7 Controls

MANUFACTURERS INDEX, SECTION 7

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 Number	Application	Differential Temperature (F)	Switch Position		Changeover	Color
			System	Fan		
T4039B1008	Fan coil, cooling only	Approximately 2 F at midscale	ON-OFF	HI-MEDLO	—	Tan

T921 Proportional Thermostats

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 mounted

Product Number	Setpoint Temperature Range (F)	Output Signal	Includes
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

Honeywell

T6051 Heavy Duty Line Voltage Thermostats

Heavy Duty Line Voltage Thermostats used to control fan coils, fans, motor starters, valves, contactors, and circulator motors in heating and/or cooling systems.

- Provide good line voltage comfort control. Use with Q651A,B subbases for system and fan switching. Removable setpoint knob locks setpoint and prevents tampering. With locking cover.

Dimensions, Approximate: 5 in. high x 3 1/8 in. wide x 1 5/8 in. deep (127 mm high x 79 mm wide x 41 mm deep)
Electrical Ratings: 120 Vac: 16 AFL, 96 ALR
240 Vac: 8 AFL, 48 ALR
Resistive 22A @ 120 Vac, 19 A @ 277 Vac
Pilot Duty 125 VA
Electrical Connections: Screw Terminal
Voltage: 120 Vac; 240 Vac
Frequency: 50/60 Hz
Sensor Element: Vapor filled dual diaphragm
Color: Plastic cover, tan

Product Number	Application	Temperature Range	Switching Action	Includes	Used With
T6051A1016	Heating and	50F - 80F	SPDT	Locking Cover	Q651A, B Subbases

VisionPRO® 8000 Touchscreen 7-Day Programmable Thermostat

The Touch Screen Universal Programmable Thermostats provide electronic control of 24 Vac heating and cooling systems or 750 mV heating system.

- Large, Clear Display with Backlighting.
- Current temperature, set temperature and time are easy-to-read and all are displayed on the home screen.
- Menu Driven Programming Guides you through the scheduling process, showing only necessary information and choices on each screen.
- Ability to Select Multiple Days allows you to easily customize the thermostat for your unique schedule.
- Real-Time Clock keeps time during power failure; automatically updates for daylight savings.
- Armchair Programming allows you to remove thermostat from wall to set the schedule.
- Precise Temperature Control (±1 F) reliable, consistent comfort.
- Multiple HOLD options allow you to modify schedule indefinitely or for a specific time.
- Change Reminders reminds you to service or replace the air filter, humidifier pad, ultraviolet lamp or thermostat batteries.
- Programmable Fan increases air quality when combined with a whole-house air cleaner.
- Outdoor Temperature Indication (Select Models) shows current outdoor temperature on the display and used for Dual Fuel Heat Pump applications.

Application: Conventional and Heat Pump systems
Dimensions, Approximate: 4 9/16 in. high x 6 in. wide x 1 1/4 in. deep
Color: Premier White®
Programmability: Universal Programming from 7 Day to Non-Programmable
Changeover: Auto or Manual
Setting Temperature Range: Heat: 40 F to 90 F; Cool: 50 F to 99 F
Power Method: Battery or Hardwired
Sensor Element: Thermistor
Mounting: Horizontal

Accessories:

32003796-001 Premier White® cover plate 7 7/8 in. x 5 1/2 in.
C7089U1006 Outdoor Sensor
C7189U1005 Remote Indoor Sensor

Product Number	Switch Positions		Terminal Designations	Stages	Comments
	System	Fan			
TH8110U1003	HEAT-OFF-COOL AUTO	AUTO-ON	R, RC, C, W (O/B), Y, G, S1, S2	Up to 1 Heat/ 1 Cool	Selectable to Heat Only or Cool Only
TH8320U1008	HEAT-OFF-COOL AUTO	AUTO-ON	R, RC, W (O/B), W2 (AUX), Y, Y2, L, E, G, C, S1, S2	Up to 3 Heat/ 2 Cool	Conventional and heat pump systems. The L terminal is an input or output.

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 Recovery™ - 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 C)
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

Product Number	Application	Switch Positions		Terminal Designations	Stages
		System	Fan		
TH4110D1007	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™ 6000 5-1-1 Day 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 Number	Switch Positions		Terminal Designations	Stages	Comments
	System	Fan			
TH6110D1005	HEAT-OFF-COOL-AUTO	AUTO-ON	Rc, R, W (O/B), Y, G, C	Up to 1 Heat/1 Cool	Standard Display

Honeywell

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 gravity
Electrical Ratings: Equipment Interface Module – 18 to 30 Vac, 50 Hz; 60 Hz
Changeover:
Auto/Manual Selectable Currents (Cooling): 1.0 A runningCurrents (Heating): 1.0 A runningCurrents (Fan): 0.6 A runningPower
Method: Thermostat – Battery
Accessories:50002883-001 FocusPRO® 5000/6000 and PRO 3000/4000 Cover Plate Assembly
50007298-001 12 p

REDLINK Wireless Technology

Product Number	Switch Positions		Terminal Designations	Stages	Accessories
	System	Fan			
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

	Product Number	Application	Setting Temperature Range (F)	Switching Action	Includes
*	T498B1512	Electric Baseboard Heat	40 F to 80 F	DPST	Positive OFF, Range stops, locking cover and extra knob decal for recalibration

* TRADELINE models

T822 Thermostat

24 Vac control of heating only systems.
- New Style Look.
- Vented cover for improved temperature sensing.
- Coiled bimetal element operates mercury switch.
- Setting lever and thermometer scale on thermostat face.
- Straight-in wiring capability.
- Mounts directly on the wall or on vertical outlet box.

Dimensions: 4 3/4 in. high x 2 7/8 in. wide x 1 3/8 in. deep.
Electrical Ratings: 20 to 30 Vac
Accuracy: 2 F
Switch Type: Mercury
Switching Action: SPST
Sensor Element: Bimetal
Mounting: Vertical Mounting

Accessories:
209649A Taupe Universal cover plate, 7 3/8 in. x 5 3/4 in. including screws and adapter plate
209650A Premier White Universal cover plate, 7 3/8 in. x 5 3/4 in. including screws and adapter plate

Product Number	Application	Color	Terminal Designations	Stages	Setting Temperature Range (F)	Anticipator (heating)	Anticipator (cooling)	Includes
* T822D1032	Heating only control in low	Taupe	R, W	1 Heat	55 F to 95 F	0.18 to 1.0A Adj.	—	Positive OFF

* TRADELINE models

T834 Thermostat

Thermostat for low voltage control of single-stage heating, cooling or heating-cooling systems.
- New Style Look.
- Integral switches control system and fan switching.
- Mount directly on wall or vertical outlet box using mounting plate to prevent electrical shorts.

Dimensions:: 2 7/8 in. high x 4 3/4 in. wide x 1 5/16 in. deep
Electrical Ratings: 20 to 30 Vac
Setting Temperature Range: 55 F to 95 F
Changeover: Manual
Stages: 1 Heat/1 Cool
Accuracy: 2 F
Switch Type: Mercury
Switching Action: SPDT
Sensor Element: Bimetal

Accessories:
209649A Taupe Universal cover plate, 7 3/8 in. x 5 3/4 in. including screws and adapter plate
209650A Premier White Universal cover plate, 7 3/8 in. x 5 3/4 in. including screws and adapter plate

Product Number	Color	Mounting	Switch Positions		Terminal Designations	Anticipator (heating)	Anticipator (cooling)
			System	Fan			
T834C1137	Taupe	Vertical Mounting	HEAT-OFF-COOL	AUTO-ON	R, W, Y, G	0.18 to 1.0A Adj.	fixed 24 to 30 Vac; O to 1.5 A fixed

Honeywell

TS86A Powerpile Thermostat

The Round® PowerPile Thermostat for control of automatic, selfpowered gas heating systems. Use only with a millivoltage pilot generator.

- Includes heating-only wallplate and cover plate for covering old thermostat mounting marks.
- Temperature scale in Fahrenheit on thermostat
- Mounts using captive mounting screws included with thermostat.

