Open: 45 seconds Close: 45 seconds	15 PSI	240°F	50 PSI
1311-104	11/4"	0.4A ①	Open: 45 seconds Close: 45 seconds	15 PSI	240°F	50 PSI

2-WIRE, 24V VALVES WITH SCREW TERMINAL WIRING PANEL AND AUXILIARY SWITCH

Model Number	Tubing Size (I.D.)	24VAC Thermostat Circuit Rating	Time Cycle	Maximum Differential Across Valve	Maximum Water Temp.	Maximum System Pressure
1361-102	3/4"	0.2A ②	Open: 45 seconds Close: 60 seconds	15 PSI	240°F	50 PSI
1361-103	1"	0.2A ②	Open: 45 seconds Close: 60 seconds	15 PSI	240°F	50 PSI
1361-104	1-1/4"	0.2A ②	Open: 45 seconds Close: 60 seconds	15 PSI	240°F	50 PSI

① Valve current is 0.4A only during opening or closing. For proper anticipation, select thermostat designed for use with a 3-wire zone valve.

 $[\]ensuremath{@}$ Valve current is 0.52A when opening but 0.2A when fully open: therefore set anticipator for 0.2A.



REPLACEMENT PARTS

REGULATORS & COVER PLATES

700 Nat. Gas Only (Unitrol® 7000) Pressure Regulator. 3.5" W.C. setting. ORDER - 1751-003



STEM ADAPTORS

700 & 710 SERIES (Unitrol® 7000) Drive Rod Adaptor. ORDER - **1751-009**



REPLACEMENT SAFETY MAGNETS

Replacement redundant valve used on 700 Series Pilot Ignition System ("D" Series), valve Factory Model 7000 BDER. ORDER - 1750-016 (HI-CAP.)



ORIFICES



UNI-LINE	TY
ORDER NO.	G
10-021	N.

TYPE GAS NAT. **TUBE SIZE** 3/16" OR 1/4"

ORIFICE SIZE

.018

MISCELLANEOUS

E.C.O. Lead Wire

High limit lead wire assembly fits into slotted magnet on gas valves to allow hookup with an external ECO (energy cut-off) switch.

18" ORDER - 10-258



SERVICE PRODUCTS & PARTS

17-110 BELT EASE

Fan and belt dressing adds traction - silences squeaks and preserves belts. BELT-EASE is packaged in aerosol cans with a special valve that works upside-down and right side up! It is complete with a special pinpoint stem that "hits the spot" with no overspray. 5.5 OZ. EACH.



90-222

MISCELLANEOUS FITTINGS

Includes: 3/16" compression nut, ball sleeve and adaptor. ORDER - **4590-068** Package of 3



Breakaway Extended 1/4" Breakaway Great for hard to reach locations. ORDER - **4590-816** Lots of 15 only.



UNI-COOL

Do away with wet rags and their questionable reliability! Do away with the messy one shot "squeeze tube" method. Make the better choice of Uni-Cool heat block compound.

Mold to an operative shape - protecting sensitive areas from heat - braze the connection and remove Uni-Cool to use again and again and again.

FEATURES

- Excellent heat block ability. Molds to desired shape
- Use with oxyacetylene, mapp gas, propane and specialty torches
- Non-toxic
- · Will not contaminate braze or weld
- · Easily removed for reuse without leaving a residue

PIPE AND TUBING PLUGS

1/4" Tubing Plug ORDER - **4590-063** Package of 12



BREAKAWAY FERRULES

Breakaway Ferrule 1/8" Tubing ORDER – **4590-065** Package of 15





720 SERIES DUAL VALVE GAS CONTROLS

The 720 Series Dual Valve Gas Controls are designed for a wide variety of heating applications and can be used to replace most constant pilot valves, including dual valve (six function) models.

The 720 Series constant pilot gas valve is a six function valve incorporating a manual valve, safety shutoff magnet, dual automatic valves (hence the term "dual valves"), main gas regulator, and pilot adjustment. Models are available with and without a pressure regulator. Uni-Kits® are factory-set at 3.5" W.C. for natural gas, but can be converted to L.P. by installing the regulator conversion kit included.

SPECIFICATIONS

Electrical Ratings	24 VAC, .5 amps, 50/60 Hz				
Pressure regulator					
Natural Gas	factory set at 3.5" W.C.				
L.P. Gas	factory set at 11.0" W.C.				
Pilot Outlet	1/4" tubing				
Ambient Temperature	–40° to 175°F				
Maximum Inlet Pressure	14" W.C. (1/2 PSI)				

The 720 Series feature an integral manual selector used to select from the 4 gas flow positions – off, on, pilot and "set". The "set" position provides pilot only gas flow during magnet energizing and lock up. Built-in stops serve to prevent accidental setting to the off position.

The wiring connections, manual selector and adjustments are easily accessible on top of the valve. With a 3-9/16" swing radius, the 720 series lends itself well to replacing many OEM valves. Controls are multiposition and can be mounted in any position (except upside down).



720-406

UNI-LINE	FACTORY	INLET SIZE	OUTLET SIZE	STRAIGHT	SIDE OUTLET	PRESSURE REGULATOR		REDUCER BUSHINGS
ORDER NO.	MODEL	(FPT)	(FPT)	THRU	WITH PLUGS	SETTING	CAPACITY	3/4" x 1/2"
720-406	7200ER	3/4"	3/4"	•		UNI-KIT	150,000	2

720 SERIES PILOT IGNITION GAS VALVES

The 720 Series Valves (7200 IPER) are designed for intermittent pilot ignition applications. The 720 IPER Series Valve incorporates a manual valve, pilot valve, dual automatic valves (2), and a main gas pressure regulator. Uni-Kits are factory-set at the 3.5" W.C. for natural gas, but can be converted to L.P. by installing the regulator conversion kit included.

SPECIFICATIONS

Electrical rating	24VAC 50/60 Hz .45 amp.
Power consumption	5 watts
N.E.C.	class 2
Terminal connections	1/4" and 3/16" quick-connect
Pilot outlet	1/4" tubing
Ambient temperature	–40 to 175°F max.
Maximum inlet pressure	14" W.C. (1/2 PSI)
Pressure regulator setting	see ordering chart

The 720 Series Valves are designed for many residential applications such as central heating units, space heaters, wall heaters, boilers,

and mobile home furnaces. The 720 series valve has a compact swing radius of only 3-9/16" to enable it to fit a wide range of OEM replacement applications. It also has all the wiring connections, manual selector, and adjustments readily available on top of the control. To prevent unsafe attempts at repair, special screws are used and replacement parts are NOT available.



SLOW OPENING MODELS*

UNI-LINE ORDER NO.	FACTORY MODEL	INLET SIZE (FPT)	OUTLET SIZE (FPT)	STRAIGHT THRU	SIDE OUTLET 1/2" FPT WITH PLUGS	PRESSURE REGULATOR SETTING	CAPACITY
720-070	7200IPER-S7C	1/2"	3/4"	•		UNI-KIT	150,000



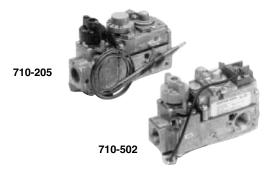
710 LOW PROFILE GAS HEATING VALVES

The 710 low capacity gas heating valves are designed for recreational vehicles and other applications with limited space. All models include a manual valve (gas cock), automatic pilot safety valve, pilot outlet, pilot

gas filter and pilot adjusting key. THE CONTROL CAN BE MOUNTED IN ANY POSITION EXCEPT UPSIDE DOWN AND ALL MODELS HAVE 3-POSITION OUTLETS.

SPECIFICATIONS

Valve type	see ordering chart
Temperature range (Hydraulic models)	58° to 90°F
Pilot outlet	1/4" tubing
Gas cock dial marking	off-pilot-on
Maximum ambient temperature	175°F
Maximum capacity Natural Gas 70,000 L.P. Gas 112,000	
Maximum inlet pressure	14" W.C. (1/2 PSI)



UNI-LINE ORDER NO.	FACTORY MODEL	INLET SIZE (FPT)	3-POSITION OUTLET (FPT) PIPE PLUGS	REDUCER BUSHINGS INCL. (FPT)	CAP. LENGTH	PRESSURE REGULATOR SETTING	APPLICATION			
HYDRAULIC	HYDRAULIC MODELS – SNAP-ACTION									
710-205	7000SRLC	1/2"	1/2"	(2) 1/2" x 3/8"	36"	3.5" W.C. NAT. GAS	WALL FURNACES REPLACES TV-27			
24 VOLT MOI	DELS									
710-402	7000ERLC	1/2"	1/2"	(2) 1/2" x 3/8"	N/A	3.5" W.C. NAT. GAS	WALL FURNACES 12 VDC / 24 VAC			
MILLIVOLT N	MILLIVOLT MODELS NOTE: Use two lead thermopiles only.									
710-502	7000MVRLC	1/2"	1/2"	(2) 1/2" x 3/8"	N/A	3.5" W.C. NAT. GAS				

700 WATER HEATING

700-800 Series bleed gas diaphragm valves feature: automatic pilot valve, bleed gas operator, inlet and outlet screens, manual "gas cock" valve, pilot adjusting key, pilot gas filter and pressure regulator (optional by model).

SPECIFICATIONS

Pressure regulator	factory set at 3.5" W.C.
Pilot outlet	1/4" tubing
Bleed port outlet(s)	1/4" tubing
Gas cock dial markings	off-pilot-on
Maximum ambient temperature	175°F
Maximum inlet pressure	14" W.C. (1/2 PSI)

Regulated models offer the additional feature of "straight line" pressure regulation allowing application of the 700 diaphragm gas valves to a wide range of capacity requirements without regulator readjustment. Minimum application for regulated models is 10% of capacity shown in the chart below, except high capacity models (1 x 1) which require a minimum of 200,000 Btu for proper regulation.



SLOW OPENING MODELS*

UNI-LINE ORDER NO.	FACTORY MODEL	INLET SIZE (NPT)	OUTLET SIZE (NPT)	PRESSURE REGULATOR SETTING	CAPACITY				
700 "THERMOCO	700 "THERMOCOUPLE" TYPE DIAPHRAGM GAS VALVES								
700-804*	7000BGOR-S7B	3/4"	3/4"	3.5" W.C. NAT. GAS	305,000				

^{*} Has slow opening feature. Can be field removed.



700 MILLIVOLT

The 700 millivolt gas valves are wall thermostat actuated combination gas valves. These controls combine a manual gas cock, automatic pilot safety valve and a millivolt operator. The automatic pilot safety is separate from the gas cock and provides gas shutoff in case of pilot outage. Regulated and non-regulated models are available (see ordering chart). Standard features include: pilot outlet, pilot gas filter and pilot adjusting key. VALVES CAN BE MOUNTED IN ANY POSITION EXCEPT UPSIDE DOWN. Consult ordering chart for individual control specifications.

SPECIFICATIONS

Electrical rating	250 MV to 750 MV
9	operating range
Pressure regulator	factory set @ 3.5" W.C.
(optional by model)	•
(optional by model)	
Pilot outlet	1-1/4" tubing
Gas cock dial marking	off-pilot-on
	<u>'</u>
Terminal type	1/4" spade
Ambient temperature	-40° to 175°F
<u> </u>	
Maximum inlet pressure	14" W.C. (1/2 PSI)

IMPORTANT WIRING INFORMATION: Most appliances manufactured in the USA and Canada are manufactured to meet the standards set forth by the American National Standards Institute (ANSI). A recent revision in the standards "mis-wiring requirements for gas valves" was effective January 1, 1996. The reason for this standard was so that you as a service technician could disconnect the gas valve wires and reconnect them without making a mistake. Therefore all Robertshaw millivolt gas valves now meet the new standard. The 700-500 series millivolt gas valves now have

a 1/4" quick connect terminal and a 3/16" quick connect terminal on the terminal block. There is NO terminal screw (or threads) on the side that has the 3/16" terminal. If your old application used a terminal screw, you will need to use the 3/16" adaptor terminal that is included with this gas valve.

NOTE: Will only work with two-lead thermopiles.

nat is	O LO
	REDUCER BUSHINGS

			3 POSITIO	ON OUTLET	PRESSURE		REDUCER BUSHINGS
UNI-LINE ORDER NO.	FACTORY MODEL	INLET SIZE (FPT)	STRAIGHT THRU (FPT)	SIDE (FPT) WITH PLUGS	REGULATOR SETTING	CAPACITY	<u>INCLUDED (NPT)</u> 3/4" x 1/2"
700-507*	7000BMVR-S7C	1/2"	3/4"	STRAIGHT-THRU	3.5" W.C. NAT. GAS	240,000	1
700-522*	7000MVRHC-S7C	1"	1"	STRAIGHT-THRU	3.5" W.C. NAT. GAS	720,000	

^{*} Has slow opening feature for soft ignition.

700 LINE VOLTAGE

The 700 line voltage combination gas controls are available in 120 VAC and 240 VAC models. These controls combine into one compact valve: a manual gas cock, automatic pilot safety valve and a silent line voltage operator. Regulated and nonregulated models are available (see ordering chart). Standard features include: pilot outlet, pilot gas

SPECIFICATIONS

Electrical rating	120 VAC034 Amp, 50/60 Hz 240 VAC017 Amp, 50/60 Hz
Pressure regulator	factory set @ 3.5" W.C.
Pilot outlet	1/4" tubing
Cover type	for conduit connection
Ambient temperature	–40° to 175°F
Lead length (std.)	32"
Maximum inlet pressure	14" W.C. (1/2 PSI)

filter and pilot adjusting key. The automatic pilot valve is separate from the gas cock and provides gas shutoff in case of pilot outage. VALVES CAN BE MOUNTED IN ANY POSITION EXCEPT UPSIDE DOWN. Consult ordering chart for indi-

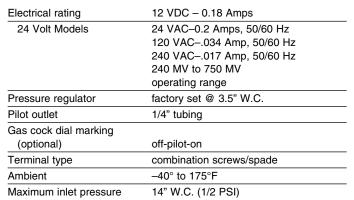
vidual control specifications.

			3 POSITIO	ON OUTLET	PRESSURE	
UNI-LINE ORDER NO.	FACTORY MODEL	INLET SIZE (FPT)	STRAIGHT THRU (FPT)	SIDE (FPT) WITH PLUGS	REGULATOR SETTING	CAPACITY
700-456*	7000ERHC-120-S7C	1"	1"	STRAIGHT-THRU	3.5" W.C. NAT. GAS	600,000

^{*} A separate pressure regulator may be required for the system.

700 DIAPHRAGM/SOLENOID VALVES

SPECIFICATIONS





For reliability, performance, flexibility and ease of installation and service in one compact control, Robertshaw's diaphragm/solenoid gas valves are the answer. These controls are single function, diaphragm types and are excellent replacements for solenoid gas valves. Models are available with or without a gas cock, and regulated and nonregulated models are available (see ordering chart). Standard

are available (see ordering chart). Standard features include: pilot outlet, pilot gas filter and pilot adjustment key. VALVES CAN BE MOUNTED IN ANY POSITION EXCEPT UPSIDE DOWN.

THESE VALVES **DO NOT** HAVE A SAFETY MAGNET.

UNI-LINE ORDER NO.	FACTORY MODEL	INLET SIZE (FPT)	3 POSITION OUTLET STRAIGHT SIDE (FPT) THRU (FPT) WITH PLUGS		STRAIGHT SIDE (FPT)		PRESSURE REGULATOR SETTING	CAPACITY	REDUCER BUSHINGS INCLUDED (NPT) 3/4" x 1/2"	
24 VOLT DIAPHRAGM MODELS – HAVE NO SAFETY MAGNET										
700-413*	7000BGVER2-4	3/4"	3/4"	STRAIGHT-THRU	1.3" & 3.5" W.C. NAT. GAS*	300,000	2			
700-422	7000BGVER	1/2"	3/4"	1/2"	3.5" W.C. NAT. GAS	240,000	1			
700-424	7000BGVER	3/4"	3/4"	STRAIGHT-THRU	3.5" W.C. NAT. GAS	300,000	2			
700-432**	7000GVERHC-S7C	1"	1"	STRAIGHT-THRU	3.5" W.C. NAT. GAS	720,000				
MILLIVOL	MILLIVOLT DIAPHRAGM MODELS – HAVE NO SAFETY MAGNET									
700-517†	7010BGVMV	3/4"	3/4"	1/2"	NONE ††	300,000	2			

^{*} Two stage valve exact replacement for Carrier EF33CB241.

700 24 VOLT COMBINATION VALVE

For reliability, performance, flexibility and ease of installation and service in one compact control, Robertshaw's 24 volt combination gas valves are the answer. These valves feature a manual valve (gas cock), an automatic pilot safety valve, inlet/outlet screens, pilot outlet, pilot gas filter and pilot adjustment key. Regulated and nonregulated models are available (see ordering chart). Models that have a safety magnet have a "notched or slotted" magnet for applications requiring the use

SPECIFICATIONS

Electrical rating	12 VDC – 0.18 amps 24 VAC – 0.2 amps, 50/60 Hz
Pressure regulator	factory set @ 3.5" W.C.
Pilot outlet	1/4" tubing
Gas cock dial marking	off-pilot-on
Terminal type	combination screw/spade
Ambient temperature	– 40° to 175°F
Maximum inlet pressure	14" W.C. (1/2 PSI)

of an ECO (Energy Cut-Off) switch. The automatic pilot safety valve is separate from the gas cock and provides gas shutoff in case of pilot outage. VALVES CAN BE MOUNTED IN ANY POSITION EXCEPT UPSIDE DOWN. Consult ordering charts for individual control specifications.

UNI-KITS®

The 700 Series 24 Volt Uni-Kits® have a pressure regulator installed that is set for natural gas (3.5" W.C.) To convert to L.P. gas, a regulator cover plate is included. Simply remove pressure regulator and install the regulator cover plate.



700-402 UNI-KIT



UNI-LINE	FACTORY	INLET	3 POSITION STRAIGHT	ON OUTLET SIDE (FPT)	PRESSURE REGULATOR			BUSHINGS ED (NPT)
ORDER NO.	MODEL	SIZE (FPT)	THRU (FPT)	WITH PLUGS	SETTING	CAPACITY	3/4" x 1/2"	1/2" x 3/8"
24 VOLT C	COMBINATION MC	DDELS						
700-402	7000BER	1/2"	3/4"	1/2"	UNI-KIT	240,000	1	
700-406	7000BER	3/4"	3/4"	STRAIGHT-THRU	UNI-KIT	300,000	2	
700-426*	7000BER-S7A	3/4"	3/4"	STRAIGHT-THRU	3.5" W.C. NAT. GAS	300,000	2	
700-434*	7000AERB-5S7C	1/2"	1/2"	1/2"		100,000		2
700-442*	7000ERHC-S7C	1"	1"	STRAIGHT-THRU	3.5" W.C. NAT. GAS	720,000		

^{*} Has slow opening feature for soft ignition.

^{**} Has slow opening feature for soft ignition.

[†] Has no gas cock.

^{††} A separate pressure regulator may be required for the system.



700 SNAP-ACTION AND SNAP-THROTTLE HYDRAULIC

The 700-200 Series snap-action and snap-throttle (modulating) hydraulic controls are combination gas valves, thermostatically operated by a remote temperature sensing bulb.

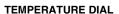
Two types of temperature adjustment models are available. One type is a single capillary model with the temperature adjustment knob on the gas valve itself. The second type is the remote dial, dual capillary model designed for cabinet mounting. These have an 18" capillary from the valve to the sensing bulb and a 48" capillary between the bulb and the remote temperature adjustment knob.

The snap-throttle type controls are factory-set to snap on at 50% of the appliance capacity. From this 50% rate, the control will modulate up to full input rate if the demand for heat is great enough (as sensed by the remote bulb). As the temperature increase is sensed by the remote bulb, the control throttles the input back down to the minimum rate and when the temperature requirement is satisfied, the control snaps "off".

DRIVE ROD ACCESSORIES - GAS COCK

Some applications will require a drive rod for the gas cock dial. Order gas cock drive rod adaptor separately.





If your application requires a drive rod for the temperature dial, simply pry off the temperature dial on the gas valve. A builtin drive rod adaptor is located underneath the temperature dial.





These controls combine a manual valve (gas cock), an automatic pilot safety valve, pressure regulator (optional by model) and a snap-acting or snapthrottle hydraulic operator for total temperature control. All models feature 3-position main gas outlets and pilot outlet, pilot gas filter, pilot adjustment key and auto-



matic pilot valve. The automatic pilot valve is separate from the gas cock and provides gas shutoff in case of pilot outage. Consult ordering charts for individual control specifications.

MODELS NOW HAVE A SLOTTED SAFETY MAGNET

SPECIFICATIONS

Temperature range	
Remote Dial	45° to 95°F
Capillary length	
Single capillary type	36"
Remote dial type	combination 18" and 48"
Bulb O.D. and length	1/4" x 8"
Pressure regulator	see ordering chart
Pilot outlet	1/4" tubing
Gas cock dial marking	off-pilot-on
Ambient temperature	–40° to 175°F
Maximum inlet pressure	14" W.C. (1/2 PSI)

UNI-LINE			O A D A OITY	REDUCER BUSHIN INCLUDED (NPT				
ORDER NO.	MODEL	SIZE (FPT)	OUTLET (FPT)	LENGTH	SETTING	CAPACITY	3/4" x 1/2"	1/2" x 3/8"
SNAP-THR	OTTLE MODELS							
700-205	7000ASTR-3	1/2"	1/2"	36"	3.5" W.C. NAT GAS	100,000		2
700-208	7000ASTR-3-1H	1/2"	1/2"	REMOTE DUAL	3.5" W.C. NAT. GAS	100,000		2
			C	APILLARY MODELS	;			



700 SERIES PILOT, DIRECT AND HOT SURFACE IGNITION

SPECIFICATIONS

Electrical	24 volt, 60 Hz
Ambient rating	-40°F to 175°F / -40°C to 80°C
Capacity (maximum regulatio	n)
1/2" x 3/4" straight through	300,000
3/4" x 3/4" straight through	350,000
1" x 1"	720,000
3/4" x 1"	530,000*
3/4" x 3/4"	450,000*
Pressure regulator setting	see Ordering Data
Maximum inlet pressure	14" W.C. (1/2 PSI)

^{*} Using reducer bushings included in 1" valves.

These 700 Series Gas Valve Uni-Kits® are designed for intermittent pilot, direct spark and hot surface applications. They incorporate a manual valve, pilot valve, and a main gas pressure regulator.

Each Uni-Kit includes all the necessary parts and instructions needed to convert to direct spark or hot surface applications. These valves are designed for many residential and commercial applications such as central heating units, wall heaters, boilers and mobile home furnaces. They also have all the wiring connections, manual selector and adjustments easily accessible.



700-059

UNI-LINE ORDER NO.	FACTORY MODEL	INLET SIZE (FPT)	OUTLET SIZE (FPT)	STRAIGHT THRU	SIDE OUTLET 1/2" FPT WITH PLUGS	PRESSURE REGULATOR SETTING	CAPACITY
UNIVERSAL	UNIVERSAL MODELS – INTERMITTENT PILOT, DIRECT SPARK AND HOT SURFACE						
700-056 •	7000 BDER-S7A†	3/4"	3/4"	•		3.5" NAT. GAS	350,000
700-057 •	7000 DERHC	1"	1"	•		4.0" NAT. GAS	720,000
700-058 •	7000 DEHC-S7A†	1"	1"	•		NONE +	††
700-059 •	7000 DERHC-S7C†	1"	1"	•		4.0" NAT. GAS	720,000
UNIVERSAL	UNIVERSAL 2-STAGE MODELS – INTERMITTENT PILOT, DIRECT SPARK AND HOT SURFACE						
700-053	7000 BDER2-4-S7A	3/4"	3/4"	NAT.	1.3" W.C.	3.5" W.C.	300,000

[†] Has slow opening feature for soft ignition. Can be field removed.

- ††720,000 Btu natural gas; 1,150,000 Btu L.P. gas.
- + Nonregulated. A separate pressure regulator may be required for the system.
- Includes parts to adapt to direct spark or hot surface applications.

KITS

712 SERIES INTERMITTENT PILOT IGNITION UNI-KITS®

The Uni-Line 712 series pilot ignition system features flame rectification with solid-state logic and flame sensing to provide automatic sequencing that will ensure proper operation of an intermittent pilot ignition device. The 712 series pilot ignition system features quick and easy installation with complete in-depth instructions and trouble shooting information.

The 712 pilot ignition systems are available with one of four different gas valve types to fit a wide range of furnace applications. Depending on the model of gas valve used, 712 systems are available to handle applications up to 720,000 Btu (natural gas).



UNI-LINE ORDER NO.	GAS VALVE	IGNITION UNIT	DESCRIPTION
			SE ON L.P. GAS APPLICATIONS
712-019	700-059 1" x 1"	780-715 (Nonlockout)	Natural Gas Only – Nonlockout. Pressure regulator is factory-set at 4.0" W.C. 720,000 Btu Max. Natural gas.

The SP845 lockout ignition control used in the 712 series Uni-Kits, provides 90 seconds of spark followed by a six minute time delay (purge) period between ignition attempts. After three tries, if no pilot flame is sensed, SP845 goes into a 1 hour lockout period. At the end of the 1 hour lockout period, if the demand for heat is still present, unit repeats the three tries for ignition.



780-910 UNIVERSAL HOT SURFACE IGNITION MODULE UNI-KIT®

The 780-910 Universal Hot Surface Ignition Module Uni-Kit is designed for use on gas fired systems. It is equipped with a self diagnostic green LED for quick troubleshooting. The LED indicates if the system is in normal operation, has gone into lockout, has a weak flame signal, or has an internal error (a defective module).

FEATURES

The 780-910 Uni-Kit will easily replace the widest variety of hot surface ignition modules found in the field today. Including systems using:

- Local (sense through the Hot Surface Ignitor) or Remote Flame Sensors
- Single or three ignition attempts
- 4 or 7 second ignition trial time
- 17 or 34 second ignitor warm up time
- 34 seconds or less pre-purge
- Natural or L.P. gas controls
- 120 VAC Hot Surface ignitors

This kit provides all the necessary instructions and hardware needed to replace most hot surface modules manufactured by Robertshaw, Honeywell and White-Rodgers.

The 780-910 provides 100% lockout and complete gas shut off if main burner does not light after the selected trial for ignition sequence has been completed. An ignition sequence is initiated by a call for heat by a room thermostat or a switch which provides power to the Ignition Control Unit (ICU). After a 34 second pre-purge cycle the ICU will start the selected ignitor warm up time (17 or 34 seconds.)

At the end of the ignitor warm up time, the gas valve is opened and will supply gas to the main burner for 4 or 7 seconds. In normal operation the main burner will light and the gas valve will remain open as long as there is a call for heat. After several seconds the ignitor is turned off and the sensor (local or remote) is activated.

If the main burner does not light the ICU will (depending on what option was chosen) go into lockout or retry. When 3 ignition attempts are being used the ICU will try again 2 more times. If the ICU fails to establish proof of flame it will then go into lockout. The module can be reset by opening system switch or thermostat contacts (lowering the set temperature below the room temperature) for a minimum of 10 seconds.

CALL FOR CROSS REFERENCE INFORMATION



780-910

SPECIFICATIONS

The 780-910 comes equipped with field selectable options; flame sense (local or remote), ignition trial times and ignitor warm up times. The flame sense option is determined by a factory installed black jumper wire. For local sense (sensing through the ignitor) the jumper must be connected to the "sense" terminal. For remote sense (a flame rod) the black jumper wire must be removed.

Ignition attempts and timing options are set by using a combination of four field removable tabs. The Cross-Reference charts in the instruction sheet will indicate the combination of tabs recommended for removal to match the specification of a specific ignition module.

Electrical rating	
Supply voltage	120 VAC, 50/60 Hz
Control input voltage	24 VAC, 50/60 Hz
Maximum ignitor current	5 amps resistive
Maximum valve current	1.5 amps at 24 VAC
Thermostat anticipator current	1 A + load
Ambient temperature	-40° to 176°F
Operating humidity	95% at 104°F



UNIVERSAL IGNITION CONTROLS

Robertshaw's Universal Ignition Control Uni-Kits feature a flame sense circuit that will work equally well on a one rod (local sense) or a two rod (remote sense) application.

FEATURES

- Replaces one rod and/or two rod systems.
- Reduces truck stock inventory, saving space and money.
- · Includes vent damper adaptor assembly.
- Easy-to-install with complete in-depth installation instructions.

ORDERING DATA

780-001 (NONLOCKOUT)

The automatic recycle features assure that, in the event of flame failure, main gas is disabled and the spark repetition sequence is restarted until pilot gas is ignited. Only after pilot ignition has been re-established can main gas be returned to the burner.

780-002 (LOCKOUT)

These kits have a lockout feature to shut off all gas to the furnace, should pilot ignition fail to occur after a predetermined time period. The 780-002 provides 3 tries for ignition, each ignition period is 90 seconds followed by a 6 minute time delay between ignition attempts. After 3 tries if no pilot flame is sensed, unit goes into lockout and must be reset at the thermostat.

780-003 (LOCKOUT WITH PRE-PURGE)

These kits have a lockout feature to shut off all gas to the furnace, should pilot ignition fail to occur after a predetermined time period. The 780-003 provides 3 tries for ignition, each ignition period is 60 seconds followed by a 5 minute time delay between ignition attempts. After 3 tries if no pilot flame is sensed, unit goes into lockout and must be reset at the thermostat. The 780-003 has a 45 second pre-purge.



REPLACES

- ROBERTSHAW
- JOHNSON CONTROLS
- HONEYWELL

SPECIFICATIONS

Input Voltage	24 VAC to 50/60 Hz
Transformer	24 VAC / 20 VA
Spark rate	3 to 4 sparks per second
Relay contact ratings	
Pilot valve	1 amp at .5 PF
Main valve	1 amp at .5 PF
Combined load	1.5 at .4 PF
Flame sense current	.7 μA DC @ 25°C / 24 VAC
Maximum total current load	1.5 amp
Flame failure reignition time	.8 seconds maximum
Thermostat anticipator setting	g .7 amp
Ambient temperature rating	-40 to 175° (-40 to 80°C)



41-400 SERIES HOT SURFACE FURNACE IGNITORS

Robertshaw's 41-400 Series Norton Hot Surface Ignitors deliver dependable ignition in heating systems of every description. From furnaces and boilers to rooftop heaters, infrared burners, unit heaters, water heaters and many other types of HVAC equipment.

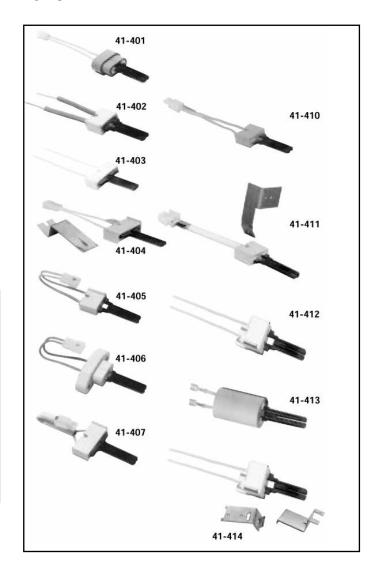
The 41-400 Series Hot Surface Ignitors are made of high-purity recrystallized silicon carbide (Crystar™) which combines physical and thermal strength with stable electrical properties. The 41-400 Series are designed to reach ignition temperature(s) within 17 seconds. They have 18-gauge nickel chrome lead wires embedded and metalized in place for maximum holding strength and electrical conductivity. The lead wires are also enclosed with a special hightemperature fiberglass insulation providing total electrical protection.

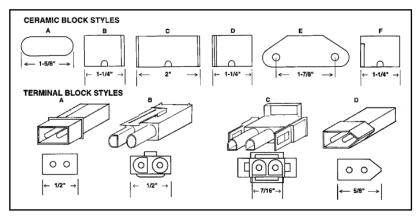
NOTE: All 41-400 series ignitors are 120 VAC models. Some hot surface modules are rated for 208/240 volts input, however they step the voltage to ignitor down to 120 VAC.

UNI-LINE ORDER NO.	FACTORY MODEL	CERAMIC BLOCK STYLE	TERMINAL CONNECTOR TYPE	LEAD WIRE LENGTH
41-401*	271A	Α	Α	4-1/2"
41-402	271W	В	NONE	19"
41-403	271M	С	NONE	5-1/2"
41-404**	271M	С	D	4-1/2"
41-405	271D	D	NONE	5-1/2"
41-406*	271Y	E	NONE	10-1/2"
41-407	271	С	В	4-1/2"
41-410	271N	В	В	4-1/2"
41-411**	271N	В	С	4-1/2"
41-412	271NM	F	D	5-1/4"
41-413	201C	†	1/4" Q.C.	1-3/8"
41-414**	271NM	F	D	5-1/4"



^{**} Includes special mounting adaptors.





^{† 2&}quot; long by 1-3/8" dia.



REPLACEMENT CONTROLS AND COMPONENTS

UNI-LINE ORDER NO.	FACTORY MODEL	DESCRIPTION	РНОТО
IGNITION COM	NTROL UNITS		
780-715	SP715U Nonlockout	Nonlockout Models. Flame rectification system. Use with gas valves 7000 BDER, 7100 DER and 7200IPER. Replaces SP715 and SP715A.	
780-735	SP735A Lockout	Lockout model. Flame rectification system. Use with gas valves 7000 BDER and 7100 DER. Has 60 second lockout timing. NOTE: SP735A is a newer and smaller version of the SP735.	
PILOT GAS SO	OLENOID VALVES		
1750-016	N/A	Pilot gas solenoid valve ("D" type 2-wire) used on factory model types: 7000 DEHC and 7000 DERHC. NOTE: Hi-Capacity model.	0
WIRING HARN	NESSES – FLAME	RECTIFICATION IGNITION UNITS	
1751-719	N/A	2C sensor/ignitor adaptor kit with 30" leads. Adapts O.E.M. pilot applications that had obsolete ignition control units and are being upgraded toflame rectification. NOTE: Must be used with appropriate 780 Series ignition unit.	0,
REPLACEMEN	NT SENSORS		
10-227	N/A	S1 Sensor Has 1/4" quick-connect terminal.	

OBSOLETE IGNITION CONTROL UNITS

Convert "D" and "K" Series heat sensing/flame switch pilot ignition systems to "flame rectification" without replacing the existing gas valve. Refer to cross-reference below for selection of the proper Modernization Kit. These Modernization Kits are designed to replace the obsolete "D" and "K" Series Pilot Ignition Control Units. Included in each kit is a universal pilot mounting bracket with factory installed electrode and sensor, ignition control unit, wiring harness and complete-in-depth instructions.

NOTE: The 780-704/705 modernization kits DO NOT include a new gas valve. They are designed to utilize the existing gas valve. The existing gas valve is at least 12 years old or older. We suggest that a complete new 712 series kit with a new gas valve be considered before using the 780-704 or 780-705 modernization kit.



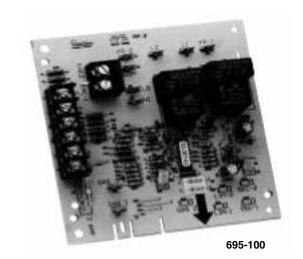


ELECTRONIC FAN CONTROLS

695-100 & 695-101 CARRIER / BDP FAN CONTROL CENTERS

The 695-100 Series Fan Control Centers are solid state controls designed and engineered for the replacement market. They specifically replace the Carrier / BDP Gas Furnace Control Centers that have been used in new equipment for many years. The Fan Control Center is an exact replacement requiring no modification to the original wiring or to the appliance sheet metal.

CROSS-REFERENCE



SPECIFICATIONS

695-100

Input voltage
Terminals; PR-1, PR-2, L1 & L2
Terminals; SEC-1 & SEC-2
Line frequency
Operating temperature
Maximum operating humidity

120 VAC
18-30 VAC
60 Hz
- 40° to 176°F
95% R.H.
non-condensing @ 50°C

Time delay timings

Heat "On"75 secondsHeat "Off"105 secondsCool "Off"90 seconds

695-101

Input voltage
Terminals; PR-1, PR-2, L1 & L2
Terminals; SEC-1 & SEC-2
Line frequency
Operating temperature
Maximum operating humidity

120 VAC
18-30 VAC
60 Hz
- 40° to 176°F
95% R.H.

Time delay timings

Heat "On" 50 seconds

Heat "Off" 80 to 240 seconds (ADJ)

Cool "Off" 90 seconds

ORDERING DATA

 UNI-LINE ORDER NO.
 DESCRIPTION

 695-100
 REPLACES HH84AA020
 UNI-LINE ORDER NO. 695-101

DESCRIPTION

REPLACES HH84AA021

non-condensing @ 50°C

MISCELLANEOUS CARRIER/BDP REPLACEMENT PARTS



10-660 (REPLACES HY660001)

The 10-660 fusible link repair kit is identical to Carrier/BDP part number HY660001. The 10-660 also replaces Carrier part number P421-1010 and 307566-701.



10-661 (REPLACES HY10LF286)

The fusible link repair kit is identical to Carrier/BDP part number HY10LF286.



10-681 (REPLACES LH33WZ511)

The 10-681 flame sensor is identical to Carrier/BDP part number LH33WZ511. The 10-681 is used in a system with the 41-409 hot surface ignitor.



ETC-111000

TEMPERATURE CONTROLS

RANGO

RANCO ETC COMMERCIAL TEMPERATURE CONTROLS

The Ranco ETC is a microprocessor-based family of temperature controls designed to provide on/off control for commercial heating, cooling, air conditioning and refrigeration applications. With its wide temperature range, one and two stage capability, selectable heating/cooling modes and multi-voltage input, the ETC is one of the most versatile temperature controls available.

DIGITAL DISPLAY

Unlike many electronic controls, the ETC is simple to install and set up. One finger is all you need to program it. The standard digital display and keypad allow the user to adjust the temperature settings with 1° resolution. Setpoint temperature, differential and mode of operation (heating or cooling) can all be selected using the keypad and display.

When not in the programming mode, the display gives a constant readout of the sensor temperature. Annunciators on the liquid crystal display also indicate when the relay is energized.

CHOICE OF ONE OR TWO STAGE MODELS

The ETC line includes both one and two stage models. On two stage controls, each stage can be set independently thus eliminating the bothersome task of calculating interstage temperatures. And two stage models can be set up with overlapping heating or cooling stages.

REMOTE TEMPERATURE SENSING

The ETC is capable of remote temperature sensing up to 400 feet away from the control when using standard 22 gauge sensor wire.

BUILT-IN SAFETY

Every ETC model is equipped with diagnostic programs that check for hardware, software or system problems and display different error codes to indicate where the trouble is.

The ETC also has a keypad lockout switch to prevent tampering with the control settings by unauthorized personnel. The switch, which is located inside the enclosure, can be used to disable the keypad function.

OPTIONAL ANALOG OUTPUT

ETC models are available with a 0 to 10 volt analog output that can be used for remote temperature indication or as input to a central monitoring system. This signal is a linear representation of the sensor temperature with 0 volt



Temperature setpoint range	–30° to 220°F
Differential range	1°F to 30°F
Input power requirements	120 or 208/240 VAC
	(24 VAC optional)
Sensor	Thermistor, 2" long x 1/4" dia.
	with 8' cable
Control Ambient Temperatures	
Operating	–20°F to 140°F
Storage	–40°F to 176°F
Dimensions	NEMA 1 models, 6.52" high x 2.7"
	wide x 2.48" deep
	NEMA 4X models, 7.84" high x
	2.7" wide x 2.48" deep
Switch action	SPDT

RELAY OUTPUT RATINGS - NO (NC):

	ONE STAGE		TWO STAGE	
	120V	208/240V	120V	208/240V
Full load amps	16 (5.8) A	8 (2.9) A	9.8 (5.8) A	4.0 (2.9) A
Locked rotor amps	96 (34.8) A	48 (17.4) A	58.8 (34.8) A	29.4 (17.4) A
Resistive amps	15 (5.8) A	8 (2.9) A	9.8 (5.8) A	4.9 (2.9) A
Horsepower	1 (1/4) HP	1 (1/4) HP	1/2 (1/4) HP	1/2 (1/4) HP
Pilot duty	125VA at 120/208/24	10 VAC	, ,	, ,

UNI-LINE ORDER NO.	NUMBER OF STAGES	ENCLOSURE	INPUT VOLTAGE	0 TO 10 VOLT OUTPUT
ETC-111000	ONE	NEMA 1	120/208/240 VAC	NO
ETC-112000	ONE	NEMA 1	24 VAC	NO
ETC-211000	TWO	NEMA 1	120/208/240 VAC	NO
ETC-212000	TWO	NEMA 1	24 VAC	NO



2374 SERIES ADJUSTABLE AIR SENSING SWITCHES

The new 2374 Series Adjustable Air Sensing Switches are designed to replace a wide variety of air-sensing switches found in residential and light commercial applications including - furnaces, electronic air cleaners and humidifiers. Two models are currently available with an adjustable range of .2" W.C. to 1.0" W.C. or 1.0" W.C. to 4.0" W.C. Both models are provided with an SPDT switch that can be actuated by positive or negative pressure, or by pressure differential.

Highly accurate, these switches are practically insensitive to temperature change with an operating temperature range of –40°F to 190°F. Each switch is provided with mounting hardware and an adjustment tool for easy installation and calibration.



Electrical rating	5 amp noninductive 120-277 VAC 5 amp noninductive 28 VDC
	1 amp pilot duty 120 VA
Control set point	field adjustable (see order chart)
Maximum pressure	.5 PSI
Ambient temperature	-40°F to 190°F (-40° to 88°C)
Operating (mounting position)	diaphragm vertical
Switch	SPDT
Electrical connections	1/4" spade
Air sample line connectors	will accept 1/8", 1/4" or 3/8" tubing



2374-410



ORDERING DATA

MANUAL RESET

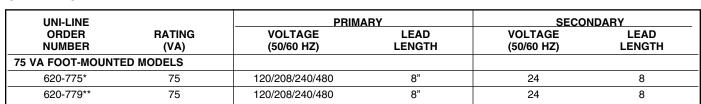
620-779

UNI-LINE ORDER NO.	SET POINT RANGE	SWITCH
2374-410	.05 TO 12.0" W.C.	SPDT
770-1	.05 TO 12.0" W.C.	SPDT
2374-498	1.0 TO 4.0" W.C.	SPDT

620 TRANSFORMERS

620 Series Transformers are avalable in a wide variety of models from universal enclosed to single voltage open frame models. All models are class II, UL 1585, component recognized by Underwriters Laboratories Inc. Refer to the ordering chart to select a transformer to meet your needs.

- UL approved 1585 Class II
- Meets applicable NEMA standards
- Thermal fuse protection



^{*} Fuse protected externally. Has external fuse holder.