Dimensions, Approximate: 3 1/4 in. diameter x 1 1/2 in. deep.
Color: Taupe
Stages: 1 Heat
Electrical Ratings: .1A at 750mV
Setting Temperature Range: 40 F to 90 F
Accuracy: 2 F
Switch Type: Mercury
Sensor Element: Bimetal
Mounting: Round

Product Number	Application	Terminal Designations	Anticipator (heating)	Switching Action
TS86A1371	750 mV	R, W	750 mV only	Dust proof mercury switch.

Y8150 Fresh Air Ventilation

The Y8150 Fresh Air Ventilation System provides fresh air to a home. The control operates a fresh air intake damper and, when necessary, activates the main HVAC blower to efficiently meet ASHRAE ventilation rates.

- Designed to help meet local ventilation codes and standards, including ASHRAE 62.2-2003 standard, Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings.
- Microcontroller optimizes the air delivery schedule to make efficient use of normal HVAC run times.
- Easy-to-use input dials allow customized ventilation for each installation.
- back to installer to confirm that air delivery requirements of selected ventilation standard are being met.
- Economical supply-only ventilation; works with forced air system.
- Can be used with other equipment, such as an HRV/ ERV, for balanced ventilation.

Product Number	Characteristics	Airflow Capacity	Amp Draw	Used with
Y8150A1009	Includes W8150A Fresh Air Ventilation Control, EARD6 normally closed 6 inch damper, AT120B 120Vac/24Vac 20VA transformer, mounting hardware for control	50 to 160 cfm	.6 A	EARD6; ER200B; ER200C; ER150C; ER150B; HR200B; HR150B

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 wallplate assembly with positive off.
137421K 3 terminal heat only wallplate assembly.
137421R 3 terminal heat only wallplate 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 raised markings. A click at each 2 degree setpoint change	137421R Wallplate, 6 in. cover ring and switch position labels.
T78K1007	White	R, W, Y	40 F To 90 F	1 Heat	Mercury Free	
T87N1000	White	R, R_c, W, Y, G O, B	40 F To 90 F	1 Heat/ 1 Cool	Mercury Free	
T87N1026	White	R, R_c, W, Y, G O, B	40 F To 90 F	1 Heat/ 1 Cool	EASY-TO-SEE model with Large raised markings. A click at each 2 degree setpoint change	6 in. cover ring and switch position labels

Honeywell

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.

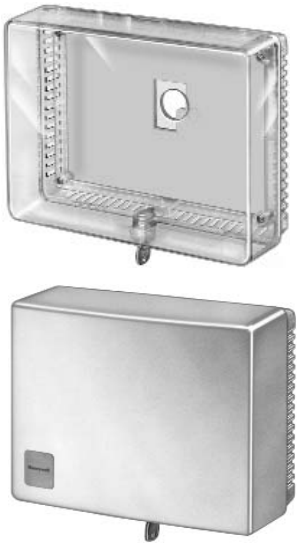
- Unique double-wall construction provides extra measure of tamperresistance.
- Used in both new and existing applications.
- Constructed of opaque polystyrene, clear acrylic, or beige painted steel.
- Includes opaque polystyrene wallplate, ring base, guard cover, tumbler lock, two keys and optional 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 Number	Size	Color	Ring Base Color	Wallplate Color	Used With
TG512A1009	large	Clear Acrylic	clear plastic	Opaque Polystyrene	T8600, T8090, Others of similar size
TG512B1007	large	Opaque polystyrene	opaque polystyrene	Opaque Polystyrene	T8600, T8090, Others of similar size

TG587 Thermostat Guard

Protects T87F thermostats and subbases against tampering, damage and unauthorized adjustment of settings.

- Helps maintain desired settings for top system performance.
- Black and satin chrome finish complements any interior decor.
- Thermostat must be mounted on Q539 subbase or three terminal wallplate.
- Includes cover, guard ring and two keys.
- Requires key for removal.

Outside Height: 2 in.
Outside Diameter: 4 1/32 in. diameter
Outside Depth: 2 in.

Accessories:
4074CAS Keys (set of 2)

Product Number	Color	Description	Used With	Includes
TG587F1008	Black with Satin chrome	Thermostat Guard for T87/Q539 with see-through face	T87F/Q539 Only	Key Lock cover with window
TG587F1016	Black with Satin chrome	Thermostat Guard for T87/Q539 without opaque window	T87F/Q539 Only	Key Lock cover without window

Honeywell

CONTACTORS

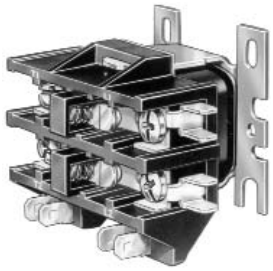
Definite Purpose Contactors – 1 and 2 pole

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-connects

Approvals:
Underwriters Laboratories, Inc. UL Component Recognized: File No. 14480, Guide No. NLDX2



Product Nimber	Contact Electrical Ratings (AFL @ 277, 480, 600 Vac)	Contact Electrical Ratings (Resistive @ 277, 480, 600 Vac)	Dimensions, Approximate (inch)	Poles	Coil Ratings Voltage	Electrical 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

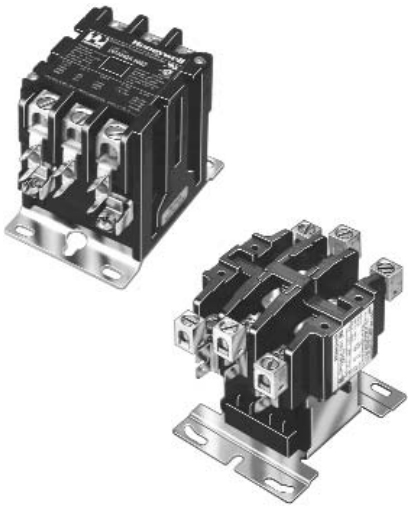
Definite Purpose Contactors – 3 pole

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

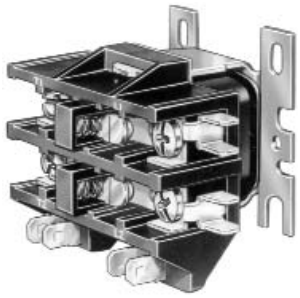
Approvals:
Underwriters Laboratories, Inc. UL Component Recognized: File No. 14480, Guide No. NLDX2



Product Nimber	Contact Electrical Ratings (AFL @ 277, 480, 600 Vac)	Contact Electrical Ratings (Resistive @ 277, 480, 600 Vac)	Dimensions, Approximate (inch)	Poles	Coil Ratings Voltage	Electrical 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.

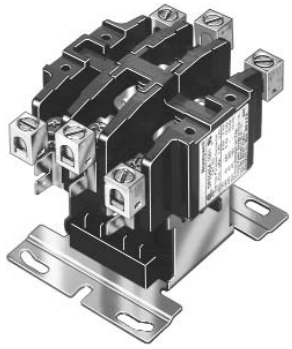
- Silver cadmium oxide contacts provide long life under demanding duty cycles.
- Low profile design allows for more wiring room.
- Multiple mounting holes and slots for convenient, interchangeable mounting with most competitive devices.

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

Product Nimber	Contact Electrical Ratings (AFL @ 277, 480, 600 Vac)	Contact Electrical Ratings (Resistive @ 277, 480, 600 Vac)	Dimensions, Approximate (inch)	Poles	Coil Ratings Voltage	Electrical 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

Product Nimber	Contact Electrical Ratings (AFL @ 277, 480, 600 Vac)	Contact Electrical Ratings (Resistive @ 277, 480, 600 Vac)	Dimensions, Approximate (inch)	Poles	Coil Ratings Voltage	Electrical 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

Honeywell

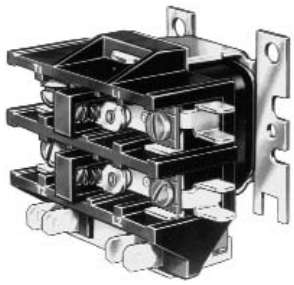
R8246 Electric Heat Contactor

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 C)
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

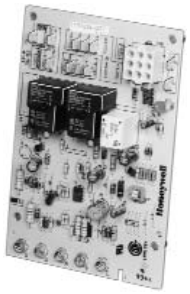
ST9103 Electronic Fan Timers

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



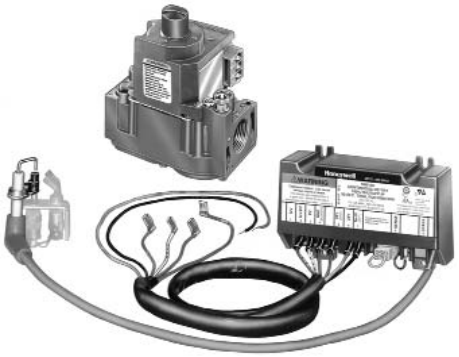
Product Number	Heat Fan OnDelay	Heat Fan Off Delay	Cool Fan On Delay	Cool Fan Off Delay	Ambient Temperature Range (F)	Replaces
ST9103A1002	adj. 60, 90, 120, 150 (set at 150 sec) 50/60 Hz	adj. 60, 90, 120, 150 sec (set at 150 sec)	fixed 0 sec	fixed 0 sec	-40 F to +150 F	ST9103A1002

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

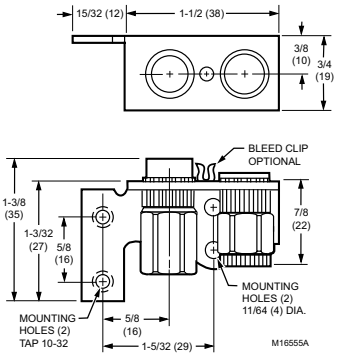
Nonprimary-aerated, insert orifice type pilot burner for main burner ignition with Q340 or Q390 Thermocouple for Pilotstat safety control operation.

- 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.

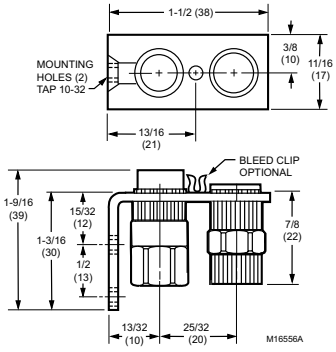
Type of Gas: Natural
Aeration: Non-primary

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.	A	Single	(L) Left	BCR-18 (0.018 in.)	1/4 in. CC inlet fitting
Q314A4586	—	1/4 in.	B	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.	B	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.	B	Single	(K) Right	BCR-18	Special mounting bracket with screws to convert bracket from from “B” to “A”

Honeywell

S8610; Intermittent Pilot Modules

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 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
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.

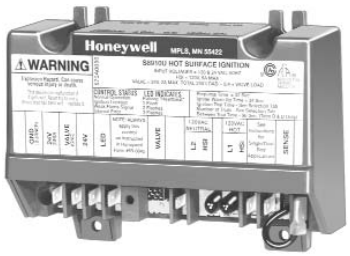
Application: Provide electronic control of intermittent pilot ignition systems used on gas fired furnaces, boilers, and other heating appliances.
Dimensions, Approximate: 3 15/16 in. high x 5 7/16 in. wide x 2 5/8 in. deep (102 mm high x 138 mm wide x 67 mm deep)
Type of Gas: Natural or LP
Electrical 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 Modules

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

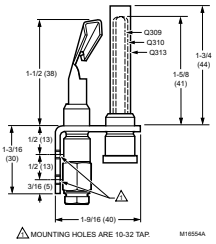
Honeywell

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



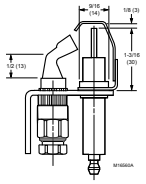
Product Number	Compression Fitting Size	Mounting Bracket	Tip Style	Includes
Q327A1626	1/4 in.	B	Batwing	Natural gas orifice, lp gas orifice, 1/4 in. cc inlet fitting

Q345 Igniter-Burner

Nonprimary-aerated combination pilot burner and igniter. 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.	B	Single	(F) Front	BCR-18 (0.018 in.)	1/4 in. cc inlet fitting and mounting adapter
Q345A1313	1 1/4 in.	B	Single	(L) Left	BCR-18 (0.018 in.)	1/4 in. cc inlet fitting and mounting adapter
Q345A1321	1 1/4 in.	B	Single	(K) Right	BCR-18 (0.018 in.)	1/4 in. cc inlet fitting and mounting adapter

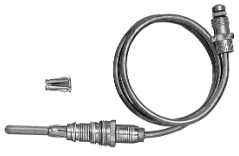
Q313 Replacement Thermopile Generators

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

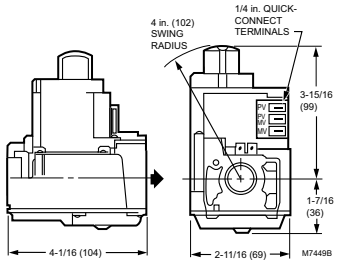
Universal electronic ignition combination gas control for use with direct spark ignition, hot surface ignition or intermittent pilot ignition in 24 Vac, gas-fired appliances, with capacities from 30 to 415 cfh.

- 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 valve.

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 maximum

Mounting: 0 to 90 degrees in any direction from the upright position of the gas control knob, including vertically.

Dimensions Diagram



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.

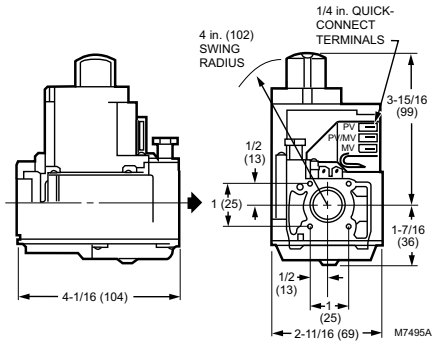
VR8200 Continuous Pilot Dual Automatic Valve Combination Gas Controls

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.

Dimensions Diagram



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.

Honeywell

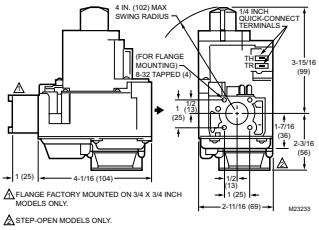
VR8300 Continuous Pilot Dual Automatic Valve Combination Gas Control

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 tapping; 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

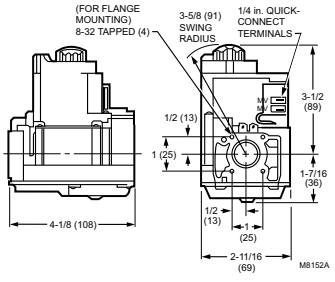
VR8205 Direct Ignition Dual Automatic Valve Combination Gas Controls

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 minimum; 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.

Dimensions Diagram



Product Number	Type	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.

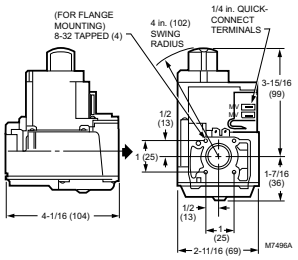
VR8305 Direct Ignition Dual Automatic Valve Combination Gas Control

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.

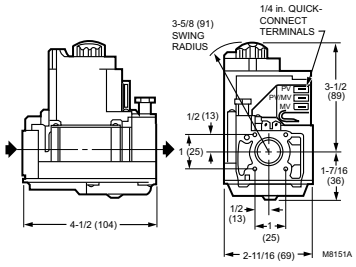
VR8204 Intermittent Pilot Dual Automatic Valve Combination Gas Controls

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.

Dimensions Diagram



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	—

Honeywell

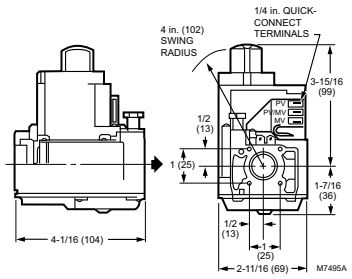
VR8304 Intermittent Pilot Dual Automatic Valve Combination Gas Control

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.