^{**} Has manual reset circuit breaker on secondary.



THERMOMETERS

900-385 OVEN OR REFRIGERATOR THERMOMETERS

Stainless steel cases that hang or stand. 2" diameter white noncoloring dials with 2° black markings. Refrigerator unit has unbreakable vinyl lens. –20° to 80°F (–30° to 28°C).

900-387 THERMOMETER

Nontoxic filled glass tube for accuracy. Hang, stand or permanent mounting. Dual Scale, 2° increments - 40° to 80°F (-40° to 26.7°C). Completely enclosed for added safety. Meets all Health Department specifications. 5" x 1.75". Shelf pack: 6.



900-385



900-387

THERMOCOUPLES & PILOTS

1820 SERIES PG9 REPLACEMENT PILOT UNI-KITS®

The 1820 Series Uni-Kits are designed to replace those hard-to-find ITTGeneral PG9 type pilots. Each Uni-Kit comes with a natural gas orifice installed and a separate L.P. gas orifice. A special 1/4" tubing adaptor is provided that allows use of original tubing with nut and ball sleeve. (No cutting of original tubing is necessary). Uni-Kits are available with and without a 32" thermopile. See Ordering Data.



ORDERING DATA

UNI-LINE ORDER NO.	FLAME PATTERN	TYPE OF GAS	WITH THERMOPILE*	REPLACES ITT-GENERAL PART NUMBER
1820-019	90° LEFT	NATURAL AND L.P. GAS	1950-532	PG9A41JTL020
		ORIFICES INCLUDED		

1830 (2CH & 2C) INCINERATOR-TARGET PILOT UNI-KITS

The 1830 Series Pilot Uni-Kit is designed to be used with all Uni-Line and competitive thermocouples. Kits include an adaptor that converts a threaded thermocouple/thermopile model 2CH to a snap-in thermocouple type, model 2C. Each kit comes with a natural gas orifice installed, and a separate L.P. gas orifice. Pilot tubing size is 1/4" tubing. These 1830 Pilot Uni- Kits are aerated type pilots, combining the best feature of an incinerator type plot and a target type pilot. These pilots have non-linting characteristics,

and no air shutters or supplementary shields requiring assembly or adjustment are needed.



1830-210

UNI-LINE ORDER NO.	FACTORY NUMBER	HOOD TYPE	MOUNTING BRACKET TYPE	FLAME PATTERN TYPE
1830-001	2CH-6	2	6	STANDARD
1830-005	4CH-6	4	6	3-WAY (A)
1830-010	3CH-6	3	6	180°
1830-110	2CH-1	2	1	STANDARD
1830-111	2CHL-1	2	1	25° LEFT
1830-210	2CH-2	2	2	STANDARD



THERMOCOUPLES & PILOTS

1830-700 PILOT ELECTRODE SERIES

The 1830-700 Series Pilot Uni-Kits are designed for use with the O.E.M.- style Pilot Ignition Systems. The electrode is permanently riveted to the pilot frame and the spark gap is fixed at 1/8." These pilots can be used to replace existing pilot assemblies or when retrofitting standing pilot applications when an exact replacement is desired. Each Uni-Kit comes with a natural gas orifice installed and a separate L.P. gas orifice. Pilot tubing size is 1/4." The 1830 Pilot Uni-Kits are aerated type pilots, combining the best feature of an incinerator type pilot and a target type pilot. These pilots have nonlinting characteristics, no air shutters or supplementary shields requiring assembly or adjustment.

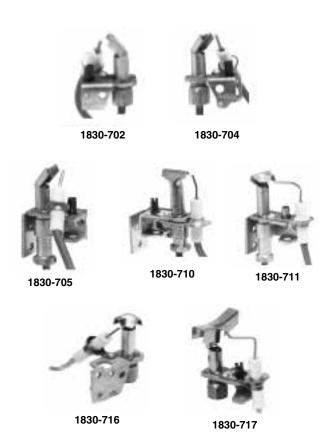
HOW TO SELECT A REPLACEMENT

Locate factory model number stamped on the old pilot. Locate this number in the ordering chart below.

ORDERING DATA

UNI-LINE ORDER NO.	FACTORY NUMBER	FLAME PATTERN TYPE	LEAD LENGTH
1830-702	2S-2	STANDARD	13"
1830-704	2SR-2	25° RIGHT	30"
1830-705	2S-6	STANDARD	24"
1830-710	3S-24F	180°	13"
1830-711	4S-6EL	3-WAY	13"
1830-716*	5SHL-1	90° LEFT	24"
1830-717	6S14-2ER	3-WAY	24"

^{*} Piezo Receptacle fits .093 diameter pin terminal.



1951 THERMOPILES

The 1951 Thermopile (pilot generators) is designed for use on self-powered gas control systems. They can be used to replace all Robertshaw and similar competitive devices. Models are available for two lead or coaxial type connection. All models include mounting nuts.

UNI-LINE ORDER NO.	LENGTH	INCLUDES PG9 PILOT ADAPTOR	CONNECTION TYPE
1951-001	36"	•	COAXIAL
			0-95-





HELPFUL DATA

DEFINITIONS:

NON-LOCKUP TYPE - NOT A FULL SHUT OFF TYPE, UNDER STATIC CONDITIONS WHEN NO GAS IS FLOWING, OUTLET PRESSURE WILL RISE TO LINE PRESSURE.

LOCKUP TYPE - UNDER STATIC CONDITIONS OF NO GAS FLOW, OUTLET PRESSURE WILL RISE SOMEWHAT ABOVE ADJUSTED PRESSURE BUT SHOULD NOT RISE TO LINE PRESSURE.

DEAD END LOCK - REDUCED PRESSURE WILL BE MAINTAINED UNDER STATIC CONDITIONS WHEN NO GAS IS FLOWING AND WILL PROTECT THE DOWNSTREAM CONTROLS.

ZERO GOVERNORS - EQUIPPED WITH A COUNTER SPRING BENEATH THE VALVE. THEY REQUIRE AN EXTERNAL IMPULSE SIGNAL, SUCH AS TOP LOADING WITH PRESSURE OR GENERATING VACUUM IN THE DOWNSTREAM PIPING.

DIFFERENTIAL PRESSURE - SIMPLY THE DIFFERENCE BETWEEN INLET PRESSURE TO THE REGULATOR AND OUTLET PRESSURE FROM THE REGULATOR. TO OBTAIN DIFFERENTIAL PRESSURE, JUST SUBTRACT THE DESIRED OUTLET PRESSURE FROM AVAILABLE INLET PRESSURE.

PRESSURE DROP - THE NATURAL LOSS OF PRESSURE THAT OCCURS IN THE REGULATOR (OR IN ANY VALE OR PIPE) DUE TO FRICTION. THIS FRICTION IMPEDES FLUID MOTION, WITHOUT REGARD TO ARTIFICIAL LOSSES DELIBERATELY CREATED BY DIAPHRAGM ACTION.

SIZING A REGULATOR

IN ORDER TO SELECT A PROPER SIZE REGULATOR ONE MUST KNOW:

- AVAILABLE INLET PRESSURE
- REQUIRED MAX. FLOW RATE IN BTU
- DESIRED **OUTLET** PRESSURE
- PIPE **SIZE**

YOU SHOULD ALSO KNOW:

- IF REGULATOR WILL BE USED FOR MAIN BURNER AND PILOT APPLICATION OR MAIN BURNER ONLY.
- IF REGULATOR MUST PROVIDE POSITIVE DEAD END LOCK-UP.
- REQUIRES ZERO GOVERNOR APPLICATION (INDICATED BY MODEL # ENDING IN Z).

SIZING EXAMPLES:

LEVER ACTING - FOR MAIN BURNER & PILOT LOAD APPLICATIONS REQUIRING POSITIVE DEAD END LOCK-UP.

EXAMPLE: TO SELECT A **325 SERIES** REGULATOR OF AMPLE CAPACITY TO HANDLE FLOW –

KNOWN: DESIRED FLOW RATE 250,000 BTUH; PIPE SIZE 1/2"; INLET PRESSURE 2 psi; OUTLET PRESSURE 7" wc.

SOLUTION: CHECK CAPACITY CHART ON 325 SERIES SALES BULLETIN. THE 325-3-1/2 HAS A MAXIMUM CAPACITY OF 289,000 BTUH. THE PRESSURE DROP AT A FLOW RATE OF 250,000 BTUH IS 3/4" psi, WELL BELOW THE AVAILABLE DIFFERENTIAL OF 1-3/4 psi. THE 325-3-1/2, USED WITH A 4" TO 12" SPRING WILL GIVE YOU THE DESIRED OUTLET PRESSURE OF 7" wc AND IS THE CORRECT REGULATOR TO USE.

POPPET MODELS - FOR MAIN BURNER AND PILOT APPLICATIONS.

EXAMPLE: TO SELECT AN **RV** TYPE REGULATOR OF AMPLE CAPACITY TO HANDLE FLOW –

KNOWN: DESIRED FLOW RATE 150,000 BTUH; PIPE SIZE 1/2" INLET PRESSURE 7" wc; OUTLET PRESSURE 4" wc SOLUTION: CHECK CAPACITY CHART ON RV SERIES SALES BULLETIN. THE RV48-1/2 HAS A MAX. CAPACITY 230,000 BTUH. THE PRESSURE DROP AT A FLOW RATE 150,000 BTUH IS 0.4", WELL BELOW THE AVAILABLE DIFFERENTIAL OF F3" wc. THE RV48 IS THE CORRECT REGULATOR FOR THE APPLICATION.

STRAIGHT-THRU-FLOW - FOR MAIN BURNER ONLY APPLICATIONS NOT REQUIRING A LOCK-UP TYPE REGULATOR.

WHEN SIZING THE **S-T-F SERIES**, IT IS RECOMMENDED THAT PRESSURE DROP NOT EXCEED 1/2 OF AVAILABLE DIFFERENTIAL PRESSURE.

EXAMPLE: TO SELECT AN RV TYPE REGULATOR TO HANDLE FLOW –

KNOWN: DESIRED FLOW RATE 2,000,000 BTUH; PIPE SIZE 1-1/4"; INLET PRESSURE 9" wc; OUTLET PRESSURE 5" wc. SOLUTION: CHECK CAPACITY CHART ON RV SERIES SALES BULLETIN ... THE RV81-1-1/4 HAS A MAXIMUM CAPACITY OF 4,500,000 BTUH. THE PRESSURE DROP AT A FLOW OF 2,000,000 BTUH IS 0.78" wc. THE RV81-1-1/4 IS THE CORRECT REGULATOR TO USE WITH THIS APPLICATION. THE PRESSURE DROP OF THE RV60-1-1/4 AT A FLOW RATE 2,000,000 BTUH IS 2.58" wc. THIS IS WITHIN THE AVAILABLE DIFFERENTIAL BUT EXCEEDS THE RECOMMENDED 50% MAXIMUM.

BALANCED VALVE - FOR MAIN BURNER & PILOT LOAD APPLICATIONS REQUIRING A LOCK-UP TYPE REGULATOR OR ZERO GOVERNOR USAGE.

EXAMPLE: TO SELECT A **210 OR R/RS SERIES** REGULATOR OF AMPLE CAPACITY TO HANDLE FLOW –

KNOWN: DESIRED FLOW RATE 6,000,000 BTUH; PIPE SIZE 1-1/2"; INLET PRESSURE 1 psi; OUTLET PRESSURE 9" wc.

SOLUTION: CHECK CAPACITY CHART ON 210 OR R/RS SERIES SALES BULLETIN ... THE 210E-1-1/2 HAS A MAXIMUM CAPACITY OF 10,000,000 BTUH (THE 210D-1-1/4 HAS A CAPACITY OF ONLY 6,000,000 BTUH). THEREFORE, THE 210E-1-1/2 USED WITH A 5" TO 12" SPRING WILL GIVE YOU THE DESIRED OUTLET PRESSURE OF 9" wc.

WARNING: NO UNTRAINED PERSON SHOULD ATTEMPT TO INSTALL, MAINTAIN, OR SERVICE A GAS PRESSURE REGULATOR.

ALL PRODUCTS, INCLUDING GAS PRESSURE REGULATORS, USED WITH COMBUSTIBLE GAS MUST BE INSTALLED AND USED STRICTLY IN ACCORDANCE WITH THE MANUFACTURER, WITH GOVERNMENT CODES AND REGULATIONS, AND PLUMBING CODES AND PRACTICES.

MAXITROL GAS APPLIANCE PRESSURE REGULATORS SHOULD BE INSTALLED AND OPERATED IN ACCORDANCE WITH THE SAFETY WARNING BULLETIN.



PRESSURE REGULATORS

MAIN BURNER & PILOT APPLICATIONS

LEVER ACTING DESIGN

Maxitrol's 325 Series regulators are for 2 psi and 5 psi piping systems. Models available for appliance main burner or pilot applications and as line pressure regulators. Gases: Natural, manufactured, mixed, liquified petroleum or LP gas-air mixture.

MODEL/SIZE	CAP.	INLET PRESSURE	OUTLET PRESSURE*
325-3-3/8 325-3-1/2	289 CFH	10 psi	2" wc - 2 psi
325-5A-3/4	675 CFH	10 psi	2" wc - 2 psi

^{*}Standard spring range: 2 - 6" wc.

For additional settings please order proper spring.

RUBBER SEAT POPPET MODELS



VENT LIMITING DEVICE When vented to the outdoors the 325 Series is suitable for multi-poise mounting. When using the vent limiting device, the regulator (325-3, 325-5A) must be mounted in a horizontal upright position. 12A09 - 325-3 12A39 - 325-5

These rubber seat poppet type regulators are designed primarily for main burner and pilot load applications where precise control of tiny flows is an essential operating requirement. ® certified (.15 CFH).

MODEL/SIZE	CAP.	INLET PRESSURE	OUTLET PRESSURE*
RV20L-1/4	65 CFH	1/2 psi	1.0" - 12" psi
RV20L-3/8	65 CFH	1/2 psi	1.0" - 12" psi
RV48-1/2	230 CFH	1/2 psi	1.0" - 12" psi
RV48-3/4	250 CFH	1/2 psi	1.0" - 12" psi

^{*}Standard spring range: 2.8 - 5.2"wc for RV20L.



VENT LIMITING DEVICE When using the vent limiting device, the regulator must be mounted in a horizontal upright position.

12A06 - RV48

MAIN BURNER ONLY

STRAIGHT-THRU-FLOW DESIGN

Maxitrol's original straight-thru-flow design regulators are main burner only, non-lockup type. Typical applications include residential, commercial, and industrial gas-fired appliances and equipment used on low pressure gas supply.

MODEL/SIZE	CAP.	INLET PRESSURE	OUTLET PRESSURE*
RV52-1/2	450 CFH	1/2 psi	1.0" - 12" wc
RV53-3/4 RV53-1	710 CFH	1/2 psi	1.0" - 12" wc
RV61-1 RV60-1-1/4	1100 CFH	1 psi	1.0" - 22" wc
RV81-1-1/4 RV81-1-1/2	2500 CFH	1 psi	1.0" - 22" wc
RV91-2 RV91-2-1/2	3275 CFH	1 psi	1.0" - 22" wc
RV111-2-1/2 RV111-3	7500 CFH	1 psi	1.0" - 22" wc

^{*} Standard spring range: 3 - 6" wc.



VENT LIMITING DEVICE When using the vent limiting device, the regulator must be mounted in a horizontal upright position.

12A06 - RV52, RV53, RV61

^{*}Standard spring range: 3.0 - 6.0"wc for RV48.

^{*} Additional sizes available.

Notes

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Notes

Power Fuses



TYPE FRS-R

DUAL ELEMENT

FOR USE IN REJECTION FUSE CLIPS OR ORDINARY FUSE CUPS

600 VOLTS

PART #	AMPS	LENGTH
FRSR10	10	
FRSR15	15	
FRSR20	20	
FRSR30	30	
FRSR40	40	7-1/8"
FRSR50	50	
FRSR60	60	
FRSR80	80	
FRSR100	100	



TYPE SC

DUAL ELEMENT

FOR LIGHTING, APPLIANCE AND MOTOR BRANCH CIRCUITS

300 VOLTS

PART #	AMPS
SC2	2
SC3	3
SC5X	5
SC8	8
SC10XX	10
SC20	20
SC30	30



TYPE FRN-R

DUAL ELEMENT

FOR USE IN REJECTION FUSE CLIPS OR ORDINARY FUSE CLIPS

250 VOLTS

PART #	AMPS	LENGTH
FRNR10	10	
FRNR15	15	
FRNR20	20	
FRNR25	25	
FRNR30	30	5-7/8"
FRNR35	35	
FRNR40	40	
FRNR45	45	
FRNR50	50	
FRNR60	60	5-7/8"
FRNR80	80	
FRNR100	100	



PLUG FUSES TYPE S

DUAL ELEMENT

FOR RUNNING AS WELL AS SHORT CIRCUIT PROTECTION

125 VOLTS

PART #	AMPS
S15	15
S20	20
S25	25
S30	30





TYPE KTK-R

NON-TIME DELAY FAST ACTING FUSE WITH BRANCH CIRCUIT PROTECTION

600 VOLTS



PART #	AMPS	SIZE
KTKR1	1	
KTKR2	2	
KTKR3	3	
KTKR5	5	
KTKR6	6	13/32 x 1-1/2"
KTKR10	10	
KTKR30	30	

TYPE FNQ

TIME DELAY

FOR MOTOR CONTROL TRANSFORMERS AND OTHER CIRCUITS WITH INRUSH CURRENTS

500 VOLTS



PART #	AMPS	SIZE
FNQR1	1	
FNQR2	2	
FNQR3	3	
FNQR4	4	13/32 x 1-1/2"
FNQR5	5	
FNQ10	10	
FNQ15	15	

TYPE FNM

DUAL ELEMENT TIME-DELAY

FOR CIRCUITS WITH HIGH INRUSH CURRENTS

250 VOLTS



PART #	AMPS	SIZE
FNM-1/2	1/2	
FNMI	1	
FNM2	2	
FNM3	3	
FNM4	4	13/32 x 1-1/2"
FNM5	5	
FNM6	6	
FNM8	8	

PLUG FUSES TYPE T

DUAL ELEMENT FOR RUNNING AS WELL AS SHORT CIRCUIT PROTECTION

125 VOLTS





PART #	AMPS
T10	10
T15	15
T20	20
T25	25
T30	30

Bussmann®

Power Fuses

TYPE AGW

NON-TIME-DELAY

FOR ELECTRONIC AND SMALL APPLIANCE CIRCUITS

PART #	AMPS	SIZE
AGW1-1/2	1-1/2	
AGW2-1/2	2-1/2	
AGW3	3	
AGW4	4	
AGW5	5	1/4" x 7/8"
AGW6	6	
AGW7-1/2	7-1/2	
AGW15	15	
AGW20	20	
AGW30	30	



TYPE ABC

NON-TIME-DELAY

FOR INSTRUMENTS ELECTRONICS AND SMALL APPLIANCES.

250 VOLTS

PART #	AMPS	SIZE
ABC5	5	
ABC8	8	
ABC10	10	1/4" x 1-1/4"
ABC15	15	
ABC20	20	



TYPE SFE

NON-TIME DELAY

RECOMMENDED FOR AUTO MOTIVE APPUCATIONS

32 VOLTS

PART #	AMPS	SIZE
SFE4	4	5/8"
SFE6	6	3/4"
SFE9	9	7/8"
SFE14	14	1-1/16"
SFE20	20	1-1/4"
SFE30	30	1-7/16"



TYPE AGA

NON-TIME-DELAY

FOR ELECTRONIC AND SMALL APPLIANCE CIRCUITS

PART	AMPS	SIZE	VOLTS
AGA1	1	1/4 x 5/8	125
AGA1-1/2	1-1/2		125
AGA2	2		
AGA5	5		
AGA6	6	1/4 x 5/8	32
AGA7	7		
AGA10	10		
AGA15	15		
AGA20	20		
AGA30	30		



TYPE AGX

NON-TIME-DELAY

FOR INSTRUMENTS, ELECTRONIC AND SMALL APPLIANCE CIRUITS

250 VOLTS

PART #	AMPS	SIZE
AGX2	2	
AGX3	3	
AGX20	20	1/4" x 1"
AGX25	25	

TYPE MDA

TIME-DELAY

RECOMMENDED FOR NEW EQUIPMENT DESIGNS

250 VOLTS



PART #	AMPS	SIZE
MDA2	2	
MDA3	3	
MDA10	10	1/4" x
MDA15	15	



GBC25

TYPE GBC

NON-TIME DELAY FOR AUTOMOTIVE USE

32 VOLTS

25

PART #	AMPS
GBC2-1/2	2-1/2
GBC8	8
GBC15	15
GBC16	16

TYPE ATC

AUTOMOTIVE APPLICATIONS FOR MOUNTING IN SPECIALLY **DESIGNED FUSEBLOCKS**

> PART# **AMPS** ATC3 3 ATC5 5 ATC7-1/2

TYPE AGC

7-1/2

NON-TIME-DELAY

RECOMMENED FOR NEW EQUIPMENT DESIGNS

250 VOLTS



PART #	AMPS	SIZE
AGC1/2	1/2	
AGC1	1	
AGC2	2	1/4" x 1-1/4"
AGC2-1/2	2-1/2	
AGC3	3	

32 VOLTS

PART #	AMPS	SIZE
AGC4	4	
AGC5	5	
AGC6	6	1/4" x x1-1/4"
AGC7-1/2	7-1/2	
AGC10	10	

Electrical Supplies



CIRCUIT BREAKERS

TWO POLE. COMMON TRIP 120-240 V.A.C.

PART #	AMPS
A215	15
A230	30
A240	40
A250	50



PUSHMATIC

PART #	AMP	POLE
P230	30	2
P240	40	2
P250	50	2
P260	60	2



SQUARE D

PART #	AMP	POLE
QO115	15	1
QO120	20	1
QO130	30	1
QO215	15	2
QO220	20	2
QO230	30	2
QO240	40	2
QO250	50	2

GENERAL DUTY SWITCHES

FUSIBLE

INDOOR, 30 AMP PLUG-FUSE + SOLID NEUTRAL



PART #	POLE	FUSES	VOLTS
N30	2	1	125
N25	3	2	125-250

60 AMP, QUICK BREAK

PART #	POLE	PHASE	VOLTS	DESCRIPTION
RW32263SN	3	1	240	RAINTITE
RW32364SN	4	3	240	RAINTITE



MAIN DISCONNECTS

PART #	POLE	PHASE	AMPS	DESCRIPTION
ACM222	2	1	60	FUSED
ACM222NF	2	1	60	NON-FUSED
750-60F-3PH	3	3	60	FUSED
750-60-NF-3PH	3	3	60	NPN-FUSED

UNIVERSAL (PLUG-IN)

INTERCHANGEABLE WITH GE, WESTINGHOUSE, BRYANT, ARROW HART, CROUSE HINDS, GT SYLVANIA, CHALLENGER, GENERAL SWITCH, MURRAY & SIEMENS-ALLIS-ITE

PART #	AMP	POLE
THQL1115	15	1
THQL1120	20	1
THQL1130	30	1
THQL2115	15	2
THQL2120	20	2
THQL2130	30	2
THQL2140	40	2
THQL2150	50	2

FEDERAL PACIFIC TYPE FP(O) NC-1/2"

	•	
PART #	AMP	POLE
FPO15	15	1
FPO20	20	1

TYPE FP(C) NA-1

PART #	AMP	POLE
FP115	15	1
FP120	20	1

TYPE FP(O) NC-1

PART #	AMP	POLE
FPO215	15	2
FPO220	20	2
FPO230	30	2
FPO240	40	2
FPO250	50	2



Electrical Accessories

SOLDERLESS TERMINALS

10000 SERIES

NON-INSULATED, SINGLE GRIP-100 PER PACKAGE RING TONGUE

PART #	WIRE SIZE	STUD SIZE
C11306	16-14	5-6
C11308	16-14	8
C11310	16-14	10
C11408	12-10	8
C11410	12-10	10



SPADE TONGUE*

PART #	WIRE SIZE	STUD SIZE
C13308	16-14	8
C14206	22-18	4-6



QUICK CONNECTS (10000 SERIES)

ADAPTER (MALE TO FEMALE)

PART #	WIRE SIZE	STUD SIZE
C18002		



ADAPTER (SCREW TYPE TO TAB)

PART #	WIRE SIZE	STUD SIZE
C18006		4-6
C18010		8-10



VOLKSWAGEN ADAPTER

PART #	WIRE SIZE	STUD SIZE
C18011		
C18012		



MALE TAB

PART #	WIRE SIZE	STUD SIZE
C18201	22-18	
C18401	12-10	



FEMALE TAB

PART #	WIRE SIZE	STUD SIZE
C18203	22-18	
C18204	22-18	
C18302	18-14	
C18403	12-10	



ANGLE FEMALE TAB

_			
I	PART #	WIRE SIZE	STUD SIZE
ľ	C18304	18-14	
ı	C18305	16-14	
1	C18308	20-12	



COMPRESSOR TERMINAL

PART #	DESCRIPTION	
13635	7 PIECE PACKAGE	
3361	100 PIECE PACKAGE	



60000 SERIES

BELLMOUTH INSULATED RING TONGUE



PART #	WIRE SIZE	STUD SIZE
C61210	22-18	10
C61306	16-14	5-6
C61308	16-14	8
C61310	16-14	10
C61314	16-14	12-1/4
C61406	12-10	4-6
C61408	12-10	8
C61410	12-10	10

SPADE TONGUE



PART #	WIRE SIZE	STUD SIZE
C63201	22-18	10
C63308	16-14	8
C63310	16-14	10
C63408	12-10	8
C63410	12-10	10

BUTT CONNECTORS



PART #	WIRE SIZE	STUD SIZE
C67202	22-18	
C67302	16-14	
C67402	12-10	

PIGTAIL CONNECTORS



PART #	WIRE SIZE	STUD SIZE
C67203	22-14	

(60000 SERIES)QUICK CONNECTS

MALE TAB



PART #	WIRE SIZE	STUD SIZE
C68301	18-14	

FEMALE TAB



Р	ART #	WIRE SIZE	STUD SIZE
C	68203	22-16	
C	68302	18-14	
C	68403	12-10	

NYLON TIES

100 PER PACKAGE

DADT #	OVERALL	MIN. TENSILE
PART #	LENGTH	STRENGTH
L-5-30-9-C	5-1/2"	50 LBS.
L-7-50-9-C	7-1/2"	50 LBS.
L-8-40-0-C	8" Black	50 LBS.
L-14-50-9-C	14"	50 LBS.
L-36-175-9-L	36"	175 LBS.
I -48-175-9-I	48"	175 LBS.

^{* #14206} WITH FLANGE

Electrical Accessories





THERMOSTAT WIRE

PLASTIC JACKETED

PART #	GAUGE	DESCRIPTION	LENGTH
20/2	20 GA.	2 WIRE	500'
20/3	20 GA.	3 WIRE	500'
20/4	20 GA.	4 WIRE	250'
20/5	20 GA.	5 WIRE	250'
20/6	20 GA.	6 WIRE	250'
20/7	20 GA.	7 WIRE	250'
20/8	20 GA.	8 WIRE	250'

PLASTIC JACKETED, UL LISTED

PART #	GAUGE	DESCRIPTION	LENGTH
18/2UL	18 GA.	2 WIRE	500'
18/4UL	18 GA.	4 WIRE	500'
18/6UL	18 GA.	6 WIRE	250'
18/8UL	18 GA.	8 WIRE	250'



BUILDING WIRE

TYPE THHN, STRANDED

PART #	GAUGE	DESCRIPTION	LENGTH
14STR-BLK	14 GA.	BLACK	500'
14STR-R	14 GA.	RED	500'
14STR-W	14 GA.	WHITE	500'
12STR-BLK	12 GA.	BLACK	500'
12STR-R	12 GA.	RED	500'
12STR-W	12 GA.	WHITE	500'
10STR-BLK	10 GA.	BLACK	500'
10STR-W	10 GA.	WHITE	500'
10STR-R	10 GA.	RED	500'
8STR-BLK	8 GA.	BLACK	500'v

TYPE THHN, SOLID

14SOL-BLK	14 GA.	BLACK	500'
14SOL-G	14 GA.	GREEN	500'
14SOL-R	14 GA.	RED	500'
14SOL-W	14 GA.	WHITE	500'
12SOL-BLK	12 GA.	BLACK	500'
12SOL-R	12 GA.	RED	500'
12SOL-W	12 GA.	WHITE	500'

Thomas@Betts

STEEL ELECTRICAL BOXES

SQUARE

PART #	DESCRIPTION
52151-1/2	1-1/2" DEEP, 1/2" K.O.s
52151-1/2-3/4	1-1/2" DEEP, 1/2"/3/4" K.O.s
52171-1/2-3/4	2-1/8" DEEP, 1/2"/3/4" K.O.s
53151-1/2-3/4	EXTENSION 1-1/2" DEEP



OCTAGON

54151-1/2	2-1/8" DEEP 1/2" K.O.s
55151-1/2	1-1/2" DEEP, 1/2" K.O.s



HANDY BOX

58361-1/2	1-7/8" DEEP, 1/2" K.O.s
58361-3/4	1-7/8" DEEP, 3/4" K.O.s
59361-1/2	1-1/2" DEEP, 1/2" K.O.s



GEM BOX

CW-1/2	1-7/8" DEEP 1/2" K.O.s
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ROUGH SERVICE LIGHT BULBS

PART #	DESCRIPTION
4431	100 WATT



ELECTRICAL BOX COVERS

SQUARE









PART #	DESCRIPTION
52-C-1	COVER BLANK
RS9	1-TOGGLE SWITCH
RS12	1-DUPLEX RECEPTACLE
RS5	2-TOGGLE SWITCH
RS2	1-TOGGLE, DUPLEX RECPT.
RS8	DUAL DUPLEX RECEPTACLE
RS11	15A SINGLE RECEPTACLE
RS13	30A SINGLE RECEPTACLE







58C1	COVER BLANK
58C30	1-TOGGLE SWITCH
58C7	1-DUPLEX RECEPTACLE

GANG PLATES FLAT



PART #	DESCRIPTION
52-C-0	SINGLE GANG
52-C-00	DOUBLE GANG

Electrical Accessories

SEALTITE FLEXIBLE CONDUIT

GREY PVC JACKET

PART #	SIZE
ST50N	1/2" x 100'
ST75N	3/4" x 100'



UL LISTED

ST50UL-25	1/2" x 25'
ST50UL	1/2" x 100'
ST75UL-25	3/4" x 25'
ST75UL	3/4" x 100'



SEALTITE FITTINGS

90° CONNECTOR

PART #	SIZE
5252	1/2" x 90º
LT492	3/4" x 90º



45° CONNECTOR

LT451	1/2" x 45º
LT452	3/4" x 45º



STRAIGHT CONNECTOR

LT101	1/2"
5233	3/4"



FLEXIBLE METALLIC CONDUIT

GREENFIELD

PART #	SIZE
38GF25	3/8" x 25'
38GF75	3/8" x 75'
38GF100	3/8" x 100'



RIGID CONDUIT FITTINGS

PART #	DESCRIPTION
H0221	1/2" OFFSET CONNECTOR
LN101	1/2" LOCKNUT
LN102	3/4" LOCKNUT
LN103	1" LOCKNUT



PULL EL'S, THREADED

PART #	DESCRIPTION
HL601	1/2" PULL EL
HL602	3/4" PULL EL



BX CONDUIT



PART #	GAUGE	DESCRIPTION	LENGTH
(12)14/2Bx25	(12)14 GA.	2 WIRE	25'
(12)14/2BX50	(12)14 GA.	2 WIRE	50'
(12)14/2BX100	(12)14 GA.	2 WIRE	100'
(12)14/3BX25	(12)14 GA.	3 WIRE	25'
(12)14/3BX50	(12)14 GA.	3 WIRE	50'
(12)14/3BX100	(12)14 GA.	3 WIRE	100'

BX & GREENFIELD CONNECTORS



PART #	SIZE
XC220	3/8" BX CONNECTOR
XC290	3/8" BX 90º
XC210	3/8" BX DUPLEX
XC280	3/8" TAKE ALL
TX220	3/8" BX TO 1/2" EMT

THINWALL CONDUIT (EMT)



PART #	SIZE
50EMT	1/2" x 10'
75EMT	3/4" x 10'
100EMT	1" x 10'

THINWALL FITTINGS (EMT)

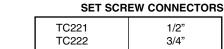
BACK TO BACK CONNECTOR



PART #	SIZE
BS201	1/2"



COMPRESSION CONNECTORS		
TC211	1/2"	
TC212	3/4"	
TC213	1"	



3/4"



	90° CONNECTOR
50EMT90	1/2"

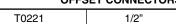
COMPRESSION TYPE COUPLING	
TK211	1/2"
TK212	3/4"
TK212	4"



SET SCREW TYPE COUPLINGS	
TK221	1/2"
TK222	7/8"



OFFSET	CONNECTORS



Installation Accessories

DEBURRING TOOL

FAST, EASY WAY TO DEBURR AND SMOOTH INSIDE OR OUTSIDE OF COPPER OR PLASTIC TUBING AND FITTINGS.

PART #	DESCRIPTION
180	DEBURRING TOOL



EXTEND-A-MATCH™

THE EXTEND-A-MATCH™ RETRACTS TO 5' LONG ENABLING IT TO BE CARRIED IN A SHIRT POCKET. THE MATCH CAN BE QUICKLY INSERTED IN THE SPRING LOADED JAWS.

PART #	DESCRIPTION
170X	EXTEND-A-MATCH



VISE-GRIP

LOCKING PLIERS CURVED JAWS WITH WIRE CUTTERS

PART #	DESCRIPTION
9001	7-1/2" ADJUSTABLE



SHEET METAL TOOL

9010	8" ADJUSTABLE
------	---------------

SCREW-ON WIRE CONNECTORS

RESISTS PRACTICALLY ALL CHEMICAL ACTION. HEAT RESISTANT UP TO 221°.
100 PER PACKAGE.

PART #	SIZE(AWG)	VOLTS/COLOR
10-100	22-16	300/GREY
10-102	22-14	300/BLUE
10-103	22-14	600/ORANGE
10-104	18-12	600/YELLOW
10-106	18-10	600/RED



COMBINATION DEVICES

ALL DEVICES SIDE WIRED. ALL DEVICES ACCEPT STANDARD DUPLEX RECEPTACLE WALLPLATES.

PART #	DESCRIPTION
8625	Sw. & REC., Sw. 10A, 120V
	1/2 H.P., REC. 15A 125V, LV.



SWITCHES & RECEPTACLES

FRAMED TOGGLE

PART #	DESCRIPTION
8601	15A - 1/2HP 120V, SP IVORY
8603	15A - 1/2HP 120V, 3-WAY IVORY
16309	20A - 220V, DPST



DUPLEX RECEPTACLES

8613	DUPLEX REC. 15A-125V, IVORY
------	-----------------------------

P.V.C. ELECTRICAL TAPE

PART #	DESCRIPTION
13229	3/4" – 66'



WD-40

WD-40

PART #	DESCRIPTION
18047	12 oz. AEROSOL

CLEAR VINYL TUBING

- A clear, tough, flexible tubing
- Use for instrument controls, humidifier over-flows, condensate pump discharge lines, laboratory applications & many more industrial & domestic uses
- Excellent for air conditioning & refrigeration condensate drains

Item No.	Description	Carton Qty.
5225	1/4" I.D. x 100' Roll	(5)
5137	3/8" I.D. x 100' Roll	(5)
5150	1/2" I.D. x 100' Roll	(5)
5162	5/8" I.D. x 100' Roll	(1)
5175	3/4" I.D. x 100' Roll	(1)
5187	7/5" I.D. x 50' Roll	(1)

WATERWAY MICROPUMP CONDENSATE PUMP

- Contains its own sump
- Nominal 5-1/2" x 1-9/16" x 1-3/16" size
- For air conditioners up to 60,000 Btu/hr
- Will lift water up to 10 feet & move 2 gallons/hr
- Built-in filter protects pump from debris
- Built in non-return valves prevent water run-back

Item	•	Carton
No.	Description	Qty.
19538	110 Volt Waterway Micropump	(1)

Kimtex® SHOP TOWELS

- Man-made fibers allow durability & softness
- Absorb 5 times their own weight in liquids
- Unaffected by strong chemicals
- Each towel is 9-1/4 x 16-3/4 & is blue in color
- Fits 13058 Access Dispenser
- Leaves less than half the surface residue of cloth shop towels

Item		Carton
No.	Description	Qty.
19098	Kimtex Pop-Up Box (50/Box)	(10)



Installation Accessories

DURAGRID® CONDENSER PADS

MOLDED STRUCTURAL PLASTIC

2" THICKNESS

3" ROUND DURAGRID® PADS

PART # / SIZE
ACP2424-2
ACP2436-2
ACP2448-2
ACP3024-2
ACP3030-2
ACP3036-2
ACP3348-2
ACP3636-2
ACP3648-2
ACP3842-2v
•

PART #	SIZE
ACP24RD-3	24"
ACP30RD-3	30"





ANTI-VIBRATION PAD

CORK/RUBBER

DESCRIPTION
4" x 4" x 7/8"
2" x 2" x 3/4"
18" x 18" x 3/4"
2"x2" Blue Foam



GEAR CLAMPS

PART #	DESCRIPTION
6202	1/4" - 5/8"
6203X	5/16" - 7/8"
5410	1/2" - 1-1/8"
5412	1/2" - 3/4"
5416	3/4" - 1-1/2"
5432	1-9/16" - 1-1/2"



RUBBER TIE DOWNS

PART #	DESCRIPTION
174	20"
175	31"



STRAIGHT BLADE PLUGS & CONNECTORS

PART #	DESCRIPTION
8639	VINYL CONN. 15A-125V, 16GA.
8641	ARMORED VINYL, 15A-125V 12-18GA.

TENSIONING TOOL

FITS ALL STANDARD AND HEAVY DUTY TIES, AND PROVIDES PROPER TIGHTNESS WHILE TRIMMING AWAY EXCESS.



PART #	DESCRIPTION
8958	TENSIONING TOOL

EGG CRATE LOUVERS

- White
- Nominal 2' x 4' panel size
- 1/2' open cell grid

PART #	DESCRIPTION
S1-650-100	2' x 4' x 1/2"
S1-650-300	4' x 2' x 1/2



FURNACE MOUNTING BLOCK

- Furnace Mounting Blocks raise the furnace over 1-1/2" off the ground for quiet, dry, long lasting operation.
- The Furnace Mounting Block is an easy
 to install, inexpensive way to assure your
 furnace isn't damaged from water on the floor. These blocks offer noise
 reduction in the form of high density foam on top and rubber feet on the
 bottom. To aid in installation, the foam features adhesive for accurate
 placement on the bottom of the furnace.

PLASTIC / METAL SECONDARY DRAIN PANS

- Manufactured from .80" impact resistant high density polyethylene plastic sheet creating a *virtually unbreakable* pan
- Rolled edges for durability & strength
- · Ribbed bottoms for rigidity
- Structurally engineered corners for strength
- 3/4" PVC fittings supplied with each pan
- No rust No breakage No leakage
- Drain pans are black in color & 2.5" deep
- Drain location LS = long side; SS = short side



Item		Carton
No.	Description	Qty.
17562	12" X 46" Bottom, 14" X 48" Overall, Drain: SS	(5)
17599	30" X 30" Bottom, 32" X 32" Overall, Drain: S	(5)
17617	30" X 60" Bottom, 32" X 62" Overall, Drain: LS	(5)
17626	36" X 60" Bottom, 38" X 62" Overall, Drain: LS	(5)
34173	24" Round Bottom, Aluminum	(5)
Metal Pans		
20x32-24	20" X 32" 24ga	(1)
26x32-24	26" X 32" 24ga	(1)
30x60-26	30" X 60" 24ga	(1)
100108459	20" Diameter	(1)
100108616	22" Diameter	(1)
100108615	28" Diameter	(1)

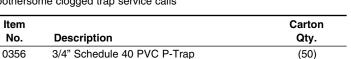
CONDENSATE TRAPS

• Full-flow condensate traps

0357

• Each trap is carefully sized, minimizing bothersome clogged trap service calls

3/4" Schedule 40 PVC R-Trap





(50)

8-10

PVC PIPE AND ACCESSORIES

PIPE

10' LENGTHS

PART #	SIZE	DESCRIPTION
6106	3/4"	SCHEDULE 40
6200	2"	SCHEDULE 40
6300	3"	SCHEDULE 40



90° ELBOW (SLIP)

PART #	SIZE
85221	1/2"
85283	3/4"
85291	2"
82312	2"*
85295	3"
82314	3"*



90° / 45° STREET ELBOW(SLIP)

PART #	SIZE	PART #	SIZE
85267	3/4" 90⁰	82297	3" 90⁰
82295	2" 90⁰	82496	3" 45⁰*
82294	2" 45⁰		



90° ELBOW

(SLIPxFPT)

PART #	SIZE
85303	3/4"



45° ELBOW (SLIP)

PART #	SIZE
85281	1/2"
85223	3/4"
85231	2"
85235	3"



COUPLING (SLIP)

PART #	SIZE
85203	3/4"
85211	2"
85215	3"
82151	3"x2"



FEMALE ADAPTER (SLIPXFIPT)

PART #	SIZE
85107	3/4"
85107	6"



TEE (SLIP)



PART #	SIZE
85401	1/2"
85403	3/4"
85411	2"
85415	3"
85939	3x3x2

TEE



(SLIP	xSLIF	PxFP	T)

SIZE
3/4"
2x2x3/4

MALE ADAPTER

(SLIP)



PART #	SIZE
85001	1/2"
85003	3/4"

REDUCING MALE ADAPTER

(MPTxSLIP)



PART #	SIZE
85025	1/2"x3/4"

REDUCER-BUSHING

(SLIP)



PART #	SIZE
85741	3/4x1/2
85743	1x3/4
85871	2x3/4
85775	3 x 2

CAP (SLIP)

PART #	SIZE
447-007	3/4"



PLUG (SLIP)

PART #	SIZE
85157	3/4"



PVC UNIONS

(SLIPxFIPT)

PART #	SIZE
457-007	3/4"

^{*}Indicates long radius

PIPE HANGERS AND ACCESSORIES

THREADED ROD

BLACK

PART #	SIZE
6206-6	1/4" x 6'
6210-6	3/8" x 6'
6210-10	3/8"x10'
6212-6	1/2" x 6'
6213-6	5/8" x 6'
6214-6	3/4" x 11'



GALVANIZED

PART #	SIZE
6206-6-G	1/4" x 6'
6210-6-G	3/8" x 6'
6212-6-G	1/2" x 6'

PIPE HANGERS FOR STRUT

TUBE CLAMPS



PART #	SIZE
701-3/8	3/8"
701-1/2	1/2"
701-5/8	5/8"
701-3/4	3/4"
701-7/8	7/8"
701-1-1/8	1-1/8"
701-1-3/8	1-3/8"
701-1-5/8	1-5/8"
701-2-1/8	2-1/8"
701-2-5/8	2-5/8"
701-3-1/8	3-1/8"

PLASTIC COATED TUBING HANGER

PART #	SIZE
C727P-1/2	1/2"
C727P-3/4	3/4"
C727P-1	1"
C727P-1-1/4	1-1/4"
C727P-1-1/2	1-1/2"
C727P-2	2"
C727P-3	3"



PIPE/RIGID CONDUIT CLAMPS



SIZE
1/2"
3/4"
1"
1-1/4"
1-1/2"
2"
2-1/2"
3"
4"

BEAM CLAMP

STEEL

SIZE
3/8"
1/2"
5/8"



MALLEABLE IRON

M775-3/8B	3/8"
M775-1/2B	1/2"



EYE COUPLINGS

PART #	SIZE
EC14	1/4"
EC38	3/8"



ISOLATOR FOR COPPER TUBE



PART #	O.D. SIZE
A716-3/8	3/8"
A716-1/2	1/2"
A716-5/8	5/8"
A716-3/4	3/4"
A716-7/8	7/8"
A716-1-1/8	1-1/8"
A716-1-3/8	1-3/8"
A716-1-5/8	1-5/8"
A716-2-1/8	2-1/8"
A716-2-5/8	2-5/8"

ROD COUPLINGS

PART #	SIZE
RC-1/4	1/4"
RC-3/8	3/8"
RC-1/2	1/2"
RC-5/8	5/8"



UNI-STRUT - 12 GA.