Dimensions Diagram



Product Number	Type of Gas	Type	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

V400

V800

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 vertically.

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	1/2 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

Honeywell

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 shutoff.
- 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. (ft^3/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 Low limit	—	10 F fixed	-30 F	3 in.	3/4 in. - 14 NPT	3 in. 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.

Capillary 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

Product Number	Electrical Ratings						
		(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

Honeywell

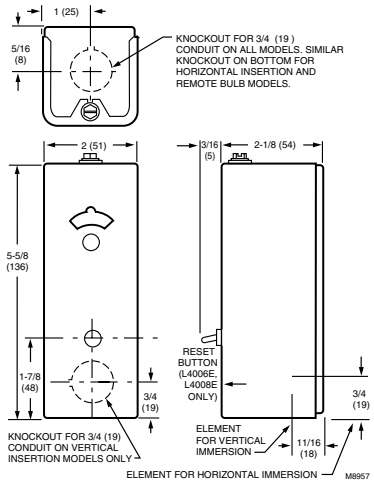
L4006; L6006 Aquastat® Controller

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

Dimensions Diagram



Product Number	Application	Operating Temperature Range (F)	Differential Temperature (F)	Switching Action	Mounting	Insulation Depth (inch)	Spud Size (inch)	Includes
L4006A1678	High or Low limit	100 F to 240 F	5 F to 30 F adj.	SPST, contacts break on temperature rise.	Horizontal or Vertical Mounting	3 in.	3/4 in. NPT	3 in. 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 conductive 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:

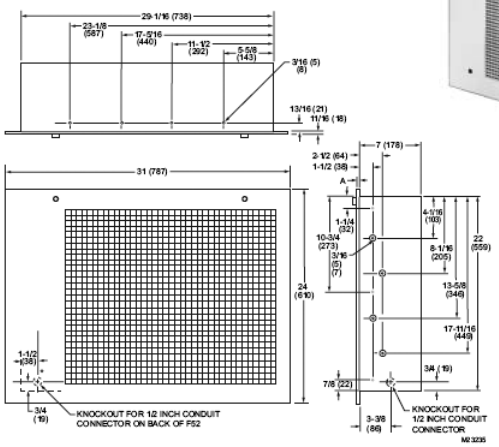
Canadian Underwriters Laboratories, Inc.
Listed: Guide No. XAPX7.
Underwriters Laboratories, Inc. Listed: File No. E4436, Guide No. XAPX

Product Number	Electrical Connections (Control Circuit)	Coil Ratings		Contact Electrical	Electrical Ratings Primary Voltage	Ratings: Switching Action	Includes
		Voltage	Current	120 Vac AFL			
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).

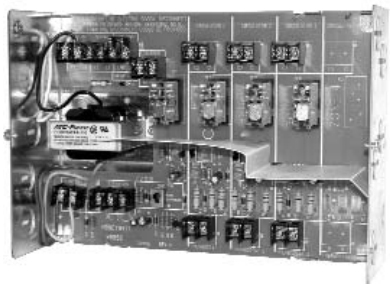
. Removes airborne particles from the air circulated through it.
. Electronic cells can be washed easily.
. Neon light shows that air cleaner is operating.
. Wiring consists of simply connecting air cleaner to power source.
. Solid state power supply is energized by an airflow switch; no interconnection 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.



Product Number	Dimensions (in.)	Air Flow Max. Capacity (cfm)	Electrical Ratings
F52F1048	20 x 12-1/2	1000	120 Vac .4amps 60Hz

Honeywell

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: 0.15 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.	4 Zone, Expandable	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, electro-mechanical 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.

Honeywell

RA889A Switching Relay

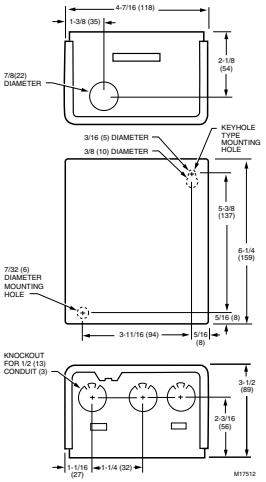
The RA889A Switching Relay with 24 V controller provides intermediate switching of line- and low-voltage devices from a line- or low-voltage controller and is typically applied in Hydronic heating systems.

- 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



Product Number	Contact Electrical Ratings			Electrical Ratings: Primary Voltage	Switching Action	Description
	Contacts Maximum Connected Loaded (120-240 Vac)	120 Vac AFL	120 Vac ALR			
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.

Honeywell

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 straight-through, 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 Number	Pipe Size (inch)	Pipe Size DN	Connection Type	Capacity (Cv)	Maximum Closeoff Pressure (psi)	End Switch	Electrical 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 nominal.
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

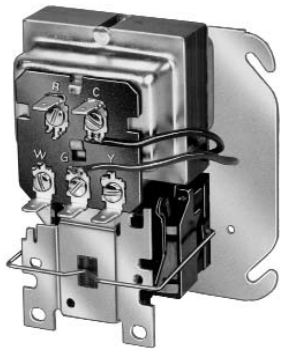
R8285 Fan Center

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

Honeywell

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

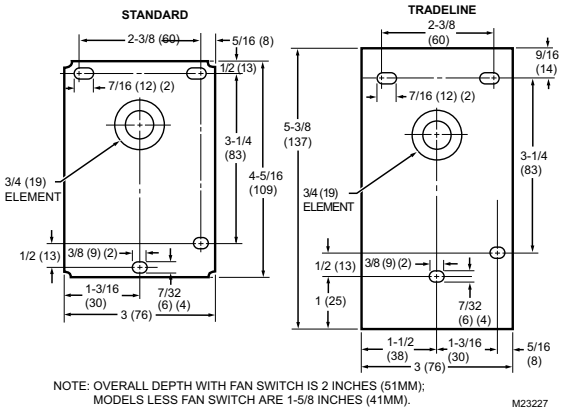
Approvals:

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).

M23227

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.

•Shuts off the fan when air temperature is indicative of fire.
•Internal snap-acting switch actuated by a bimetal-strip inserted directly into the air stream responds rapidly to tem perature changes.
•Requires manual reset.

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

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

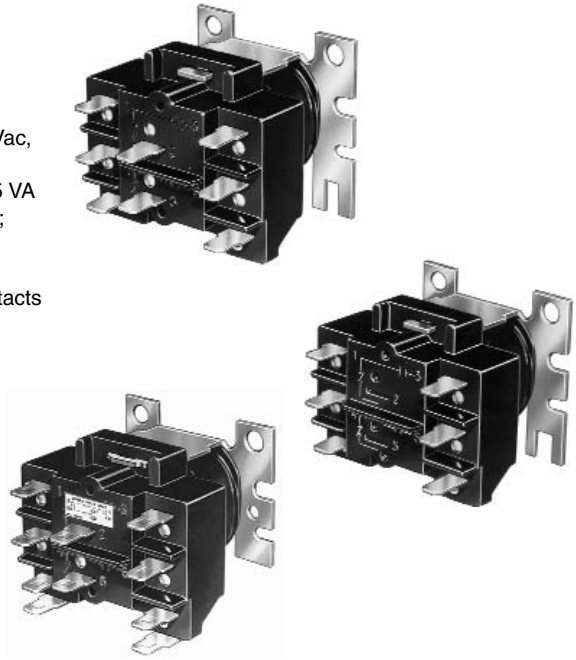
Provide heavy duty switching for refrigeration and air conditioning equipment, appliances, vending machines and similar applications.
- Molded terminal numbers and circuit diagram on top of relay provide easy identification for wiring and checking system operation.
- Untaped coil assures cooler operation.
- 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

Honeywell

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 Number	Electrical Ratings, Contacts	
	(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;

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

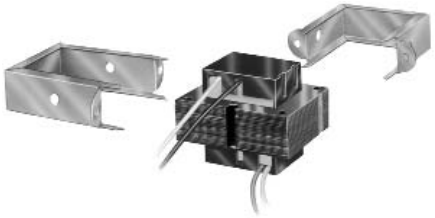
Product Number	Description
Q633A1007	Plate Mounted Relay Receptacle

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.
- 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.

Product Number	Dimensions, Approximate (inch)	Electrical Ratings			Mounting	NEMA Rating
		Primary Voltage	Secondary Voltage	Output		
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 x 2-3/16in. deep	120 Vac	26.5 V.O.C.	24 Vac at 40 VA	Channel Frame Mounting allows for Direct, Horizontal, or Vertical Foot mounting.	NEMA type D

Honeywell

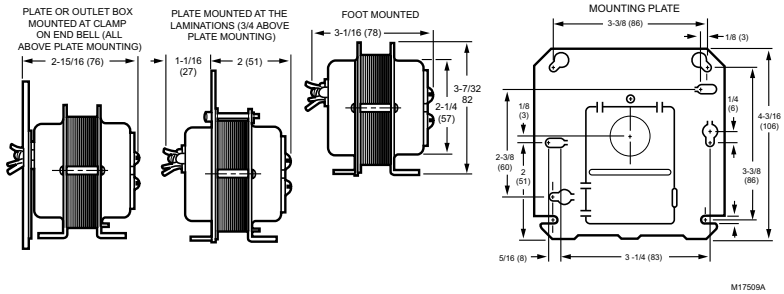
AT72 NEMA Standard Transformer

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

Dimension Diagram



Product Number	Dimensions, Approximate (inch)	Electrical Ratings			Mounting
		Primary Voltage	Secondary Voltage	Output	
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.

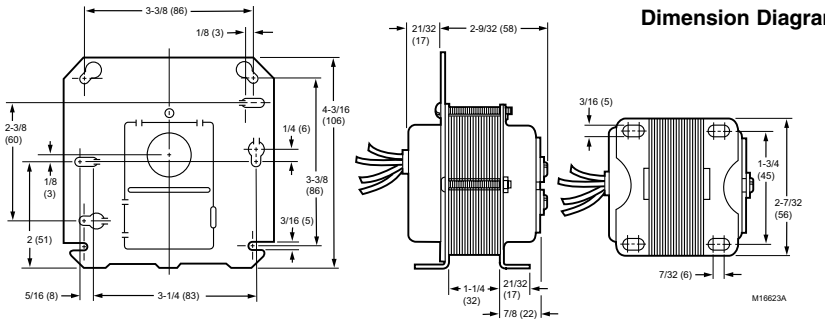
AT87 NEMA Standard Transformer

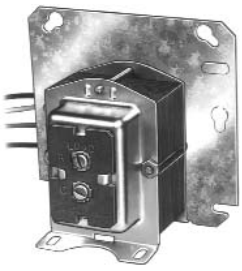
Used primarily for powering 24V air conditioning circuits. Can also be used in other applications that do not exceed the listed ratings.

- 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

Dimension Diagram



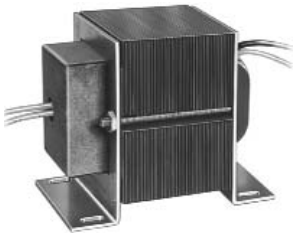


Product Number	Electrical Ratings			Mounting	Includes
	Primary Voltage	Secondary Voltage	Output		
AT87A1106	120 Vac, 208 Vac, 240 Vac	26.5 V.O.C.	24 Vac at 50 VA	Foot mounted or 4x4 in plate.	Built-in protection. Primary winding burnout.
AT87A1155	480 Vac	26.5 V.O.C.	24 Vac at 48 VA	Foot mounted	Energy limiting overload protection

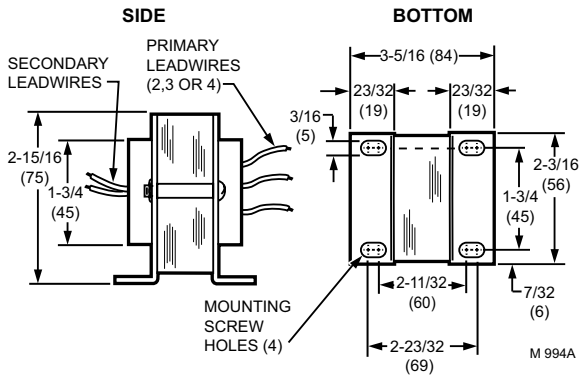
AT88 Transformer

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.



Dimension Diagram



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

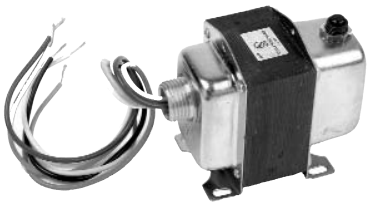
Approvals:
Canadian Standards Association: Certified
Underwriters Laboratories, Inc. UL Component Recognized.

Product Number	Electrical Ratings			Mounting	Includes
	Primary Voltage	Secondary Voltage	Output		
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

	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

Product Number	Dimensions, Approximate (inch)	Electrical Ratings			Mounting	Includes
		Primary Voltage	Secondary Voltage	Output		
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.

Honeywell

AT140; AT150A,B; AT175A General Purpose Transformer

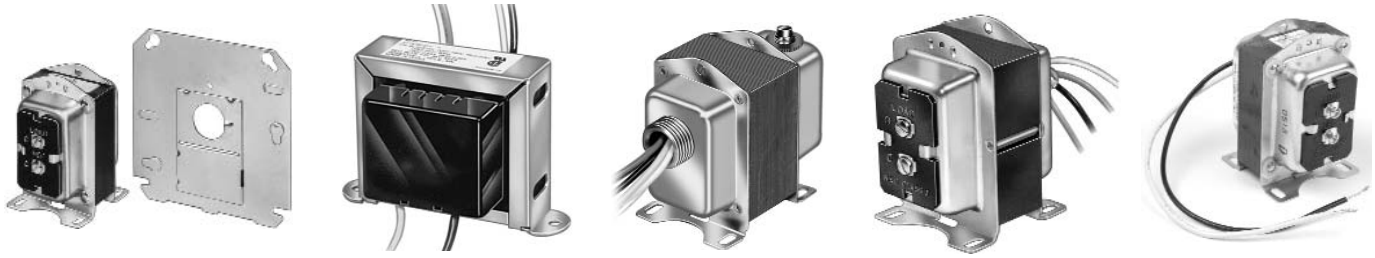
Provide power to 24 Vac circuits in heating/cooling control systems. Intended for use in systems with predictable, uniform loads. Can be used in any application that does not exceed the listed ratings.

- 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

Product Number	Electrical Ratings			Mounting	Includes
	Primary Voltage	Secondary Voltage	Output		
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

Honeywell

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

Product Number	Pipe Size (inch)	Pipe Size DN	Connection Type	Capacity (Cv)	Operating 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.

Dimensions, Approximate: 4 11/16 in. high x 2 15/16 in. wide x 2 1/8 in. deep
Mounting: Wall mounted
Temperature Range: 50 F to 125 F
Differential: 4% to 6% RH
Voltage: 24 Vac; 120 Vac; 240 Vac

	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

Honeywell

T6031A Refrigeration Temperature Controller

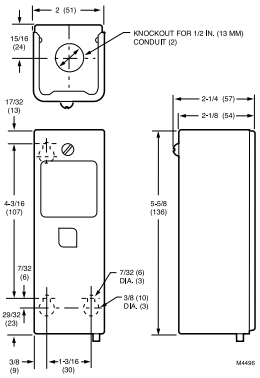
Provide limit or temperature control in refrigerated areas where remote mounting of sensing element is required.