/	

PART #	DEPTH
A1400HS-10	1-5/8"
B1400HS-10	13/16"

ANGLE CLIP

PART #	SIZE
540-3/8	3/8"
540-1/2	1/2"



SLOTTED ANGLE IRON 10'.



PART #	DEPTH
A1400HS-10	1-5/8"
B1400HS-10	13/16"

PIPE HANGING DEVICES



CONDUIT CLAMPS

GALVANIZED

(WITHOUT STOVE BOLTS)

	SIZE CONDUIT	
PART #	RIGID	THINWALL
445-0	1/2" - 3/8"	1/2"
445-1	3/4"	3/4"
445-2	1"	1"
445-3	1-1/4"	1-1/4"
445-4	1-1/2"	1-1/2"
445-5	2"	2"
445-6	2-1/2"	
445-7	3"	



COPPER

(WITH STOVE BOLTS)

PART #	SIZES
C455-0	3/8" -1/2"
C455-1	3/4"
C445-2	1"
C445-3	1-1/4"
C445-4	1-1/2"
C445-5	2"



REDUCING WASHERS FOR SWITCH BOXES

PART #	SIZE
KOW3412	3/4" - 1/2"
KOW134	1" - 3/4"



BEAM CLAMP HEAVY DUTY

WITH 1/4"-20 x 1" SLOTTED SCREW. ASSURES THE MOST DEPENDABLE UNIVERSAL SUPPORT FOR HEAVY PIPING, CONDUITS, HANGER RODS ETC.

PART #
425



DOUBLE LEAF SPRING TOGGLE BOLTS

ROUND HEAD

PART #	SIZE
TB3163	3/16" x 3"
TB3164	3/16" x 4"
TB5164	5/16" x 4"
TB5165	5/16" x 5"
TB386	3/8" x 6"
TB144	1" x 4"
TB145	1" x 5"



SETTING TOOLS



SIZE
3/16"
1/4"
5/16"
3/8"
1/2"

LEAD EXPANSION ANCHORS

SETTING PUNCH INCLUDED WITH EAOH BOX.



PART #	SIZE
LA316	3/16"
LA14	1/4"
LA516	5/16"
LA38	3/8"
LA12	1/2"

ITW TAPCON

CONCRETE FASTENER - HEX HEAD



PART #	DIA./IN.	LENGTH
TCSHS-316x134	3/16	1-3/4"
TCSHS-316x234	3/16	2-3/4"
TCSHS-316x334	3/16	3-3/4"
TCSHS-14x114	1/4	1-3/4"
TCSHS-14x134	1/4	1-3/4"
TCSHS-14x234	1/4	2-3/4"
TCSHS-14x334	1/4	3-3/4"

WINGS FOR TOGGLE BOLTS



PART #	SIZE
TW14	1/4"
TW516	5/16"
T38	3/8"
TW12	1/2"

VERTICAL SAMMYS (ANCHORS) 3/8"



PART #	SIZE
CST20	5/16" x 1-1/2"
GST20	1/4" x 2"
100X	Nut Driver Tool



PIPE HANGING DEVICES

FLAT-END LAG SCREWS

STOVE BOLTS INCLUDED UNASSEMBLED

PART #	SIZE
FE650-0	1/4" x 3"
FE650-1	5/16" x 3-1/2"
FE650-2	3/8" x 4"



GALVANIZED PLASTER WASHERS



	OUTSIDE		HOLE	BOLT
PART #	DIAMETER	GAUGE	SIZE	SIZE
PW138732	1-3/8"	18	3/16"	3/16"
PW138516	1-3/8"	18	1/4"	1/4"
PW1381332	1-3/8"	18	3/8"	3/8"

RING AND BOLT HANGERS

NUTS AND BOLTS NOT ASSEMBLED

GALVANIZED



PART #	SIZE	WIDTH	BOLT SIZE
6002	1/2"	7/8"	1/4" x 3/4"
6003	3/4"	7/8"	1/4" x 3/4"
6004	1"	7/8"	1/4" x 3/4"
6005	1-1/4"	7/8"	1/4" x 3/4"
6006	1-1/2"	7/8"	1/4" x 3/4"
6007	2"	7/8"	1/4" x 3/4"
6008	2-1/2"	1-1/8"	1/4" x 3/4"
6009	3"	1-1/8"	5/16" x 3/4"
6011	4"		

COPPER

PART #	SIZE	WIDTH	BOLT SIZE
6002C	1/2"	7/8"	1/4" x 3/4"
6003C	3/4"	7/8"	1/4" x 3/4"
6004C	1"	7/8"	1/4" x 3/4"
6005C	1-1/4"	7/8"	1/4" x 3/4"
6006C	1-1/2"	7/8"	1/4" x 3/4"
6007C	2"	7/8"	1/4" x 3/4"
6008C	2-1/2"	7/8"	1/4" x 1"

CLEVIS HANGER

BLACK

PART #	SIZE
CL710-3/4B	3/4"
CL710-1B	1"
CL710-1-1/4B	1-1/4"
CL710-1-1/2B	1-1/2"
CL710-2B	2"
CL710-2-1/2B	2-1/2"
CL710-3B	3"
CL710-4B	4"

COPPER

P	ART #	SIZE
ТВ	CTL710-3/4	3/4"
ТВ	CTL710-1	1"
ТВ	CTL710-1-1/4	1-1/4"
ТВ	CTL710-1-1/2	1-1/2"
ТВ	CTL710-2	2"
ТВ	CTL710-2-1/2	2-1/2""

RISER CLAMP

STANDARD



PART #	SIZE
C720-3/4B	3/4"
C720-1B	1"
C720-1-1/4B	1-1/4"
C720-1-1/2B	1-1/2"
C720-2B	2"
C720-2-1/2B	2-1/2"
C720-3B	3"
C720-4B	4"
C720-5B	5"

COPPER

PART #	SIZE
C720-3-1/2	3-1/2"
C720-4	4"
C720-5	5"
C720-6	6"
C720-7	7"
C720-10	10"

COACH SCREWS



PART #	SIZE
CS5/8 X 3-1/2	5/8" x 3-1/2"
CS14 X 3	1/4" x 3"



GALVANIZED PIPE STRAPS

STANDARD TWO HOLE FOR HEAVY WALL PIPE

PART #	SIZE
7704	1/4"
7708	1/2"
7710	3/4"
7712	1"
7714	1-1/4"
7716	1-1/2"
7718	2"
7720	2-1/2"



HEAVY DUTY ONE HOLE PIPE STRAPS

"SNAP-ON" ONE HOLE TYPE FOR HEAVY WALL PIPE

PART #	SIZE
8704	3/8"BX
8708	1/2"
8710	3/4"
8712	1"
8714	1-1/4"
8716	1-1/2"
8718	2"



GALVANIZED PIPE STRAPS

STANDARD TWO HOLE TYPE FOR THIN WALL PIPE

PART #	SIZE
7707	1/2"
7709	3/4"



HEAVY DUTY ONE HOLE PIPE STRAPS

"SNAP-ON" ONE HOLE TYPE FOR THIN WALL PIPE

PART #	SIZE
16-900	1/2" IPS
16-901	3/4" IPS
8711	1"



PIPE HANGING DEVICES

COPPER TUBING STRAPS

STANDARD TWO HOLE TYPE



PART #	SIZE
7908	1/2"
7910	3/4"
7912	1"
7914	1-1/4"
7916	1-1/2"

COPPERIZED PERFORATED HANGER IRON



PART #	LENGTH	GAUGE
510AC	10'	20
510ACx100	100'	20

GALVANIZED PERFORATED HANGER IRON

PART #	WIDTH	LENGTH	GAUGE
520A	3/4"	20	10'
524A	3/4"	24	10'
520Cx100	3/4"	20	100'
514x10	1"	14	10'

STANDARD TYPE WIRE PIPE HOOKS



BLACK

PART #	SIZE
6116	1/2" x 6"
6126	3/4" x 6"
6136	1" x 6"
6146	1-1/4" x 6"
6156	1-1/2" x 6"

COPPER

SIZE
1/2" x 6"
3/4" x 6"
1" x 6"
1-1/4" x 6"
1-1/2" x 6"

FASTENERS & ACCESSORIES

SLOTTED ROUND STOVE BOLT

WITH HEX NUT

PART #	SIZE
SBN316x34	3/16" x 3/4"
SBN316x1	3/16" x 1"
SBN316x112	3/16" x 1-1/2"
SBN14x12	1/4" x 1/2"
SBN14x34	1/4" x 3/4"
SBN14x1	1/4" x 1"
SBN14x112	1/4" x 1-1/2"
SBN14x2	1/4" x 2"
SBN14x3	1/4" x 3"
SBN14x4	1/4" x 4"



FINISHED HEX NUTS

PART #	SIZE
HN316	3/16"
HN14	1/4"
HN516	5/16"
HN38	3/8"
HN716	7/16"
HN12	1/2"
HN58	5/8"
HN34	3/4"



HEX HEAD LAG BOLT

GIMLET POINT

PART #	SIZE
HHLB14x2	1/4" x 2"
HHLB14x3	1/4" x 3"
HHLB14x4	1/4" x 4"
HHLB38x2	3/8" x 2"
HHLB38x3	3/8" x 3"
HHLB38x4	3/8" x 4"



SHORT LAG SCREW SHIELD

PART #	SIZE
LS14	1/4"
LS38	3/8"



STEEL DROP-IN ANCHOR

PART #	SIZE
PE SDIA14	1/4"
PE SDIA38	3/8"
PE SDIA12	1/2"



HEX HEAD BOLT

GRADE 2 LOW CARBON STEEL



PART #	SIZE
HHB14x34	1/4" x 3/4"
HHB14x1	1/4" x 1"
HHB14x112	1/4" x 1-1/2"
HHB516x34	5/16" x 3/4"
HHB516x1	5/16" x 1"
HHB516x112	5/16" x 1-1/2"
HHB516x2	5/16" x 2"
HHB516x212	5/16" x 2-1/2"
HHB516x3	5/16" x 3"
HHB38x34	3/8" x 3/4"
HHB38x1	3/8" x 1"
HHB38x112	3/8" x 1-1/2"
HHB38x2	3/8" x 2"
HHB38x212	3/8" x 2-1/2"
HHB38x3	3/8" x 3"
HHB38x312	3/8" x 3-1/2"
HHB716x175	7/16" x 1-3/4"
HHB12x1	1/2" x 1"
HHB12x112	1/2" x 1-1/2"
HHB12x2	1/2" x 2"
HHB12x212	1/2" x 2-1/2"
HHB12x3	1/2" x 3"
HHB12x312	1/2" x 3-1/2"
HHB12x4	1/2" x 4"
HHB58x112	5/8" x 1-1/2"
HHB58x3	5/8" x 3"
HHB58x312	5/8" x 3-1/2"
HHB58x412	5/8" x 4-1/2"
HHB34x1	3/4" x 1"
HHB34x3	3/4" x 3"
HHB34x312	3/4" x 3-1/2"

LOCK WASHERS



PART #	SIZE
LW316	3/16"
LW14	1/4"
LW516	5/16"
LW38	3/8"
LW12	1/2"
LW58	5/8"

FLAT WASHERS



PART #	SIZE
FW316	3/16"
FW14	1/4"
FW516	5/16"
FW38	3/8"
FW12	1/2"
FW58	5/8"
FW34	3/4"

90° ELBOW



	BLACK	CAST	GALV.
SIZE	PART #	PART #	PART #
1/8"	BE01		GE01
1/4"	BE02		GE02
3/8"	BE03		GE03
1/2"	BE04	CE04	GE04
3/4"	BE06	CE06	GE06
1"	BE08	CE08	GE08
1-1/4"	BE10	CE10	GE10
1-1/2"	BE12	CE12	GE12
2"	BE16	CE16	GE16
2-1/2"	BE20	CE20	GE20
3"	BE24	CE24	GE24
3-1/2"	BE28	CE28	
4"	BE32	CE32	GE32
5"	BE40	CE40	
6"	BE48	CE48	



45° ELBOW

	BLACK	CAST	GALV.
SIZE	PART #	PART #	PART #
1/8"	BA01		GA01
1/4"	BA02		GA02
3/8"	BA03		GA03
1/2"	BA04	CA04	GA04
3/4"	BA06	CA06	GA06
1"	BA08	CA08	GA08
1-1/4"	BA10	CA10	GA10
1-1/2"	BA12	CA12	GA12
2"	BA16	CA16	GA16
2-1/2"	BA20	CA20	GA20
3"	BA24	CA24	GA24
3-1/2"	BA28	CA28	
4"	BA32	CA32	
5"	BA40	CA40	
6"	BA48	CA48	



90° ELBOW REDUCER

	BLACK	CAST	GALV.
SIZE	PART #	PART #	PART #
1/4" x 1/8"	BE0201		GE0201
3/8" x 1/8"	BE0301		
3/8" x 1/4"	BE0302		GE0302
1/2" x 1/4"	BE0402		GE0402
1/2" x 3/8"	BE0403	CE0403	GE0403
3/4" x 1/4"	BE0602		CE0602
3/4" x 3/8"	BE0603		CE0603
3/4" x 1/2"	BE0604	CE0604	GE0604
1" x 3/8"	BE0803		GE0803
1" x 1/2"	BE0804	CE0804	GE0804
1" x 3/4"	BE0806	CE0806	GE0806
1-1/4" x 1/2"	BE1004	CE1004	GE1004
1-1/4" x 3/4"	BE1006	CE1006	GE1006
1-1/4 x 1"	BE1008	CE1008	GE1008
1-1/2" x 1/2"	BE1204	CE1204	
1-1/2" x 3/4"	BE1206	CE1206	GE1206
1-1/2" x 1"	BE1208	CE1208	GE1208
1-1/2" x 1-1/4"	BE1210	CE1210	GE1210
2" x 1/2"	BE1604	CE1604	
2" x 3/4"	BE1606	CE1606	GE1606
2" x 1"	BE1608	CE1608	GE1608
2" x 1-1/4"	BE1610	CE1610	GE1610
2" x 1-1/2"	BE1612	CE1612	GE1612
2" x 1-1/4"	 DE0040	CE2010	 OF0010
2-1/2" x 1-1/2"	BE2012	CE2012	GE2012
2-1/2" x 2"	BE2016	CE2016	GE2016
3" x 1-1/4		CE2410	
3" x 1-1/2"		CE2412	
3" x 2" 3" x 2-1/2"	BE2416 BE2420	CE2416 CE2420	GE2416 GE2420
3 x 2-1/2 3-1/2" x 3"	DE2420 	CE2420 CE2824	GE2420
3-1/2 x 3 4" x 2"	BE3216	CE2824 CE3216	
4" x 2-1/2"	DE3210 	CE3216 CE3220	
4" x 3"	BE3224	CE3224	GE3224
4" x 3-1/2"		CE3228	
5" x 2-1/2"		CE4020	
5" x 3"		CE4024	
5" x 3-1/2"		CE4028	
5" x 4"		CE4032	
6" x 3"		CE4824	
6" x 4"		CE4832	
6" x 5"		CE4840	
8" x 6"		CE6448	

FLOOR FLANGE

PART #	SIZE
BFF04	1/2"
BFF06	3/4"
BFF08	1"
BFF10	1-1/4"
BFF12	1-1/2"
BFF16	2"



COUPLINGS*

	BLACK	GALV.
SIZE	PART #	PART #
1/8"	BMC01	GMC01
1/4"	BMC02	GMC02
3/8"	BMC03	GMC03
1/2"	BMC04	GMC04
3/4"	BMC06	GMC06
1"	BMC08	GMC08
1-1/4"	BMC10	GMC10
1-1/2"	BMC12	GMC12
2"	BMC16	GMC16
2-1/2"	BMC20	GMC20
3"	BMC24	GMC24
4"	BMC32	GMC32
5"	BMC40	
6"	BMC48	
* 4 /0" O" OTE	EL DI 401/ 041/	AAUZED



COMPANION FLANGE

BLACK

PART #	SIZE
CF12x40	1-1/2" x 5"
CF24x60	3" x 7-1/2"
CF24x72	3" x 9"
CF32x72	4" x 9"
CF40x80	5" x 10"
CF40x88	5" x 11"
CF48x88	6" x 11"
CF64x108	8" x 13-1/2"



COMPANION FLANGE UNION

CAST IRON

PART #	SIZE
CFU16	2"
CFU20	2-1/2"
CFU24	3"
CFU28	3-1/2"
CFU32	4"
CFU40	5"
CFU48	6"
CFU64	8"



CAPS

GALV.



SIZE	PART #	PART #
1/8"	BC01	GC01
1/4"	BC02	GC02
3/8"	BC03	GC03
1/2"	BC04	GC04
3/4"	BC06	GC06
1"	BC08	GC08
1-1/4"	BC10	GC10
1-1/2"	BC12	GC12
2"	BC16	GC16
2-1/2"	BC20	GC20
3"	BC24	GC24
3-1/2"	BC28	GC32
4"	BC32	
5"	BC40	
6"	BC48	-

BLACK

FACE BUSHING



PART #	SIZE
BFB0403	1/2" x 3/4"
BFB0604	3/4" x 1/2"
BFB0406	1" x 3/4"

CROSS, BLACK



PART #	SIZE
BCR06	3/4"
BCR08	1"
BCR10	1-1/4"
BCR16	2"
BCR32	4"

^{* 1/2&}quot; - 2" STEEL: BLACK GALVANIZED



HEX BUSHINGS

GALVANIZED

PART #	SIZE	PART #	SIZE
GB0201	1/4" x 1/8"	GB1206	1-1/2" x 3/4"
GB0301	3/8" x 1/8"	GB1208	1-1/2" x 1"
GB0302	3/8" x 1/4"	GB1210	1-1/2" x 1-1/4"
GB0401	1/2" x 1/8"	GB1602	2" x 1/4"
GB0402	1/2" x 1/4"	GB1603	2" x 3/8"
GB0403	1/2" x 3/8"	GB1604	2" x 1/2"
GB0601	3/4" x 1/8"	GB1606	2" x 3/4"
GB0602	3/4" x 1/4"	GB1608	2" x 1"
GB0603	3/4" x 3/8"	GB1610	2" x 1-1/4"
GB0604	3/4" x 1/2"	GB1612	2" x 1-1/2"
GB0801	1" x 1/8"	GB2004	2-1/2" x 1/2"
GB0802	1" x 1/4"	GB2006	2-1/2" x 3/4"
GB0803	1" x 3/8"	GB2008	2-1/2" x 1"
GB0804	1" x 1/2"	GB2010	2-1/2" x 1-1/4"
GB0806	1" x 3/4"	GB2012	2-1/2" x 1-1/2"
GB1002	1-1/4" x 1/4"	GB2016	2-1/2" x 2"
GB1003	1-1/4" x 3/8"	GB2404	3" x 1/2"
GB1004	1-1/4" x 1/2"	GB2406	3" x 3/4"
GB1006	1-1/4" x 3/4"	GB2408	3" x 1"
GB1008	1-1/4" x 1"	GB2410	3" x 1-1/4"
GB1202	1-1/2" x 1/4"	GB2412	3" x 1-1/2"
GB1203	1-1/2" x 3/8"	GB2416	3" x 2"
GB1204	1-1/2" x 1/2"	GB2420	3" x 2-1/2"

HEX BUSHINGS

CAST IRON

SIZE	PART #	SIZE	PART #
1/4" x 1/8"	CB0201	2-1/2" x 1"	CB2008
3/8" x 1/8"	CB0301	2-1/2" x 1-1/4"	CB2010
3/8" x 1/4"	CB0302	2-1/2" x 1-1/2"	CB2012
1/2" x 1/8"	CB0401	2-1/2" x 2"	CB2016
1/2" x 1/4"	CB0402	3" x 1/2"	CB2404
1/2" x 3/8"	CB0403	3" x 3/4"	CB2406
3/4" x 1/8"	CB0601	3" x 1"	CB2408
3/4" x 1/4"	CB0602	3" x 1-1/4"	CB2410
3/4" x 3/8"	CB0603	3" x 1-1/2"	CB2412
3/4" x 1/2"	CB0604	3" x 2"	CB2416
1" x 1/8"	CB0801	3" x 2-1/2"	CB2420
1" x 1/4"	CB0802	3-1/2" x 1"	CB2808
1" x 3/8"	CB0803	3-1/2" x 1-1/4"	CB2810
1 x 1/2"	CB0804	3-1/2" x 1-1/2"	CB2812
1" x 3/4"	CB8006	3-1/2" x 2"	CB2816
1-1/4" x 1/8"	CB1001	3-1/2" x 2-1/2"	CB2820
1-1/4" x 1/4"	CB1002	3-1/2" x 3"	CB2824
1-1/4" x 3/8"	CB1003	4" x 1"	CB3208
1-1/4" x 1/2"	CB1004	4" x 1-1/4"	CB3210
1-1/4" x 3/4"	CB1006	4" x 1-1/2"	CB3212
1-1/4" x 1"	CB1008	4" x 2"	CB3216
1-1/2" x 1/4"	CB1202	4" x 2-1/2"	CB3220
1-1/2" x 3/8"	CB1203	4" x 3"	CB3224
1-1/2" x 1/2"	CB1204	4" x 3-1/2"	CB3228
1-1/2" x 3/4"	CB1206	5" x 2"	CB4016
1-1/2" x 1"	CB1208	5" x 2-1/2"	CB4020
1-1/2" x 1-1/4	CB1210	5" x 3"	CB4024
2" x 1/4"	CB1602	5" x 3-1/3"	CB4028
2" x 3/8"	CB1603	5" x 4"	CB4032
2" x 1/2"	CB1604	6" x 2"	CB4816
2" x 3/4"	CB1606	6" x 2-1/2"	CB4820
2" x 1"	CB1608	6" x 3"	CB4824
2" x 1-1/4"	CB1610	6" x 3-1/2"	CB4828
2" x 1-1/2"	CB1612	6" x 4"	CB4832
2-1/4" x 1/2"	CB2004	6" x 5"	CB4840
2-1/4" x 3/4"	CB2006	7-1/2" x 6"	CB6048

REDUCING TEES





PART #	SIZE \ IN.	PART #	SIZE / IN.	PART #	SIZE / IN.	PART #	SIZE / IN.
GT020201	1/4 x 1/4 x 1/8	GT080604	1 x 3/4 x 1/2	GT120808	1-1/2 x 1 x 1	GT161604	2 x 2 x 1/2
GT020203	1/4 x 1/4 x 3/8	GT080606	1 x 3/4 x 3/4	GT120810	1-1/2 x 1 x 1-1/4	GT161606	2 x 2 x 3/4
GT030202	3/8 x 1/4 x 1/4	GT080608	1 x 3/4 x 1	GT120812	1-1/2 x 1 x 1-1/2	GT161608	2 x 2 x 1
GT030203	3/8 x 1/4 x 3/8	GT080802	1 x 1 x 1/4	GT121004	1-1/2 x 1-1/4 x 1/2	GT161610	2 x 2 x 1-1/4
GT030302	3/8 x 3/8 x 1/4	GT080803	1 x 1 x 3/8	GT121006	1-1/2 x 1-1/4 x 3/4	GT161612	2 x 2 x 1-1/2
GT030304	3/8 x 3/8 x 1/2	GT080804	1 x 1 x 1/2	GT121008	1-1/2 x 1-1/4 x 1	GT161620	2 x 2 x 2-1/2
GT040204	1/2 x 1/4 x 1/2	GT080806	1 x 1 x 3/4	GT121010	1-1/2 x 1-1/4 x 1-1/4	GT201216	2-1/2 x 1-1/2 x 2
GT040303	1/2 x 3/8x3/8	GT080810	1 x 1 x 1/4	GT121210	1-1/2 x 1-1/2 x 1-1/4	GT201220	2-1/2 x 1 x 2-1/2
GT040304	1/2 x 3/8 x 1/2	GT100408	1-1/4 x 1/2 x 1	GT121204	1-1/2 x 1-1/2 x 1/2	GT201616	2-1/2 x 2 x 2
GT040402	1/2 x 1/2 x 1/4	GT100410	1-1/4 x 1/2 x 1-1/4	GT121206	1-1/2 x 1-1/2 x 3/4	GT201620	2-1/2 x 2 x 2-1/2
GT040403	1/2 x 1/2 x 3/8	GT100610	1-1/4 x 3/4 x 1-1/4	GT121208	1-1/2 x 1-1/2 x 1	GT202006	2-1/2 x 2-1/2 x 3/4
GT040406	1/2 x 1/2 x 3/8	GT100804	1-1/4 x 1 x 1/2	GT121210	1-1/2 x 1-1/2 x 1-1/4	GT202008	2-1/2 x 2-1/2 x 1
GT060404	3/4 x 1/2 x 1/2	GT100806	1-1/4 x 1 x 3/4	GT121216	1-1/2 x 1-1/2 x 2	GT202010	2-1/2 x 2-1/2 x 1-1/4
GT060406	3/4 x 1/2 x 3/4	GT100808	1-1/4 x 1 x 1	GT160416	2 x 1/2 x 2	GT202012	2-1/2 x 2-1/2 x 1-1/2
GT060408	3/4 x 1/2 x 1	GT100810	1-1/4 x 1 x 1-1/4	GT160616	2 x 3/4 x 2	GT202016	2-1/2 x 2-1/2 x 1
GT060602	3/4 x 3/4 x 1/4	GT101003	1-1/4 x 1-1/4 x 3/8	GT160816	2 x 1 x 2	GT202024	2-1/2 x 2-1/2 x 3
GT060603	3/4 x 3/4 x 3/8	GT101004	1-1/4 x 1-1/4 x 1/2	GT161010	2 x 1-1/4 x 21	GT241624	3 x 2 x 3
GT060604	3/4 x 3/4 x 1/2	GT101006	1-1/4 x 1-1/4 x 3/4	GT161012	2 x 1-1/4 x 1-1/2	GT242406	3 x 3 x 3/4
GT060608	3/4 x 3/4 x 1	GT101008	1-1/4 x 1-1/4 x 1	GT161016	2 x 1-1/4 x 2	GT242408	3 x 3 x 1
GT080208	1 x 1/2 x 1	GT101012	1-1/4 x 1-1/4 x 1-1/2	GT161208	2 x 1-1/2 x 1	GT242410	3 x 3 x 1-1/4
GT080404	1 x 1/4 x 1/4	GT120412	1-1/2 x 1/2 x 1-1/2	GT161210	2 x 1-1/2 x 1-1/4	GT242412	3 x 3 x 1-1/2
GT080406	1 x 1/2 x 3/4	GT120606	1-1/2 x 3/4 x 3/4	GT161212	2 x 1-1/2 x 1-1/2	GT242416	3 x 3 x 2
GT080408	1 x 1/2 x 1	GT120612	1-1/2 x 3/4 x1-1/2	GT161216	2 x 1-1/2 x 2	GT242420	3 x 3 x 2-1/2



REDUCER

DLACK GALV.	BL	.ACK	GALV.
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	BLACK	GALV.
SIZE	PART #	PART #
1/4" x 1/8"	BMC0201	GMC0201
3/8" x 1/8"	BMC0301	GMC0301
3/8" x 1/4"	BMC0302	GMC0302
1/2" x 1/8"	BMC0401	GMC0401
1/2" x 1/4"	BMC0402	GMC0402
1/2" x 3/8"	BMC0403	GMC0403
3/4" x 1/8" 3/4" x 1/4"	BMC0601 BMC0602	GMC0601 GMC0602
3/4" x 1/4 3/4" x 3/8"	BMC0603	GMC0602 GMC0603
3/4" x 1/2"	BMC0604	GMC0604
1" x 1/4"	BMC0802	GMC0802
1" x 3/8'	BMC0803	GMC0803
1" x 1/2"	BMC0804	GMC0804
1" x 3/4"	BMC0806	GMC0806
1-1/4" x 1/2"	BMC1004	GMC1004
1-1/4" x 3/4"	BMC1006	GMC1006
1-1/4" x 1"	BMC1008	GMC1008
1-1/2" x 1/2"	BMC1204	GMC1204
1-1/2" x 3/4"	BMc1206	GMC1206
1-1/2" x 1"	BMC1208	GMC1208
1-1/2" x 1-1/4" 2" x 1-1/2"	BMC1210 BMC1612	GMC1210 GMC1604
2" x 3/4"	BMC1606	GMC1604 GMC1606
2" x 1"	BMC1608	GMC1608
2" x 14"	BMC1610	GMC1610
2" x 1-1/2"	BMC1612	GMC1612
2-1/2" x 1"	BMC2008	GMC2008
2-1/2 x 1-1/4"	BMC2010	GMC2010
2-1/2 x 1-1/2"	BMC2012	GMC2012
2-1/2 x 2"	BMC2016	GMC2016
3" x 1"	BMC2408	GMC2408
3" x 1-1/4"	BMC2410	GMC2410
3" x 1-1/2" 3" x 2"	BMC2412 BMC2416	GMC2412 GMC2416
3" x 2-1/2"	BMC2420	GMC2416 GMC2420
3-1/2" x 2"	BMC2816	
3-1/2" x 2-1/2"	BMC2820	
3-1/2" x 3"	BMC2824	
4" x 1-1/2"	BMC3212	
4" x 2"	BMC3216	
4" x 2-1/2"	BMC3220	GMC3220
4" x 3"	BMC3224	
4" x 3-1/2"	BMC3228	
5" x 4"	BMC4032	
6" x 4"	BMC4832	

45° STREET ELBOW



	BLACK	GALV.
SIZE	PART #	PART #
1/2"	BSA04	GSA04
3/4"	BSA06	GSA06
1"	BSA08	

90° STREET ELBOW



	BLACK	GALV.
SIZE	PART #	PART #
1/8"	BSE01	GSE01
1/4"	BSE02	GSE02
3/8"	BSE03	GSE03
1/2"	BSE04	GSE04
3/4"	BSE06	GSE06
1"	BSE08	GSE08
1-1/4"	BSE10	GSE10
1-1/2"	BSE12	GSE12
2"	BSE16	GSE16
2-1/2"	BSE20	GSE20
3"	BSE24	
4"	BSE32	

SQUARE HEAD PLUGS



	BLACK	GALV.
SIZE	PART #	PART #
1/8"	BP01*	
3/8"	BP02*	GP02*
1/4"	BP03*	GP03*
1/2"	BP04	GP04
3/4"	BP06	GP06
1"	BP08	GP08
1-1/4"	BP10	GP10
1-1/2"	BP12	GP12
2"	BP16	GP16
2-1/2"	BP20	GP20
3"	BP24	GP24
3-1/2"	BP28	
4"	BP32	
5"	BP40	
6"	BP48	

^{*}STEEL

STRAIGHT TEE

	BLACK	CAST	GALV.
SIZE	PART #	PART #	PART #
1/8"	BT01		GT01
1/4"	BT02		GT02
3/8"	BT03		GT03
1/2"	BT04	CT04	GT04
3/4"	BT06	CT06	GT06
1"	BT08	CT08	GT08
1-1/2"	BT10	CT10	GT10
1-1/4"	BT12	CT12	GT12
2"	BT16	CT16	GT16
2-1/2"	BT20	CT20	GT20
3"	BT24	CT24	GT24
3-1/2"	BT28	CT28	
4"	BT32	CT32	
5"	BT40	CT40	
6"	BT48	CT48	



UNIONS

SIZE	PART #	PART #
1/8"	GF BU01	GF GU01
1/4"	GF BU02	GF GU02
3/8"	GF BU03	GF GU03
1/2"	GF BU04	GF GU04
3/4"	GF BU06	GF GU06
1"	GF BU08	GF GU08
1-1/4"	GF BU10	GF GU10
1-1/2"	GF BU12	GF GU12
2"	GF BU16	GF GU16
2-1/2"	GF BU20	GF GU20
3"	GF BU24	GF GU24
4"	GF BU32	

BLACK

GALV.



REDUCING TEE, BLACK

	1	Γ	1		T
PART #	SIZE \ IN.	PART #	SIZE / IN.	PART #	SIZE / IN.
BT010102	1/8 x 1/8 x 1/4	BT100410	1-1/4 x 1/2 x 1-1/4	BT161216	2 x 2-1/2 x 2
BT020201	1/4 x 1/4 x 1/8	BT100606	1-1/4 x 3/4 x 3/4	BT161604	2 x 2 x 1/2
BT020203	1/4 x 1/4 x 3/8	BT100608	1-1/4 x 3/4 x 1	BT161606	2 x 2 x 3/4
BT030202	3/8 x 1/4 x 1/4	BT100610	1-1/4 x 3/4 x 1-1/4	BT161608	2 x 2 x 1
BT030203	3/8 x 1/4 x 3/8	BT100804	1-1/4 x 1 x 1/2	BT161610	2 x 2 x 1-1/4
BT030302	3/8 x 3/8 x 1/4	BT100806	1-1/4 x 1 x 3/4	BT161612	2 x 2 x 1-1/2
BT030304	3/8 x 3/8 x 1/2	BT100808	1-1/4 x 1 x 1	BT161620	2 x 2 x 2-1/2
BT040204	1/2 x 1/4 x 1/2	BT100810	1-1/4 x 1 x 1-1/4	BT201216	2 x 1-1/2 x 2
BT040303	1/2 x 3/8 x 3/8	BT101004	1-1/4 x 1-1/4 x 1/4	BT201220	2-1/2 x 1-1/2 x 2-1/2
BT040304	1/2 x 3/8 x 1/2	BT101006	1-1/4 x 1-1/4 x 3/4	BT201616	2-1/2 x 2 x 2
BT040402	1/2 x 1/2 x 1/8	BT101008	1-1/4 x 1-1/4 x 1	BT201620	2-1/2 x 1-1/2 x 2-1/2
BT040403	1/4 x 1/4 x 3/8	BT101012	1-1/4 x 1-1/4 x 1-1/2	BT202006	2-1/2 x 2-1/2 x 3/4
BT040406	1/2 x 1/2 x 3/4	BT120412	1-1/2 x 1/2 x 1-1/2	BT202008	2-1/2 x 2-1/2 x 1
BT040408	1/2 x 1/2 x 1	BT120606	1-1/2 x 3/4 x 3/	BT202010	2-1/2 x 2-1/2 x 1-1/4
BT060206	3/4 x 1/4 x 3/4	BT120612	1-1/2 x 3/4 x 1-1/2	BT202012	2-1/2 x 2-1/2 x 1-1/2
BT060303	3/4 x 3/8 x 3/8	BT120808	1-1/2 x 1/1	BT202016	2-1/2 x 2-1/2 x 2
BT060306	3/4 x 3/8 x 3/4	BT120810	1-1/2 x 1 x 1-1/4	BT202024	2-1/2 x 2-1/2 x 3
BT060404	3/4 x 1/2 x 1/2	BT120812	1-1/2 x 1 x 1-1/2	BT241616	3 x 1 x 1
BT060406	3/4 x 1/2 x 3/4	BT121004	1-1/2 x 1-1/4 x 1/4	BT241624	3 x 1 x 3
BT060408	3/4 x 1/2 x 1	BT121006	1-1/2 x 1-1/4 x 3/4	BT242016	3 x 2-1/2 x 1
BT060602	3/4 x 3/4 x 1/8	BT121008	1-1/2 x 1-1/4 x 1	BT242020	3 x 2-1/2 x 2-1/2
BT060603	3/4 x 3/4 x 3/8	BT121010	1-1/2 x 1-1/4 x 1-1/4	BT242406	3 x 3 x 3/4
BT060604	3/4 x 3/4 x 1/2	BT121012	1-1/2 x 1-1/4 x 1-1/2	BT242408	3 x 3 x 1
BT060608	3/4 x 3/4 x 1	BT121204	1-1/2 x 1-1/2 x 1/2	BT242410	3 x 3 x 1-1/4
BT060610	3/4 x 3/4 x 1-1/4	BT121206	1-1/2 x 1-1/2 x 3/4	BT242412	3 x 3 x 1-1/2
BT080208	1 x 1/8 x 1	BT121208	1-1/2 x 1-1/2 x 1	BT242416	3 x 3 x 2
BT080404	1 x 1/2 x 1/2	BT121210	1-1/2 x 1-1/2 x 1-1/4	BT242420	3 x 3 x 2-1/2
BT080406	1 x 1/2 x 3/4	BT121216	1-1/2 x 1-1/2 x 2	BT242432	3 x 3 x 4
BT080408	1 x 1/2 x 1	BT160416	2 x 1/2 x 2	BT322032	4 x 2-1/2 x 4
BT080604	1 x 3/4 x 1/2	BT160616	2 x 3/4 x 2	BT322432	4 x 3 x 4
BT080606	1 x 3/4 x 3/4	BT160808	2 x 1 x 1	BT323212	4 x 4 x 1-1/2
BT080608	1 x 3/4 x 1	BT160812	2 x 1 x 1-1/4	BT323216	4 x 4 x 2
BT080802	1 x 1 x 1/8	BT160816	2 x 1 x 2	BT323220	4 x 4 x 2-1/2
BT080803	1 x 1 x 3/8	BT161008	2 x 1-1/4 x 1	BT323224	4 x 4 x 3
BT080804	1 x 1 x 1/2	BT161010	2 x 1-1/4 x 1-1/4	BT484816	6 x 6 x 1
BT080806	1 x 1 x 3/4	BT161012	2 x 1-1/4 x 1-1/2	BT484820	6 x 6 x 2-1/2
BT080810	1 x 1 x 1-1/4	BT161016	2 x 1-1/4 x 2	BT484824	6 x 6 x 3
BT080812	1 x 1 x 1-1/2	BT161208	2 x 1-1/2 x 1	BT484832	6 x 6 x 4
BT080816	1 x 1 x 2	BT161210	2 x 1-1/2 x 1-1/4		
BT100408	1-1/2 x 1/2 x 1	BT161212	2 x 1-1/2 x 12		