- 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



Product Number	Bulb Size (inch)	Capillary Length (ft)	Temperature			Switching
			Setting Range (F)	Differential (F)	Maximum Operating (F)	
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

Product Number	Temperature				Capillary Length (ft)	Bulb Size (inch)	Output	Sensor Element	Includes	Comments
	Setpoint Range (F)	Differential (F)	Maximum Operating (F)	Interstage Differential (F)						
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 temperature

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	Differential Setpoint Range (F)	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' Outdoor 30'	1/2 in. diameter x 4 3/16 in. long	-----	Copper 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: Gray
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

Product Number	Temperature Setpoint Range (F)	Temperature 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 24Vac.

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

Honeywell

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.

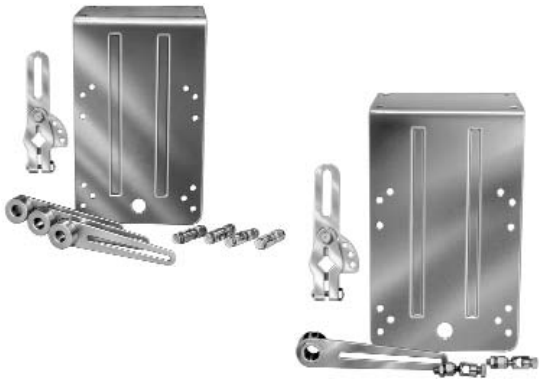
Used with Actuator: Modutrol Motor
Stem Force Rating: 80 or 160 lbf
Ambient Temperature Range: -40 F to +150 F

Accessories:

220829BCQ1 Barber-Colman Valve Adapter Kit
220829JCQ1 Johnson Control Valve Adapter Kit
220829LGQ1 Landis and Gyr Powers Valve Adapter Kit
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 to water or steam valve	Motor bracket, damper arm, motor crankarm, and 2 ball joints
Q605E1050	—	Damper-Linkage including Damper arm, motor crankarm, and 2 ball joints- Connects Modutrol motor to water or steam valve.	Damper arm, motor crankarm, 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: Electric**Fail 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; 90° to 160°	Dependent on wiring (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)	—

Honeywell

M6285 Floating Modutrol IV™ Series 2 Motors

These Series 62 Modutrol IV Motors are spring return floating control motors. Use these motors with controllers that provide a switched spdt or floating output to operate dampers or valves. These motors also have an internal electrically isolated feedback potentiometer that provides indication of the motor shaft position and can be used for slaving Series 90 Motors or rebalancing an external control circuit.

- Replaces M945B,C,G,K,L,AD Motors.
- Integral spring return returns motor to normal position when power is interrupted.
- 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).
- Spring return motors can operate valve linkages form 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).
- 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.
- Include electrically isolated feedback potentiometer that provides shaft position indication.
- TRADELINE models have linear feedback, configurable for slaving Series 90 Motors.

Application Type: Electric
Fail Safe Mode: Spring Return
Control Signal: Floating
External Auxiliary Switches Available: Yes
Feedback: Yes
Electrical Connections: Quick-connect terminals
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)
M6285A1005	60 lb-in.	24V	30-60 sec	0	Adjustable; 90° to 160°	Dependent on wiring (normally closed)

M9164; M9174 Modutrol IV™ Series 2 Motors

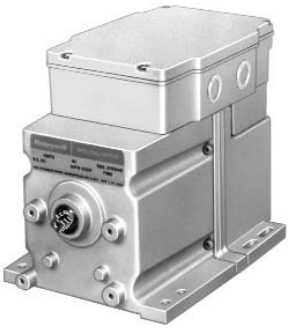
These Series 90 Modutrol IV Motors are non-spring return modulating proportional control motors. Use these motors with controllers that provide a Series 90 output to operate dampers or valves.

- Replaces M934A,D; M941; and M944A,C,D motors.
- Quick-connect terminals are standard.
- Adapter bracket for matching shaft height of older motors is available.
- Motors have field adjustable stroke (90° to 160°).
- Integ
- 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.
- Field addable interface modules can be mounted in the junction box to upgrade the motor to Series 70 (electronic) control.

Application Type: Electric
Fail Safe Mode: Non-Spring Return
Control Signal: Proportional
External Auxiliary Switches Available: Y
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
M9164D1009	35 lb-in.	24V	30-60 sec	0	Adjustable; 90° to 160°	Counter-clockwise (as viewed from power end) (normally open)	—
M9174D1007	75 lb-in.	24V	30-60 sec	0	Adjustable; 90° to 160°	Clockwise (as viewed from power end) (normally closed)	—

M9185; M9186 Modutrol IV™ Series 2 Motors



These Series 90 Modutrol IV Motors are spring return modulating proportional control motors. Use these motors with controllers that provide a Series 90 output to operate dampers or valves.

- Replaces M965 and M975 motors.
- 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°).
- Nominal timing standard of 30 seconds, and 60 seconds
- Spring return motors can operate valve linkages from power end or auxiliary end shafts for normally closed or normally open.
- All models have dual shafts (slotted and tapped on both ends).
- All models have auxiliary switch cams.
- Motors are designed for either normally open or normally closed.

Application Type: Electric
Fail Safe Mode: Spring Return
Control Signal: Proportional, 135 ohm
External Auxiliary Switches Available: Yes
Electrical Connections: Quick-connect terminals
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.
Ambient Temperature Range: -40 F to +150 F
Weight: 9.812 lb

Product Number	Torque/Force (lb-in., lb)	Voltage	Timing Nominal Timing (sec)	Internal Auxiliary Switch	Stroke	Shaft Rotation (upon control signal increase)
M9185D1004	60 lb-in.	24V	30-60 sec	0	Adjustable; 90° to 160°	Clockwise (as viewed from power end) (normally closed)

M9184; M9194 Modutrol IV™ Series 2 Motors

These Series 90 Modutrol IV™ Motors are non-spring return modulating proportional control motors. Use these motors with controllers that provide a Series 90 output to operate dampers or valves.

- Replaces M934A,D; M941; M944A,C,D motors.
- Quick-connect terminals are standard.
- Adapter bracket for matching shaft height of older motors is available.
- Motors have field adjustable stroke (90° to 160°)
- All models have dual shafts (slotted and tapped on both ends).
- All models have auxiliary switch cams..
- Motors are designed for either normally open or normally closed.

Application Type: Electric
Fail Safe Mode: Non-Spring Return
Control Signal: Proportional, 135 ohm

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.
Weight: 7.5 lb

Product Number	Torque/Force (lb-in., lb)	Voltage	Timing Nominal Timing (sec)	Internal Auxiliary Switch	Stroke	Shaft Rotation (upon control signal increase)
M9184D1021	60 lb-in.	24V	30-60 sec	0	Adjustable; 90° to 160°	Clockwise (as viewed from power end) (normally closed)
M9194D1003	300 lb-in.	24V	120-240 sec	0	Adjustable; 90° to 160°	Clockwise (as viewed from power end) (normally closed)

Honeywell

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 Number	Torque Rating (lb-in.)	Voltage	Run Time (Maximum (sec)	Timing Opening, Nominal (sec)	Nominal Current Draw (amps)		Nominal Power (watts)		Includes	Used With
					Opening	Holding	Opening	Holding		
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.

Dimensions, Approximate: 5 1/2 in. high x 4 1/4 in. wide x 2 5/8 in. D
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 conduit box

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.

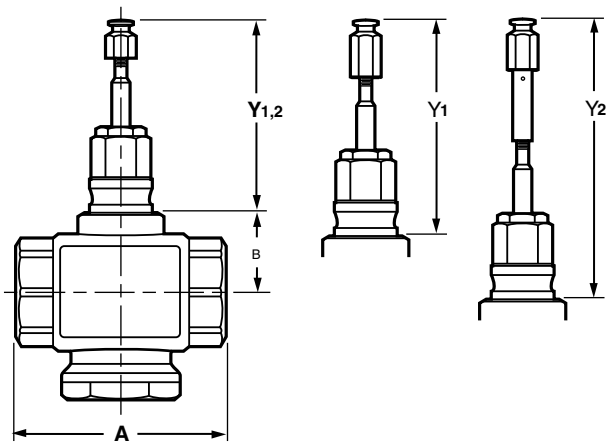
- Sizes range from 2-1/2 to 3 inches.
- Spring-loaded, self-adjusting packing.
- Stainless steel stem prevents corrosion.
- Valve designs provide equal percentage characteristics of flow for close control of water, and linear characteristic of flow for close control of steam.
- Valves utilize direct 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 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

Dimensions Diagram



VALVE SIZE (IN)	A in.	B 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.
V5011N1XXX	3-1/2	5-1/4

[a] Y2 WITH STEM EXTENSION FOR MP953C,E (8 IN. ONLY)

Product Number	Pipe Size (inch)	Valve Action	Flow Characteristic	Capacity (Cv)	Materials (Seat)	Materials (Plug/Ball/ Disc)	Maximum 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

Honeywell

V5013N Three-Way Threaded Globe Valves

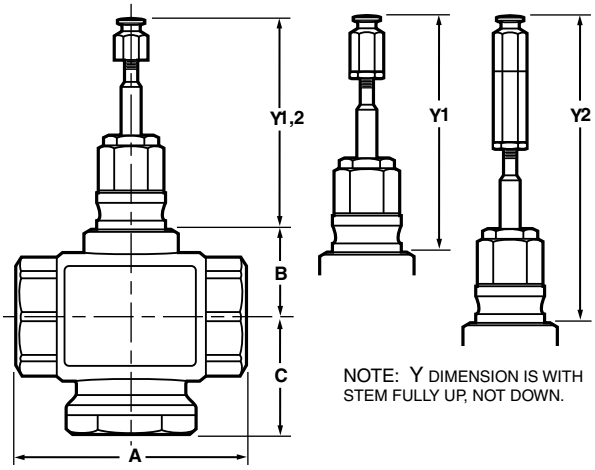
The V5013N is a three-way threaded globe valve that controls hot water, cold water, and glycol solutions (up to 50 percent concentration) in heating or cooling HVAC applications. The valves are used for mixing service to direct flow from one or two inlets to a common outlet in two-position or modulating control systems.

- Red brass body with NPT-threaded connections.
- Stainless steel stem and brass plug.
- Low seat leakage rating.
- Spring-loaded, self adjusting packing.
- 50:1 rangeability per VDI/VDE 2173.
- Constant total flow throughout full stem travel.
- Accurate positioning to ensure state-of-the-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

Dimensions Diagram



NOTE: Y DIMENSION IS WITH STEM FULLY UP, NOT DOWN.

VALVE SIZE	A	B	C	Y 1 STEM UP	Y 2 [a] STEM UP
1/2 (15)	3-1/4	1-9/16	2-9/16	4-3/16	5-15/16
3/4 (20)	3-1/4	1-9/16	2-9/16		
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		

[a] 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

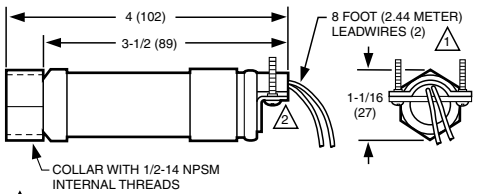
Compact flame detector for use with flame safeguard controls with ultraviolet amplifiers.

- 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. sighting pipe.
Ambient Temperature Range: 0 F to 215 F

Used With: Flame Amplifiers: R7249A, B, R7849A, B, R7749B, R7259, R7290

Dimensions Diagram



1 C7027A1064 HAS 24 FOOT (7.32 METER) LEADWIRES. C7027A1114 HAS 44 IN. (1.118 M) LEADWIRES WITH 22 IN. (558 MM) FLEXIBLE CONDUIT.

2 MODELS AVAILABLE WITH SPUD CONNECTOR (1/2-14 NPSM INTERNAL THREADS) INSTEAD OF CLAMP TYPE CONNECTOR.

C7027

M1943F

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	—

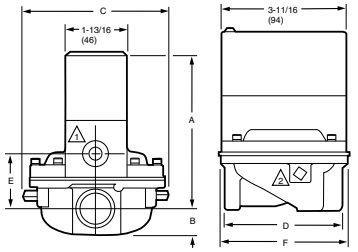
V48A; V88A Diaphragm Gas Valves

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 straight-through 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
Frequency: 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 SIZE (IN.)	APPROXIMATE DIMENSIONS					
	A	B	C	D	E	F
	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

1 BLEED TAPPING: 1/8-27 NPT, OR 1/8-28 BSP, PL.

2 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; OR 1/8-28 BSP, PL FOR 1 THROUGH 1-1/2 IN. SIZES, 1/4-19 BSP,PL FOR 2 THROUGH 3 IN SIZES.

M8487

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

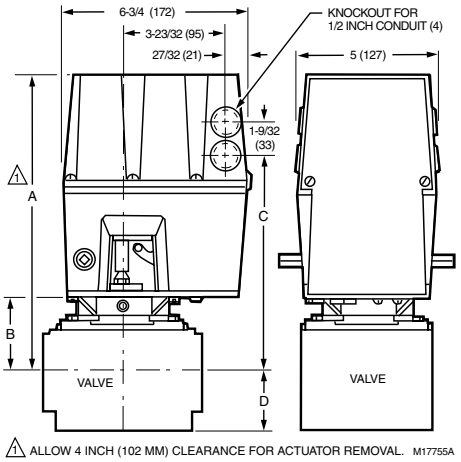
V4055A,B,D,E On-Off Fluid Power Gas Valve Actuator

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



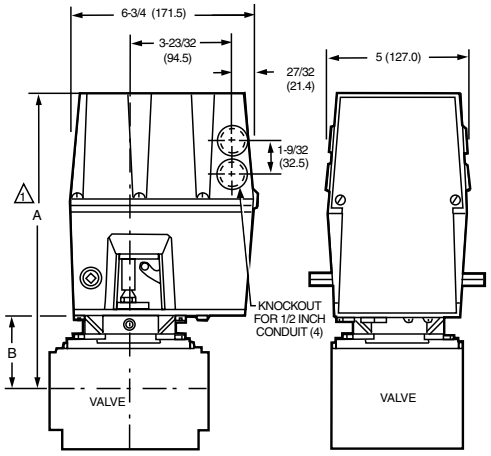
Product Number	Electrical Ratings	Internal Auxiliary Switch	Proof of Closure Auxiliary Switch	Timing (Opening)	Timing (Closing) < 1 sec	Maximum Operating Pressure (psi)	Damper Shaft	Description
V4055A1098	110 Vac; 120 Vac	No	No	13 sec	Yes	5 psi	Yes	ON-OFF actuator. Normally used with V5055/V5907A,B valve 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.

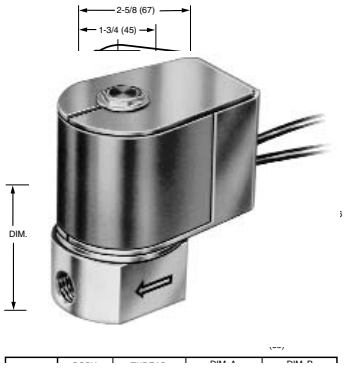
Dimensions Diagram



Product Number	Electrical Ratings	Internal Auxiliary Switch	Proof of Closure Auxiliary Switch	Timing (Opening)	Timing (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.

Honeywell

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 deep
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
L91B1035	0 to 15 psi	25 psi	1.5 to 12 psi	Single potentiometer, 140 ohms	—
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 surface 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/in^2	4 to 16 oz/in^2	SPDT break R-B, make R-W on pressure rise
L608A1053	0 to 4 psi	4 to 16 oz/in^2	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

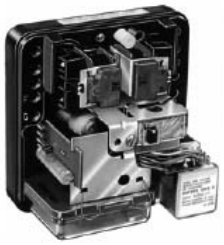
Primary control provides solid state, electronic flame safeguard protection for industrial and commercial single or dual fuel burners.