REDUCING TEES, CAST IRON

PART #	SIZE \ IN.	PART #	SIZE / IN.	PART #	SIZE / IN.	PART #	SIZE / IN.
CT040402	1/2 x 1/2 x 1/4	CT121006	1-1/2 x 1-1/4 x 3/4	CT200816	2-1/2 x 1 x 2	CT242420	3 x 3 x 2-1/2
CT040406	1/2 x 1/2 x 3/4	CT121008	1-1/2 x 1-1/4 x 1	CT200820	2-1/2 x 1 x 2-1/2	CT242432	3 x 3 x 4
CT060404	3/4 x 1/2 x 1/2	CT121010	1-1/2 x 1-1/4 x 1-1/4	CT201012	2-1/2 x 1-1/4 x 1-1/2	CT320632	4 x 3/4 x 4
CT060406	3/4 x 1/2 x 3/4	CT121012	1-1/2 x 1-1/4 x 1-1/2	CT201016	2-1/2 x 1-1/4 x 2	CT321616	4 x 2 x 2
CT060604	3/4 x 3/4 x 1/2	CT121016	1-1/2 x 1-1/4 x 2	CT201020	2-1/2 x 1-1/4 x 2-1/2	CT321620	4 x 2 x 2-1/2
CT060608	3/4 x 3/4 x 1	CT121204	1-1/2 x 1-1/2 x 1/2	CT201212	2-1/2 x 1-1/2 x 1-1/2	CT321624	4 x 2 x 3
CT080404	1 x 1/2 x 1/2	CT121206	1-1/2 x 1-1/2 x 3/4	CT201216	2-1/2 x 1-1/2 x 2	CT321632	4 x 2 x 4
CT080406	1 x 1/2 x 3/4	CT121208	1-1/2 x 1-1/2 x 1	CT201220	2-1/2 x 1-1/2 x 2-1/2	CT322020	4 x 2-1/2 x 2-1/2
CT080408	1 x 1/2 x 1	CT121210	1-1/2 x 1-1/2 x 1/4	CT201224	2-1/2 x 1-1/2 x 3	CT322024	4 x 2-1/2 x 3
CT080604	1 x 3/4 x 1/2	CT121216	1-1/2 x 1-1/2 x 2	CT201604	2-1/2 x 2 x 1/2	CT322032	4 x 2-1/2 x 4
CT080606	1 x 3/4 x 3/4	CT160416	2 x 1/2 x 2	CT201606	2-1/2 x 2 x 3/4	CT322410	4 x 3 x 1-1/4
CT080608	1 x 3/4 x 1	CT160612	2 x 3/4 x 1-1/2	CT201608	2-1/2 x 2 x 1	CT322412	4 x 3 x 1-1/2
CT080804	1 x 1 x 1/2	CT160616	2 x 3/4 x 2	CT201610	2-1/2 x 2 x 1-1/4	CT322416	4 x 3 x 2
CT080806	1 x 1 x 3/4	CT160808	2 x 1 x 1	CT201612	2-1/2 x 2 x 1-1/2	CT322420	4 x 3 x 2-1/2
CT080810	1 x 1 x 1-1/4	CT160810	2 x 1 x 1-1/4	CT201616	2-1/2 x 2 x 2	CT322424	4 x 3 x 3
CT100408	1-1/4 x 1/2 x 1	CT160812	2 x 1 x 1-1/2	CT201620	2-1/2 x 2 x 2-1/2	CT322432	4 x 3 x 4
CT100410	1-1/4 x 1/2 x 1-1/4	CT160816	2 x 1 x 2	CT201624	2-1/2 x 2 x 3	CT323206	4 x 4 x 3/4
CT100606	1-1/4 x 3/4 x 3/4	CT161006	2 x 1-1/4 x 3/4	CT202004	2-1/2 x 2-1/2 x 1/2	CT323210	4 x 4 x 1-1/4
CT100608	1-1/4 x 3/4 x 1	CT161008	2 x 1-1/4 x 1	CT202006	2-1/2 x 2-1/2 x 3/4	CT323212	4 x 4 x 1-1/2
CT100610	1-1/4 x 3/4 x 1-1/4	CT161010	2 x 1-1/4 x 1-1/4	CT202008	2-1/2 x 2-1/2 x 1	CT323216	4 x 4 x 2
CT100804	1-1/4 x 1 x 1/2	CT161012	2 x 1-1/4 x 1-1/2	CT202010	2-1/2 x 2-1/2 x 1-1/4	CT323220	4 x 4 x 2-1/2
CT100806	1-1/4 x 1 x 3/4	CT161016	2 x 1-1/4 x 2	CT202012	2-1/2 x 2-1/2 x 1-1/2	CT323224	4 x 4 x 3
CT100808	1-1/4 x 1 x 1	CT161204	2 x 1-1/2 x 1/2	CT202016	2-1/2 x 2-1/2 x 2	CT323240	4 x 4 x 5
CT100810	1-1/4 x 1 x 1-1/4	CT161206	2 x 1-1/2 x 3/4	CT202024	2-1/2 x 2-1/2 x 3	CT402040	5 x 2-1/2 x 5
CT100812	1-1/4 x 1 x 1-1/2	CT161208	2 x 1-1/2 x 1	CT241024	3 x 1-1/4 x 3	CT402440	5 x 3 x 5
CT101004	1-1/4 x 1-1/4 x 1/2	CT161210	2 x 1-1/2 x 1-1/4	CT241220	3 x 1-1/2 x 2-1/2	CT404248	5 x 5-1/4 x 6
CT101006	1-1/4 x 1-1/4 x 3/4	CT161212	2 x 1-1/2 x 1-1/2	CT241224	3 x 1-1/2 x 3	CT403240	5 x 4 x 5
CT101008	1-1/4 x 1-1/4 x 1	CT161216	2 x 1-1/2 x 2	CT241612	3 x 2 x 1-1/2	CT403248	5 x 4 x 6
CT101012	1-1/4 x 1-1/4 x 1-1/2	CT161604	2 x 2 x 1/2	CT241616	3 x 2 x 2	CT404020	5 x 5 x 2-1/2
CT120410	1-1/2 x 1/2 x 1-1/4	CT161606	2 x 2 x 3/4	CT241620	3 x 2 x 2-1/2	CT404024	5 x 5 x 3
CT120412	1-1/2 x 1/2 x 1-1/2	CT161608	2 x 2 x 1	CT241624	3 x 2 x 3	CT404032	5 x 5 x 4
CT120612	1-1/2 x 3/4 x 1-1/2	CT161610	2 x 2 x 1-1/4	CT242016	3 x 2-1/2 x 2	CT404048	5 x 5 x 6
CT120804	1-1/2 x 1 x 1/2	CT161612	2 x 2 x 1-1/2	CT242020	3 x 2-1/2 x 2-1/2	CT404848	5 x 6 x 6
CT120806	1-1/2 x 1-1/2 x 3/4	CT161620	2 x 2 x 2-1/2	CT242024	3 x 2-1/2 x 3	CT483232	6 x 4 x 4
CT120808	1-1/2 x 1 x 1	CT161624	2 x 2 x 3	CT242406	3 x 3 x 3/4	CT484020	6 x 5 x 2-1/2
CT120810	1-1/2 x 1 x 1-1/4	CT161632	2 x 2 x 4	CT242408	3 x 3 x 1	CT484040	6 x 5 x 5
CT120812	1-1/2 x 1 x 1-1/2	CT200416	2-1/2 x 1/2 x 2	CT242410	3 x 3 x 1-1/4	CT484832	6 x 6 x 4
CT120816	1-1/2 x 1 x 2	CT200420	2-1/2 x 1/2 x 2-1/2	CT242412	3 x 3 x 1-1/2	CT484840	6 x 6 x 5
CT121004	1-1/2 x 1-1/4 x 1/2	CT200620	2-1/2 x 3/4 x 2-1/2	CT242416	3 x 3 x 2	CT484864	6 x 6 x 8

BLACK & GALVANIZED NIPPLES

BLACK	SIZE	GALV.	BLACK	SIZE	GALV.
		GALV.			GALV.
B01xCL	1/8 x cl.		B03x035	3/8 x 3-1/2 3/8 x 4	
B01x015	1/8 x 1-1/2		B03x040		
B01x020	1/8 x 2		B03x045	3/8 x 4-1/2	
B01x025	1/8 x 2-1/2		B03x050	3/8 x 5	
B01x030	1/8 x 3		B03x055	3/8 x 5-1/2	
B01x035	1/8 x 3-1/2		B03x060	3/8 x 6	
B01x040	1/8 x 4		B03x065	3/8 x 6-1/2	
B01x045	1/8 x 4-1/2		B03x070	3/8 x 7	
B01x050	1/8 x 5		B03x075	3/8 x 7-1/2	
B01x055	1/8 x 5-1/2		B03x080	3/8 x 8	
B01x060	1/8 x 6		B03x085	3/8 x 8-1/2	
B01x065	1/8 x 6-1/2		B03x090	3/8 x 9	
B01x070	1/8 x 7		B03x095	3/8 x 9-1/2	
B01x075	1/8 x 7-1/2		B03x100	3/8 x 10	
B01x080	1/8 x 8		B03x105	3/8 x 10-1/2	
B01x085	1/8 x 8-1/2		B03x110	3/8 x 11	
B01x090	1/8 x 9		B03x115	3/8 x 11-1/2	
B01x095	1/8 x 9-1/2		B03x120	3/8 x 12	
B01x100	1/8 x 10		B04xCL	1/2 x cl.	
B01x105	1/8 x 10-1/2		B04x015	1/2 x 1-1/2	G04x015
	1/8 x 11			1/2 x 2	
B01x110			B04x020		G04x020
B01x115	1/8 x 11-1/2		B04x025	1/2 x 2-1/2	G04x025
B02xCL	1/4 x cl.		B04x030	1/2 x 3	G04x030
B02x015	1/4 x 1-1/2		B04x035	1/2 x 3-1/2	G04x035
B02x020	1/4 x 2		B04x040	1/2 x 4	G04x040
B02x025	1/4 x 2-1/2	G02x025	B04x045	1/2 x 4-1/2	G04x045
B02x030	1/4 x 3		B04x050	1/2 x 5	G04x050
B02x035	1/4 x 3-1/2	G02x035	B04x055	1/2 x 5-1/2	G04x055
B02x040	1/4 x 4		B04x060	1/2 x 6	G04x060
B02x045	1/4 x 4-1/2		B04x065	1/2 x 61/2	G04x065
B02x050	1/4 x 5	G02x050	B04x070	1/2 x 7	G04x070
B02x055	1/4 x 5-1/2		B04x075	1/2 x 7-1/2	G04x075
B02x060	1/4 x 6		B04x080	1/2 x 8	G04x080
B02x065	1/4 x 6-1/2		B04x085	1/2 x 8-1/2	G04x085
B02x070	1/4 x 7		B04x090	1/2 x 9	G04x090
B02x075	1/4 x 7-1/2		B04x095	1/2 x 9-1/2	G04x095
B02x080	1/4 x 8		B04x100	1/2 x 10	G04x100
B02x085	1/4 x 8-1/2		B04x105	1/2 x 10-1/2	G04x105
B02x090	1/4 x 9		B04x110	1/2 x 11	G04x110
B02x095	1/4 x 10		B04x115	1/2 x 11-1/2	G04x115
B02x100	1/4 x 10-1/2		B04x120	1/2 x 12	G04x120
B02x105	1/4 x 10-1/2		B04x140	1/2 x 12	
B02x103	1/4 x 10-1/2		B04x160	1/2 x 14 1/2 x 16	
B02x115	1/4 x 11-1/2		B04x180	1/2 x 10	
B02x120	1/4 x 11-1/2		B04x180 B04x200	1/2 x 16 1/2 x 20	
B03xCL	3/8 x cl.		B04x240	1/2 x 24	
B03x015	3/8 x 1-1/2		B04x300	1/2 x 30	
B03x020	3/8 x 2		B04x360	1/2 x 36	
B03x025	3/8 x 2-1/2		B04x420	1/2 x 42	
B03x030	3/8 x 3		B04x480	3/4 x 48	



BLACK & GALVANIZED NIPPLES

B06xc1 3/4 x cl. G06XCL B08x105 1 x 10-1/2 B06x015 3/4 x 1-1/2 G06x015 B08x110 1 x 11 B06X020 3/4 x 2 G06x020 B08x115 1 x 11-1/2 B06x025 3/4 x 2-1/2 G06x025 B08x120 1 x 12	G08x105 G08x110 G08x115
B06x015 3/4 x 1-1/2 G06x015 B08x110 1 x 11 B06X020 3/4 x 2 G06x020 B08x115 1 x 11-1/2 B06x025 3/4 x 2-1/2 G06x025 B08x120 1 x 12	G08x110
B06X020 3/4 x 2 G06x020 B08x115 1 x 11-1/2 B06x025 3/4 x 2-1/2 G06x025 B08x120 1 x 12	
B06x025 3/4 x 2-1/2 G06x025 B08x120 1 x 12	I GURXIIS
	G08x120
B06x030 3/4 x 3 G06x030 B08x140 1 x 14	
B06x035 3/4 x 3-1/2 G06x035 B08X160 1 x 16	
B06x040 3/4 x x4 G06x040 B08x180 1 x 18	
B06x045 3/4 x 4-1/2 G06x045 B08x200 1 x 20	
B06x050 3/4 x 5 G06x050 B08X240 1 x 24	
B06x055 3/4 x 5-1/2 G06x055 B08x300 1 x 30	
B06x060 3/4 x 6 G06x060 B08x360 1 x 36	
B06x065 3/4 x 6-1/2 G06x065 B08x420 1 x 42	
B06x070 3/4 x 7 G06x070 B08X480 1 x 48	
B06x075 3/4 x 7-1/2 G06x075 B10XCL 1-1/2 x cl.	G10xCL
l II II II	
B06x080 3/4 x 8 G06x080 B10x020 1-1/2 x 2	G10x020
B06x085 3/4 x 8-1/2 G06x085 B10x025 1-1/4 x 2-1/2	
B06x090 3/4 x 9 G06x090 B10X030 1-1/4 x 3	G10x030
B06x095 3/4 x 9-1/2 G06x095 B10X035 1-1/4 x 3-1/2	
B06x100 3/4 x 10 G06x100 B10x040 1-1/4 x 4	G10x040
B06x105 3/4 x 10-1/2 G06x105 B10x045 1-1/4 x 4-1/2	G10x045
B06x110 3/4 x 11 G06x110 B10x050 1-1/4 x 5	G10x050
B06x115 3/4 x 11-1/2 G06x115 B10x055 1-1/4 x 5-1/2	G10x055
B06x120 3/4 x 12 G06x120 B10x060 1-1/4 x 6	G10x060
B06x140 3/4 x 14 B10X065 1-1/4 x 6-1/2	G10x065
B06x160 3/4 x 16 B10X070 1-1/4 x 7	G10x070
B06x180 3/4 x 18 B10X075 1-1/4 x 7-1/2	G10x075
B06x200 3/4 x 20 B10x080 1-1/4 x 8	G10x080
B06x240 3/4 x 24 B10x085 1-1/4 x 8-1/2	G10x085
B06x300 3/4 x 30 B10X090 1-1/4 x 9	G10x090
B06x360 3/4 x 36 B10X095 1-1/4 x 9-1/2	G10x095
B06x400 3/4 x 40 B10x100 1-1/4 x 10	G10x100
B06x420 3/4 x 42 B10x105 1-1/4 x 10-1/2	G10x105
B06x480 3/4 x 48 B10x110 1-1/4 x 11	G10x110
B08x020	G10x115
B08x025	G10x120
B08x030 1 x 3 G08x030 B10X180 1-1/4 x 18	
B08x035	
B08x040	
B08x045	
B08x050	
B08x055 1 x 5-1/2 G08x055 B10X420 1-1/4 x 42	
B08x060 1 x 6 G08x060 B10X480 1-1/4 x 48	
B08x065	G12xCL
B08x070	G12x020
B08x075	
B08x080 1 x 8 G08x080 B12X030 1-1/2 x 3	G12x030
B08x085	
B08x090	G12x040
B08x095	
B08x100	G12x050

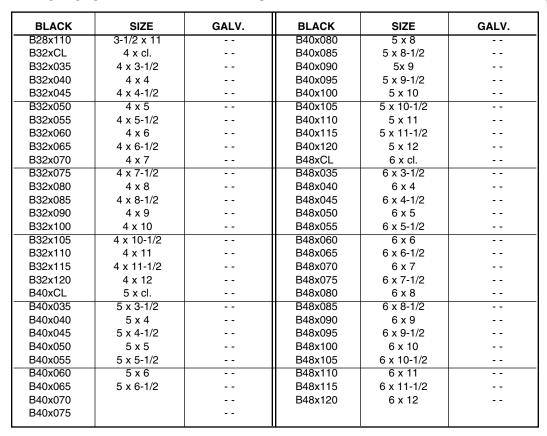


BLACK & GALVANIZED NIPPLES

BLACK	SIZE	GALV.	BLACK	SIZE	GALV.
B12x055	1-1/2 x 5-1/2	G12x055	B20xCL	2-1/2 x cl.	G20xCL
B12x060	1-1/2 x 6	G12x060	B20x020	2-1/2 x 2	G20x020
B12x065	1-1/2 x 6-1/2	G12x065	B20x025	2-1/2 x 2-1/2	G20x025
B12x070	1-1/2 x 7	G12x070	B20x030	2-1/2 x 3	G20x030
B12x075	1-1/2 x 7-1/2	G12x075	B20x035	2-1/2 x 3-1/2	G20x035
B12x080	1-1/2 x 8	G12x080	B20x040	2-1/2 x 4	G20x040
B12x085	1-1/2 x 8-1/2	G12x085	B20x045	2-1/2 x 4-1/2	G20x045
B12x090	1-1/2 x 9	G12x090	B20x050	2-1/2 x 5	G20x050
B12x095	1-1/2 x 9-1/2	G12x095	B20x055	2-1/2 x 5-1/2	G20x055
B12x100	1-1/2 x 10	G12x100	B20x060	2-1/2 x 6	G20x060
B12x105	1-1/2 x 10-1/2	G12x105	B20x065	2-1/2 x 6-1/2	G20x065
B12x110	1-1/2 x 11	G12x110	B20x070	2-1/2 x 7	G20x070
B12x115	1-1/2 x 11-1/2	G12x115	B20x057	2-1/2 x 7-1/2	G20x075
B12x120	1-1/2 x 12	G12x120	B20x080	2-1/2 x 8	G20x080
B12x180	1-1/2 x 18		B20x085	2-1/2 x 8-1/2	G20x085
B12x200	1-1/2 x 20		B20x090	2-1/2 x 9	G20x090
B12x240	1-1/2 x 24		B20x095	2-1/2 x9-1/2	G20x095
B12x300	1-1/2 x 30		B20x100	2-1/2 x 10	G20x100
B12x360	1-1/2 x 36		B20x105	2-1/2 x 10-1/2	G20x105
B12x420	1-1/2 x 42		B20x110	2-1/2 x 11	G20x110
B12x480	1-1/2 x 48		B20x115	2-1/2 x 11-1/2	G20x115
B16xCL	2 x cl.	G16CL	B20x120	2-1/2 x 12	G20x120
B16x025	2 x 2-1/2	G16x025	B24xCL	3 x cl.	G24xCL
B16x030	2 x 3	G16x030	B24x030	3 x 3	G24x030
B16x035	2 x 3-1/2	G16x035	B24x035	3 x 3-1/2	G24x035
B16x040	2 x 4	G16x040	B24x040	3 x 4	G24x040 G24x045
B16x045 B16x050	2 x 4-1/2 2 x 5	G16x045 G16x050	B24x045 B24x050	3 x 4-1/2 3 x 5	G24x045 G24x050
B16x055	2 x 5-1/2	G16x050	B24x055	3 x 5-1/2	G24x055
B16x060	2 x 5-1/2 2 x 6	G16x060	B24x060	3 x 6	G24x060
	_				
B16x065 B16x070	2 x 6-1/2 2 x 7	G16x065 G16x070	B24x065 B24x070	3 x 6-1/2 3 x 7	G24x065 G24x070
B16x075	2 x 7-1/2	G16x070 G16x075	B24x075	3 x 7-1/2	G24x075
B16x080	2 x 7-1/2 2 x 8	G16x073	B24x080	3 x 8	G24x075
B16x085	2 x 8-1/2	G16x085	B24x085	3 x 8-1/2	G24x085
B16x090	2 x 9	G16x090	B24x090	3 x 9	G24x090
B16x095	2 x 9-1/2	G16x095	B24x095	3 x 9-1/2	G24x095
B16x100	2 x 10	G16x100	B24x100	3 x 10	G24x100
B16x105	2 x 10-1/2	G16x105	B24x105	3 x 10-1/2	G24x105
B16x110	2 x 11	G16x110	B24x110	3 x 11	G24x110
B16x115	2 x 11-1/2	G16x115	B24x115	3 x 11-1/2	G24x115
B16x120	2 x 12	G16x120	B24x120	3 x12	G24x120
B16x180	2 x 12-1/2		B28xCL	3-1/2 x cl.	
B16x200	2 x 20		B28x040	3-1/2 x 4	
B16x240	2 x 24		B28x045	3-1/2 x 4-1/2	
B16x300	2 x 30		B28x050	3-1/2 x 5	
B16x360	2 x 36		B28x060	3-1/2 x 5-1/2	
B16x420	2 x 42		B28x070	3-1/2 x 6	
B16x480	2 x 48		B28x085	3-1/2 x 6-1/2	



BLACK & GALVANIZED NIPPLES





NIPPLE PAKS & PIPE LENGTHS

BLACK & GALVANIZED NIPPLES SINGLE RUN

(1 ea. CLOSE TO SIX)

BLACK	SIZE	GALV.
B04SR	1/2"	G04SR
B06SR	3/4"	G06SR
B08SR	1"	G08SR
B10SR	1-1/4"	G10SR
B12SR	1-1/2"	G12SR
B16SR	2"	G16SR

BLACK & GALVANIZED STEP SAVER (CLOSE TO SIX)

BLACK	SIZE	QTY. EA. LENGTH	GALV.
B04STEP	1/2"	6	G04STEP
B06STEP	3/4"	6	G06STEP
B08STEP	1"	5	G08STEP
B10STEP	1-1/4"	3	G10STEP
B12STEP	1-1/2"	3	G12STEP

BLACK -21' LENGTH* PART # SIZE

PART #	SIZE
B04	1/2"
B06	3/4"
B08	1"
B10	1-1/4"
B12	1-1/2"
B16	2"

BLACK -10' LENGTH*

PART #	SIZE
B04	1/2"
B06	3/4"
B08	1"

	PART #	SIZE
ľ	B10	1-1/4"
ı	B12	1-1/2"
	B16	2'

GALVANIZED -21' LENGTH*

PART #	SIZE
G04	1/2"
G06	3/4"
G08	1"

PART #	SIZE
G10	1-1/4"
G12	1-1/2"
G16	2'

*CUT TO ORDER LENGTHS AVAILABLE AT AT AN ADDITIONAL CHARGE.



RADIATOR VALVES & ACCESSORIES

BRONZE RADIATOR VALVES

STEAM

PART #	SIZE
T431 - 1/2	1/2"
T431 - 3/4	3/4"
T431 - 1	1"
T431 - 1-1/4	1-1/4"
T431 - 1-1/2	1-1/2"
T431 - 2	2"



BRONZE RADIATOR ELBOWS

SCREWED CONNECTION



NO. 46-100 125 P.S.I.

PART #	SIZE
T438 -1/2	1/2"
T438 - 3/4	3/4"
T438 -1	1"
T438 - 1-1/4	1-1/4"

SWEAT CONNECTION

PART #	SIZE
S438 -1/2	1/2"
S438 - 3/4	3/4"

BRONZE RADIATOR VALVES

HOT WATER ANGLE VALVE

PART #	SIZE
T437 - 1/2	1/2"
T437 - 3/4	3/4"
T437 - 1	1"
T437 - 1-1/4	1-1/4"
T437 - 2	2"



STANDARD STEAM COCK

PART #	SIZE
46-102-01	3/8"
46-103-01	1/2"
46-104-01	3/4"
46-105-01	1"

SWEAT CONNECTION

PART #	SIZE
S437 -1/2	1/2"
S437 - 3/4	3/4"





MANUAL SHUT-OFF

MANUAL VALVES SHOWN HERE ARE DESIGNED FOR FURNACE, BOILER, WATER HEATERS, AND OTHER GENERAL HEATING APPLICATIONS.





215-100 and 101

215-102, 103 and 104

PART #	N.P.T. INCH SIZE	CAP. BTU/HR @ 1.0" PRESSURE DROP
215-101	1/2 x 1/2	685,000
215-102	3/4 x 3/4	1,395,000
215-103	1 x 1	1,800,000
215-104	1-1/4 x 1-1/4	2,800,000

MANUAL SHUT-OFF VALVES 1-1/4" - 2-1/2"



PART #	SIZE
50-GB6-02	1-1/4"
50-GB7-02	1-1/2"
50-GB8-02	2"
50-803-02	2-1/2"



BOILER RELIEF VALVES & ACCESSORIES

A.S.M.E. SAFETY RELIEF VALVES

PART #	DESCRIPTION	LBS/HR
10-408-05	3/4" @ 30 psi	550



10 SERIES

WATER HEATER DRAIN VALVES



NO. 31-600 SERIES

PART #	SIZE
31-612-01	3/4" x 3"

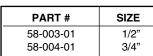
LOW PRESSURE SAFETY VALVES

PART #	DESCRIPTION	LBS/HR
13-211-08	3/4" @ 15 psi	475
13-202-08	1" @ 15 psi	643
13-213-08	1-1/4" @ 15 psi	1200
13-214-08	1-1/2" @ 15 psi	1900



13 SERIES

BALANCING VALVES



PART #	DESCRIPTION	LBS/HR
12-205-08	2" @ 15 psi	2500
12-206-08	2-1/2" @ 15 psi	3529
12-206-08	3" @ 15 psi	4100



12 SERIES

NO. 58 SERIES

TEE HANDLE FEMALE

20-100 SERIES STANDARD PATTERN

AIR COCKS

PART #	SIZE
41-060-01*	1/8"
41-070-01*	1/4"
41-380-01	1/4"
41-390-01	3/8"

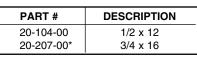
*MPT

PART #	DESCRIPTION	LBS/HR
14-205-00	2" @15 psi	3150
14-206-08	2-1/2" @15 psi	4676
14-207-11	3" @15 psi	6843



14 SERIES

ROUGH BRONZE WATER GAUGES



*HEAVY PATTERN

COMPRESSION GAUGE COCKS

PART #	SIZE
26-302-28	3/8"
26-305-28	1/2"



26-100 SERIES 125 POUNDS SOFT METAL SEAT

GAUGE GLASS COMPONENTS

PART #	DESCRIPTION
40593	5/8" Rubber Washers
20-207-03	3/4" Vales only
C-1408-06	5/8 Glass Nut
D-1606-00	3/4" Glass Washer
D-1871-00	5/8" Teflon Washer
E-1819-00	5/8" Brass Washer



VALVES & ACCESSORIES

BRASS LEVER HANDLE GAS COCK

PART #	SIZE
58L003	1/2"
58L004	3/4"
58L005	1"
58L006	1-1/4"



QUICK OPENING IPS BRASS GATE VALVE

PART #	SIZE
HF 1801	3/4"
HF 1802	1"
HF 1803	1-1/4"
HF 1804	1-1/2"
HF 1805	2"



HEAVY STEEL HINGED PIPE REPAIR CLAMP

PART #	SIZE
HF 1530	1/2"
HF 1531	3/4"
HF 1532	1"
HF 1533	1-1/4"
HF 1534	1-1/4"



HEAVY PATTERN STEEL NIPPLE "TOTE" TRAY CADDY

PART #	SIZE
HF 3500	1/2"
HF 3501	3/4"
HF 3502	1"
HF 3503	1-1/4"
HF 3504	1-1/2"
HF 3505	2"



AGA APPROVED GAS RANGE CONNECTORS



PART #	SIZE / LENGTH
20-3132-12	1/2" / 12"
20-3132-18	1/2" / 18"
20-3132-24	1/2" / 24"
20-3132-36	1/2" / 36"
20-3132-48	1/2" / 48"
20-3132-60	1/2" / 60"

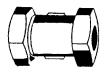
PART #	SIZE / LENGTH
30-4142-18	3/4" / 18"
30-4142-24	3/4" / 24"
30-4142-30	3/4" / 30"
30-4142-36	3/4" / 36"
30-4142-48	3/4" / 48"
30-4142-60	3/4" / 60"



COPPER-FLEX CONNECTORS FOR WATER HEATERS

PART #	SIZE / LENGTH
8612	3/4" / 12"
8615	3/4" / 15"
8618	3/4" / 18"

GALVANIZED COMPRESSION COUPLINGS



PART #	SIZE
2103	1"
2104	1-1/4"
2105	1-1/2"
2108	3"

ALUMINUM TUBING



PART #	SIZE / LENGTH	
11-291	1/8" @50'	
11-294	1/4"@5' W/Nuts	
11-193	1/4" @ 50'	
11-194	5/16"@ 50"	
11-195	3/8" @ 50'	
11-198	5/8" @ 50'	



AIR MOVING ACCESSORIES

V-BELTS

Oil and heat resistant. Static dissipating. A Sectional Classical V-Belts



1/2" TOP x 5/16" THICK x 40° ANGLE

	OUTSIDE		OUTSIDE		OUTSIDE
PART #	LENGTH	PART #	LENGTH	PART #	LENGTH
	21"	4L360 (A34)	36"	4L500 (A48)	50"
	22"	4L370 (A35)	37"	4L510 (A49)	51"
	23"	4L380 (A36)	38"	4L520 (A50)	52"
	24"	4L390 (A37)	39"	4L530 (A51)	53"
4L250	25"	4L400 (A38)	40"	4L540 (A52)	54"
4L260	26"	4L410 (A39)	41"	4L550 (A53)	55"
4L270	27"	4L420 (A40)	42"	4L560 (A54)	56"
4L280 (A26)	28"	4L430 (A41)	43"	4L570 (A55)	57"
4L290 (A27)	29"	4L440 (A42)	44"	4L580 (A56)	58"
4L300 (A28)	30"	4L450 (A43)	45"	4L590 (A57)	59"
4L310 (A29)	31"	4L460 (A44)	46"	4L600 (A58)	60"
4L320 (A30)	32"	4L470 (A45)	47"	4L610 (A59)	61"
4L330 (A31)	33"	4L480 (A46)	48"	4L620 (A60)	62"
4L340 (A32)	34"	4L490 (A47)	49"	4L630 (A61)	63"
4L350 (A33)	35"			4L640 (A62)	64"
				4L650 (A63)	65"



CAST IRON FHP PULLEYSSINGLE GROOVE FOR "4L" BELTS

FEATURES:

 SHEAVES ARE EQUIPPED WITH SQUARE HEAD SET SCREWS WITH NO KEY SEAT.

	BORE	DIAMETER	
PART #	SIZE	O.D.	PITCH
M05P10	5/8"	4.93"	5"
M06P-10	5/8"	5.93"	6"
M06P-16	1"	5.93"	6"
M07P-10	5/8"	6.93"	7"
M08P-10	5/8"	7.93"	8"
M12P-12	3/4"	11.93	12"
M12P-16	1"	11.93	12"



CAST IRON FHP SHEAVES SINGLE GROOVE FOR "4L" BELTS

FFATURES:

• ALL SHEAVES FITTED WITH HOLLOW HEAD SET SCREWS

 ANY STANDARD SINGLE GROOVESHEAVE CAN BE USED AS COMPANION SHEAVE.

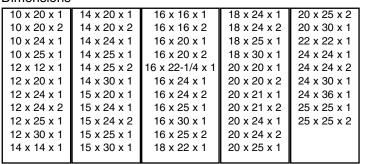
	BORE	DIAMETER	
PART #	SIZE	O.D.	PITCH
M44V-10	5/8"	4.15"	2.8 to 3.8



AIR FILTERS*

DISPOSABLE FIBERGLASS PANEL FILTERS

Dimensions



PERMANENT METAL AIR FILTERS

	PART # / SIZE	PART # / SIZE
FA	10-1/2 x 26 x 1	FA 19-1/2 x 29-1/2 x 1
FA	14 x 16 x 1	FA 20 x 20 x 1
FA	15 x 24 x 1	FA 20 x 20 x 2
FA	15-1/2 x 24 x 1	FA 20 x 24 x 1
FA	15 x 25 x 1	FA 20 x 25 x 1
FA	16 x 16 x 1	FA 20 x 25 x 2
FA	16 x 18 x 1	FA 20 x 28 x 1
FA	16 x 20 x 1	FA 20 x 29 x 1
FA	16 x 25 x 1	FA 24 x 24 x 1
FA	16 x 25 x 2	FA 25 x 25 x 1
FA	19-1/2 x 24-1/2 x 1	FA 25 x 33 x 1
		FA 27-1/2 x 23-1/2 x 1

^{*} OTHER SIZES AVAILABLE ON SPECIAL REQUEST.



BALL, GATE & SWING CHECK VALVES

FORGED BRASS BALL VALVE - I.P.S

ALL PURPOSE — 100% PORT

T100-1/4 T100-3/8 T100-1/2 T100-3/4 T100-1 T100-1-1/4 T100-1-1/2 T100-2 T100-2-1/2 T100-3



MODEL T-100 *AGA, UL AND FM LISTED*

FORGED BRASS BALL VALVE - C x C

ALL PURPOSE — 100% PORT



MODEL S-100 *UL AND FM LISTED*

PART # / SIZE
S100-1/2
S100-3/4
S100-1
S100-1-1/4
S100-1-1/2
S100-2
S100-2-1/2
S100-3

CAST BRASS GATE VALVE – I.P.S.

PART # / SIZE
T301-1/4
T301-3/8
T301-1/2
T301-3/4
1301-1
T301-1-1/4
T301-1-1/2
1301-2
T301-2-1/2
T301-3



MODEL T-301

CAST BRASS GATE VALVE - C x C



MODEL S-301

PART # / SIZE
S301-1/2
S301-3/4
S301-1
S301-1-1/4
S301-1-1/2
S301-2
S301-2-1/2
S301-3

BRASS SWING CHECK VALVE - I.P.S.

T501-1/2 T501-3/4 T501-1 T501-1-1/4 T501-1-1/2 T501-2 T501-2-1/2



MODEL T-501

BRASS SWING CHECK VALVE - C x C.



MODEL S-501

PART # / SIZE
S501-1/2
S501-3/4
S501-1
S501-1-1/4
S501-1-1/2
S501-2



VALVES & ACCESSORIES

T-HANDLE GAS COCKS

PART # / SIZE T204-1/2 T204-3/4



MODEL T-204

BRONZE Y-PATTERN CHECK VALVE

PART # / SIZE
T511-1/2
T511-3/4
T511-1
T511-1-1/4
T511-2



BRASS STOP & WASTE VALVES

PART # / SIZE
T611-1/2
T611-3/4



BRASS BOILER DRAINS MPT

PART # / SIZE	
T621-1/2	
T621-3/4	



DIELECTRIC UNIONS



PART#	SIZE
701-103	1/2"
701-104	3/4"
701-105	1"
701-106	1-1/4"
701-107	1-1/2"
701-108	2"

GASKETS

PART#	SIZE
701-603	1/2"
701-604	3/4"
701-605	1"
701-606	1-1/4"
701-607	1-1/2"
701-608	2"

BRASS SILLCOCKS



T641-1/2 T641-3/4

BRASS BOILER DRAINS FPT



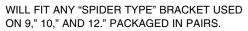
PART # / SIZE T622-1/2 T622-3/4

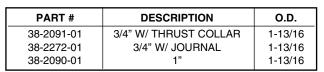
AIR MOVING ACCESSORIES



BEARINGS

CARTRIDGE TYPE BEARINGS





SEALED TYPE BEARINGS

SELF-ALIGNING POROUS BRONZE SLEEVE PRESSED IN HOUSING.

PART #	DESCRIPTION	O.D.
38-2443-01	5/8" SHAFT	1-13/16
38-2443-02	3/4" SHAFT	1-13/16
M90-121	3/4" SHAFT	2-1/16
38-2443-03	1" SHAFT	1-13/16
M90-122	1" SHAFT	2-1/16

SEALED BEARINGS WITH INSULATOR

FOR USE WHERE OPERATING CONDITIONS EXCEED THE LIMITS OF SLEEVE BEARINGS OR WHERE REPETITIVE FAILURES OCCUR.

PART #	DESCRIPTION	O.D.
38-2588-01	3/4" SHAFT	1-13/16
38-2590-01	1" SHAFT	2-17/32
38-2569-01	1-3/16" SHAFT	2-17/32



OIL TYPE BEARINGS

SELF ALIGNING. SELF OILING

PART #	DESCRIPTION	O.D.
38-2404-01	5/8" SHAFT	1-13/16
38-2442-01	3/4" SHAFT	1-13/16
38-2442-02	1" SHAFT	2-1/2

OIL TYPE BEARINGS

SELF-ALIGNING, SELF-OILING WITH SINTERED BRONZE BUSHINGS AND DRIVE TYPE OIL CUPS.

PART #	DESCRIPTION	O.D.
M90-120	3/4" SHAFT	1-13/16
38-2450-01	3/4" SHAFT	1-13/16
M90-103	3/4" SHAFT	2-1/16
38-2449-01	1" SHAFT	1-13/16
M90-105	1" SHAFT	2-1/16
38-2094-01	1" HEAVY DUTY	2-1/2

SHAFTS

PART #	SIZE
38-2205-01	5/8" x 20"
38-2096-01	3/4" x 20"
38-2095-01	1" x 25"

PILLOW BLOCK BEARINGS

SELF-ALIGNING, STATIC FREE AND QUIET OPERATING. TWO 1/8" RUBBER SPACERS PROVIDED FOR USE AS NEEDED.

PART #	DESCRIPTION
38-2204-01	5/8" SHAFT
38-2086-01	3/4" SHAFT
38-2087-01	1" SHAFT
38-2093-01	1" HEAVY DUTY



PILLOW BLOCK BALL BEARINGS

PERMANENTLY SEALED AND LUBRICATED RUBBER MOUNTED OIL-RESISTANT ISOLATOR.

PART #	SHAFT DIA.	SPREAD	HOLE SIZE	SHAFT HEIGHT
LAU 38-2568-01	1"	3-7/8 - 4-1/8	9/16 x 13/32	1-7/16
LAU 38-2569-01	1-13/16"	4-1/2 - 4-3/4	3/4 x 9/16	1-11/16



AIR MOVING ACCESSORIES

VIBRO-PADS



ELIMINATES NOISE, VIBRATION AND WEAR ON BLOWERS, FANS, MOTORS ETC.

PART #	DESCRIPTION
38-2209-01	12 PER PACKAGE



BEARING BRACKET KIT

ARMS CAN BE CUT TO FIT MOST BLOWERS. INCLUDES SHAFT AND HARDWARE.

PART #	DESCRIPTION
029175-01	3/4" BORE
029176-01	1" BORE

MOTOR ADJUSTMENT GROMMETS



REDUCES MOTOR VIBRATION AND NOISE.

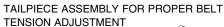
PART #	DESCRIPTION
38-2525-01	6 PER BAG



DIRECT DRIVE MOTOR MOUNTING BRACKET

PART #	DESCRIPTION
UE 1479	FOR 10" BLOWER
026126-01	FOR 12" BLOWER

MOTOR ADJUSTMENT KIT



PART #
38-2523-01





THRUST SLEEVE AND SPACER KIT

ELIMINATES END PLAY ON END SUPPORTED BLOWER WHEELS

PART #	DESCRIPTION
38-2203-01	3/4" SHAFT

THRUST SPACER KIT



ONE DOZEN PER PACKAGE

PART #	DESCRIPTION
38-2491-02	3/4" SHAFT
38-2491-03	1" SHAFT



THRUST COLLAR KIT

PART #	DESCRIPTION
38-2431-01	5/8" SHAFT
38-2206-01	3/4" SHAFT
38-2207-01	1" SHAFT

ACCESSORIES



Below Zero PVC Cement

For PVC types I & II, potable water and SW pipe and fittings up to 6" in diameter.



PART #	DESCRIPTION
60142	1/2 Pint
60145	1 Pint

Purple Primer - NSF Listed

Hi-etch primer for use on both PVC and CPVC pipe, tubing and socket-type fittings.



PART #	DESCRIPTION
30756	1/2 Pint
30757	1 Pint

SAM™ CL-3 PVC Cleaner

Sam™ CL3 is a clear cleaner for use on all PVC, CPVC and ABS pipe, tubing, and socket-type fittings.



PART #	DESCRIPTION
55723	1/2 Pint
55725	1 Pint



100% Silicone Sealant

100% silicone, flexible, long-lasting formula gives tight, weather-resistant elastic seal to glass, metal, and ceramic surfaces. Will not crack, shrink or peel. Can be applied at temperatures below freezing. Rapid, room-temperature curing. Solvent clean-up. Meets Federal Specs. TT-S-00230C and TT-S-001543A.

PART #	DESCRIPTION
0809-01	10.3 oz. RTV
0816-61	10.3 oz. BLACK
0826-01	10.3 oz. CLEAR
0816-51	10.3 oz. GREY

POAM FILL

Polyurethane Expanding Foam

Triple-expanding foam. Seals, bonds and insulates quickly with just the touch of a finger. Fills large and small holes in ceilings, floorboards, concrete or cinder block walls, ducts, cables, plumbing areas and central heating pipes.

Use indoors or out.

PART #	DESCRIPTION
0909	FOAM SEALANT



JOMAR® SEAL

Joint and sealing compound

A rust colored cohesive, smooth flowing liquid, containing an alcohol solution, pigmented with iron oxide, organic gums and resin. It is lead free, free of halogens. **W.O.G. plus** is not a strong sensitizer, is non-corrosive and is a Quality/High Performance resin compound, with built in Elasticity that Resists Vibration and temperature change. **W.O.G. plus** is fast drying, Flex/hard set, brushable, cures by solvent evaporation.

PART #	DESCRIPTION
400-303	1 PINT





SPRAY PAINT

PART #	DESCRIPTION
921	BLACK GLOSS
923	COPPER METALLIC
940	MACHINERY GRAY
987	BLACK GLOSS LACQUER
990X	GRAY LACQUER



BRAZING & SOLDERING PRODUCTS

SILVALOY Excel

Using ultra-high purity input materials and state of the art alloying technology, Wolverine has engineered EXCEL to be the highest quality line of Brazing Alloys available today. It's consistent melt and flow characteristics are unmatched, enhancing the quality of every joint you make.

PART #	SILVER	PHOS.	FLOW POINT	Pcs.
30040*	5%	6%	1495⁰	28
30077	15%	5%	1475⁰	28

^{*}Dyna-Flow mini tube 6% silver #66039



SILVABRITE / SILVABRITE-S

These solders have been specifically formulated to make difficult repairs swiftly and confidently. Use Silvabrite for fast melting, free flowing jobs.

PART #	SILVER	TIN	FLOW POINT	LBS.
56619	4%	96%	430º	1
53113	5%	95%	535º	1



A-56T

Has the lowest brazing temperature, best wetting and best flow of all the cadmium-free alloys. Its low zinc content minimizes problems due to longer heating cycles (as in furnace brazing), or due to excessive heating (as by less skilled operators).

PART #	SILVER	COP.	ZINC	FLOW POINT	Oz.
56613	56%	22%	17%	1205⁰	1



BRIDGIT® LEAD FREE SOLDER

Widely used in plumbing applications where lead bearing solders are prohibited. Contains nickel making joints extremely strong. Wide plastic range makes Bridgit® an excellent alloy for large diameter and ill-fitted pipes. Must be used with Bridgit® Flux. Part #16000

COMMON SOLDER: 95/5, 50/50

95/5 is tin/antimony solder well-suited for applications where moderately-elevated temperature is a factor. Not recommended for refrigerant connections.

50/50 is a tin/lead solder that can be used to join most copper alloys. Not recommended for joints subject to high stress or vibration.

PART #	TIN	LEAD	FLOW POINT	LBS.
10030	95%	5%	464º	1
10028	50%	50%	420º	1



FLUX

Stay-Clean paste soldering flux is for almost all metals other than aluminum, magnesium or titanium. Use with solders with a liquidus temperature below 700°F.

Stay-Silv white brazing flux for all metals other than aluminum, magnesium or titanium. Effective to $1600^{\circ}F$.

Bridgit paste flux is designed especially for lead free solders and resists the higher temperatures making it ideal for all plumbing applications.

PART #	DESCRIPTION
40027	4 oz. Liquid Stay-Clean Paste Flux
40022	7 oz. Liquid Stay-Silv Flux
40057	4 oz. Bridgit Paste Soldering Flux



ACCESSORIES



SLIC-TITE® PASTE WITH TEFLON*

Heavy Duty Thread Compound

Heavy duty thread sealing compound. Loaded with PTFE particles uniformly suspended in neutral vehicle. Non-toxic, non-drying, antiseize. Premium white grade. Washes off hands or clothing. Brushes on in cold and heat.

SLIC-TITE contains a product made from "Teflon" and other PFTE resins, which helps to seal on many difficult thread applications. Classified Underwriters Laboratories. Do not use on oxygen systems.



PART #	DESCRIPTION
42019	1/2 PINT
15808	1 PINT
42013	1 Quart
42014	1 Gallon

SLIC-TITE® PIPE THREAD TAPE OF TEFLON*

Also recommended for oxygen systems. Heavy duty industrial sealant.

- · High density.
- Permits easy disassembly, even after many years.
- Withstands temperatures -450° to +550°F.
- Withstands pressures 2000 psi and over.

Made of pure white "Teflon". When used properly, SLIC-TITE Tape provides a highly resistant seal on any threaded pipe or fitting. Use on any service. Non-toxic. Safe on food lines.

PART #	DESCRIPTION
44082	1/2" x 300"
44083	1/2" x 600"
44084	1/2" x 1200"
44086	3/4" x 600"
44087	1" x 300"
44088	1" x 600"



E-Z BREAK ANTI SEIZE COMPOUND

- · Copper-based anti-seize and lubricating compound.
- · Resists rust and corrosion.
- · Recommended for coating nuts, bolts, valves, flanges, for easy break out after years of service.
- Temperature: to 1800°F (982°C).

PART #	DESCRIPTION
08910	10oz w/brush



T-O-T® PIPE JOINT COMPOUND

No-drip siliconized

No-drip pipe joint compound. Siliconized for speed spreading. For water, steam, air, natural gas. Nontoxic. Available in flat top and brush-in-cap cans. Do not use on oxygen systems. Use SLIC-TITE Teflon Tape or packing.

PART #	DESCRIPTION
12219	1/2 PINT
12208	5 LBS.

REGULAR FLUX PASTE

NON-ACID / NON-TOXIC / LEAD FREE

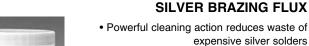
For copper, galvanized iron, sheet lead, zinc, nickel, tin, silver, mild steel, terne plate, malleable iron. Use with 40-60, 50-50, 60-40 or 95-5 new tin/silver, string or bar solder...or any standard soft solder. Super detergent action eliminates unnecessary cleaning. Helps to assure sound joints.

PART #	DESCRIPTION
22101	2 oz.
22107	4 oz.
22194	4 oz. BIC

REGULAR FLUX LIQUID

- Contains no zinc chloride or other metal chloride.
 - Non-acid, non toxic, lead free.
- Use with new LEAD FREE, 50/50 and 95/5 solders. • For use on copper galvanized iron, sheet lead.

PART #	DESCRIPTION
23104	4 oz.



- Packed in break-resistant plastic jars.
- Use with torch, furnace, resistance or induction heating.
 - Production sizes available.
 - Meets Mil. Spec. MIL-F-4883.
 - · Certified by NSF.
- Temperature range: 1000° to 1700°F.

PART #	DESCRIPTION
22305	6 oz.





ACCESSORIES

COOL GEL® HEAT BARRIER SPRAY

Reduces danger of fire to surrounding surfaces such as studs, drywall and insulation. Helps prevent heat damage to components and surrounding materials during soldering, braxing and welding. Wont drip, run off or leave a residue.

PART #	DESCRIPTION
11509	12 oz.



LA-CO® ALUMINUM FLUX PASTE AND SOLDER (CARDED)

Complete repair kit for professional repairmen. Solders aluminum easily. For aluminum evaporators, ducts, tubing. Also solders aluminum to copper. Self-selling card with complete instructions.

PART #	DESCRIPTION
36474	2 oz.

ALERT LEAK DETECTOR

- Safe for oxygen service.
- Bright orange color for easy visibility.
- Non-toxic.
- · Available in handy squeeze bottle.
- Non-corrosive, no salts to promote corrosion of metal surfaces.
- Sticks to surfaces for longer period of leak detection.
- Temperature range: 32° F. to 200°F. (0° C. to 93°C.)

PART #	DESCRIPTION
32844	8 oz.
32851	1 Qt.



PACKING & GASKET SEALANT CORD OF TEFLON

USE FOR: Pump, Packing, Valve Packing, Faucet Packing, Stuffing Boxes, Pump Housings. USED AS: Gaskets, for Pipe Couplings, Expansion Joints, Rams and Plungers, Flanges and Gear Cases.

• Withstands temperatures -450° to -550°F.

Pure virgin, Teflon cord. Eliminates stocking of gasket sizes. Can be used on any metal or plastic for liquid or gas and all chemicals and solvents including oxygen.

Non-toxic and safe for foods.

PART #	DESCRIPTION
45091	5/32" x 20'

RUST BUSTER

- Goes to work instantly every time.
- Packaged in a handy, telescoping-spout applicator.
- Quickly loosens rusted bolts, screws, shafts, piping, and all types of "frozen" connections and assemblies.
- Contains no acids, alkali or other harmful ingredients.
- Safe for skin, clothes, metals and friction-type surfaces.
- The penetrant used by professional mechanics in industry and the military.

PART #	DESCRIPTION
79706	4 oz.









DURA-INK® FELT TIP MARKERS

Industrial type. Permanent oil ink. Marks on any surface – metal, wood, glass, plastic, paper, etc. Long-lasting, water-resistant, fade resistant, high intensity ink. For identification of plumbing and refrigeration ports, layout work, shipping cartons and crates. U.S. Fed. Spec. TT-1-544.

PART #	DESCRIPTION
96023	Sharpie #15 Black
96121	Sharpie #20 Yellow
96122	Sharpie #20 Red
96223	Sharpie #25 Black



SMOKE DETECTORS

S1-D4120 SERIES DUCT-MOUNTED SMOKE DETECTORS

Duct Mounted Smoke Detectors are designed for early detection of smoke and particles of combustion present in the air moving through air conditioning or ventilation ducts. They are self contained, operating from either 120V/240V/24V/24Vdc and

provide contacts for both direct fan control and capability for remote annunciation or alarm panel operation.

These units consist of either an ionization or photoelectronic type detector assembly enclosed in a molded NORYL® plastic housing with a translucent cover. The wiring box, containing two conduit holes, is an integral part of the housing with access for the detector circuitry by removal of the cover. Mounting is by means of two screws and speednuts. Sampling tubes are available in various lengths for ducts up to 12 feet in width and must be ordered separately (see ordering data).

All units are UL listed and mount easily to round or rectangular ducts. Units are reset by momentary interruption of power or by use of a remote reset station (see ordering data).



UNI-LINE ORDER NO.	FACTORY MODEL	DESCRIPTION
SL2000N	DH460ACDCI	4-Wire Ionization Duct Detector

SAMPLING TUBES

UNI-LINE ORDER NO.	FACTORY MODEL	DESCRIPTION
STN2.5	ST-3	Metal Sampling Tube (2-4')

MISCELLANEOUS ACCESSORIES

UNI-LINE	FACTORY	
ORDER NO.	MODEL	DESCRIPTION
21-284	MO2-04	Calibrated Test Magnet

SERVICE PRODUCTS

17-110

BELT EASE

Fan and belt dressing adds traction – silences squeaks and preserves belts. BELT-EASE is packaged in aerosol cans with a special valve that works upside-down and right side up! It is complete with a special pinpoint stem that "hits the spot" with no overspray. 5.5 OZ. EACH.



FIII

Scotch-Seal

17-104

3M RUBBER ADHESIVE (1300)

A fast drying rubber adhesive that develops high immediate strength. Has excellent heat resistance. Especially effective for door gasket and rubber to metal installations on kitchen appliances, it is yellow in color.

DUST MASKS

19662 5 PACK

DUST/MIST DISPOSABLE RESPIRATOR

The North disposable Dust/Mist Respirator is so comfortable a wearer will hardly notice when it's on. The anatomical design conforms automatically to the wearer's face, especially in the sensitive nose bridge area. The filter material is soft and won't irritate. The outer shell is strong enough to avoid the wilting and collapsing found in other disposables. NIOSH/MSHA certified TO-21C-347.





ACCESSORIES

BOILER TREATMENTS

8-WAY & 8-WAY PUMP-IN-A-CAN

Complete Boiler Water Treatment (non-chromate. biodegradable).1. Removes Sludge. 2. Removes Rust Scale. 3. Inhibits Boiler Corrosion. 4. Inhibits Steam Line Corrosion. 5. Prevents Oxygen Pitting. 6. Inhibits Lime Scale. 7. Prevents Surging and Foaming. 8. Controls pH with a Color Indicator. Concentrated Pump-in-A-Can is pressurized and treats boilers in 2 minutes from start to finish. Does not contain petroleum distillates. Will not damage rubber or synthetic seals or gaskets.



PART #	DESCRIPTION
1309E	1 Quart
1309G	1 Gallon
1309DA	Aerosol

SURGEMASTER

Cures and prevents priming, surging and foaming in steam boilers. Sure-cure color indicator tints boiler water to take the guesswork out of treatment dosage. With RX3 anti-foam and corrosion inhibitor too. Does not contain petroleum distillates. Will not damage rubber or synthetic seals or gaskets

PART #	DESCRIPTION
1321N	5.3 oz.
1323YD	Surgex



SEALMASTER

Fills and seals holes, cracks and loose joints in steam and hot water boilers and baseboard radiators. Does not contain petroleum distillates. Will not damage rubber or synthetic seals or gaskets.



PART #	DESCRIPTION
1317E	1 Quart
1317G	1 Gallon

CONDENSER COIL CLEANER

Con-Coil

Foaming cleaner and brightener for finned air cooled condenser coils. Leaves aluminum and copper clean, insulation-free, and as bright and shiny as new.

PART #	DESCRIPTION
S1-EC01*	Coil Rite 1 Gallon
0509G	1 Gallon (Acid)
05091	5 Gallons

^{*}Vegatable based

FURNACE CEMENT PYROSEAL

(Non-Asbestos)

Non-freezing, smooth, creamy, easy spreading furnace and retort cement for all high temperature sealing and bonding up to 3000°F. Shrink-proof, crack-proof. Use in combustion chambers, for sealing doors and flue pipes.

PART #	DESCRIPTION
35515	1/2 Gallon

SOOT REMOVERS

SOOTSPRAY (Aerosol)

The original soot-remover aerosol. Reaches where powders and vacuum cleaners cannot. Cuts vacuum time by 50-100%. Catalytically active for safest possible soot removal. Approved for Connecticut sale. Contains no lead. Non-flammable.

PART #	DESCRIPTION
0320DA	14 oz. Aerosol

CONTACT CLEANER CONTAX

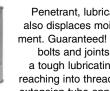


Electrical contact-point cleaner. Flushes off metallic oxides caused by moisture, arcing. greasy films or dirt. Non-conductive, non-toxic. Dries instantly. Leaves no residue. Safe for use on metals and plastics. Comes with extension tube applicator for pin-point spraying.

PART #	DESCRIPTION
0505DA	14 oz. Aerosol

LUBRICANTS

LETSGO



Penetrant, lubricant and freeze-up preventer, also displaces moisture from wiring and equipment. Guaranteed! Quickly loosens frozen nuts, bolts and joints. Covers metal surfaces with a tough lubricating film. Foams on application reaching into threads and crevices. Comes with extension tube applicator for pin-point spraying.

PART #	DESCRIPTION
0905DA	12 oz. Aerosol

ACCESSORIES

SCALE REMOVERS

Assure fast penetration of hard-to-remove scales in cooling systems. Liquid scale removers should be used for cleaning heavily scaled equipment, removing problem scales and for jobs where speed and higher capacity are necessary. Solid scale remover should be used when safety to both operator and equipment is the important consideration. Preferred for descaling aluminum, stainless steel, cast iron, hot dip zinc or galvanized equipment.



PART #	DESCRIPTION
WL1	1 Gallon
WL5	5 Gallon
WS10	Solid,10 Lbs.

ANTIFOAM

Reduces the amount of foam generated by the descaling process, especially in systems containing large amounts of carbonate (lime) scale.

PART #	DESCRIPTION
AF1	16 oz.



LIQUID ICE MACHINE CLEANER

Used to clean all types of ice machines: cube, tube or flake and for descaling commercial dishwashers.

PART #	DESCRIPTION
H418	8 oz.
H419	1 Gallon



ELECTRONIC CELL CLEANER

This specially formulated cleaner provides effective, safe cleaning of air cleaning equipment. Very effective at removing dust, hair, smoke film, pollen and mold spores, as well as bacteria from the surface of the cells, ionizer wires and prefilters. No scrubbing or high pressure sprayers required. Simply spray it on, let it sit a few minutes, then rinse away.

PART #	DESCRIPTION
ECC	1 Quart







VIRGINIA NO. 10 DEGREASING SOLVENT

A blend of selected solvents which effectively remove all grease and grease-bound dirt from machined parts, motor armatures, coils, switches, breakers and electronic components. Non-injurious to most electrical insulation coverings. Leaves no undesirable current-conducting residues.

PART #	DESCRIPTION
D10E	1 Gallon
D210	14 Oz.



PIPE SAVER

Pipe Saver is a propylene glycol based anti-freeze designedfor use in chillers, glycoolers, hydronicboilers, solar heating systemsand other closed water systems. Pipe Saver provides excellent heattransfer properties which are enhanced by thecarefully selectedinhibitor. Pipe Saver provides additionallubrication for seals, gaskets, o-rings, rubber and most synthetics which extends system component life.

PART #	DESCRIPTION
35281	1 Gallon
PSH	Hydrometer





Calci-Solve

Quickly dissolves lime, rust, scale and hard water deposits in plumbing, heating and cooling equipment, wells and water systems Disintegrates concrete, plaster, grout in drains. Cleans excessively stained toilets. Hydrochloric acid formula with special corrosion inhibitors and foam reducing agents.

PART #	DESCRIPTION
1CS	1 Gallon
100110459	Food Grade





COIL CLEANER

realules.

- Easy to use aerosol spray cans
- No mixing, no sprayer, no mess • Ready-to-use
 - Zip Foam for condenser coils must be rinsed with water
 - Zip Clean for evaporator coils no rinsing required

PART #	DESCRIPTION
S1-ZC-01	Condenser Cleaner
S1-ZC-02	Evap Cleaner



INSULATION TAPES

VIRGINIA CORK INSULATION TAPE #PT1

Economical, yet quite effective! PRESSTITE CORK INSULATION TAPE... the best product of its kind! Either may be used for hot or cold pipes or tubes.

VIRGINIA FOAM INSULATION TAPE #K501

Prevents pipe sweat, holds down heat loss on hot pipes below 160°F. Easy to mold around fittings and valves. Adheres to clean metal surfaces and to itself.



PART #	DESCRIPTION
PT1	1/8" x 2" @ 30 ft.
K501	1/8" x 2" @ 30 ft.

SEALING GUM CORDS AND SLUGS

CORDS: Pre-shaped, never hardens. A non-staining white sealer for all sealing uses.

SLUGS: For any opening or gap. Shape by hand for desired form.

PART #	DIA.	LENGTH
PP33	3/16"	100'
PP36	3/8"	25'
PP22	SLU	JGS



MASTICS

VIRGINIA KMP INSULATION MASTIC

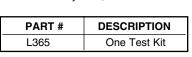
Weatherproofs, prevents rust, stops condensation, dripping. Reduces heat transfer and conductivity.

PART #	DESCRIPTION
PM11	1 Gallon



TKO REFRIGERATION OIL ACID TEST KIT

One-bottle test is the faster way of determining if compressor oil is safe or acidic. Fill bottle to line with oil and shake. If test remains purple, oil is safe. If it turns yellow, it is acidic.





INSULATION ADHESIVE

Provides a durable, high strength bond between virtually any surfaces that are clean and dry. Insures a secure vapor seal at joints and seams of insulation tubes and sheets. Brush Top.



PART #	DESCRIPTION
VAHP	1/2 Pint
VHP	1 pint

ACCESSORIES

SUNISO GS REFRIGERATION OILS

3GS SUNISO Parameters of O.E.M. approved. The highest quality refrigeration oil available. Minimum pour point -45°F. Low moisture content, compatible with oil refrigerants. Lengthens life of refrigeration parts.

PART #	DESCRIPTION
L318	3GS, 1 GAL.
L319	4GS, 1 GAL.

DUAL-PURPOSE VACUUM PUMP OIL



DUAL-PURPOSE: 1. Advanced lubricating oil, cleans, lubricates and seals. 2. An outstanding flushing oil (cleaning agent) for cleaning dirty, contaminated pumps.

PART #	DESCRIPTION
	1 Quart
L341	1 Gallon



ALKI-FOAM

Concentrated non-acid alkaline foaming coil cleaner and brightener.

PART #	DESCRIPTION
AKF1	1 Gallon



PRESSURIZED SPRAYERS

Convenient size, ideal for applying water soluble chemicals. Adjustable spray tip for a steady stream or wide fan spray.

Just pump it up and spray.

PART #	DESCRIPTION
050P	1/2 Gallon
2000P	2 Gallon



THERMAL BLOCK

Virginia Thermal Block is a protective heat sink compound which applies quickly and easily to all metals directly from the tube. Protects adjacent heat-sensitive materials, delicate parts and painted surfaces. Thermal Block effectively absorbs surface heat generated by welding, brazing or soldering on metals or other materials.

PART #	DESCRIPTION
TB11	One Test Kit

POWER VENTERS



POWER VENTER

FOR VENTING MANY GAS FIRED FURNACES, BOILERS OR WATER HEATERS

PART #	VENT PIPE	BTU/	l	PIPE LE	-	CFM AT 70°				
	DIA.	HR.	G	AS FIRI	ED	0"	.50"	75"	1.0"	1.4"
		INPUT	300'	400'	500'	SP	SP	SP	SP	SP
		50,000	100'	100'	100					
HSJ	4"	75,000	100'	100'	100	110	85	67	10	
		100,000	100'	100'	100					
		125,000	35'	23'						
		150,000	100'	60'	35'					
	4"	200,000	87'	57'	27'				10	
		250,000	40'	12'						
HS-1		300,000	4'			450	445	95		
		150,000	100'	100'	100'	158	115	95	12	
	6"	200,000	100'	100'	100'					
		250,000	100'	92'						
		300,000	30'							
		350,000	100'	100'	100'					
		400,000	100'	100'	100'				196	158
	6"	450,000	100'	100'	67'					
		500,000	100'	72'						
		550,000	94'							
HS-2		600,000	15'			286	235	215		
		350,000	100'	100'	100'	200	200	213		
		400,000	100'	100'	100'					
	8"	450,000	100'	100'	100'					
		500,000	100'	100'						
		550,000	100'							
		600,000	67'							
		450,000	100'	100'	100'					
	8"	500,000	100'	100'	82'					
		600,000	100'	100'			500 430			
		700,000	7'	100'		500		384	221	106
HS-3		450,000	100'	100'		300		007		106
	10"	500,000	100'	100'						
		600,000	100'	100'						
		700,000	21'	100'						



POWER VENTERS MODELS HSJ, HS1, HS2

Used for side wall venting natural gas, LP or oil fired equipment including: furnaces, boilers, water heaters and unit heaters. All models feature the new UC1 Universal Control and a diaphragm Fan Proving Switch safety interlock. Damper allows adjustment for maximum combustion efficiency. Inputs up to 600,000 BTU/hr. MODELS HSJ, HS-1, HS-2 Designed for 24V controlled gas appliances. Includes a 24/115V relay and diaphragm Fan Proving Switch safety interlock. Inputs up to 600,000 BTU/hr. intake systems for balanced exhaust and combustion air.

UCI CONTROL

The new standard interlock control for Tjernlund's full line of Power Venters, Draft Inducers and Combustion Air In-forcers. Can be interlocked with virtually any burner control circuit. Features include: adjustable pre & post purge, LED status/diagnostic indicators, 10 second prover switch delay to avoid burner start up and wind induced short cycling. Interlocks with any 24-120 VAC burner control circuit and also includes "dry" contact actuation option. Selectable voltage eliminates false activation by burner control check circuits.

FEATURES

FEATURES				
	HSJ	HS-1	HS-2	HS-3
FACTORY MOUNTED & WIRED DIAPHRAGM PROVING SWITCH	•	•	•	•
FACTORY MOUNTED & WIRED 24/115 VOLT RELAY	•	•	•	•
VIBRATION ISOLATION MOUNT W-1/4" BOLT	•	•	•	•
COMPATIBLE WI WATER HEATER CONTROL MODULE: WHK-2	•	•	•	•
VARI-DRAFT DAMPER	•	•	•	•
ONE YEAR LIMITED WARRANTY	•	•	•	•



DRAFT INDUCERS

AUTO-DRAFT® INDUCERS

Assures a positive draft where down drafts, negative building pressures, undersized flues or long horizontal vent pipe runs are present.

Not to be used for Side Wall venting applications.

Appliance interlocks are necessary to meet national codes. Options include the Model PS1505 pressure switch or limit switches. Can be used with the new UC1 Universal Control. Input ranges from 25,000 to 4,000,000 BTU/hr.



	PIPE SIZE	GAS FIRING W/ DRAFT HOOD*					
PART #	IN.	BTU	270° FLUE GAS				
		INPUT	S.P.	CFM			
	3	69,000	.034	48			
DJ3	4	105,000	.042	72			
	5	111,000	.043	72			
	6	100,000	.041	68			
	5	270,000	.063	190			
D3	6	356,000	.073	246			
	7	360,000	.075	259			
	8	320,000	.068	217			
	8	900,000	.125	590			
I	9	1,110,000	.135	765			
	10	1,250,000	.140	850			
	12	1,030,000	.128	710			
	9	1,460,000	.145	1010			
	10	2,080,000	.170	1370			
	12	1,920,000	.160	1325			
IL	14	1,840,000	.159	1270			
	16	900,000	.120	620			
	18	650,000	.099	450			
	16	4,000,000	.250	2760			
XL	18	3,900,000	.240	2650			
	20	2,800,000	.195	1935			
	24	1,500,000	.150	1035			

AIR PRESSURE SWITCH



The Tjernlund Fan Prover has been designed to monitorthe pressure within the fan housing only. A motor or wheel failurewill decrease housing pressure and deactivate the pressure switch,thus preventing combustion.

PART #	DESCRIPTION
PS1503	Positive Pressure
PS1505	Fan Proving Switch
PS2501	Pos/Neg Pressure Switch

DUCT BOOSTER

The Tjernlund Duct Booster® is the ORIGINAL money saving and energy efficient residential booster fan. It increases the comfort level in hard to heat or cool areas. Fits round or flat forced air heating/cooling ductwork. Boosts air flow up to 275 CFM.



PART #	DESCRIPTION
DB2	Duct Booster

WATER HEATER VENTING PACKAGE

FOR WATER HEATERS UP TO 120,000 BTU/HR. DESIGNED TO VENT WATER HEATERS THE EQUIVALENT OF 75 FEET. **Kit includes:** fan motor, vent hood, low voltage 24v connections, 24v solenoid gas valve, post-purge timer and gas diaphragm switch.

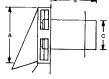


PART #	HEIGHT	WIDTH	DEPTH	INLET/OUTLET	BTU/CAPACITY
VP2	10-1/2"	7-1/2"	10"	3"	Up to 60/mbh
VP3	7-7/8"	10-1/4"	7"	4"	60-120/mbh

VENT HOODS

Specially designed to terminate Tjernlund Side Wall Vent Systems. They are also an approved method of terminating many horizontally vented appliances. Vent Hoods feature heavy duty, corrosive resistant aluminumconstruction. Models VH1-4, 6, 8 also feature built in clearances from combustibles.

PART #	Α	В	С
VH1-4	9"	7-3/4"	6-5/8"
VH1-6	10-1/8"	7-5/8"	8-3/8"
VH1-8	18-3/8"	16"	8"



WATER HEATER CONTROL MODULE

WHK-

Includes Gas Pressure Switch, Spillage Switches and all necessary hardware to interlock a Power Venter or Draft Inducer to an instantaneous water heater or millivolt pool heater.

WHK-2

The WHK-2 is used to interlock a millivolt controlled water heater of up to 120,000 BTU/hr with a Power Venter or Draft Inducer. Kit includes: Gas Solenoid Valve and Linear Limit Switch safety interlock to provide 100% safety shut down if a venting malfunction occurs, Gas Pressure Switch, Post Purge Timer/Relay and Control Cables necessary for interlock.

PART #	DESCRIPTION
WHK-1	Water Heater Control Interlock
WHK-2	Millivolt Heater Applications

ACCESSORIES



BAROMETRIC DRAFT CONTROLS

Quality engineered and manufactured to maintain a consistent draft on a wide range of oil and gas fired heating equipment. May be used with chimney vented or power vented heating equipment. For LP and Natural gas applications with vent diameters from 6-10", choose the DC6G thru DC10G.

PART #	SIZE
DC6G	6"
DC8G	8"
DCG9	9"
DC10G	10"





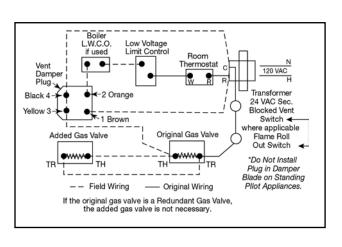
VENT DAMPERS

ELECTRIC VENT DAMPER

Recommended for use on listed gas-fired appliances with standing pilot or intermittent ignition. Installations must have a draft and/or barometric damper.

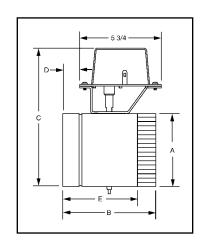
ALUMINIZED STEEL

MODEL #	DIAMETER	VOLTS
8116321	4"	24
8116322	5"	24
8116323	6"	24
8116324	7"	24
8116325	8"	24
8116326	9"	24





Dim. A Pipe Size	Dim. B Length	Dim. C Height	Dim. D	Dim. E
4	6-1/16	8-7/8	15/16	4-13/16
5	6-1/16	9-7/8	15/16	4-13/16
6	6-1/2	10-7/8	1-3/16	5-1/4
7	7-1/16	11-7/8	1-7/16	5-13/16
8	8-1/16	12-7/8	1-15/16	6-13/16
9	10-1/8	13-7/8	3	8-7/8



9

lotors

MANUFACTURERS INDEX, SECTION 9

A.O. SMITH MOTORS 9-1 – 9-7

A.O.SMIT

MOTORS

3.3 Shaded Pole Motors Enclosed

НР	RPM/ Speeds	Volts	Amps	Stock Number	Rotation	Dim. BM	Shaft Length and Dia.	Wgt.
1/50	1550	115	8.0	A0124	CCWLE	2.25	2.25 x .25	3
1/50	1550	115	0.8	A0125	CWLE	2.25	2.25 x .25	3





WINDOW AIR CONDITIONER Open

HP	RPM/ Speeds	Volts	Amps	Stock Number	Rotation	Dim. BM	Shaft Length and Dia.	Wgt.
1/14, 1/25	1550/2spd	115	2.5, 1.5	A0366	CCWLE	3.2	6.38 x .31 x 6.38	6
1/12, 1/20, 1/30	1550/3spd	115	2.8-2.0-1.6	A0367	CCWLE	3.6	5.75 x .31 x 5.75	6

Single Shaft Open Fan/Blower Motors

Furnaces - Air Handlers - Fan Coils



Auto Protector

• 40°C Ambient

Sleeve Bearing

- · Continuous Air Over
- Multiple Mount
- 42 Frame (5.0" Dia.)

- 1/2" Dia. Flatted Shaft**
- 60 HZ only Open Construction

НР	RPM/ Speeds	Volts	Amps	Stock Number	Rotation	Motor Type	Ring* Type	Dim. Ref.	Conn. Dia.	Notes	Wgt.
1/5-1/8-1/10	1050/3	115	6.5	BL6414	CCWLE	В	В	7	1	6	11

Type B



Approximate Dimensions

Ref.	ВМ	R	С	N	Т	Х	Υ
7	3-7/8	4-9/16	9-15/16	5-1/2	1/2	1/2	

Notes:

6. 3 thru bolts, 4.42 dia. bolt circle

Totally Enclosed Fan/Blower Motors Unit Heaters



Type C

- Auto Protector • Continuous Air Over
- Mounted Capacitor (PSC)
- Sleeve and Ball Bearing
- 42 & 48 Frame
- 40°C Ambient • Multiple Mount
- 60 HZ only

ă	НР	RPM	Volts	Amps	Frame	Stock Number	Bearings		Motor Type			Notes	Wgt.
	SHADED POLE 1/15	1050	115	3.1	42Y	U6430	Sleeve	CCWLE	Α	В	1	 5,6	8

HP	RPM	Volts	Amps	Frame	Stock Number	Bearings	Rotation	Motor Type	Ring* Type	Dim. Ref.	Conn. Dia.	Notes	Wgt.
1/8	1075	115	3.2	42Y	U6521	Sleeve	REV	С	**	3	49	2,5,7	13
1/6	1075	115	3.0	48Y	UH1016	Ball	REV	D	**	5	49	1,3,7	13
1/4	1075	115	4.0	48Y	US1026	Sleeve	REV	D	**	4	49	3,7	13
1/3	1075	115	4.9	48Y	UH1036	Ball	REV	D	**	7	50	3,7	13

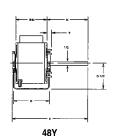


Type D

Approximate Dimensions

Ref.	вм	R	С	N	Т
1	3.59	4.33	6.79	2.625	.5
2	4.09	4.83	7.89	3.25	.5
33 8	375	4.625	7.3125	2.92	.75
4	4.3125	4.92	7.85	2.9375	.625
5	4.24	4.80	8.5	3.78	.88
6	4.625	5.8125	8.125	2.9375	.625





- Notes: 1. 3.5" Shaft Height 2. 2.6" Shaft Height
- 3. 4 thru bolts and 4
- dummy studs on a 5.15 dia. bolt circle 5. 3 thru bolts on a 4.42
- dia, bolt circle 6. 36" leads
- 7. 60" leads
- **Base included

A.O. SMITH

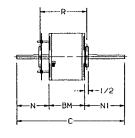
Double Shaft Fan/Blower Motors

Room Air Conditioners - Fan Coils - Blowers

НР	RPM/ Speeds	Volts	An Rated	nps Max.	Stock Number	Capac.	Ring* Type	Dim. Ref	Conn. Dia.	Wgt.
1/3	1625/3	208-230	2.0	2.8	RA1034	5/370V	D	5	20	15
1/3	1625/3	208-230	1.9	2.6	RA1036	5/370V	D	7	20	15
1/2	1075/3	208-230	2.7	3.4	RA1056	7.5/370V	D	12	20	18

Approximate Dimensions

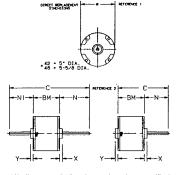
Ref.	ВМ	С	N	N1	Max.	Min.
5	4-5/16	20	7-11/16	8	6-5/16	5-1/16
7	4-9/16	20	8-3/16	7-1/4	6-9/16	5-5/16
12	5-1/16	20	7-11/16	7-1/4	7-1/16	5-13/16



"CONSERVATIONIST"

- Auto Protector
- CCWLE Rotation
- Continuous Air Over
- Energy Efficient
- Length Adaptor and 2-1/4" – 2-1/2" Res. Rings**
- PSC
- Semi-enclosed Construction
- Sleeve Bearing
- 1/2" Dia. Double Shaft
- 14" Leads (Minimum)
- 40ºC Ambient
- 48 Frame (5-1/4" Dia.)
- 60 HZ

O.E.M. Motors - Direct Replacement



1/2 diameter shaft unless otherwise specified 48" frame unless otherwise specified R= ring-to-ring dimension when applicable

CARRIER Stock No. OCA10206

1/5 HP, 208-230V, 1050 RPM, 2 spd, 1.3 amps, Reversible Rotation

Outdoor Condenser Fan for "The Round One." Lug Mount Replaces Part No. F48SD6MA22, SD6MA4, SD6MA11, SD6MA6, SD6MA16. Use with 5 MFD 440 VAC Capacitor. Dimensions ref. (2) BM = 3-3/8", C = 3.0", N = 4-5/16", X/Y = 5/16"



CARRIER Stock No. OCA1036

1/3 HP, 208-230V, 1075/870 RPM, 2.5 amps, Reversible Rotation

Ball Bearing, 1/3 HP Version of OCA10206. Outdoor Condenser Fan Motor for "The Round One". Lug Mount, 7" BC. Use with 5 MFD, 370 VAC Capacitor. Dimensions ref. (2) BM = 4-1/2", C = 8-13/16", N = 4-1/4", X/Y = 7/16"

Wgt. 16

Wgt.

10



НР	RPM	Speeds	Volts	Amps	Stock Number	Rot.	Capacitor	Shaft Dia. & Length	Motor Dia.	"A" Dim.	Conn. Dia. No.	Cross Reference
1/5	1075	1	208-230	1.4	OYK6518	CWLE	5MFD/370V	6-3/8 x 1/2 x 6-5/16"	5"	3-7/8"	58	024-20795-700
1/2	1050	1	230	4.3	OYK1056	CWLE	5MFD/370V	9-3/8 x 1/2 x 9-3/8"	5-5/8"	5-1/4"	58	024-20797-700

O. SMIT

MOTORS

High Efficiency Indoor Blower Motors

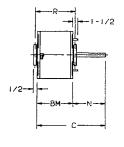
"CONSERVATIONIST"

- Auto Protector
- Continuous Air Over
- High Efficiency
- Multiple Mount
- Open Construction

Furnaces - Air Handlers - Evaporators

- PSC
- Reversing Plug
- Sleeve Bearing
- 1/2" Dia. Flatted Shaft
- 2-1/4"- 2-1/2" Resilient Rings
- 26" Leads (Minimum)
- 40ºC Ambient
- 48 Frame (5-5/8" Dia.)
- 60 HZ
- 3 Speed

НР	RPM/ Speeds	Volts	Am Rated	nps Max.	Stock Number	Capac.	Ring* Type	Dim. Ref	Conn. Dia.	Notes	Speed
1/4	1075	208-230	1.5	1.9	FD1026	5/370V	D	4	10		3
1/3	1075	208-230	2.1	3.0	FD1036	5/370V	D	18	10		3
1/2	1075	208-230	2.7	3.4	FD1056	7.5/370V	D	8	10		3
1	1075/3	115	12.3	14.0	BDL1106	20/370V	Е	11	10	2	3
1	1075/3	208-230	5.1	6.5	BD1106	20/370V	Е	12	10	2	3



Approximate Dimensions

Ref.	ВМ	R	С	N
4	4-1/16	4-5/8	10-1/2	6-7/16
8	5-3/16	5-3/4	11-1/2	6-7/8
11	5-13/16	6-3/8	12-1/4	6-7/16
12	5-9/16	6-1/16	12	6-7/16
18	4-11/16	5-1/4	11	6-7/16

Notes: 2. Ball bearing, 1/2" double flat shaft,

Standard Efficiency Indoor Blower Motors

Furnaces - Air Handlers - Blowers



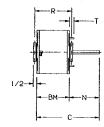
STANDARD EFFICIENCY, replaces GE 3583, 84, 85, 86, 87, 88, 89, 90

	RPM/			nps	Stock	_	Ring*		Conn.	
HP	Speeds	Volts	Rated	Max.	Number	Capac	Type	Ref	Dia.	Wgt.
1/4	1075/3	115	3.5	4.6	DL1026	5/370V	С	1	51	12
1/3	1075/3	115	4.9	6.4	DL1036	7.5/370V	С	2	51	14
1/2	1075/3	115	6.5	9.0	DL1056	10/370V	С	3	51	16
3/4	1075/3	115	8.9	10.3	DL1076	15/370V	D	5	52	19

^{*} For ring type

Approximate Dimensions

Ref.	ВМ	R	С	N	Т
1	4-1/16	4-5/8	8-1/2	4-7/16	1/2
2	4-5/16	4-7/8	8-3/4	4-7/16	1/2
3	5-1/16	5-5/8	9-1/2	4-7/16	1/2
5	5-5/8	6-5/16	10-1/8	4-1/2	1-5/8





Add adapter FM55 Fleximount

- Auto Protector
- Class "B" Insulation
- Continuous Air Over
- Lead Reversible
- Open Construction
- PSC
- Ring adapters included
- Sleeve Bearing
- Standard Efficiency
- Three Speed
- 2-1/4" or 2-1/2" Rings
- 26" Leads
- 40ºC Ambient
- 48 Frame (5-3/8" Dia.)
- 60 HZ only

MOTORS

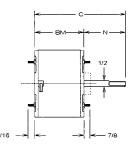
O. SMIT

Totally Enclosed Outdoor Sleeve Bearing Fan Motors

Condensers - Heat Pump - Refrigeration



- All Angle Mount
- Auto Protector
- Class "B" Insulation
- Energy Efficient
- Ext. Thru Bolts -Both Ends
- Permanent Split Capacitor
- Reversing Plug
- Sleeve Bearing
- 1/2" Dia. Shaft -Dbl. Flat
- 4, 6, & 8-Pole
- 26" Leads
- 48 Frame (5-5/8" Dia.)
- 60ºC Ambient
- 60 HZ



"TURN-A-BOUT" (CAPACITOR NOT INCLUDED)

НР	RPM/ Speeds	Volts	Am Rated	ıps Max.	Stock Number	Capac.	Dim. Ref	Conn. Dia.
1/6	825/1	208-230	1.1	1.6	FSE1018S	5/370V	12	15
1/4	1075/1	208-230	1.3	1.8	FSE1026SV1	5/370V	2	15
1/4	825/1	208-230	1.5	1.9	FSE1028S	5/370V	13	15
1/3	1075/1	208-230	1.8	2.8	FSE1036SV1	7.5/370V	10	15
1/3	825/1	208-230	1.8	2.4	FSE1038S	7.5/370V	8	15
1/2	1075/1	208-230	2.8	4.0	FSE1056SV1	10/370V	11	15
1/2	825/1	208-230	2.7	3.7	FSE1058S	10/370V	9	15
3/4	1075/1	208-230	4.9	5.2	FSE1076SV1	15/370V	5	64

Approximate Dimensions

Ref.	ВМ	С	N
2	4-5/16	10-5/16	6
5	5-5/8	12-1/16	6-7/16
8	5-3/16	11-3/16	6
9	5-11/16	11-11/16	6
10	4-7/8	10-7/8	6
11	5-3/8	11-3/8	6
12	4-3/16	10-3/16	6
13	4-15/16	10-15/16	6

Outdoor Ball Bearing Fan Motors

Condensers - Heat Pump - Refrigeration



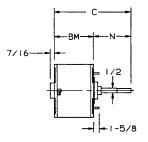
- Auto Protector
- Ball Bearing
- Class "B" Insulation
- Closed Except Lead End
- Energy Efficient • Lead Reversible
- Permanent Split Capacitor
- Shaft Slinger
- Vert. Up or Horiz. Mount
- 1/2" Dia. Shaft Dbl. Flat
- 26" Leads
- 48 Frame (5-5/8" Dia.)
- 60ºC Ambient
- 60 HZ

Approximate Dimensions

Ref.	ВМ	С	N
3	4-13/16	11-1/4	6-7/16
5	5-9/16	12	6-7/16

"CONSERVATIONIST" - SEMI-ENCLOSED

НР	RPM/ HP Speeds Volts		Amps Rated Max.		Stock Number Capac.		Dim. Conn. Ref Dia.		Notes	Wgt.
1/3	1075/750	208-230	1.7	2.6	F1036	7.5/370V	3	13		16
1/2	825	208-230	2.9	3.4	F1058	10/370V	5	55		19



Totally Enclosed Outdoor Ball Bearing Fan Motors

Condensers - Heat Pump - Refrigeration



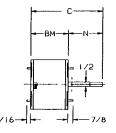
- All Angle Mount
- Auto Protector
- Class "B" Insulation
- Energy Efficient
- Ext. Thru Bolts Both Ends
- 1/2" Dia. Shaft Dbl. Flat
- 26" Leads
- 48 Frame (5-5/8" Dia.)
- 60ºC Ambient
- 60 HZ
- Permanent Split Capacitor
- Reversing Plug

Approximate Dimensions

Ref.	BM	С	N
10	5-5/16	8-5/8	3-5/16

"CONSERVATIONIST" "TURN-A-BOUT" 1 AND 2-SPEED

RPM/		Am		Stock		Dim. Conn.				
HP	Speeds	Volts	Rated	Max.	Number	Capac.	Ref	Dia.	Notes	Wgt.
1/2	1050	460	.9	1.1	FEH1056S	10/370V	10	17		19



A.O. SMITH

MOTORS

Outdoor Ball Bearing Condenser Fan Motors



- Auto Protector
- Ball Bearing
- Base Mounted
- Capac. Mounted (1Ø)
- Conduit Box
- Open Lead End Only
- Reversible
- 60 HZ

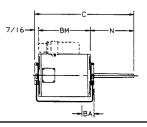
Approximate Dimensions

Ref.	ВМ	С	N	Shaft Height	ВА
1	7-1/4	12-1/2	5	3	2-1/2

SINGLE PHASE - PSC

Important: Use amps as well as HP for replacement reference.

НР	RPM	Volts N	lax Amps @230V	Frame	Stock Number	Shaft	Base	Dim. Ref	Conn. Dia.	Wgt.
1/2	1075	208-230/460	5.2	48	FB1056	1/2" Flat	Resilient	1	42	22



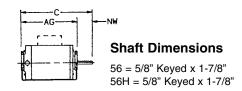
Three Phase ODP Resilient Base Motors

Pumps, Blowers, Conveyors, Industrial Duty





- Ball & Sleeve Bearing
- Continuous Duty
- Open Drip Proof
- 40ºC Ambient
- 60HZ



НР	RPM	FL Volts	Amps	S.F.	Frame	Stock Number	Bear- ings	Prot.	Approx. "C"	Dim. "AG"	Conn. Dia.	Wgt.
3/4	1725	208-230/460	2.6/1.3	1.25	56	RB3074A	Ball	Auto	11.3	9.1	35	24
1	1725	208-230/460	3.2/1.6	1.15	56	RB3104A	Ball	Auto	11.8	9.6	35	31
1-1/2	1725	208-230/460	4.6/2.3	1.15	56H	RB3154A	Ball	Auto	11.8	9.6	35	30
2	1725	208-230/460	5.8/2.9	1.15	56H	RB3204A	Ball	Auto	12.8	10.6	35	41

Three Phase ODP Rigid Base Motors



- Ball Bearing
- Continuous Duty
- Heavy Duty Steel Construction
- Open Drip Proof
- 40°C Ambient
- 60HZ

	НР	RPM	Volts			Frame	Stock Frame Number Prot.				N.P. Eff.%	Conn. Dia.	Wgt.
l	2	1725	200-230/460	6.8/3.4	1.15	145T	OB3204T	None	13.2	10.6	78	34	41

MOTORS

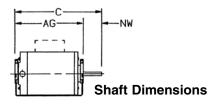
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Capacitor Start Resilient Base Motors





- Class "B" Insulation
- Energy Efficient (see notes)
- High Start Torque
- Open TEAO
- Reversible
- · Sleeve & Ball Bearing
- Suitable for 208 Volts at 1.0 S.F.
- 2, 4 and 6 Pole
- 40ºC Ambient
- 60 HZ



48 = 1/2" Flat x 1-5/8" 56 = 5/8" Keyed x 1-7/8"

НР	RPM	Volts	FL Amps	S.F.	Frame	Stock Number	Bear- ings	Prot.	Approx.	Dim. "AG"	En- close	Conn. Dia.	Notes	Wgt.
1/2	1725	115/230	8.6/4.3	1.00	56	RS1051A	Sleeve	Auto	10.3	8.1	Open	38		18
1/2	1725	115/230	8.8/4.4.	1.25	56	RS1054A	Sleeve	Auto	10.3	8.1	Open	38		25
1/2	3450	115/208-230	7.2/3.6	1.6	56	BK1052	Ball	Auto	10.9	8.7	Open	22	5,6,7,8	19
1/2	1725	115/208-230	7.6/3.8	1.25	56	BK1054	Ball	Auto	11.6	9.4	Open	22	5,6,7,8	22
3/4	3450	115/208-230	10.0/5.0	1.5	48	BF1072	Ball	Auto	11.1	9.2	Open	22	5,6,7,8	22
3/4	3450	115/208-230	10.0/5.0	1.5	56	BK1072	Ball	Auto	11.6	9.4	Open	22	5,6,7,8	22
1	1725	115/230	14.2/7.1	1.25	56H	RS1104A	Sleeve	Auto	11.8	9.6	Open	38		31
1	3450	115/208-230	12.6/6.3	1.4	48	BF1102	Ball	Auto	11.6	9.7	Open	22	5,6,7,8	24
1-1/2	1725	115/230	16.4/8.2	1.2	56H	RB1154A	Ball	Auto	12.8	10.6	Open	38		41
2	1725	115/208-230	24.6/12.3	1.15	56	RB1204A	Ball	Auto	12.8	10.6	Open	38		44
2	3450	115/208-230	21.2/10.6	1.2	56H	BK1202	Ball	Auto	14.2	12.0	Open	22	5,6,7,8	39
2	1725	115/208-230	25/12.5	1.15	56H	BK1204	Ball	Auto	15.3	13.1	Open	22	5,6,7,8	46

Notes:

- 5. Sealed switch design
- 6. Start capacitor inside7. Terminal board

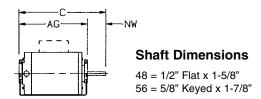
- 8. Moderate start torque
- 10. Energy efficient split phase start/ capacitor run

Split Phase Resilient Base Motors

Belt Drive and Blower Applications



- · Class "B" Ins.
- Continuous Duty
- Energy Efficient (see notes)
- Open and TEAO
- Reversible
- Single and Two Speed
- · Sleeve & Ball Bearing
- 60 HZ (50 HZ per notes)



SPLIT PHASE - NEMA AND UNITY SERVICE FACTOR

НР	RPM	Volts	FL Amps	S.F.	Frame	Stock Number	Bear- ings	Prot.	Approx. "C"	Dim. "AG"	En- close	Conn. Dia.	Notes	Wgt.
1/4	1725	115	4.6	1.35	48/56	GF2024	Sleeve	Auto	9.2	7.3	Open	39	1	14
1/3	1725	115	5.9	1.35	48/56	GF2034	Sleeve	Auto	9.4	7.5	Open	39	1	16
1/3	1725	230	3.3	1.35	48	GF2038	Sleeve	Auto	9.4	7.5	Open	39	9	16
1/2	1725	115	7.2	1.25	48/56	GF2054	Sleeve	Auto	9.9	8.0	Open	39		
1/2	1725	115/230	8.8/4.4	1.25	56	RB2054D	Ball	Auto	10.0	8.1	Open	38	7	
3/4	1725	115	10.9	1.25	56	GK2074	Sleeve	Auto	10.8	8.9	Open	39		

- 1. 48/56 FR = 1/2" x 1.5" Shaft with 5/8" shaft adapter -48/56 slotted 3" height base
- 7. 1/2" extended thru bolts, shaft end
- 9. Suitable for 208V at 1.0 S.F.

A.O. SMITH

MOTORS

Oil Burner Motor

Features

Applications: Domestic high and low pressure oil burners and other applications where 48M and 48N flange mounting is required.

This line of motors includes open (enclosed except for shaft end bracket) and totally enclosed designs to meet all requirements. All mounting dimensions such as location of ears, diameter of rabbet fit and shaft size are in accordance with NEMA standards. Most of the normally stocked replacement ratings feature the **external reversing switch** for ease of use in those tight, dark and dirty locations. All ratings include sleeve bearings for quiet operation and manual reset thermal overload protectors for safe, dependable use.



Reversible Switch Model Oil Burner Motor

SPLIT PHASE, 60 HZ, ENCLOSED, REVERSIBLE, FACTORY CONNECTED FOR CW ROTATION

НР	RPM	Volts	Approx. F. L. Amps	S.F.	Frame	Stock Number	Bear- ings	Prot.	Dim. Ref.	Notes	Wgt.
1/8	1725	115	2.5	1.0	48N	EL2005	Sleeve	Manual	1	1,3	8
1/6	1725	115	3.2	1.0	48N	XEL2014	Sleeve	Manual	3	1,3	11

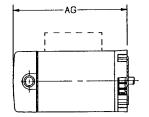
Approximate Dimensions

Ref.	С	AG	N	AK	AJ
1	7.16	5.22	1.82	6.37	7.25
3	7.66	5.72	1.82	6.37	7.25

Round Flange Jet Pump Motors

Important: <u>Total output</u> (HP x service factor) of replacement motor must equal or exceed motor being replaced.





HP	RPM	Voltage	Max. Amps	S.F.	Frame	Stock Number	Shaft	Rotation	Approx. "AG"	Conn. Dia.	Wgt.
1/3	3450	115/230	8.6/4.3	1.8	56C	K1032	Key	Rvrsble	8-1/4	22	15
1/2	3450	115/230	10.8/5.4	1.6	56C	K1052	Key	Rvrsble	8-5/8	22	16
3/4	3450	115/230	14.8/7.4	1.5	56C	K1072	Key	Rvrsble	9-1/2	22	19
1	3450	115/230	16.2/8.1	1.4	56C	K1102	Key	Rvrsble	10	22	22
1-1/2	3450	115/230	22/11	1.3	56C	K1152	Key	Rvrsble	11-5/16	22	28

- Auto Protector
- Ball Bearings
- Capacitor Start
- Carbon Keyed and 416 Stainless Thrd. Shaft
- CCWPE & Dual Rotation
- Continuous Duty
- High Service Factors
- Internally Mtd.
 Capacitor
- NEMA "56C" Mount
- Open Drip Proof
- Sealed switch design
- 40°C Ambient
- 60 HZ
- "778" Design

Notes

MANUFACTURERS INDEX, SECTION 10

AIRMASTER	
BROAN	
MASTERFLOW	
TJERNLUND	

HIGH PERFORMANCE DUCT BOOSTER® FANS

Versatile and durable Tjernlund High Performance Fans feature exceptional air handling performance with low noise and extremely low power usage.

- Use in temperatures up to 140°F
- · Variable speed adjustable
- Permanently sealed bearings
- Totally enclosed
- Maintenance free
- · Quiet operation

M-Series (Metal Housing)

Ideal for long runs or air supply and exhaust applications requiring a metal housing.

Features include:

- · Powder coated, galvanized housing
- · Horizontal or vertical mounting
- Connects to rigid or flex ducts
- Mounting bracket included

d Air d OD



Dimensions

Model	OD	а	b	С	d
M-4	8	5-1/2	7/8	7/8	4
M-6	11-1/2	6	3/4	7/8	6
M-8	13-1/4	6-1/4	1	7/8	8

M-Series Electrical and Performance Data

	Max	Max		Nom.		CFM VS Static Pressure					Duct			
Model	Amps	Watts	Volts	RPM	0"	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1 1/2"	Dia.	Weight
M-4	.17	19	115	2950	117	101	86	72	58				4"	6 Lbs
M-6	.74	84	115	2700	257	241	221	197	178	143	99		6"	9 Lbs
M-8	1.02	116	115	2600	481	444	403	361	319	237	177	76	8"	11 Lbs

VENTILATION ACCESSORIES



VERSA-CAP®

NON-CLOGGING POSITIVE DRAFT DESIGN RECOMMENDED FOR CHIMNEY OR HOT STACK APPLICATIONS.

PART #	ADJUSTABLE THROAT SIZE
3050	2-7/8" - 5"
5070	4-7/8" - 7"
7090	6-7/8" - 9"
9011	8-7/8" - 11"
1200	12" - 14"



FLUSH FLANGE WALL LOUVERS

REVERSIBLE FOR FLUSH OR RECESSED MOUNTING ON FRAME OR BRICK STRUCTURES.



PART #	OPENING DIMENSIONS	FREE AREA SQR. IN.
DA1824	18 x 24	180
DA2430	24 x 30	302

POWER ATTIC VENTILATORS

ROOF OR GABLE MOUNTED DESIGNS.

PART #	MOUNTING	CFM @ .03 S.P.
PR2	ROOF	1300
PG2N	GABLE	1300
HI22BZ*	ROOF	1300



ROOF LOUVERS

50 SERIES - 77 SERIES

SQUARE HOOD DESIGN FOR EFFECTIVE WEATHER PROTECTION AND MAXIMUM AIR MOVEMENT. CAN BE USED ON ANY ROOF NOT EXCEEDING 6/12 PITCH.



PART #	FLASHING DIMENSIONS
R50A	17-3/8" x 15-3/8"
R77A	17" x 17-3/8"

^{*}Weathered Wood look.



VERTICAL DISCHARGE FANS

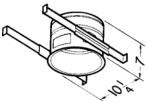
Efficient, high-performance for ceiling installations.

Offered in two sizes to meet Various room requirements.

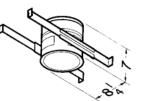
MODEL	VOLTS	CFM	DUCT
504	120	350	10" Rd.
505	120	180	8" Rd.



MODEL 504 HOUSING



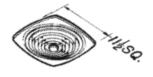
MODEL 505 HOUSING



MODEL 504 GRILLE

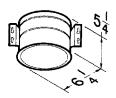


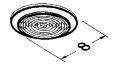
MODEL 505 GRILLE



MODEL 673

VOLTS	RPM	SONES	CFM	DUCT
120	2600	4.5	60	6" Round



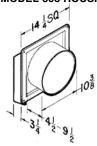


WALL FAN



MODEL	MODEL VOLTS		DUCT	
508	120	270	10" Rd.	

MODEL 508 HOUSING



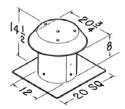
MODEL 508 GRILLE



ROOF CAPS

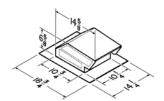
Model 612

- For flat roof installation
- .025 Aluminum natural finish
- Built-in bird screen
- For up to 12" round duct



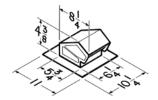
MODEL 634

- 24 GA. CRCQ steel, black electrically-bonded epoxy finish
- Built-in backdraft damper and bird screen
- For 3-1/4" x 10" or up to 8" round duct



MODEL 636

- 24 GA. CRCQ steel, black electrically-bonded epoxy finish
- Built-in backdraft damper and bird screen
- For 3" or 4" round duct





Wall Control

MODEL 57V (IVORY), 57X (WHITE) Electronic Variable Speed Control (3 Amp)

- Rotary dial for variable selection of fan speed and sound level
- Positive off position
- Fits single-gang box
- Built-in radio noise suppressor
- 120 VAC, 3.0 Amp capacity
- For use with all Broan fans within Amp rating except ceiling paddle fans
- Do not use with impedance protected motor



COMBINATION UNITS

Model 655 — Heater/Fan/Light

Model 657 — Fan/Light

GRILLE

- White polymeric grille
- Directional vanes for heat and exhaust
- Snap-in light diffusing lens for 100W bulb (not included)

VENTILATOR

· Low sound, high performance blower wheel

LEATED

• 1300 watts, with metal blower wheel for efficient, even heating

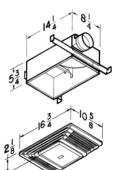
MODEL	DESCRIPTION	VOLTS	AMPS	CFM	DUCT
655	Heater/Fan/Light	120	12.8	70	4" Round
657	Fan/Light	120	2.0	70	4" Round

MODEL 696 — Fan/Light

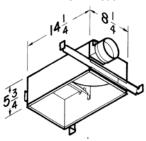
• Two blower wheels, each powered by its own permanently lubricated-plug-in motor, quietly deliver high-efficiency performance.

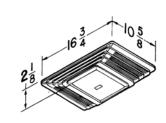
MODEL NO.	SONES @ 0.0" S.P.	CFM @ STATIC PRESSURE .250	VOLTS	SIZE
696	5.1	100	120	4" Round

MODELS 655 & 657





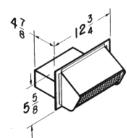




WALL CAPS

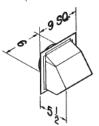
MODEL 639

- For 31/4" x 10" duct
- Spring-loaded backdraft damper and bird screen
- 24 GA CRCQ Steel, black electrically bonded epoxy finish.



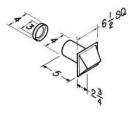
MODEL 641 / 843BL

- For 6" round duct
- Spring-loaded backdraft damper and bird screen
- 22 GA CRCQ Steel, black electrically bonded epoxy



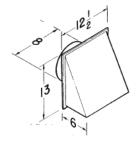
MODEL 642

- For 3" or 4" round duct
- Built-in backdraft damper



MODEL 643

- For 8" round duct
- Built-in backdraft damper
- .025 Aluminum natural finish





CEILING/WALL FANS

- Durable Broan-designed blower wheel.
- Torsion spring grille mounting no tools necessary.
- Compact housing fits easily between ceiling joists or wall studs.
- Double strength steel mounting flanges with keyhole slots for fast installation.

MODEL 670

MODEL NO.	SONES @ 0.0" S.P.	CFM @ STATIC PRESSURE .250	TOTAL VOLTS	SIZE
670	3.4	46	120	3" Round

MODEL 671

MODEL	VOLTS	CFM	SONES	DUCT
671	120	70	6.0	3" Round

MODEL 676

	MODEL	VOLTS	SONES	CFM	DUCT
ı	676	120	4.0	110	4" Round

MODEL 678

MODEL	VOLTS	SONES	CFM	DUCT
678	120	2.5	50	4" Round

MODEL 679

I	MODEL	VOLTS	SONES	CFM	DUCT
ı	679	120	3.5	70	4" Round

MODEL 684

MODEL NO.		STATIC PRESSURE (in. wg Ps) .250	VOLTS	DUCT SIZE
684	CFM	77	120	4"Round
	Sones	3.6		

MODELS 688 & 689

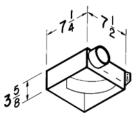
MODEL	VOLTS	SONES	CFM	DUCT
688	120	4.0	50	3" Round
689	120	5.5	60	3" Round

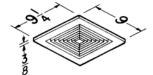
SOLITAIRE® BATH FANS

Ultra-quiet high performance fans with a modern styled, low profile grille.

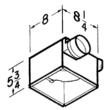
MODEL NO.	SONES @ 0.1" S.P.	CFM @ STATIC PRESSURE .250	VOLTS	SIZE
S90	2.5	90	120	4" Round

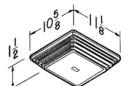
MODELS 670 & 671



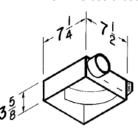


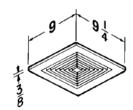
MODELS 676 & 684

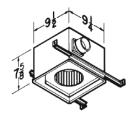




MODELS 688 & 689













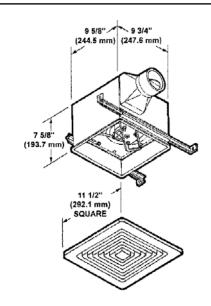
SOLITAIRE ULTRA-SILENT® VENTILATION FANS

Ultra-quiet high performance fans with a modern styled, low profile grille.

ACCESSORIES

- Plug in permanently lubricated motor
- Low RPM for ultra-quiet performance

MODEL NO.	SONES @ 0.1" S.P.	CFM @ STATIC PRESSURE .250	VOLTS	SIZE
S50U	.05	50	120	4" Round
QTR80	1.0	80	120	4" Round
S110U	1.5	110	120	4" Round







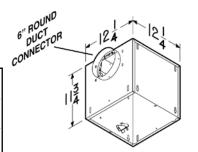
Incredibly reliable. Unbelievably quiet. Offering the CFM choices you need at the lowest sound levels in the industry.

L150 SERIES

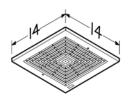
ACCESSORIES

- Electronic Variable Speed Controls Model 72V (120 VAC)
- Model 961L In-line Adapter Plate

MODEL NO.	NOMINAL VOLTAGE		CFM / SONES .250" Ps
L150	120 VAC	CFM Hor. Sones Hor.	141 2.2
		CFM Ver. Sones Ver.	149 2.0

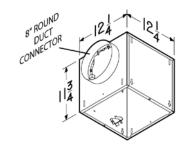




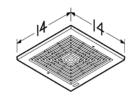


L200 & L300 SERIES

MODEL NO.	NOMINAL VOLTAGE		CFM / SONES .250" Ps	NOMINAL RPM	AMPS @60 Hz
L200	120 VAC	CFM Hor.	196	740	1.8
		Sones Hor.	2.3		
		CFM Ver.	197	760	1.8
		Sones Ver.	2.3		
L300	120 VAC	CFM Hor.	303	905	2.6
		Sones Hor.	3.3		
		CFM Ver.	306	940	2.6
		Sones Ver.	3.4		



POLYMERIC GRILLE **MODELS L200 & L300**





CENTRIFUGAL DIRECT DRIVE EXHAUST FAN MODEL CDD

FEATURES

- Durable and Quiet at Higher Static Pressures
- Suitable for Roof or Wall Mount
- 115V, 1 Phase, 2 Speed, Open Drip Proof Motors
- Bird Screen Standard

- AMCA Licensed for Air
- UL 705 Listed
- Emergency Disconnect Switch Standard
- Non-Overloading, Backward Inclined Wheel
- Variable Speed Control Standard



PERFORMANCE

Catalog				TIP	IP Capacity (CFM) at "S.P.							
Number	SPEED	HP	RPM	SPEED	0"	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	1"
CDD100-2	High	1/15	1600	3770	541	490	442	394	342	275	197	
CDD120-2	High	1/15	1525	4192	768	690	611	528	439	344	250	
CDD300B-2	High	1/4	1625	4999	1409	1362	1314	1265	1211	1157	1094	955
CDD330B-2	High	1/3	1700	5229	1329	1279	1230	1182	1139	1095	1049	933
CDD550B-2	High	1/2	1650	5940	2564	2488	2410	2333	2244	2155	2066	1833

Speed Control allows for CFM range to 50% of CFM stated.

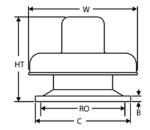
115V MODELS

Wheel Dia.	EDP Number	Catalog Number	Ship Wt.	2 Sp.	8" Curb 12" Curb	(EDP#) (EDP#)	Gravity Damper Motor Kit	(EDP#) (EDP#)
9"	6310XB15	CDD100-2	30	Х	PACA17.75-8 PACA17.75-12	(31100) (31101)	BD14.5A Motor Kit 115/230V	(9021450) (94283)
10-1/2"	6312XB15	CDD120-2	35	Х	PACA17.75-8 PACA17.75-12	(31100) (31101)	BD14.5A Motor Kit 115/230V	(9021450) (94283)
10-3/4"	6325CB15	CDD300B-2	45	Х	PACA20-8 PACA20-12	(31102) (31103)	BD16.75A Motor Kit 115/230V	(9021670) (94283)
11-3/4"	6330DB15	CDD330B-2	45	Х	PACA20-8 PACA20-12	(31102) (31103)	BD16.75A Motor Kit 115/230V	(9021670) (94283)
12"	6350FB15	CDD550B-2	50	Х	PACA20-8 PACA20-12	(31102) (31103)	BD16.75A Motor Kit 115/230V	(9021670) (94283)

Motorized damper requires 12" Curb.

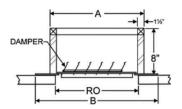
DIMENSIONS

Catalog Number	Ht.	w	В	С	Roof Opening
CDD100-2	14"	19"	1-1/2"	19"	12.75"
CDD120-2	16"	21"	1-1/2"	19"	12.75"
CDD300B-2	23-1/2"	27-5/8"	1-1/2"	21"	16"
CDD330B-2	23-1/2"	27-5/8"	1-1/2"	21"	16"
CDD550B-2	23-1/2"	27-5/8"	1-1/2"	21"	16"



OPTIONAL CURB DIMENSIONS

Curb Cat. No.	A Sq.	B Sq.	Roof Opening	Damper Cat. No.
PACA17.75	17-3/4"	23-3/4"	12-3/4"	BD14.5A
PACA20	20"	24"	15"	BD16.75A





DIRECT DRIVE CENTRIFUGAL UPBLAST/WALL FAN

MODEL CDU

Roof and Wall Mount Versatility

FEATURES

- High Vertical Discharge Prevents Recirculation
- Emergency Disconnect Switch Standard
- Non-Overloading, Backward Inclined Wheel
- Variable Speed Control Standard
- Rubber Vibration Isolators for Quiet Operation
- Compact Size for Easy Installation
- Models CDU120-500 UL 762 Listed for Smoke & Grease Laden Air; Model CDU100 UL 705 Listed



PERFORMANCE

Catalog				TIP				Ca	pacity (C	FM) at "S	6.P.			
Number	SPEED	HP	RPM	SPEED	0"	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	1"	1-1/4"	1-1/2"
CDU100-2	High	1/15	1600	3770	537	493	447	398	343	280	204			
CDU120-2	High	1/15	1500	4123	718	654	584	501	402	304	206			
CDU300B-2	High	1/4	1525	4691	1183	1120	1056	990	916	834	739	541	343	
CDU300B-2	High	1/3	1700	5229	1342	1290	1237	1181	1116	1051	984	831	595	
CDU500B-2	High	1/2	1670	6012	2181	2116	2052	1987	1922	1865	1786	1615	1418	1174

Variable speed control allows for 50% range of stated CFM. Speed control can be wired for low or high speed. Performance shown is for installation Type A; Free Inlet, Free Outlet. Performance includes effect of bird screen in the airstream. Speed (RPM) shown is nominal and performance is based on actual speed of test.

115V MODELS & OPTIONAL CURBS

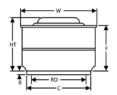
				ODP			Roof Mou	nt
Wheel Dia.	EDP Number	Catalog Number	Ship Wt.	2 Speed / 1 Phase 115V	8" Curb 12" Curb	(EDP#) (EDP#)	Gravity Damper Motor Kit	(EDP#) (EDP#)
9"	6410XB15	CDU100-2	30	Х	PACA17.75-8 PACA17.75-12	(31100) (31101)	BD14.5A Motor Kit 115/230V	(9021450) (94283)
10-1/2"	6412XB15	CDU120-2	40	Х	PACA17.75-8 PACA17.75-12	(31100) (31101)	BD14.5A Motor Kit 115/230V	(9021540) (94283)
11-3/4"	6425CB15	CDU250B-2	50	Х	PACA20-8 PACA20-12	(31102) (31103)	BD16.75A Motor Kit 115/230V	(9021670) (94283)
11-3/4"	6430DB15	CDU300B-2	50	Х	PACA20-8 PACA20-12	(31102) (31103)	BD16.75A Motor Kit 115/230V	(9021670) (94283)
13-3/4"	6450FB15	CDU500B-2	55	Х	PACA20-8 PACA20-12	(31102) (31103)	BD16.75A Motor Kit 115/230V	(9021670) (94283)

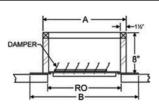
DIMENSIONS

Wheel Dia.	Catalog Number	Ht.	w	В	С	F	RO
9"	CDU100-2	13-1/3"	19-3/4"	1-1/2"	19"	9-3/4"	12-3/4"
10-1/2"	CDU120-2	15-1/2"	24"	1-1/2"	19"	11-5/8"	12-3/4"
11-3/4"	CDU250B-2	23"	26"	1-1/2"	21"	20-1/2"	16"
11-3/4"	CDU300B-2	23"	26"	1-1/2"	21"	20-1/2"	16"
13-3/4"	CDU500B-2	23"	26"	1-1/2"	21"	20-1/2"	16"

CURB DIMENSIONS

Curb Cat. No.	A Sq.	B Sq.	Roof Opening	Damper Cat. No.
PACA17.75	17-3/4"	23-3/4"	12-3/4"	BD14.5A
PACA20	20"	24"	15"	BD16.75A





OPTIONAL ACCESSORIES

EDP No.	Catalog Number	Wall Mount Damper (EDP #)	Wall Grille (EDP #)
6410XB15	CDU100-2	D15V (9111500)	WG15 (9121500)
6412XB15	CDU120-2	D15V (9111500)	WG15 (9121500)
6425CB15	CDU250B-2	D17V (9111700)	WG17 (9121700)
6430DB15	CDU300B-2	D17V (9111700)	WG17 (9121700)
6450FB15	CDU500B-2	D17V (9111700)	WG17 (9121700)

ACCESSORIES

EDP No.	Description
62000	Curb Hinge
62001	Bird Screen - for CDU 100 - 120
62002	Bird Screen - for CDU 250 - 500
62003	Grease Box



CENTRIFUGAL BELT DRIVE EXHAUST FAN MODEL CBD*

Handles Higher Static Pressures - Quietly

FEATURES

- Non-Overloading Backward Inclined Wheel
- Aluminum Housing
- Forced Air Thru Motor Compartment
- Variable Pitch Motor Pulley Allows for Field Adjustments
- Bird Screen
- Emergency Disconnect Switch Standard

• AMCA Licensed for Sound and Air

- Suitable for Wall Mount up to CBD240MA
- UL 705 Listed



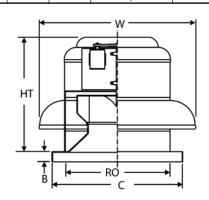
\A/I 1	Use Column at	0-1		F						Capacit	v (CFM)	at "S.P			
Wheel Dia.	right for last two	Cat. Number	НР	Fan RPM	Tip Speed	Max BHP	0"	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"
Dia.	digits of EDP No.	CBD130CA	1/4	1255	4410	0.29	1985	1892	1799	1705	1609	1357	-	1-1/4	1-1/2
13"	6513D П П	CBD130CA	1/3	1328	4780	0.23	2152	2066	1980	1894	1807	1607	1300	_	_
10	6513F П П	CBD130FA	1/2	1531	5511	0.57	2481	2406	2332	2258	2182	2031	1850	1598	_
	6515D 1	CBD150DA	1/2	1066	4395	0.36	2769	2646	2523	2371	2219	1795	1000	1330	
15"	6515F 1	CBD150FA	1/2	1230	5072	0.56	3195	3088	2982	2867	2735	2452	2069	_	_
13	6515H П П	CBD150HA	3/4	1389	5727	0.81	3608	3513	3419	3325	3217	2984	2718	2377	1877
	6515J П П	CBD150JA	1	1527	6296	1.08	3966	3880	3794	3709	3623	3413	3201	2944	2630
	6518D	CBD180DA	1/3	802	3915	0.36	3114	2952	2789	2600	2391	-	-	-	-
	6518F	CBD180FA	1/2	922	4501	0.55	3580	3439	3298	3148	2984	2604	_	_	_
18"	6518H 🗂 🗖	CBD180HA	3/4	1039	5072	0.79	4035	3909	3784	3659	3520	3227	2866	_	_
	6518J П П	CBD180JA	1	1159	5658	1.10	4501	4388	4276	4164	4051	3793	3513	3189	2763
	6518K	CBD180KA	1-1/2	1305	6371	1.57	5068	4968	4868	4768	4669	4457	4225	3976	3688
	6518M П П	CBD180MA	2	1437	7015	2.08	5580	5490	5399	5308	5218	5037	4831	4620	4394
	6520D	CBD200DA	1/3	671	3624	0.36	3850	3632	3382	3071	2666	-	-	-	-
	6520F	CBD200FA	1/2	761	4110	0.49	4366	4174	3981	3725	3435	2541	_	_	-
20"	6520H 🗂 🗖	CBD200HA	3/4	869	4693	0.79	4986	4817	4649	4460	4234	3691	2751	_	-
	6520J 77	CBD200JA	1	962	5196	1.07	5520	5367	5215	5063	4872	4447	3904	-	-
	6520K	CBD200KA	1-1/2	1093	5903	1.57	6271	6137	6003	5869	5735	5385	4993	4523	3830
	6520M 7	CBD200MA	2	1204	6503	2.10	6908	6786	6665	6543	6421	6140	5814	5438	5011
	6524H 1	CBD245HA	3/4	658	4264	0.77	6224	5942	5660	5279	4839	3537	-	-	-
	6524J 	CBD245JA	1	727	4711	1.05	6876	6622	6367	6060	5709	4814	3156	-	-
24"	6524K 🗖 🗍	CBD245KA	1-1/2	829	5372	1.56	7841	7618	7394	7171	6882	6230	5394	4019	-
	6524M 🗂 🗂	CBD245MA	2	914	5922	2.07	8645	8443	8240	8037	7825	7274	6621	5826	4564
	65240 📆	CBD245OA	3	1050	6804	3.15	9932	9755	9579	9402	9226	8817	8337	7779	7133
	6530J 	CBD300JA	1	504	4074	1.05	8259	7887	7503	7073	6548	5082	-	-	-
	6530K 🗂 🗍	CBD300KA	1-1/2	575	4648	1.56	9423	9097	8770	8421	8032	7039	5647	-	-
30"	6530M 🗖 🗍	CBD300MA	2	631	5100	2.06	10341	10043	9746	9437	9104	8332	7287	5910	-
	6530O _	CBD300OA	3	727	5876	3.16	11914	11656	11398	11140	10868	10277	9584	8702	7619
	6530P 🗂 🗂	CBD300PA	5	859	6943	5.20	14077	13859	13641	13422	13204	12744	12241	11720	11022
	6536J 	CBD365JA	1	377	3677	1.01	10900	10230	9487	8630	7285	-	-	-	-
	6536K _	CBD365KA	1-1/2	430	4193	1.56	12433	11845	11244	10542	9749	-	-	-	-
36"	6536M <u></u>	CBD365MA	2	475	4632	2.07	13734	13202	12670	12065	11429	9688	-	-	-
	65360 📆	CBD365OA	3	544	5305	3.09	15729	15265	14800	14366	13781	12641	10930	-	-
	6536P 📆 📆	CBD365PA	5	643	6271	5.19	18592	18199	17806	17413	17020	16096	15157	13894	11990

Performance shown is for installation Type A: Free Inlet; Free Outlet. Power Ratings (BHP) do not include Drive Losses. Performance ratings do not include the effects of appurtenances in the air stream.

DIMENSIONS

Catalog Number	Ht.	w	В	С	RO
CBD130	25-1/2"	28-1/4"	1-1/2"	21"	15"
CBD150	28-1/4"	31-1/2"	2"	24-3/4"	18.75"
CBD180	31-1/2"	37-1/2"	2"	28"	22"
CBD200	31-1/2"	37-1/2"	2"	28"	22"
CBD245	37-1/2"	42"	1-1/2"	33"	27"
CBD300	39"	51-1/4"	2"	40"	34"
CBD365	42-1/2"	61-3/8"	2"	44"	38"







CENTRIFUGAL BELT DRIVE EXHAUST FAN MODEL CBD

					_			
			Ends in 09	Ends in 12				
Cat. Number	Max. Sones	Ship Wt.	1 Phase 115/230V	3 Phase 208/230/460V	8" Curb 12" Curb	(EDP#) (EDP#)	Damper - Gravity Motorized Damper Kit	(EDP#) (EDP#)
CBD130CA	10.8	105	Х	-	PACA20-8	(31102)	BD16.75A	(9021670)
CBD130DA	11.8	105	X	X	PACA20-12	(31103)	Motor Kit 115/230V	(94283)
CBD130FA	17.1	105	X	X			Motor Kit 460V	(94282)
CBD150DA	10.2	120	Х	Х				
CBD150FA	13.0	120	X	X	PACA23.75-8	(31107)	BD29A	(9022900)
CBD150HA	15.8	130	X	X	PACA23.75-12	(31108)	Motor Kit 115/230V	(94283)
CBD150JA	21.0	130	X	X			Motor Kit 460V	(94282)
CBD180DA	8.3	150	Х	Х				
CBD180FA	10.2	150	X	X				
CBD180HA	12.5	160	X	X	PACA27-8	(31112)	BD23.75A	(9022370)
CBD180JA	13.9	160	X	X	PACA27-12	(31113)	Motor Kit 115/230V	(94283)
CBD180KA	19.2	180	X	X			Motor Kit 460V	(94282)
CBD180MA	24.0	190	X	X				
CBD200DA	7.0	155	Х	Х				
CBD200FA	8.4	155	X	X				
CBD200HA	10.0	165	X	X	PACA27-8	(31112)	BD23.75A	(9022370)
CBD200JA	12.8	165	X	X	PACA27-12	(31113)	Motor Kit 115/230V	(94283)
CBD200KA	15.0	185	X	X			Motor Kit 460V	(94282)
CBD200MA	19.8	195	-	X				
CBD245HA	11.0	185	Х	Х				
CBD245JA	13.0	185	X	X	PACA32-8	(31115)	BD37A	(9023700)
CBD245KA	14.8	205	X	X	PACA32-12	(31116)	Motor Kit 115/230V	(94283)
CBD245MA	17.7	215	-	X			Motor Kit 460V	(94282)
CBD245OA	25.0	215	-	X				
CBD300JA	8.3	315	Х	Х				
CBD300KA	10.7	335	X	X	PACA39-8	(31118)	BD44A	(9024400)
CBD300MA	12.6	345	-	X	PACA39-12	(31119)	Motor Kit 115/230V	(94283)
CBD300OA	14.8	345	-	X			Motor Kit 460V	(94282)
CBD300PA	21.0	380	-	X				
CBD365JA	7.4	335	Х	Х				
CBD365KA	10.2	355	X	X	PACA43-8	(31121)	BD39.75A	(9023970)
CBD365MA	11.5	365	-	X	PACA43-12	(31122)	Motor Kit 115/230V	(94283)

The sound ratings shown are loudness values in fan sones at 5 ft. (1.5m) in a hemispherical free field calculated per AMCA Standard 301. Values shown are for installation Type A: Free inlet fan sone levels. Sones are given for the highest value over catalog range.

Χ

OPTIONAL CURB DIMENSIONS

14.9

19.7

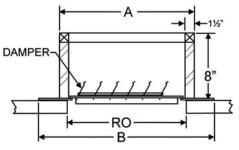
CBD365OA

CBD365PA

Curb Cat. No.	A Sq.	B Sq.	Roof Opening	Damper Cat. No.
PACA20	20"	24"	15"	BD16.75A
PACA23.75	23.75"	27.75"	18.75"	BD29A
PACA27	27"	31"	22"	BD23.75A
PACA32	32"	36"	27"	BD37A
PACA39	39"	43"	34"	BD44A
PACA43	43"	47"	38"	BD39.75A

365

400



ACCESSORIES

(94282)

Motor Kit 460V

EDP No.	Description
INO.	Description
62000	Curb Hinge



BELT DRIVE CENTRIFUGAL UPBLAST EXHAUST FAN MODEL CBU*

High Efficiency...Quiet Operation

FEATURES

- Non-Overloading Backward Inclined Aluminum Wheel
- Suitable for Wall Mount up to CBU245
- Variable Pitch Motor Pulley Allows for Field Adjustment
- Emergency Disconnect Switch Standard



- AMCA Licensed for Sound and Air
- UL 762 Listed for Smoke & Grease Laden Air

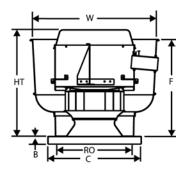


Wheel	Use Column at right for last two	Cat.		Fan	Tip	Max				Capacit	y (CFM)	at "S.P.			Sones@
Dia.	digits of EDP No.	Number	HP	RPM	Speed		1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	.25"S.P.
	6613C	CBU130CA	1/4	1216	4377	0.28	1746	1652	1556	1294	-	-	-	-	13.8
13"	6613D 7	CBU130DA	1/3	1331	4791	0.37	1940	1861	1773	1580	1267	-	-	-	16.6
	6613F	CBU130FA	1/2	1535	5526	0.57	2278	2216	2145	1993	1820	1564	-	-	22
	6615D 🔲	CBU150DA	1/3	1069	4408	0.36	2445	2303	2154	1758	-	-	-	-	13.1
15"	6615F 🔲 🗍	CBU150FA	1/2	1225	5051	0.55	2866	2756	2632	2349	1989	-	-	-	15.3
	6615H 🗂 🗂	CBU150HA	3/4	1395	5752	0.81	3317	3228	3126	2908	2644	2334	1818	-	18
	6615J 🔲 🗍	CBU150JA	1	1529	6305	1.07	3669	3587	3506	3308	3104	2848	2560	-	23
	6618D 🔲 🗍	CBU180DA	1/3	805	3930	0.36	2739	2556	2361	1851	-	-	-	-	9
	6618F 🔲 🗍	CBU180FA	1/2	913	4457	0.53	3196	3037	2876	2527	-	-	-	-	11.7
18"	6618H 🔲 🗍	CBU180HA	3/4	1044	5097	0.79	3733	3603	3462	3174	2866	2421	-	-	15.3
	6618J 🔲 🗍	CBU180JA	1	1157	5649	1.08	4190	4075	3953	3699	3430	3151	2743	-	18.7
	6618K 🗖🗖	CBU180KA	1-1/2	1319	6439	1.59	4837	4736	4635	4417	4194	3959	3714	3052	23
	6620D 🔲	CBU200DA	1/3	673	3635	0.36	3292	2992	2598		-	-	-	-	8.9
	6620F 🔲 🗍	CBU200FA	1/2	766	4173	0.53	3884	3643	3367	2599	-	-	-	-	12
20"	6620H 🔲 🗍	CBU200HA	3/4	875	4726	0.79	4527	4364	4143	3615	2889	-	-	-	14.2
	6620J 🗂 🗍	CBU200JA	1	968	5228	1.07	5067	4934	4762	4359	3821	3068	-	-	16.5
	6620K 🗂 🗍	CBU200KA	1-1/2	1100	5941	1.57	5826	5709	5593	5264	4894	4423	3871	-	21
	6624H 🗂 🗍	CBU245HA	3/4	659	4270	0.78	5445	5091	4716	3646	-	-	-	-	12.5
	6624J 🔲 🗍	CBU245JA	1	730	4730	1.06	6157	5857	5537	4782	-	-	-	-	15.4
24"	6624K 🗂 🗍	CBU245KA	1-1/2	831	5384	1.56	7147	6915	6636	6063	5357	4193	-	-	18.7
	6624M 🗂 🗍	CBU245MA	2	912	5909	2.07	7930	7718	7492	6980	6427	5743	4648	-	21
	6624O []	CBU245OA	3	1050	6804	3.15	9246	9066	8882	8471	8026	7554	6997	5267	27
	6624P 📆	CBU245PA	5	1241	8041	5.21	11054	10900	10774	10434	10083	9707	9331	8456	37
	6630H 🗂 🗂	CBU300HA	3/4	458	3702	0.77	6445	5941	5388		-	-	-	-	9
	6630J 	CBU300JA	1	507	4098	1.05	7305	6895	6419	5333	-	-	-	-	11.4
30"	6630K 🗖 🗖	CBU300KA	1-1/2	577	4664	1.55	8494	8184	7801	6949	5945	-	-	-	14.3
	6630M 🗂 🗍	CBU300MA	2	635	5133	2.06	9453	9189	8884	8147	7335	6377	-	-	16.6
	6630O []	CBU300OA	3	731	5909	3.15	11016	10806	10573	10017	9362	8669	7887	-	21
	6630P 🔲	CBU300PA	5	864	6984	5.19	13153	12985	12409	11942	11400	10829	9582	-	27
	6636K 🗂 🗍	CBU365KA	1-1/2	429	4184	1.55	11593	10935	10138		-	-	-	-	12
	6636M 🗖 🗍	CBU365MA	2	470	4583	2.05	12917	12349	11716	9975	-	-	-	-	14.6
36"	6636O 	CBU365OA	3	542	5286	3.14	15195	14737	14236	13080	11483	-	-	-	18.3
	6636P 🗖 🗖	CBU365PA	5	640	6241	5.19	18234	17864	17474	16625	15644	14424	12824	-	25
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DIMENSIONS

Wheel Dia.	Catalog Number	Ht.	w	В	С	F	RO
13"	CBU130	25-1/2"	28-1/4"	1-1/2"	21"	23"	15"
15"	CBU150	28-1/4"	31-1/2"	2"	24-3/4"	23"	18.75"
18"	CBU180	31-1/2"	37-1/2"	2"	28"	26"	22"
20"	CBU200	31-1/2"	37-1/2"	2"	28"	26"	22"
24"	CBU240	37-1/2"	42"	1-1/2"	33"	31"	27"
30"	CBU300	39"	51-1/4"	2"	40"	33-1/8"	34"
36"	CBU360	42-1/2"	61-3/8"	2"	44"	45-1/4"	38"

NOTE: Instructions for Wall Mounting included with each fan. * Non-Stock item.





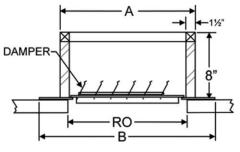
BELT DRIVE CENTRIFUGAL UPBLAST EXHAUST FAN MODEL CBU

	-	Ends in 09	Ends in 12			Optional Accessori	es	l	
Cat.	Ship	1 Phase Single 9	3 Phase Speed (ODP)	8" Curb (E 12" Curb (E 18" Hlg	DP#) h	Damper/Gravity		Dampe	l Mount er (EDP#)
Number	Wt.	115/230V	208/230/460V	Ventilated Cur		Motorized Damper			ille (EDP #)
CBU130CA	120	X	-	PACA20-8	(31102)	BD16.75A	(9021670)	<u>D17V</u>	(9111700)
CBU130DA	120	X	X	PACA20-12	(31103)	Motor Kit 115/230V	(94283)	WG17	(9121700)
CBU130FA	120	X	X	PACA20-18V	(31104)	Motor Kit 460V	(94282)		
CBU150DA	130	Х	Χ	PACA23.75-8	(31107)	BD29A	(9022900)		
CBU150FA	130	X	X	PACA23.75-12	(31108)	Motor Kit 115/230V	(94283)	<u>D17V</u>	(9111700)
CBU150HA	140	X	X	PACA23.75-18\	/ (31109)	Motor Kit 460V	(94282)	WG17	(9121700)
CBU150JA	140	X	X						
CBU180DA	150	X	Х						
CBU180FA	150	X	X	PACA27-8	(31112)	BD23.75A	(9022370)	D17V	(9111700)
CBU180HA	160	X	X	PACA27-12	(31113)	Motor Kit 115/230V	(94283)	WG17	(9121700)
CBU180JA	160	X	X	PACA27-18V	(31114)	Motor Kit 460V	(94282)		
CBU180KA	180	X	X						
CBU200DA	155	Х	Х						
CBU200FA	155	X	X	PACA27-8	(31112)	BD23.75A	(9022370)	D17V	(9111700)
CBU200HA	165	X	X	PACA27-12	(31113)	Motor Kit 115/230V	(94283)	WG17	(9121700)
CBU200JA	165	X	X	PACA27-18V	(31114)	Motor Kit 460V	(94282)		
CBU200KA	185	X	X						
CBU245HA	200	Х	Х						
CBU245JA	200	X	X	PACA32-8	(31115)	BD37A	(9023700)	D20V	(9112000)
CBU245KA	220	X	X	PACA32-12	(31116)	Motor Kit 115/230V	(94283)	WG20	(9122000)
CBU245MA	230	-	X	PACA32-18V	(31117)	Motor Kit 460V	(94282)		
CBU245OA	230	-	X						
CBU245PA	270	-	X						
CBU300HA	340	Х	Х						
CBU300JA	340	×	X	PACA39-8	(31118)	BD44A	(9024400)		
CBU300KA	360	×	X	PACA39-12	(31119)	Motor Kit 115/230V	(94283)		N/A
CBU300MA	370	-	Χ	PACA39-18V	(31120)	Motor Kit 460V	(94282)		
CBU300OA	370	-	Χ						
CBU300PA	410	-	Χ						
CBU365KA	500	Х	X	PACA43-8	(31121)	BD39.75A	(9023970)		
CBU365MA	510	-	X	PACA43-12	(31122)	Motor Kit 115/230V	(94283)		N/A
CBU365OA	510	-	X	PACA43-18V	(31123)	Motor Kit 460V	(94282)		
CBU365PA	550	-	X		,				

Backdraft Damper not for use in kitchen exhaust applications.

CURB DIMENSIONS

Curb Cat. No.	A Sq.	B Sq.	Roof Opening	Damper Cat. No.
PACA20	20"	24"	15"	BD16.75A
PACA23.75	23.75"	27.75"	18.75"	BD29A
PACA27	27"	31"	22"	BD23.75A
PACA32	32"	36"	27"	BD37A
PACA39	39"	43"	34"	BD44A
PACA43	43"	47"	38"	BD39.75A



ACCESSORIES

EDP No.	Description
62000	Curb Hinge
62002	Bird Screen
62003	Grease Box

Notes

MANUFACTURERS INDEX, SECTION 11

A.W. SPERRY 11-2 – 11-3
FIRST CHOICE TOOL11-1
GALAXY DRILL BITS11-16
KLEIN TOOL
ENOX SAWS
MALCO11-4 – 11-6
RIGID TOOLS11-17 – 11-21
SCHAEFER BRUSH11-27 – 11-28
ΓΙF LEAK DETECTORS11-24 – 11-26
TURBO TORCH11-21 – 11-23



Aviation Snips

Applications

 sheet metal strapping

vinyl

• linoleum

• canvas

- rubber
- gaskets
- · cardboard
- plastic cloth
- paper

P6510L

• and other similar materials

P6510R

Note: Do not use aviation snips for cutting/nipping hardened wire, springs, nails, etc.

P6510-L offset - left cut aviation snip (cuts straight and tight left curves)

P6510-R offset - right cut aviation snip (cuts straight and tight right curves)

These models are best suited for making long cuts through soft sheet metal and a multitude of other materials. The offset blade pattern guides the material being cut away from the blades. The off-set blade pattern also positions the user's hand above the material being cut.

1	
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Stock	Nominal	Pinch-to-Point	*Cutting
No.	Length	Cut Length	Capacity
P6510L	9-3/4"	1-1/4"	18 ga CR
	248mm	32mm	22 ga SS
P6510R	9-3/4"	1-1/4"	18 ga CR
	248mm	32mm	22 ga SS

P6716-S straight cut aviation snip

(cuts straight and wide curves to the left and right)

P6716-L left cut aviation snip (cuts straight and tight curves to the left)

P6716-R right cut aviation snip (cuts straight

and tight curves to the right) These models are best suited for trim cutting soft sheet metal and for cutting a multitude of other materials. The P6716-S straight cut aviation snip is the most versatile of all aviation snip models.

Stock	Nominal	Pinch-to-Point	*Cutting
No.	Length	Cut Length	Capacity
P6716S	9-3/4"	1-1/2"	18 ga CR
	248mm	36mm	22 ga SS
P6716L	9-3/4"	1-3/8"	18 ga CR
	248mm	35mm	22 ga SS
P6716R	9-3/4"	1-3/8"	18 ga CR
	248mm	35mm	22 ga SS



P6716R



P6716-B bulldog/notch cut aviation snip (short straight cuts)

These models are best suited for cutting multiple thickness and rolled edges of sheet metal and up to 16 gauge soft sheet metal as well as other

Stock No.	Nominal Length	Pinch-to-Point Cut Length	*Cutting Capacity
P6716B	9"	7/8"	16 ga CR
	229mm	22mm	18 ga SS



*CR = cold-rolled steel metal 16ga = 0.062"/1.574mm thickness 18ga = 0.049"/1.244mm thickness 22ga = 0.028"/0.711mm thickness

All Purpose Tinner Snips

Regular/Straight Pattern

Hot drop-forged of high carbon steel and heat-treated to assure strength and durability. Outer blade surfaces are ground smooth and fully polished. "Kush-n-Kote" durable vinyl plastic coats handles and bows for user comfort.

Stock	Nominal	Pinch-to-Point	*Cutting
No.	Length	Cut Length	Capacity
P77S	7"	1-3/4"	24 ga CR
	178mm	44mm	28 ga SS
P127S	12"	3"	20 ga CR
	305mm	76mm	22 ga SS



Duckbill/Circular Pattern

Hot drop-forged of high carbon steel and heat-treated to assure strength and durability. Outer blade surfaces are ground smooth and fully polished. "Kush-n-Kote" durable vinyl plastic coats handles and bows for user comfort. Ideal for cutting intricate scrolls, circles, and tight curves.

Stock	Nominal	Pinch-to-Point	*Cutting
No.	Length	Cut Length	Capacity
P77D	7"	1-3/4"	26 ga CR
	178mm	44mm	28 ga SS
P107D	10"	2-1/4"	24 ga CR
	254mm	64mm	26 ga SS
P127D	12"	3"	22 ga CR
	305mm	76mm	24 ga SS

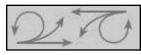


Aviation Snips - Verticle

Right angle blades make cutting easier in tight spaces and overhead. Capacity to cut 24 ga. cold-rolled sheet metal and 28 ga, stanless steel sheet metal.



P6900L



Left Cutting Pattern



P6900R



Right Cutting Pattern

A.W. SPERRY INSTRUMENTS INC.



DIGITAL MULTIMETER SNAP AROUND Model DSA500A

Lifetime Limited Warranty
Continuity Buzzer
Data Hold
Safety design conforming to the following
provisions of IEC61010
Overvoltage category III 300V, pollution
degree 2,
Overvoltage category II 600V, pollution

degree 2,
"Sleep" feature to extend battery life
Provides a dynamic range of 4,000 counts

Uses shrouded transformer jaws to further improve safety



DIGITAL MULTIMETER Model DM-350A

UL Listed to Both US and Canadian Standards Meets CE Requirements One Year Limited Warranty Designed to CAT III 600V Overload Protection on all Ranges Up to 2000 Hours Battery Life Diode Test Function Recessed Safety Designed Input Terminals

DIGITAL HYGROMETER



One Year Limited Warranty Compact & Lightweight Easy to Operate Backlit Display Max Hold Data Hold Digital & Analog Output Auto Power Off RH #STK3026RH



DIGITAL MULTIMETER Model DM5300

UL Listed to Both US and Canadian Standards Meets CE Requirements Five Year Limited Warranty Drop Proof to 10 Feet Data Hold Max Hold Built-In Hanger & Tilt Stand Rubber Holster Continuity, Diode Test Safety Yellow



DIGITAL MULTIMETER Model DM4000A

UL Listed to Both US and Canadian Standards One Year Limited Warranty Overload Protection on all Ranges Continuity Recessed Safety Designed Input Terminals Built-in Tilt Stand Diode Test



DIGITAL THERMOMETER Model DT35A

Dual Temperature Input
Meets CE Requirements
One Year Limited Warranty
Reads Both °F and °C
Uses Standard K-Type Thermocouple Probe
External Offset Calibration Adjustment
Data Hold
Max Function
Temperature Differential Function
Ergonomically Contoured



DIGITAL VOLTMETER MODEL DM-3A

UL Listed to Both US and Canadian Standards

Meets CE Requirements
One Year Limited Warranty
Overload Protection on all Ranges
Built-In Test Leads
"Booklet Style" Carrying case
Continuity
Auto Power Off
Auto Power Off
Range Hold

DIGITAL PSYCHROMETER



Min/Max Data Hold °F/°C Switch Auto Power Off Reset Button #DP122

A.W. SPERRY INSTRUMENTS INC.



WIRE SORTER

Model WS-6A economically and easily sorts up to 6 single or 6 pair of un-powered wires with or without a known ground path. Connect one clip(s) of the WS-6A colored "Identifier Leads" to one end of cable and the other clip(s) to ground. Touch the Wire Sorter at the other end of cable being identified. LED display instantly identifies matching wire ends or pairs.

#WS6A

FEATURES

- · Quickly identifies un-marked wiring
- · Locates proper wiring in bundled groups
- Works on non-energized lines
- Detects if there is voltage on the line
- · Simple to operate



PHASE SEQUENCE AND OPEN PHASE INDICATOR MODEL PSI-8031

FEATURES

- Dual purpose...indicates Phase Sequence and Open Phase.
- Broad operating range...up to 600v on 3-Phase Power Source.
- Color coded insulators over alligator clips... for instant identity.
- Shock resistant plastic housing...tough and durable
- No exposed metal parts...for greater safety.
- Extremely easy to read...with just a quick glance.
- Palm-size, lightweight...readily portable.

PACKAGING

Packed complete with C-31 Carrying Pouch. Operating Instructions SPB-126 and Warranty Card.



UL LISTED SP152A POCKET SIZE MULTIMETER

FEATURES

- UL listed
- Ruggedized impact resistant case
- Industry standard safety recessed input terminals and shielded banana plugs
- Mirrored scale plate
- Diode protected meter...Prevents damage due to overloads
- · Handy tilt stand/carry handle
- · Battery test function

PACKAGING

Packed complete with TL-56 Test Leads, Two (2) B-1 Batteries, F-1 Fuse and Form #245 Operating Instructions.



Model SP5A

UL LISTED SP5A POCKET SIZE MULTIMETERS

FEATURES

- UL listed
- Safety designed...with recessed test lead connections.
- High impact thermoplastic case
- Mirrored scale plate...eliminates errors due to parallax
- Diode protected meter prevents...damage due to overloads
- Small sized & lightweight...fits easily in hand and pocket
- Extra long probe tips...can be used in many industrial type applications
- Economically powered...by only one 1.5V AA battery
- Perfect for all uses on the job...in the house or for hobbies.



DOUBLE CUT SNIP

Double cut design is ideal for cutting metal pipe or duct. Double cut design removes a curled strip of metal from path with virtually no surface distortion. Double cut also features adjustable taper ground outer blade. Offset handle design aids maneuverability and also protects user's hands.



PART #	LENGTH
4R	8-1/2"

ANDY™ ALUMINUM SNIPS

Strong and Lightweight with Inlaid Steel Blades

Superior quality, heavy duty snips are only 1/3 the weight of steel types, and give many more years of service. Comfortable, sleek contour aluminum handles have reinforcing ribs to duplicate the strength of steel. Handles will not spring when cutting heavy gauges of sheet metal. Inlaid blades are supreme cutlery grade moly steel, electronically heat treated and tem-



pered for continuous use. Precision ground, beveled cutting edges stay sharp longer and make pattern cutting, even circle cuts, an easy job. Blades are resharpenable and also easily replaced when necessary. Metallic gray, baked enamel finish gives these snips a professional look to match their professional standard of performance.

PART #	LENGTH
M12	12"
M14	14"

OFFSET HAND SEAMER

Bends and flattens metal easily, overhead or in confined areas. The Malco Offset Hand Seamer features the same great functional design and compact, rugged construction as the popular S2 model.



PART #	LENGTH
S3	8"

2-IN-1 HAND RIVETER

Polished finish, nickel-chrome plated.

PART #	LENGTH
21N1K	8"



5-BLADE CRIMPER

For joining identical size sheet metal pipes—all round, square and corrugatedfast and easy at the job site. Nickel plated steel.



PART #	LENGTH
C5	9"

SINGLE CRIMPER

One blade crimp is perfectly suited for the corners of downspouts. Handy lock makes tool pocket sized for on-the-job use. Zinc plated steel. Red grips.



PART #	LENGTH
SC1X	8"

OFFSET CRIMPER

Ideal crimping tool wherever you encounter tight working quarters or working overhead. A unique blade design keeps handles offset and keeps hands off work obstacles such as floor joists and underlayments.



HAND SEAMER

Bends and flattens metal easily. Makes permanent, tight fitting seams. Scaled depth marks on jaws are in 1/4" increments. Jaws are drop forged, high impact steel.



PART #	LENGTH
S2	8"

HAND NOTCHER

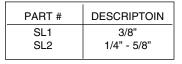
Notcher makes a clean 30° "V" shaped cut in sheet metal. 13/16" maximum throat depth. Upper cutting jaw is drop forged high impact alloy steel.



PART #	LENGTH
N1	8"
N2	8"

SNAP LOCK PUNCHES

Punch impression spaced 3/8" from edge of metal. Heavy forged cutting jaw.







SCRATCH AWLS

Use scratch awls to scribe on metal or pierce holes in wood, plastic, leather - even light gauges of sheet metal. Blades are high carbon, alloy tool steel fully polished to resist rust. Blade tapers to a fine point and may be resharpened many times. Easy-to-spot orange handles are shock and shatter resistant. Shallow fluted handles with large end bearing surface provide a sure, comfortable grip. User has choice of large diameter or regular grip handles. All handles are non-roll design for on-the-job convenience. Blades and handles are joined securely and will give many years of dependable service.

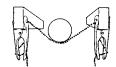
PART #	LENGTH
A0	3"
A1X	3-1/2"
A2	4"



PIPE & DUCT HOLDERS

LIKE AN EXTRA PAIR OF HANDS. Two powerful clamps and four feet of strong 125 lb. tensile strength beaded chain. Set holds any size or shape duct or pipe in place, either between or under joists until it is properly secured. Also ideal for installing fiberglass duct, link chain will not puncture foil skin. Chain locks quickly and easily into top and bottom slots of clamps at 1/2" intervals. Clamp handles are a big 8" long for extra leverage and one hand operation. Both clamps and chain are nickel plated steel.

PART #	LENGTH
2DH	1 PAIR



FLEX DUCT CUTTER

Built-in wire cutter lets you finish the job you started with just one tool! Double edged blade cleanly pierces through outer skin and insulation.



PART #	LENGTH
FDC1	11-7/8"

DIVIDERS

Accurate and fast adjusting. 2 sizes for circles up to 36" and 48". Scribes a thin, accurate line time after time. Nickel plated steel body.

PART #	LENGTH
18	11"
24X	13-1/2"



FOLDING TOOLS

Sturdy tools fold 24 to 30 gauge mild steel. Tools have folding seams for both 3/8" and 1/2" folds. Available in 8" and 12" folding lengths. Handy hang-up hole. Steel seam halves are securely fastened together with permanent welds. Gray metallic baked enamel finish.



PART #	LENGTH
8X	8"
12F	12"
18F	18"
24F	24"

DUCT STRETCHERS

Improved design allows tool to pull duct together from either direction without adjusting the wheels. Use the Duct Stretcher to hold duct in place with one hand while slipping drive cleat in place with other hand. Additional spacing holes allow wheels to he adjusted to span greater distances.

PART #	LENGTH	
DS1	Standard	
DS2	Offset	\$1
DS3	Locking	

HOLE CUTTER

Cuts holes up to 12" diameter in 20 gauge sheet metal. Use with any standard 1/4" electric drill. Cutter pivots on a pro-drilled center hole. Patented shoe feature permits smooth finishing of holes. High speed bearings at top and bottom of drill shaft insure perfect cutting balance and long life of mill type cutting bit. Cast aluminum body. All wearing parts made of special heat treated steel.

PART #	HOLE DIA.
HC1	2"-12"

REPLACEMENT PARTS

PART #	DESCRIPTION
СВ	BIT
HC1B	PIVOT PT.





TOP READING

TORPEDO LEVELS

MAGNETIC BASE

Duplex milled aluminum frame with "cycolac" end plates is lightweight and withstands shock or abuse. Precision cast parallel edges will not scratch work surface. Three large vials — plumb, level and 45°. White vial holders and top read feature facilitate quick, easy reading. Grooved working edge designed for use on pipe and conduit.



PART #	LENGTH
L9M	9"

HAMMERS RIVETING HAMMER

Leather Handles

PART #	WEIGHT
RH4	12 oz.

SHEET METAL HAMMERS Leather/ Wood Handle

PART #	WEIGHT
2SW	18 oz.
SH3	18 oz.



1/8" - 3/16" HOLE PUNCH

ADJUSTS FROM 1/4" to 1-1/8" DEPTHS

PART #	DESCRIPTION
HP18K	1/8"
HPD316	3/16"





HEX HEAD DRIVERS

PART #	DESCRIPTION
HHD1	1/4" Hand Driver
HHD2	5/16" Hand Driver

HEX CHUCK DRIVERS	
Use with Zip-in and Type "A" hex head self-drilling	- Total 100 miles
screws and Bit-Tip drill and tap screws.	

PART #	HEX OPENING	HEX DIA.	NOSE DIA.	O/A LENGTH
MSH-1/4	1/4"	1/4"	7/16"	1-3/4"
MSHL-1/4	1/4"	1/4"	7/16"	2-9/16"
MSHXL-1/4	1/4"	1/4"	7/16"	6"
MSH-5/16	5/16"	1/4"	1/2"	1-3/4"

TOP BUTTON ACTION

UTILITY KNIFE

Die-cast heavy duty model comes complete with 3 surgical quality. extra heavy precision blades that fit all popular models. Safe, easy to operate, thumb action mechanism on top facilitates three cutting positions.





REPLACEMENT **BLADES - 5 PAK**

PART #
CSB5

MINI-KNIFE®







ADJUSTABLE

SHEET METAL SCRIBER

The Malco A60 is pocket size, yet adjustable from 1/4" to 12-1/2" depths. Simply rotate the scriber extension and knob assembly end to end in sleeve holder for larger 6-1/2" to 12-1/2" depth trim lines.

PART #
A60



PRY BARS

HANDY BAR

HB/PB construction gives superior strength, yet is lightweight for less worker fatigue.

PART #	LENGTH
HB15	15"
PB18	18"



WE

TPB1

B BELT	
PART #	DESCRIPTION





2-1/4" WIDE, ADJ. TO 46"

	PART #	DIA.	LENGTH	SHANK / DIA.
	WB1/2	1/2"	6"	1/4"
	WB5/8	5/8"	6"	1/4"
ı	WB3/4	3/4"	6-1/8"	1/4"
ı	WB1	1"	6-1/8"	1/4"
ı	WB1-1/4	1-1/4"	6-1/8"	1/4"
ı	WB1-1/2	1-1/2"	6-1/8"	1/4"
1		1	1	1



TOOL BAGS



Canvas Tool Bags

Durable bags made of one-piece No. 8 white canvas. Bottom and 3" (76 mm) of lower sides are covered with onepiece Naugahyde, cemented and lockstitched. Bottom is protected with steel studs. Mouth has steel frame. Handles are harness leather. All bags have two retaining straps and buckles. Bags are 6" (15 cm) wide. For shoulder strap kit see Cat. No. 5102-18.

Cat. No.	Length	Depth	
5102-18	18" (46 cm)	14" (36 cm)	

MISCELLANEOUS BAGS

Canvas **Zipper Bag**



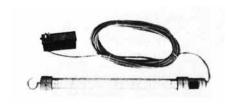
Sturdy whitecanvas bag with strong zipper.

Convenient storage for pliers, wrenches and other tools.

Cat. No. Length 7-1/2" x 12" (19 x 30 cm) 5139

DROP LITES SERIES DROP-LITES





Drop-Lite with 3-Conductor Cord

Heavy-duty construction includes steel swing-open guard with hanger-hook, 3-conductor cord with molded plug cap, push-button switch, convenience outlet, comfortable grip. Bulb not included

Cat. No.	Cord Length	Type	Rating
225DCG	25'	16/3 SJT	13A-125V
250DCG	50'	16/3 SJT	13A-125V

Fluorescent Drop Lite

Provides cool, energy-efficient illumination. Has shatter-resistant shield with a no-glare reflector, instant-starter switch in handle, convenient hanging-hook, grounded plug-in ballast. Furnished with 15-watt fluorescent bulb and 25-ft. 18/2 SJT cord.

Cat. No. Description 825FL Fluorescent drop lite.

TOOL BOXES

HI-VIZ 3-Tier Tool Box

Additional Features:

- Offers maximum space and organization in a compact unit.
- All the storage compartments nest for maximum storage in one compact unit.
- · V-groove in lid to hold conduit or pipe for sawing.
- Top tray has compartments for small tools and parts.
- Tote tray holds larger tools and accessories.
- Tote and top tray have molded handles to carry separately.
- Large tub for big power tools.



54700

HI-VIZ Sit/Stand 3-Tier Tool Box

Additional Features:

- Lid has a no-slip surface and is strong enough to stand or sit on.
- Convenient, adjustable shoulder strap and top handle for carrying.
- Offers maximum space and organization in a compact unit.
- V-groove in lid to hold conduit or pipe for sawing.
- Top tray has compartments for small tools and parts.
- Tote tray holds larger tools and accessories.
- Large tub for big power tools.



54701

Cat. No.	Per Pak	Depth	Width	Heigth	Weight
54700	1,165 cu in.	9"	16-1/4"	12-1/2"	5lbs
54701	4,095 cu in.	13-1/2"	20-3/4"	16-3/4"	13lbs



SIDE-CUTTING PLIERS



High-Leverage NE-Type Side Cutters

Our most popular side cutting pliers. Smooth, streamlined nose with knurled jaws. High-leverage design provides 46% greater cutting and gripping power than regular 8-1/2" and 9-1/4" side cutters. Blue plastic-dipped handles.

Cat. No. D213-9NE



High-leverage design. Rivet is closer to the cutting edge for 46% greater cutting and gripping power than other plier designs.

Cat. No. D2000-9NE

Klein 2000 Series

VA D2000-9NE Same as D213-9NE except with ultra-durable "2000 Series" cutting knives for ACSR, bolts, nails and most hardened wire. Blue plastic-dipped handles.



Standard NE-Type Side Cutters

Smooth, streamlined design. Slides more easily in and out of tool pouch. Plastic-dipped handles.

Cat. No. D201-7NE D201-8NE

DIAGONAL-CUTTING PLIERS



Heavy-Duty Diagonal Cutters with Tapered Nose

Tapered nose and standard-bevel cutting knives. One-inch jaws reach into confined spaces. Plastic-dipped handles.

Cat. No. D220-7

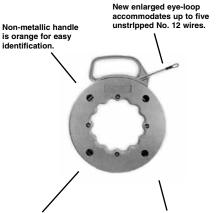


Standard Diagonal Cutters with Tapered Nose

Tapered nose and standard-bevel cutting knives. Available with or without coil spring. Plastic-dipped handles.

Cat. No. D202-5

FISH TAPE



Lightweight, high-impact, high-visibility orange CYCOLAC* REEL.

Four viewports let you see how much tape Is In reel.

Klein-Flex™ Fish Tapes in Convenient Winder Reel

Klein-Flex tape pulls wire through every type of conduit, including aluminum, plastic and "flex". No kinks, no jams, no backups.

LONG-NOSE PLIERS



Standard Long-Nose with Side Cutters

Standard long-nose design with cutting knives at hinge. Permits wrapping, looping, and cutting with a single pliers. Available with or without coil spring. Plastic-dipped handles

Cat. No. D203-6 D203-7



Extra-Slim Needle-Nose

Long, narrow nose and slim hinge for efficient use in extremely close quarters. Finely knurled jaws grip thin wire without damaging it. With coil spring. Plastic-dipped handles.

Cat. No. D335-5-1/2C

REPLACEMENT TAPE



†Klein-Flex Tapes in uncased coils, including replacement tapes for winder reels

Same as tape in reel but with eye-loops on both ends. Three standard lengths; other lengths available on special order.

Cat. No. Length 50050 †50'

Smooth and easy to handle. Enlarged eyeloop accommodates up to five un-stripped No.12 wires. 500-lb. maximum rated load. In 25' and 50' lengths with reel; also available in coiled 25', 50', and 100' lengths without reel.

Klein-Flex Fish Tapes with Reel.

 Cat. No.
 Description
 Reel Dia.

 50150
 50' (15.2 m) in reel
 12"



KLEIN STRIPPERS/CUTTERS

Combination Wire-stripping & Cutting Tools



Wire Strippers-Cutters

Compact, lightweight strippers gauge, cut, strip and loop wire. Spring-loaded, self-opening action. Flat design makes them easy to store and carry. Narrow nose fits into tight places. Strip wire quickly, cleanly, evenly. Strong, hardened-steel with precision-ground stripping holes. Clear gauge markings on both sides. Black oxide finish. Comfortable plastic-dipped handles. Overall length 6" (152 mm).

	Handle	Strips
Cat. No.	Color	AWG Gauges
11045	Yellow	No. 10, 12, 14. 16
		18 solid wire





1. Adjust wire stop for stripping length up to 1".

Automatic Wire Stripper

One light squeeze* strips wire from No. 10 to 22 AWG, up to a full 1" without nicking, cutting or fraying the wire. Operator fatique is reduced by the mechanical lever-action of the unit. Blades also available for 8 to 12 AWG and 16 to 26 AWG, plus three metric blade sizes covering a range of 0.15 mm² to 6.0 mm². In use, a gripper holds wire securely in a centerline position while knife-type stripping blades with form-ground holes cleanly cut insulation. Automatic feature holds jaw open for removing wire without crushing end. Die-cast construction, with comfortable plastic hand grips. Supplied with adjustable wire stop as standard feature, to assure uniform, precise strip length. Overall length is 6-1/2" (17

* For clear nylon-jacketed conductors, two activations are required.

Cat. No. Strips AWG Gauges 10, 12, 14, 16, 18, 20, 22



Insert wire into desired size stripping hole as marked on blade.



 Squeeze handle. Wire Is automatically gripped and stripped with the same motion. Release pressure and jaws automatically open to release stripped wire. For clear nylon-jacketed conductors, two activations are required.

Alligator and General-Purpose Clips Mini-Paks Alligator Clips

Cat. No.	Description
B19310	Four No. 19310 alligator clips.
B19318	Two No. 19310 alligator clips & one
	each No. 19316 & 19317 insulators.
B19311	Four No. 19311 alligator clips.
B19319	Two each No. 59310 & 69310 alligator
	clips.
B19320	Two each No. 59311 & 69311 alligator
	clips.
B19312	Four No. 19312 mini-gator clips.
B19313	Four No. 19313 mini-gator clips.
B19314	Four No. 19314 general-purpose clips.
B19315	Four No. 19315 general-purpose clips.
B19321	Two each No. 19316 & 19317 insula-
tors.	
	B19310 B19318 B19311 B19319 B19320 B19312 B19313 B19314 B19315 B19321



Extra-Capacity Design Plastic-Dipped Handles

Same as series 507, but with plastic-dipped handles. Also available with heavy-duty plastic-dipped handles.

Plastic-Dipped Handles

Cat. No.	Length	Capacity
D507-6	6"	15/16"
D507-8	8"	1-1/8"
D507-10	10"	1-5/16"
D507-12	12"	1-1/2"

HAMMERS

Heavy-Duty Curved-Claw Hammer



Curved claw gives maximum nail-pulling leverage. Polished dropforged, tempered-steel head. High-strength fiberglass shaft keeps head tight. Durable plastic-alloy jacket protects neck from fraying and splintering. Comfortable, perforated neoprene grip bonded to handle.

Cat. No.	Head Weight	Overall Length
818-16	16 oz.	13"
818-20	20.07	13"



KLEIN HEX-KEY WRENCHES



Eight-Key Set: Sizes .050", 1/16", 5/64", 3/32", 7/64", 1/8", 9/64", and 5/32"

Cat. No. 70581 Handle Length 3-1/16" (78 mm) Key Lengths 1-1/2" to 2-3/8" (38 to 60 mm)



Eight-Key Set: Sizes 3/32", 7/64", 1/8", 9/64", 5/32", 3/16", 7/32", and 1/4"

Cat. No. 70583 Handle Length 5-1/4" Key Lengths 3-3/8" to 4-5/8"

5-1/4" 3-3/8" to 4-5/8" (133 mm) (86 to 117 mm)

HEX-KEY WRENCHES

HEX-KEY SETS



L-Style Hex-Key Pouched Sets

Convenient sets of hex keys, packed in press-lock seal-tight vinyl pouches. Keeps wrenches together, keeps dust and dirt out. For detailed hex-key specifications, see individual listings.

Cat. No. Description and Contents LLK12 7-Piece Foot-Long Set

FL5 (5/64"), FL6 (3/32"), FL8 (1/8"), FL10 (5/32"), FL12 (3/16"),

FL14 (7/32"), SL16 (1/4")

T-Handle Hex Keys

Note: 6" and 9" English measure T-handle hex-key lengths are nominal.



Individual T-Handle Hex Keys

T-Handle design delivers more power to hex-head fasteners. Handles have comfortable, molded-in finger grips. Cat. No. and hex size on handle for positive identification. Available in 6" length in both English and metric measure, and 9" blade length English measure.

9" Length (English Measure)

Cat. No.	Hex Size x Blade Length
79206	3/32" x 7-1/4"
79207	7/64" x 7-1/4"
79208	1/8" x 7-1/4"
79209	9/64" x 7-1/4"
79210	5/32" x 7-1/4"

Cat. No.	Hex Size x Blade Length	
79212	3/16" x 7-1/2"	
79214	7/32" x 7-1/2"	
79216	1/4 x 7-1/2"	
79220	5/16" x 7-1/2"	
79224	3/8" x 7-1/2"	

T-Handle Hex-Key Sets with Stand

These sets are made up from the T-handle hex keys listed above: 6" English or metric, or 9" English-measure lengths. They are furnished complete with a rugged metal stand for convenient hanging or storage on a bench or wall.



Cat. No. Description

70153 Set of ten 9" English-measure hex keys

(No. 79206 thru No. 79224), plus metal stand.

SCREWDRIVERS CUSHION-GRIP SCREWDRIVERS



Heavy-Duty Square-Shank, Keystone-Tip

Designed for the most demanding uses. With heavy-duty square shank for wrench-assisted turning. Keystone-tip.

	Shank Tip Width	Overall
Cat. No.	x Shank Length	Length
600-1	1/4 x 1-1/2 (6 x 38)	3-7/16 (87)
600-6	5/16 x 6 (8 x 152)	10-15/16 (278)





Heavy-Duty Round-Shank, Keystone-Tip

Built to handle the tough jobs with ease. Keystone-tip.

	Shank Tip Width	Overall	
Cat. No.	x Shank Length	Length	
602-4	1/4 x 4 (6 x 102)	8-11/32 (212)	
602-6	5/16 x 6 (8 x 152)	10-15/16 (278)	



Round-Shank, Cabinet-Tip

Perfect for electrical and telephone work. Tip is no wider than shank diameter for use in recessed holes and other tight spaces.

Cat. No.	Shank Tip Width x Shank Length	Overall Length
601-4	3/16 x 4 (5 x 102)	7-3/4 (197)



Round-Shank, Special Profilated® Phillips-Tip

Tips are profilated to provide a more consistent geometric symmetry than conventional Phillips-tip screwdrivers. Provide more accurate fit and torque without slippage.

	Point	Shank	Overall
Cat. No.	Size	Length	Length
603-3	No. 1	3 (76)	6-3/4 (171)
603-4	No. 2	4 (102)	8-5/16 (211)



Magnetic Screwdriver Set

Each screwdriver has a powerful magnet built into its shank to hold interchangeable bits and also screws. Interchangeable bits store inside handle for quick access.

	Bits	Shank	Overall
Cat. No.	Included	Length	Length
70035	2 Slotted	3-3/4"	7-1/4"
	No. 1 & 2 Phillips		

PLASTIC-HANDLE, SLOTTED SCREWDRIVERS



3/16-In. Round-Shank, Cabinet-Tip

Medium-duty screwdrivers well-suited for electrical and telecommunications work.

x Shank Length	Length
3/16 x 4 (4.8 x 102)	7-5/8 (194)
3/16 x 6 (4.8 x 152)	9-5/8 (244)
3/16 x 8 (4.8 x 203)	11-5/8 (295)
	x Shank Length 3/16 x 4 (4.8 x 102) 3/16 x 6 (4.8 x 152)



1/4-In. Round-Shank, Keystone-Tip

Fills many job needs with a choice of lengths.

	Shank Tip Width	Overall
Cat. No.	x Shank Length	Length
BD144	1/4 x 4 (6.3 x 102)	7-5/8 (194)
A416-6	1/4 x 6 (6.3 x 152)	9-5/8 (244)
A416-8	1/4 x 8 (6.3 x 203)	11-5/8 (295)

Stubby Screwdrivers

Allows work in close quarters. No. A132 has cabinet tip. No. A135 has keystone tip.





PLASTIC-HANDLE, PHILLIPS-TIP SCREWDRIVERS

Stubby Round-Shank, Profilated® Phillips-Tip

Precision-fitted tips in stubby style for close-quarter work.

Cat. No.	Point	Shank	Overall
	Size	Length	Length
P5	2	1-3/8 (35)	3-5/8 (92)





1/8-In. Round-Shank, Cabinet-Tip

Small-diameter shank for use in recessed holes or tight places.

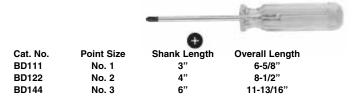
	Shank Tip Width	Overall
Cat. No.	x Shank Length	Length
A216-4	1/8 x 4 (3.2 x 102)	7 (178)
A216-6	1/8 x 6 (3.2 x 152)	9 (228)
A216-8	1/8 x 8 (3.2 x 203)	11 (279)



Profilated Phillips-Tip Screwdrivers – Round-Shanks

Oversized handle is 35% larger than comparable screwdriver handles.

Delivers up to 50% extra power to perform tough jobs with minimum effort.



Keystone-Tip Screwdrivers – Round-Shanks

Oversized handle is 35% larger than comparable screwdriver handles. Delivers up to 50% extra power to perform tough jobs with minimum effort.



Cat. No. Shank Tip Width Shank Length Overall Length BD158 5/16" 10"" 13-3/16"

BULL DRIVER® PLASTIC-HANDLE SCREWDRIVERS

The most powerful screwdrivers you can buy. Over-sized handle is 35% bigger, delivering up to 50% extra power to perform tough jobs with minimum effort and maximum comfort. Bull Driver screwdrivers feature exclusive Comfordome® handle, fully fluted with chamfered edges for fatigue-free driving, plus durable chrome-vanadium tempered-steel shafts and nickel-chrome precision forged and polished blades with black tips.



Square-Shank, Keystone-Tip



	Shank Tip Width	Overall
Cat. No.	x Shank Length	Length
BD284	1/4 x 4	8-1/2
BD286	1/4 x 6	10-1/2
BD306	5/16 x 6	11-3/16
BD308	5/16 x 8	13-5/16
BD310	5/16 x 10	15-3/16

LOCKING PLIERS

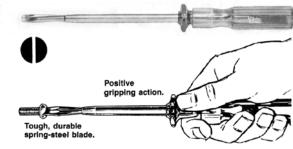


Klein-Lok® Pliers

Versatile 10" locking pliers. Rugged, powerful, a "must" for every tool user. Pliers adjust easily to lock at any size with desired amount of pressure. Release lever opens jaws fully. Can also be used as nonlocking pliers. Top-grade alloy steel; heat treated for maximum strength and durability. Nickel-plated finish.

Cat. No.	Description	
9001	10" (254mm) Straight Jaw Pliers	

SCREW-HOLDING SCREWDRIVERS



Slotted Screw-Holding Screwdrivers

Split-blade screw-holding driver wedges into screw slot. Positive gripping action holds, starts and drives slotted screws in awkward, hard-to-reach places.

	Shank Tip Width	Overall
Cat. No.	x Shank Length	Length
K36†	3/16 x 6 (4.8 x 152)	9-3/4

†Blade thickness of .043" expanding lo .085".



Pocket-Clip Screwdriver

Each screwdriver has a powerful magnet built into its shank to hold interchangeable bits and also screws. Interchangeable bits store inside handle for quick access.

	Shank Tip	Shank	Overall
Cat. No.	Width	Length	Length
A116-3	3/32"	3"	5-7/16"

NUT DRIVERS

PLASTIC-HANDLE HOLLOW-SHAFT NUT DRIVERS

Vaco nut drivers meet or exceed current ANSI and MIL specifications.

Patented shaft construction withstands high torque. Shafts on Vaco drivers are completely hollow, from the socket to the handle, to accommodate the longest stud.

Sockets and shafts are specially heat treated for extra hardness. Exterior surfaces are finished in bright nickel-chrome for durability and corrosion resistance.

Smooth Comfordome® handles fit the palm of the hand perfectly. Exclusive fullsize top with no unfinished seams, no sharp edges to cause fatigue. Handles are break resistant, impervious to most acids and alkalies, and are full-fluted for better grip and driving torque. Edges are chamfered for comfort. Handles are color-coded for easy identification.



Individual 3-inch Shaft Nut Drivers

Cat. No.	Handle Color	Hex Size	Overall Length
S6	Black	3/16"	6-5/8 (168)
S8	Red	1/4"	6-5/8 (168)
S10	Amber	5/16"	6-5/8 (168)
S11	Green	11/32"	6-5/8 (168)
S12	Blue	3/8"	6-5/8 (168)
S14	Brown	7/16"	7 (178)
S16	Red	1/2"	7 (178)



PLASTIC-HANDLE HOLLOW-SHAFT NUT DRIVERS AND SETS



Individual 6-Inch-Shaft Nut Drivers

Cat. No.	Handle Color	Hex Size	Overall Length
S66	Black	3/16"	9-5/8
S86	Red	1/4"	9-5/8
S106	Amber	5/16"	9-5/8
S116	Green	11/32"	9-5/8
S126	Blue	3/8"	9-5/8
S146	Brown	7/16"	10
S166	Red	1/2"	10

Seven-Piece 6-Inch-Shaft Nut-Driver Set

Contains all seven 6-inch-shaft nut drivers above in a reclosable vinyl seal-tight pouch.



Cat. No. VA 89904



Magnetic Nut Drivers

Similar to standard nut drivers but with powerful nut-holding magnet built into shank. Features same quality materials and workmanship as hollow-shaft tools.

	Handle	Hex	Shank	Overall
Cat. No.	Color	Size	Length	Length
S8M	Red	1/4"	3	6-5/8
S10M	Amber	5/16"	3	6-5/8
S86M	Red	1/4"	6	9-5/8
S106M	Amber	5/16"	6	9-5/8

Stubby 1-1/4-Inch-Shaft Nut Drivers



Cat. No.	Handle Color	Hex Size	Overall Length
SS8	Amber	1/4"	3-3/4
SS10	Amber	5/16"	3-3/4
SS12	Amber	3/8"	3-3/4

MEASURING TOOLS

STEEL TAPES



Power-Return Tapes

Easy feed, positive lock and smooth power return. Thumb-action control knob placed for convenient, efficient use. Black numerals on yellow background. For inside and outside measuring. Tough DuPont Mylar coating resists abrasion, rust, most oils and acids; lasts up to 10 times longer than ordinary finishes. Tape graduated on both edges in 16ths, inches and feet. Stud markings indicated. Useful reference tables on reverse side of 10', 12' and 16' tapes. Chrome-plated case. Replaceable blade. Belt clip.

Cat. No.	Length	Width
922-12	12'	3/4"
922-16	16'	3/4"
928-25HV	25'	1"
922-30	30'	1"

Replacement Blades for tapes above

Cat. No.	Length	Width
923-20	20'	3/4"

FOLDING WOOD RULES



Standard Rules

Strong 6' long hardwood rules. Black markings on yellow, with stud center in red. Measurements are marked on both sides and both edges, graduated to 1/16th inch. Markings are imbedded in the wood and have a tough, clear abrasion-resistant coating. Riveted lock joints are designed for long wear and maintained accuracy. All metal parts are brass plated.

Cat. No.	Reading	Width
900-6	Inside	6'
901-6	Outside	6'

Benfield® BENDERS

CONDUIT BENDERS



Klein-Benfield® Benders

Fixed-radius, one-sweep design permits pinpoint precision even by inexperienced users. Has easy-to-read cast-in benchmark symbols and offset-degree scales on opposite sides, plus a countersunk and painted arrow and star to indicate beginning and back-of-bend locations. No. 51201 for 1/2" EMT only, also has 45° bend center-marker and cast-in offset formula in addition to the multipliers.

	For Thinwall	For Rigid
Cat. No.	(EMT) Conduit	Conduit
51201	1/2"	-
51202	3/4"	1/2"

Reciprocating Blades & Hacksaws



RECIPROCATING BLADES

PART #	L x W	TEETH / IN.	RECOMMENDED USES	
656R	6 x 3/4"	6		
156R	12 x 3/4"	6	wood, incl. nail embedded pipe, structural steel &	
956R	9 x 3/4"	6	stainless steel	
676RC	6 x 7/16"	6	wood contours	
606R	6 x 3/4"	6	wood, comp. mat.	
610R	6 x 3/4"	10	wood, non-ferrous metals	
810R	8 x 3/4"	10/14	wood, compositions	
614R	6 x 3/4"	14		
618R	6 x 3/4"	18	heavy ga. metal	
318R	3 x 1/4"	18	Metal under 1/8"	
424R	4 x 3/4"	24	Metal & galvanized	
624R	6 x 3/4"	24	Pipe 18 ga. & under	
636RP	6 x 3/4"	6	Plaster board	
966R	9 x 7/8"	6	Demolition	DEMOLITION
960R	9 x 7/8"	10	Steel; 3/16" - 3/4"	DEMOLITION
650R	6 x 3/4"	10/14	Steel; 1/8" - 1"	HEAVY-DUTY

Hand Saw



Hackmaster® High Tension Hand Hacksaw Frame

With 12" blade. Tension to 28,000 psi. The finest frame you can buy. **PART #20918-4012**

Tri-Fold Saw



Heavy duty aluminum handle with 6" reciprocating saw blade. Locks in 3 positions as well as folding safely into handle.

PART #20992-3636 Wood & Drywall #20933-3618 Metal

Close Quarter Saw



Rigid soild bar construction, cuts where other saws can't. Hardened carbon blade.

PART #20908-908



Hole Saws / Vari-Bits

Bi-Metal

4/6 Vari-Tooth®, Positive Rake 1-1/8" Cutting Depth



PART #	DIAMETER	MANDREL
SH.625	5/8"	
SH.750	3/4"	SHM5514
SH.875	7/8"	SHM5516
SH1.0	1"	SHM5518
SH1.062	1-1/16"	
SH1.125	1-1/8"	
SH1.250	1-1/4"	Any Mandrel
SH1.375	1-3/8"	Below
SH1.500	1-1/2"	
SH1.625	1-5/8"	
SH1.750	1-3/4"	SHM5573
SH1.875	1-7/8"	SHM5545
SH2.0	2"	
SH2.125	2-1/8"	
SH2.250	2-1/4"	
SH2.500	2-1/2"	SHM5573
SH2.625	2-5/8"	SHM5545
SH3.0	3"	
SH3.250	3-1/4"	
SH3.500	3-1/2"	
SH3.625	3-5/8"	SHM5573
SH3.750	3-3/4"	SHM5545
SH4.0	4"	
SH4.125	4-1/8"	
SH4.250	4-1/4"	
SH4.500	4-1/2"	SHM5573
SH4.750	4-3/4"	SHM5545
SH5.0	5"	
SH6.0	6"	



SHM5514 SHM5516 SHM5518 SHM5545 SHM5573

MANDRELS

PART #	SIZE/ IN.	SHANK SIZE
SHM5514	9/16x1-1/2"	1/4" RND
SHM5516	9/16x1-1/2"	3/8" HEX
SHM5518	9/16x1-1/2"	7/16" HEX
SHM5545	1-1/4" x 6"	7/16" HEX
SHM5573	1-1/4" x 6"	5/8" HEX

ACCESSORIES

PART#	SIZE
SHA5500	12" Extension
SHA5511	Mandrel Adpt.

#SHJ92 Journeyman's Kit

A deluxe plumber's kit containing 9 Bi-Metal HSS Hole Saws Covering tap sizes 1/2" to 2" Diameters 3/4" - 2-1/2" SHM5514 & 5545 Mandrels plus 5511Mandrel Adapter.





One Tooth available



Carbide Tipped Heat Resistant Carbide Teeth For use with ceramics or steel

PART #	SIZE/	ARBOR
	IN.	#
30216	1"	
30232	2"	6L
30234	2-1/8"	
30236	2-1/4"	
30240	2-1/2"	
30248	3"	6L
30252	3-1/4"	
30256	3-1/2"	
30258	3-5/8"	
30260	3-3/4"	6L
30264	4"	
30266	4-1/8"	
30268	4-1/4"	6L
30272	4-1/2"	
30276	4-3/4"	
30280	5"	6L
30296	6"	



Vari-Bits

Double fluted cutting surface, no pilot hole necessary.

PART #	HOLE SIZES IN.	CHUCK SIZE	NUMBER OF HOLE SIZES
30881	1/8" - 1/2"	1/4"	13
30883	1/4" - 3/4"	3/8"	9
30886	3/8" - 1/2"	1/4"	2
30887	7/8"	3/8"	1
30888	7/8" - 1-1/8"	3/8"	2
30912	7/8" - 1-3/8"	3/8"	5



Wood Boring Bits

Self-feeding, one peice construction. Cutter blades welded to shank.

PART#	SIZE
WB100	1"
WB112	1-1/8"
WB125	1-1/4"
WB137	1-3/8"
WB150	1-1/2"
WB175	1-3/4"
WB200	2"
WB212	2-1/8"
WB256	2-5/8"

Drill Bits



HAMMER DRILLS

HAMMER DRILLS			
PART #	DIAMETER/	DRILL	
	LENGTH	DEPTH	
H1873	3/16 x 3	1-1/2"	
H1876	3/16 x 6	4"	
H25013	1/4 x 13-1/2	12"	
H2504	1/4 x 4	2-1/2"	
H2506	1/4 x 6	4-1/2"	
H3126	5/16 x 6	4-1/2"	
H37513	3/8 x 13-1/2	12"	
H3756	3/8 x 6	4-1/2"	
H37518	3/8 x 18	16-1/2"	
H37524	3/8 x 24	22-1/2"	
H50013	1/2 x 13-1/2	12"	
H50018	1/2 x 18	16-1/2"	
H50024	1/2 x 24	22-1/2"	
H5006	1/2 x 6	4-1/2"	
H6256-3/8*	5/8 x 6-3/8	4-1/2"	
H6256	5/8 x 6	4-1/2"	
H62513	5/8 x 13-1/2	13"	
H62518	5/8 x 18	16-1/2"	
H3756	3/4 x 6	4-1/2"	
H75013	3/4 x 13-1/2	12"	
H75018	3/4 x 18	16-1/2"	
H7506-3/8*	3/4 x 6	4-1/2"	
H7506	3/4 x 6	4-1/2"	
H8756	7/8 x 6	4-1/2"	
H10006	1 x 6	4-1/2"	
H10013	1 x 13	12"	



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BELL HANGER BITS

PART#	SIZE
BH25018	1/4 X 18"
BH25024	1/4 X 24"
BH25036	1/4 X 36"
BH37518	3/8 X 30"
BH37524	3/8 X 24"

HAMMER TOOLS

COLD CHISEL

PART#	SIZE
CF12	1 x 12"
CF18	1 x 18"

MOTAR REMOVING CHISEL

PART#	SIZE
CM015	11/8 x 18"

BULL POINT

1	PART#	SIZE
	CM12	12"
	CM18	18"

SCALING CHISEL

PART#	SIZE
CS12	2" x 12"
CS18	2" x 18"

JOBBER LENGTH DRILLS SOLID CARBIDE

	SIZE/	OVERALL		
PART #	IN.	LENGTH		
JL.062	1/16	1-1/2"		
JL.078	5/64	1-3/4"		
JL.093	3/32	2"		
JL.109	7/64	2-1/4"		
JL.125	1/8	2-1/4"		
JL.140	9/64	2-1/2"		
JL.156	5/32	2-1/2"		
JL.171	11/64	2-3/4"		
JL.187	3/16	2-3/4"		
JL.203	13/64	3"		
JL.218	7/32	3"		
JL.234	15/64	3-1/4"		
JL.250	1/4	3-1/4"		
JL.281	9/32	3-1/2"		
JL.312	5/16	3-3/4		
JL.343	11/32	4"		
JL.375	3/8	4-1/4"		
JL.406	13/32	4-1/2"		
JL.437	7/16	4-1/2"		
JL.468	15/32	4-3/8"		
JL.500	1/2	4-3/8"		





SPLINE SHANK BITS

PART #	SIZE/	DRILL
	IN.	DEPTH
PB37512	3/8 x 12	6"
PB37518	3/8 x 18	12"
PB50018	1/2 x 18	12"
PB100012	1 x 12	6"
PB100018	1 x 18	12"
PB100023	1 x 23-1/2	17-1/2"
PB100036	1 x 36	30"
PB150023	1-1/2 x 23-1/2	12-1/2"

CENTER PUNCH



SCREW EXTRACTORS



PART#	SIZE
SXS#1-#5	3/32-1/4

TAPCON COMPATIBLE DRILL BITS

PART#	SIZE	
DF1565	5/32 x 5-1/2	
DF1875	3/16 x 5-1/2	

13pc DRILL SET METAL INDEX

PART#	SIZE	
M13	1/16 - 1/4	

^{*}Shank Diameter



Heavy-Duty Pipe Wrenches



The original heavy-duty pipe wrench, known for its serviceability. Replaceable jaws are made of hardened alloy steel. Full floating hook jaw gives instant grip and release. Handy pipe scale and large easyto-spin adjusting nut allow fast, one-hand setting to pipe size. Comfort grip, malleable iron I-beam handle.

Catalog No.	Wrench Size	Cap. In.	Wt. Lbs.
31000	6"	3/4	1/2
31005	8"	1	3/4
31010	10"	1-1/2	1-3/4
31015	12"	2	2-3/4
31020	14"	2	3-1/2

Catalog No.	Wrench Size	Cap. In.	Wt. Lbs.
31025	18"	2-1/2	5-3/4
31030	24"	3	9-3/4
31035	36"	5	19
31040X	48"	6	34-1/4

Aluminum Handle Straight Pipe Wrenches



Aluminum handles make these heavy-duty wrenches almost 40% lighter than similar wrenches with malleable iron handles. Parts are identical to those of RIDGID Straight Pipe Wrenches. Ideal for over head work. Also available with special hook and heel jaws for plastic pipe.

Cat. No.	Model No.	Wrench Size	Capacity	Wt. Lbs.
31090	810	10"	1-1/2"	1
31095	814	14"	2"	2-1/3
31100	818	18"	2-1/2"	3-2/3
31105	824	24"	3"	6
31110	836	36"	5"	11
31115	848	48"	6"	18-1/2

Heavy-Duty Offset Pipe Wrench



These wrenches are just as strong as regular RIDGID heavy-duty wrenches of the same size. Jaw opening parallels handle making these ideal wrenches for fast, easy, one-hand operation overhead or in tight places. Spring suspended hook jaw gives tight grip, fast release. Narrow jaw head fits into close quarters. Adjusting nut turns easily for fast size adjustment.

I	Cat. No.	Wrench Size	Capacity	Wt. Lbs.
l	89440	18"	1/4" thru 2-1/2"	5-3/4

End Pipe Wrenches



Designed with an offset jaw and longer handle swing to ease work in tight places, these wrenches offer the quality features of famous RIDGID Straight Pipe Wrenches: replaceable jaws, full floating hook jaw, easy-spin adjusting nut, pipe scale and malleable iron I-beam handle.

Catalog	Wrench	Cap.	Wt.
No.	Size	In.	Lbs.
31075	E-18	2-1/2	5-3/4

Compound Leverage Pipe Wrenches



Gives you many times the turning power of a regular pipe wrench of equal jaw capacity. Turns frozen pipe or fittings, pays for itself quickly in salvaged fittings alone. Short handle and short turning action are handy in close guarters, on concealed piping, close under floors, against walls or in narrow trenches.

Cat. No.	Model No.	Pipe Capacity	Wt. Lbs.
31380	S-4A	5"	33-1/2



Chain Wrenches Light & Heavy Duty

The design of these rugged wrenches makes it easier to work in extra close quarters...on round, square or irregular shapes. Fast ratchet-like action lets you work from either side. Hardened alloy steel jaws are replaceable. Tempered steel chain is held securely in double lock grips, releases quickly.

Cat.	Model	Capa	acity	Chain	Wt.
No.	No.	Rated	Actual	Length	Lbs.
31310	C-12	2"	4"	15-3/4"	1-3/4
31320	C-18	2-1/2"	5"	20-1/4"	6
31325	C-24	3"	5"	20-1/4"	8
		•	•		

Drop Head Ratchet Threaders



Nos. 12-R Exposed Ratchet

Unusually handy, efficient drop-head dies. Head locks in or releases by pull of ratchet knob. Separate sets of alloy steel chaser dies, quickly removed or reversed for close-to-wall threads. Unless otherwise specified NPT dies are furnished.

Cat. No.	Model No.	Capacity	Wt. Lbs.
36345	00-R	1/2" - 1"	10
36475	12-R	1/2" thru 2"	34-3/4

Drop Head Replacement Dies

12-R Right Hand Thread

- II IIIgiii		14	oo ii iiigiii i	iuiiu ii
PART#	SIZE		PART#	SIZE
37480	1/2"		36940	1/4"
37485	3/4"		36945	3/8"
37490	1"		36950	1/2"
37495	1-1/4"		36955	3/4"
37500	1-1/2"		36960	1"
37505	2"			•

00-R Right Hand Thread



Hatchet & Handles				
PART#	SIZE			
38545	11R			
38555	12R			

Databat & Handlas



Nos. 2-A Heavy-Duty Pipe Cutters

Gives fast, clean pipe cutting by hand or power. Extra long shank protects adjustment threads. Extra large handle for quick, easy



adjustment. Balanced frame of special malleable iron. Equipped with tough blade cutter wheel. Can convert to 3-wheel cutter by replacing rollers with cutter wheels.

Cat. No.	Model No.	Capacity	Wt. Lbs.
32820	2-A	1/8" thru 2"	7-1/4

No. 202 Wide-Roll Pipe Cutter

Featuring extra wide rolls, this
Heavy-Duty Cutter is especially
designed for use with Power
Drives. Wide rolls prevent cock or
wobble of cutter for perfect tracking, cleaner cuts. Capacity 1/8" through 2".



Cat. No.	Model No.	Capacity	Wt. Lbs.
32895	202	1/8" thru 2"	7-3/4

4-Wheel Pipe Cutters

These 4-wheel cutters are designed for work in areas where a complete turn is impossible. No. 42-A has short handle for



use in extra-tight places where only a quarter turn can be made.

Cat. No.	Model No.	Capacity	Wt. Lbs.
32870	42-A	3/4" thru 2"	7

Pipe Cutter Wheels



Cat. No.	Model No.	Туре	For RIDGID Pipe Cutter
33105	F-3	Thin	2-A, 42A, 202

Quick-Acting Tubing Cutters

Model 152 feature a quick-acting design, I-beam construction, hardened wear surfaces and thrust bearing slide assemblies for smooth operation. These cutters are available in models for plastic pipe or metallic tubing.

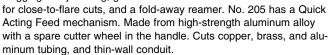


Cat. No.	Model No.	Description/Capacity	Wt. Lbs.
31642	152	1/4" through 2-5/8" O.D.	2

Enclosed Feed Screw Tubing Cutter

Grooved Rollers for Close Flare Cut-Offs

No. 150 and No. 205 feature an enclosed feed screw to eliminate clogging and jamming, grooved rolls



Cat. No.	Model No.	Description/Capacity	Wt. Lbs.
31622	150	1/8" through 1-1/8" O.D.	7/8
33055	205	1/4" through 2-3/8" O.D.	1-3/4

65R-TC Jam-Proof Ratchet Pipe Threaders

True-Centering workholder — sets instantly, flip of lever tightens all 3 jaws together — true threads even on over - or - under size pipe. Easy adjustment for drip threads. TC workholder available for old 65-R's. Threads 1", 1-1/4", 1-1/2" & 2" pipe with 1 set of high-speed dies — sets to correct size in 8 seconds. Jamproof — kicks out automatically — no watching. Right hand only.



Cat. No.	Model No.	Capacity	Wt. Lbs.
36570	65R-TC	1", 1-1/4", 1-1/2", 2"	27
38100	Set of Dies	1" - 2"	

Geared Pipe Threaders

No. 141 for 2-1/2", 3", 3-1/2" & 4" Pipe and Conduit with 1 set of dies.

Jam-proof for safe power or hand threading. Drive pinion kicks out automatically. Just one set of High-Speed dies threads 4 sizes of pipe and conduit. No die sets to change or lose. Die size selector plate sets quickly and locks at desired size.

sets quickly and locks at desired size.
Each adjustment for tapered, straight,
over or under size threads. Fast-action, cam-type. Set screw holds

over or under size threads. Fast-action, cam-type. Set screw holds work centered for true threads. Fully enclosed, protected gear.

I	Cat. No.	Model No.	Description	Wt. Lbs.
	36620	141	With 1 Set of Dies Dies 2-1/2 - 4"	93





No. 300 Power Drive

Lightweight • Heavy-Duty Full 2" Capacity • All-Metal Construction

Ideal for bench, truck or stand mounting. RIDGID Speed Chuck holds tight, forward or reverse...integral foot switch



for safer operation...replaceable jaw inserts...all-metal, one-piece hand wheel...2 tool support bars...1/2 h.p. 115V. Universal, reversible motor. 230 V. motor available at no extra cost. 3-jaw, cam-action, rear centering device keeps pipe straight for true threads and cuts. Capacity 1/8" thru 2" pipe and conduit, 1/4" thru 2" bolts and rod, also plenty of power for geared tools.

Cat. No.	Model No.	Description	Wt. Lbs.
41855	300	Power Drive	85-1/2

No. 1206 Stand for No. 300 Power Drive

When you take your RIDGID 300 Power Drive out on the job, here's just what you'll need for easy portability and time-saving work base. Integral folding legs and tray are extra rigid when opened for use...fold and chain lock closed for easy carrying...no loose parts.



Cat. No.	Model No.	Description	Wt. Lbs.
42360	1206	Stand for 300 Power Drive	29

No. 32 Transporter

Effortless transportation — Rugged 2-wheel Transporter attaches to RIDGID 200 or 300 Power Drive or Tristand Vises in a matter of seconds.



Mfrs. Code No. 785461

Cat. No.	Model No.	Description	Wt. Lbs.
42575	32	Transporter	14-1/4

Bench Chain Vise

Crank handle is anchored to base. Rugged cast-iron base has handy pipe rest and bender. Capacities of 1/8" through 8".



Cat. No.	Model No.	Description	Wt. Lbs.
40185	BC210	Top screw	7-3/4

Accessories for No. 300 Power Drive

No. 811 A Quick-Opening Die Heads

RIDGID Universal Quick-Opening Die Head or No. 815 Self-Opening Die Head snap-locks into carriage quickly, easily...eliminates slow back-off. Single adjustment on carriage centers die heads for true threads.

811-A Dies

PART#	SIZE
47765	1/2" - 3/4"
47750*	1" - 2"
47770	1" - 2"



Cat. No.	Model No.	Description	Wt. Lbs.
97065	811A	Pipe — 1/8" thru 2"	12-1/2
		Bolt — 1/4" thru 2"	

No. 311 Carriage with Lever for No. 300 Power Drive

Slip this strong carriage on your RIDGID 300 Power Drive, with 2 support bars, and you'll get fast cut-and-thread efficiency. Holds die head, cutter and reamer at your fingertips exactly like a Pipe Machine. No tools to drop. Easy sliding...snugs right up to chuck for close threading and cut-off. Die head and cutter operate independently... swings up and stays out of way when not in use. Add a RIDGID No. 819 Nipple Chuck, and you can thread close nipples.

Cat. No.	Model No.	Description	Wt. Lbs.
68815	311	Carriage with Lever	15-1/2

No. 360 Cutter

1/8" through 2" Pipe, 1/4" through 7/8" Rod with No. 1 & 2 Wheels, 5/16" through 1" Rod with E-1032 Cutter Wheel

Full-floating, wheel-type cutter...wide rolls for straight cuts at Pipe Machine speed. Attaches easily with swivel drive pin. Fits 311 Carriage.

Cat. No.	Model No.	Description	Wt. Lbs.
42370	360	Cutter for No. 311 Carriage	8-1/2

No. 312 Carriage Lever

RIDGID No. 312 Carriage Lever gives fast, easy positioning of die head, cutter or reamer...increases leverage for quicker threading and reaming.

Cat. No.	Model No.	Description	Wt. Lbs.
42385	312	Carriage Lever	3-1/4



Pipe Taps Carbon Steel Right Hand Only



Made of special carbon tool steel, taps are available with American Standard (N.P.T.) right hand taper pipe threads.

Cat. No.	Model No.	Size - Threads/Inch	Wt. Lbs.
35815	E-5112	1/8" - 27	1/16
35820	E-5113	1/4" - 18	1/8
35825	E-5114	3/8" - 18	1/4
35830	E-5115	1/2" - 14	1/4
35835	E-5116	3/4" - 14	1/2
35840	E-5117	1" - 11-1/2	1
35845	E-5118	1-1/4" - 11-1/2	1-1/4
35850	E-5119	1-1/2" - 11-1/2	2
35855	E-5120	2" - 11-1/2	3-1/4

Thread Cutting Oil

Finest quality, special purpose sulphurlard cutting oil that cools, speeds metal removal, produces smooth, clean threads, prevents chips from welding to dies. An exactly formulated combination of petroleum oils and special additives. Will not congeal at 20°F. Comparative tests prove the superiority of





RIDGID Thread Cutting Oil. Excellent for drilling, turning and other metal cutting operations but should not be used tor lubricating. Available in Dark and Nu-Clear.

Size Container	Nu-Clear Cat. No.	Dark Cat. No.	No. Per Case	Wt. Lbs. to Case
1 qt.	41565	41590	12	28
1 gal.	70835	70830	6	50

No. 418 Oiler

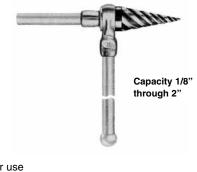
The 418 oiler features a patent pending fastenerless twist and lock that easily locks in place. The material withstands abrasion, is lighter than metal and does not rust.



Cat. No.	Model No.	Description	Wt. Lbs.
72327	418	Hand operated oiler.	2-1/4
		54" hose and fittings	
72332	#4	Hand operated oiler only	1-1/4

No. 2-S Spiral Ratchet Pipe Reamer

Special spiral design of 2-S
Reamer cuts into metal with
least effort — fast, clean cuts,
long cutting life. Makes easy,
time-saving work of reaming
pipe or enlarging conduit box
outlets. Reams sheet metal
— smooth and easy without
chatter. Complete with handle.
Reamer unit available alone for use
in RIDGID No. 00-R ratchet handle.



Cat. No.	Model No.	Description	Wt. Lbs.
34955	2-S	Spiral Reamer Complete	7-1/4

Ratchet Pipe Reamers

Reams fast, clean, with light pressure. Long-taper design won't dig in...safe for Power Drive use. Heat-treated cutting edges stay sharp. Complete with handle. Reamer Units available. No. 2 fits 00-R Ratchet and Handle; No. 3 fits 111-R Ratchet and Handle.



Cat. No.	Model No.	Description	Wt. Lbs.
34945	2	Straight Reamer Complete	7



Midget Tubing Cutters

For up to 15/16" O.D. Tubing in **Extreme Close Quarters**



These tubing cutters are specifically designed for use in extra close quarters on small size hard and soft copper, aluminum, brass and plastic tubing. Two rollers opposite cutter wheel permit easier rotation and faster cutting. Slide and wheel housing are strong and light weight. Large, knurled feed screw knob gives easy control of cutting pressure for cleancuts.

Cat. No.	Model No.	Capacity	Turning Radius	Wt. Lbs.
40617	101	1/4" – 1-1/8" O.D.	2-1/16"	1/2
32985	104	1/8" – 15/16" O.D.	1-11/16" max.	1/4

Hammer-Type Flaring Tools

These hardened steel tools produce uniform flares in all tube including stainless steel. Light weight, hollow construction, transmits full hammer impact to tube.



Cat	. No.	Model No.	Capacity	Wt. Lbs.
41	335	E-52	1" Water Tube	3/4

Swaging Tools

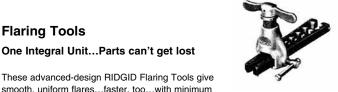
RIDGID Swaging Tools are quality made and zinc plated for accuracy and durability. The set of four tools is packaged in a handy vinyl pouch. Each tool is also available separately. Capacities: 1/4", 3/8", 1/2", 5/8" O.D. For copper, aluminum or brass.



Cat. No.	Model No.	Capacity	Wt. Lbs.
52420	570	Includes-562, 563, 564,	1
	Kit	and 565	

Flaring Tools

One Integral Unit...Parts can't get lost



smooth, uniform flares...faster, too...with minimum effort, even on large sizes. Large, comfort-grip feed screw handle turns easily. Hardened steel flaring cone, eccentrically mounted in precision bearings, produces rolling action for even metal flow...gives uniform flare walls without galling. Flare can then be ironed by continued cone action. Heat treated flaring bars are precision-ground. Tubing hole sizes are clearly marked. Rugged yokes slide to desired size. Yoke clamp screw fits into centering hole...locks bars, yoke and tubing into alignment. Stop pins keep yoke on flaring bars at all times. All Flaring Tools listed immediately below are recommended for soft materials such as aluminum and soft copper. No. 454-W, No. 455 and No. 375 will also flare steel, stainless steel, hard copper and brass. No. 454-W will also flare plastic water tube.

Cat. No.	Model No.	Type	Sizes (in.)	Wt. Lbs.
83037	458	45°	1/8, 3/16, 1/4, 5/16, 3/8, 1/2, 5/8, 3/4	3-1/2

Sledge Hammers

Hickory Handles



	Cat. No.	Model No.	Description	Length	Head Wt.
ı	52495	250	Short Handle Sledge	15-1/2"	2-1/2 lb.

No. 1203 Jab Saw



This rugged saw is extra handy for those hard to get at sawing jobs. Handle is rugged aluminum casting. Backbone and clamping insert are tempered steel. The saw comes equipped with a RIDGID No. 1024-A Hack Saw Blade. However, any make or size, even broken blades, can be used depending on the cutting job.

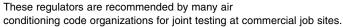
Blade can be used extended for deep cuts. Or, it can be extended and flexed for cuts flush to any surface.

Cat. No.	Model No.	Description	Wt. Lbs.
35995	1203	Jab Saw	3/4

© TurboTorch®

Nitrogen Regulators **Purging Regulators**

TurboTorch offers nitrogen and carbon dioxide purging regulators in easy to read 2"/51 mm gauges. Constructed of forged brass, they are designed for testing and purging brazed joints.



High Pressure Low Pressure Delivery **PART Gauge Range** Gauge Range Range No. P.S.I.G. P.S.I.G. P.S.I.G. 4000 245-03P 600 0-500 1424-009 Replacement Gauge 1424-0381 Replacement Guage





MT1

- MAPP® Gas replacement tank for use with TurboTorch dual fuel hand torches. Also use with TurboTorch #TT-LP Leak
- Contains 16oz. of MAPP® Gas.
- CGA 600 Connection
- Non-Refillable

© TurboTorch®

SWIRL AIR ACETYLENE KITS ACETYLENE TIPS & COMPONENTS



X3B Kit

Flexible kit brazes light/medium gauge steel.

Components:

- AR-B (CGA 520) Regulator
- G-4 Handle
- AH-12Hose
- A-3 Tip
- A-11 Tip
- Soft solders to 3" (75mm)
- Silver brazes to 1-5/8" (40mm)
- "B" Tank Connection
- Instruction Manual



Higher capacity kit brazes medium/ heavy gauge steel.

Components:

- AR-B (CGA 520) Regulator
- G-4 Handle
- AH-12 Hose
- A-5 Tip
- A-14 Tip
- Soft solders to 3-1/2" (90mm)
- Silver brazes to 2" (50mm)
- "B" Tank Connection
- Instruction Manual





SA Snappy Adapter

Screws into Sof-Flame or other threaded handles adapting it to the TurboTorch Quick Disconnect tips. Provides the advantages of TurboTorch at lowest cost.



Acetylene Hose AH12

3/16" I.D. with 3/8" 24-thread LH nuts. G-4 handle, AR-B (CGA-520) & AR-MC (CGA-200) regulators. AH-12,12 ft. (3.6m) hose







*Heat shields available



G-4 TurboTorch Handle

Handle with valve and quick disconnect. Fits all TurboTorch and Proline tips. Uses "OH" replacement O-rings. 3/8"-24 "A" Size 3/8"-24 Hose Connection.



Acetylene Regulators ARB, ARMC

Brass construction, adjustable with contents gauge. AR-B (CGA-520), fits "B" tank & 3/8" 24-thread LH hose nut. AR-MC (CGA-200) fits "MC" tank & 3/8" 24-thread LH hose nut.

	TIP SIZE		GAS FLOW		COPPER TUBING SIZE	
TIP NO.	IN.	мм	@14 PSI FT ³ /HR.	(0.9 BAR) M ³ /HR.	SOFT SOLDER IN.	SILVER IN.
A-3	1/4	6.4	3.6	.31	1/4 – 1	1/8 - 1/2
A-5	5/16	7.9	5.7	.48	3/4 - 1-1/2	1/4 - 3/4
A-8	3/8	9.5	8.3	.71	1 – 2	1/2 – 1
A-11	7/16	11.1	11.0	.94	1-1/2 – 3	7/8 — 1-5/8
A-14	1/2	12.7	14.5	1.23	2 – 3-1/2	1 – 2



Pro-Line Swirl Air Self Lighting Acetylene Tips

	TIP SIZE	GAS FLOW	COPPER TUBING SIZE	
TIP		@14 PSI	SOFT SOLDER	SILVER
NO.	IN.	SCFH	IN.	IN.
PL-12A*	3/8	9	2 – 4	1 – 2



PL-12ADLX-B

*Full kits available PL-12ADLX-B. PL-5A kits available w/ MC fitting.

© TurboTorch®

MAPP® & PROPANE SELF LIGHTING TORCHES

Patented swirl combustion gives you the best burn in a self-lighting package. The flame tube swivels 180° for easy positioning.



Self-Lighting Torch

- · Maximum targeted heat output
- Swirl flame
- · Trigger start self-igniting
- · Piston regulator provides consistent performance
- · Durable cast aluminum housing

PL-5A TurboLite® Self-Lighting Torch



PL-5ADLX-B TurboLite®

Self-Lighting Torch Kit

iurbo 🗸 Lite



- TL-5A Torch
- AR-B Regulator, CGA-520
- AH-12 Hose



TL-5A

HAND TORCHES

MAPP® and PROPANE GASES

STK9 Kit (0386-0403)

Components:

- STK-R Pressure Regulator CGA-600
- ST-3 Tip
- Instruction Manual

OXYGEN-FUEL CUTTING & BRAZING EQUIPMENT

110-01FP



Components:

- 221-05FP Oxygen Regulator CGA-540
- 201-05FP Acetylene Regulator CGA-200
- 103-01FP Handle with Flash Arrestors
- 151-01FP Cutting Attachment
- 163-01P "B" to "A" Adapter
- 000-W-1, 0-W-1 & 2-W-1 Nozzles
- 0-3-101 Cutting Tip
- 252-03P 3/16" A Size x 12-1/2' ft. Twin Hose
- 251-01P Goggle
- 141-01 Carrying Case & Instruction Booklet

PLASMA CUTTER TPC-18 18" Cutting System



Tip paks of 5 availabe

Components:

Output:..... 12 amps fixed 1 Phase, 60 Hz, 20 Amps Cut Capacity:..... 1/8" (3.2mm) Duty Cycle: 30%

Panel Controls: On/Off Lighted Dimensions:.... Height: 10" (254mm) Width: 9" (229mm)

Length: 16" (406mm)

Weight: 63 lb (25Kg) Air from built in air compressor

Electrode to Tip Control: Torch mounted switch Lead Length: 20 ft (6.1m)

BRAZING & SOLDERING ALLOYS







AK1

Brazing Alloys for Maintenance on Steel Products

BF-1 Bronzeflow (0386-0422) (for steel materials other than stainless steel available in 1 lb. or 25 lb. package) Brazing range 1595-1620°F (868-882°C) for low fuming bronze. Ideal for maintenance repairs on plumbing and heating. Tensile strength - 63,000 psi. Meets AWS A5.8, ASTM B-259, Federal QQR571B, MIL-R-19631 B specifications.

Aluminum Brazing Alloy

AK1 (0386-0423) Aluminum brazing alloy rod and flux for aluminum products, even anodized aluminum. Ideal for refrigerant coil and tubing repair. Kit includes rod and self-cleaning flux.

Leak Detectors



TIF8800A

COMBUSTIBLE GAS DETECTOR

The TIF8800 is a highly reliable broad-band combustible gas detector extremely useful as a general purpose tool in any environment where gasoline, propane, natural gas or fuel oil is used. In conjunction with specific carbon monoxide measuring equipment, it is a valuable adjunct in diagnosing heating system problems.

This instrument has many applications such as checking for arson, manholes for safety, faulty and leaking automobile exhaust systems, etc... This instrument provides a unique audible alarm signal that increases to a siren as the gas leak is approached.

FEATURES

- Automatic warm-up
- · Audible "geiger counter" signal
- Adjustable sensitivity
- Cordless operation
- · Low battery indicator
- · Long, flexible probe
- Includes Deluxe Carrying Case

Materials the 8800 will respond to:

HYDROCARBONS

- Methane (natural gas) Ethane
- Propane Benzene Acetylene
- Butane N-Bulane Isobutane
- Pentane Hexane Gasoline
- Toluene Naptha

HALOGENATED HYDROCARBONS

- Methyl Chloride Melhylene Chloride
- Trichloroethane

· Vinyl Chloride

ALCOHOLS

- •Methanol Ethanol Propanol
- Butanol

ETHERS

Methyl Ether

KETONES

- Methyl Acetate Methyl Ethyl Ketone
- Acetone

OTHER COMPOUNDS

- Suffer Dioxide Ammonia
- Hydrogen Sullide Hydrogen
- Toluene Naptha Chlorine

CHEMICALS

- Industrial Solvents Dry Cleaning Fluids
- Lacquer Thinners



Replacement Parts

Sensing Tip...Part #TIF8801

Battery Recharger (115V) Part #TIF8803A

Battery Recharger (220V) Part #TIF8806B

Carrying Case...Part #TIF8804

2 (2.4V) Ni-Cad Batteries Part #TIF8806A

TIF8900A

COMBUSTIBLE GAS DETECTOR

FEATURES

- · Solid state sensor technology, long life and precision
- Broad band of combustible gas detection
- Sensitivity as low as 5 ppm
- Adjustable sensitivity
- Audible "Geiger counter" signal
- LED Leak Intensity Lights
- Automatic warm up
- Cordless operation
- Flexible 16" stainless probe for hard to reach places
- · Rechargeable battery and charger included
- · Rugged custom carrying case
- · Made in the USA

APPLICATIONS:

- · Gas lines and Pipes
- Exhaust and Fuel leaks
- Propane filling stations
- Fuel in marine bilges
- Heat Exchanger leaks
- · Check manholes for safety
- Detect arson residue IAQ tests
- · Liquid or gas fired heating systems







Leak Detectors

TIFH10A

A/C PUMP STYLE REFRIGERANT LEAK DETECTOR

The TIF8500A is a professional grade service tool for accurate measurements of Carbon Monoxide (CO) levels in any environment or application, including ambient, appliance surroundings and furnace flues. The TIF8500A has an industry first, "Voice" feature which allows the unit to actually speak out the measured reading.

FEATURES

- High efficiency pump
- Powered by 115 volts
- Dual sensitivity positions
- Visual indicator in probe
- · Built-in carrying case
- U.S. Patent #'s Re: 32,552



TIF9010A

"SLIMLINE" ELECTRONIC SCALE

The TIF9010 Electronic Scale is a brand new, low cost alternative to current electronic charging meters. Its unique "slimline" design is less than half as thick as current units. With a weight capacity of 75 pounds (34Kg) it will handle a wide range of both standard and recovery cylinders.

The TIF9010 provides a simple means of measuring refrigerant into a system or into a recovery tank. One half ounce resolution and 2% accuracy far exceed that of "bathroom" type scales, currently the only low cost alternative. Compact in both size and price, the TIF9010 is completely portable and designed for tough in-field use. Less than 2 inches thick, under 4 pounds and powered by a single 9V battery the TIF9010 is ready to go anywhere.

FEATURES

- · Designed for both charging and recovery
- Slimline design is ultra compact
- 75 pound (34Kg) maximum capacity
- 1/2 ounce resolution/accuracy
- Two simple controls
- 9V battery powers all functions
- Pounds/Kilograms selectable
- Can be used with ALL refrigerants
- Steel platform
- Independent control module
- Removable lid
- One Year Warranty
- Made in the U.S.A.



Analyzing Equipment



TIF8500A

CARBON MONOXIDE ANALYZER

The TIF8500A is a professional grade service tool for accurate measurements of Carbon Monoxide (CO) levels in any environment or application, including ambient, appliance surroundings and furnace flues. The TIF8500A has an industry first, "Voice" feature which allows the unit to actually speak out the measured reading.

FEATURES

- · Tactile keypad controls
- Protective Rubber "Boot"
- 15" Stainless Probe, with 5' hose
- Field replaceable electrochemical sensor
- Measures level of Carbon Monoxide (CO) in any environment
- Voice feature for audible read out
- Field replaceable electrochemical sensor
- · Rapid warm up
- · Headphones included for high noise areas or for privacy
- · Cordless and portable
- Ranges from 1 10,000ppm with resolution of 1 ppm



TIFVA500

DIGITAL HVAC ANALYZER

The TIF VA500A offers a range of features never before included in a single instrument. More than just an Anemometer, the VA500A measures all HVAC inlet and outlet variables, allowing an intelligent analysis of system performance. This one tool can replace up to four others, and eliminates the need for cumbersome flow hoods, psychrometers, etc. So easy to use, you will be performing complex measurements within minutes of unpacking the tool.

APPLICATIONS:

Ambient Temperature, Inlet and Outlet Temperatures, Cooling Efficiency, Ambient Humidity, Inlet and Outlet Humidity, (De-) Humidification Efficiency, Inlet and Outlet Velocity, System Balancing, Calibrating/Setting Vents, Airflow Measurements, Power Measurements (BTU), System Efficiency (BTU IN vs BTU OUT), System Adjustments, Performance Checks, Fan Adjustments, Blower Performance, Heating and Air Conditioning, Air Circulation and Exchange, Refrigeration, Industrial.

- Measures Temperature (°F) and Humidity (%RH)
- Measures Dew Point (°F)
- Measures Velocity (FPS) and Volume (CFM)
- Measures Power in BTU/HR
- Direct Readings no additional calculations needed
- Allows measurement of rectangular and ROUND GRILLS
- Lightweight and Completely portable
- Three simple keypad controls operate ALL FUNCTIONS
- Low Battery Indication
- Audible and Visual Prompts
- Large 3/4" LCD Readout
- Memory holds cumulative volume (CFM) and power (BTU/HR) measurements
- Six foot connector cord to probe
- 9V Battery Operated
- Protective Carrying Case Included



Temperature Ranges: 23°F to 149°F (-5° to 65°C)
Humidity Ranges: 10-95% RH

Velocity Range: 2.6 to 49.2 FPS (0.8 to 15

m/sec)

Temperature Accuracy: ± 2ºF **Humidity Accuracy:** ± 3% **Dew Point Accuracy:** ± 3% **Velocity Accuracy:** ± 3% of rdg **Temperature Response Time:** < 5 secs **Humidity Response Time:** <10 secs Velocity Response Time: < 3 secs 4 digit 3/4" LCD Display: Coil Cord Length: 72 inches (1.8m)

Operating Temperature: 32°F to 122°F (0° to 50°C)
Power Supply: One 9V Alkaline battery



CLEANING BRUSHES

COPPER TUBE BRUSHES

FOR REFRIGERATION FITTINGS

PART #	SIZE / NOM.
924X	1/4"
925	3/8"
926	1/2"
927	5/8"
928	3/4"
929	7/8"
931	1-1/8"
932	1-3/8"
934	1-5/8"
935	2-1/8"



COPPER TUBE BRUSHES

FOR CLEANING THE OUTSIDE OF PIPE

PART #	SIZE ID / OD
963	1/8" / 1/4"
964	1/4" / 3/8"
965	3/8" / 1/2"
966	1/2" / 5/8"
967	5/8" / 3/4"
968	3/4" / 7/8"
970	1" / 1-1/8"



CONDENSER & HEAT EXCHANGER BRUSHES

BRASS WIRE TUBE BRUSHES SINGLE SPIRAL RECOMMENDED FOR BRASS OR COPPER TUBES

PART #	BRUSH DIA / OD
43602	1/4"
43604	3/8"
43610	1/2"
43616	5/8"
43622	3/4"
43625	13/16"
43628	7/8"





EXTENSION HANDLES

FITS LINE NOS. 43500, 43600 & 43800

PART #	DIMENSIONS
13001	HANDLE
13002	24" w/MALE & FEMALE THREADS
13003	36" w/MALE & FEMALE THREADS
13044	4' ROD FOR 1/4" CONDENSER BRUSHES

ROUND FLUE BRUSHES

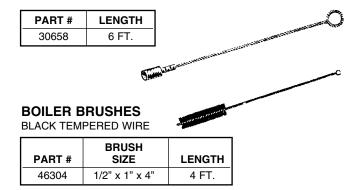
DOUBLE SPIRAL - THREAD NIPPLES

PART #	FLUE SIZE	BRUSH DIA/OD
43312	1-1/2"	1-1/4"
43316	2"	1-3/4"
43322	2-1/2"	2"
43326	3"	2-1/2"
43332	3-1/2"	3"
43336	4"	3-3/4"



FLUE BRUSH HANDLES

TWISTED GALVANIZED, WIRE SEMI-FLEXIBLE WITH 1/4" NIPPLE & COUPLING





Caulking Gun 3985

1/10 gallon, half-barrel with smooth rod and quick release mechanism. Holds most standard cartridges. Use for simple application of glazing, sealants, caulks, and other home improvement compounds. Labeled. 12 to Case.



SCHAEFER BRUSH MANUFACTURING

CLEANING BRUSHES

NEW PARTS CLEANING BRUSH

POLYPROPLYENE BRISTLES

PART #	TRIM	LENGTH	
25010	2-7/8"	12"	



RADIATOR CLEANING BRUSHES

ONE ROW, FLAT LACQUERED WOOD HANDLE GENUINE BLACK HORSE HAIR

PART #	BRUSH LENGTH	OVERALL LENGTH
76020	9"	24"

TWISTED WIRE

PART #	BRUSH DIA/OD	BRUSH LENGTH	OVERALL LENGTH
76221	2-1/8"		
76324	2-1/2"	7"	27"
76524	2-1/2"		





DUCT CLEANING BRUSHES

DOUBLE SPIRAL BRASS WIRE

ĺ	PART #	BRUSH DIA/OD	BRUSH LENGTH	OVERALL LENGTH
ı	76200X	2-1/8"	7"	48"

ACID BRUSHES

TIN HANDLE

PART #	BRUSH WIDTH	OVERALL LENGTH
10002	1/2"	5"



EXTENSION HANDLES

THREADED NIPPLE ON ONE END NIPPLE & COUPLING ON OTHER

PART #	LENGTH
31458	6 FT.

DOPE BRUSHES

ROUND WOOD HANDLE

PART #	BRUSH WIDTH	OVERALL LENGTH	
10007	3/4"	7"	



CONDENSER FIN WHISK BROOMS

SYNTHETIC FIRES

PART #	BRUSH WIDTH	OVERALL LENGTH
2026	3-1/8"	7"



WIRE BRUSHES

WOOD HANDLE

PART #	BRUSH DIA/OD	BRUSH LENGTH	OVERALL LENGTH
81234	4	5"	10"



PLASTIC HANDLE

PART #	WIDTH	BRUSH LENGTH	BRISTLE LENGTH
67243	2"	3/4"	1-3/4"
67245	3"	7/16"	2"