- 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

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 Burners
Dimensions, 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

JOHNSON CONTROLS

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

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

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

JOHNSON CONTROLS

BASO Pilot Siwtches

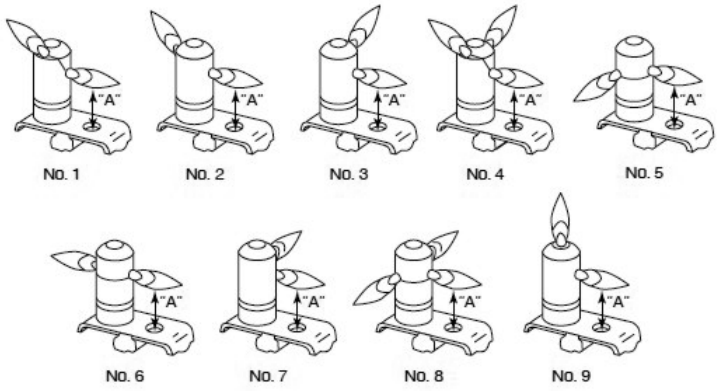
Description
The L61 and L62 Series BASO Pilot Switches are for use on all gas-fired, standing pilot equipment that requires main burner shutoff when the pilot is extinguished. Typical applications include domestic central heating and commercial space heating appliances, as well as industrial processing equipment (e.g., die-casting machines, degreasers).

The L61LL-1 is the universal replacement for BASO 860-1, 861-1, 960-1, 961-1, and L61LL-3 pilot switches. 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

JOHNSON CONTROLS

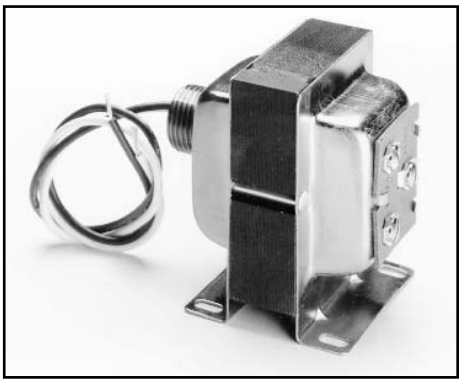
MIZER™ Retrofit Gas Control System

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 8 in. primary leads	Three screw terminals (one is blind)	Foot 4 in. x 4 in. plate*
50 VA Capacity Transformers with Circuit Breakers					
Y63T31-0	120/208/240	24	Male Fitting 8 in. primary leads	Three screw terminals (one is blind)	Foot 4 in. x 4 in. plate*
92 VA Capacity Transformers with Circuit Breakers					
Y64T22-0	120/208/240	24	End Bell Hole 8 in. primary leads	End Bell Hole 8 in. secondary leads	Plate

*4 in. x 4 in. plate and nut packed with transformer

JOHNSON CONTROLS

F61 Series

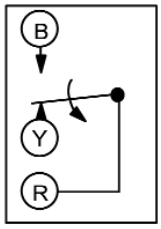
Flow Switch (Standard Flow Rate – SPDT)

F61KB-11

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.

Series F61



Action on Increase of Flow

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

Applications

- use on lines carrying water or ethylene glycol
- not for use with hazardous fluids or in hazardous atmospheres

Replacement Kits

Code Number	Description
KIT21A-600	Stainless Steel 3-piece Paddle (3 in., 2 in., and 1 in. Segments)
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

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P47 Series

Steam Pressure Limit Control

P47AA-1

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

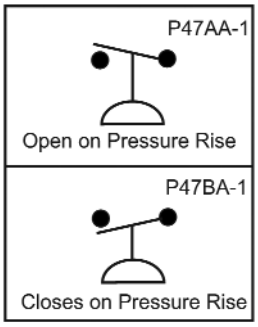
- long-life contact structure with high contact force
- easy-to-adjust single sight set scales show both cut-in and cut-out settings

Applications

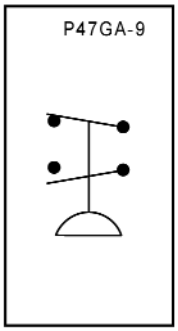
P47 steam pressure controls are designed for high limit or operating control applications. A typical use is as a limit control on steam heating systems. Models that close on a pressure increase are used on steam unit heaters to avoid blower operation when steam pressure is below the point required for 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.



SPST



4-wire, 2-circuit Action on Pressure Rise

Selection Chart

Code Number	Number of Poles	Range	Diff psi		Max Overpressure psig
			Min	Max	
CONTACTS OPEN ON RISE – AUTOMATIC RESET					
P47AA-1C	1	0 to 15 psig	2	8	50

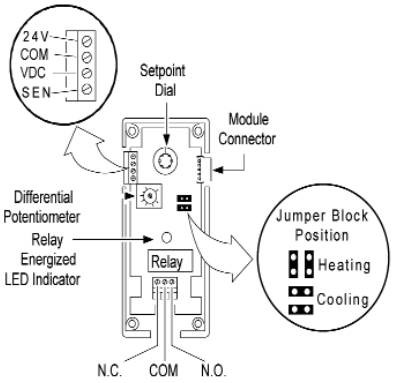
JOHNSON CONTROLS

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.



A350

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)

A350R

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

Selection Chart

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

JOHNSON CONTROLS

G600, G670

Ignition Control Replacement Parts

G670AW-1

G600AX-1 with Mounting Bracket

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.

Selection Chart (Replacement Ignition Controls)

Code Number	100% Lockout	Damper Plug	Remarks
G600AX-1	No	Yes	24 VAC, Terminal Board Wiring
G600LX-1	25 Seconds	Yes	24 VAC, Terminal Board Wiring
G670AW-1	No	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

JOHNSON CONTROLS

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

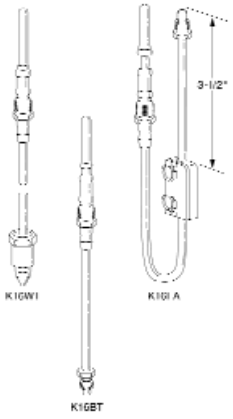
K15

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.



K16

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.

K19

Selection Chart

Code Number	Length (in.)
K19AT-48	48
K19AT-60	60
K19AT-72	72

JOHNSON CONTROLS

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 Temperature Control with Display, A99 Sensor Included	Supply Voltage: 120 or 240 VAC 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

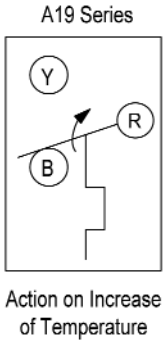
Specifications and Electrical Ratings

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
Output Relay Contacts Electrical Ratings	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
	Locked Rotor Amperes N.O. (N.C.):	96 (34.8) A 55.2 (24) A 48 (29.4) A
	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 Temperature		Operating: -30 to 140°F
		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

JOHNSON CONTROLS

A19 Series

Remote Bulb Control



Action on Increase of Temperature

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

Applications

The A19 is suitable for temperature control in heating, ventilating, air conditioning, and refrigeration.

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

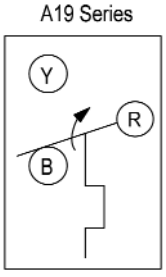
The A19 Series controls are single stage temperature controls that incorporate liquidfilled sensing elements.

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 Number	Switch Action	Range °F	Bulb and Capillary	Bulb Well No. (order separately)	Range Adjuster	Max Bulb 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

[a] With 3 inch bulb support

P20 Series

Air Conditioning/Pressure Cutout Control

P20DB-1

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

Selection Chart

Code Number	Maximum Temperature	Switch Action	Range psig	Differential psi	Factory Setting – psig		Max Bellows Pressure psig
					Opens	Closes	
P20BB-1C[a]	140°F	Open On Fall	7 to 150	Manual Reset	40	Lockout Man. Reset	250
P20DB-1C[b]		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

Applications
- control of cooling tower fans; motorized valves or solenoid operated valves

Specifications
- ambient temperature limits: -65 to 150°F
- maximum bulb temperature: 170°F

A72

Selection Chart

Code Number	Switch Action	Range °F	Diff F°	Bulb and Capillary
A72AE-1C	DPST Close High	25 to 90	4 to 25	11/16 in. x 6 3/4 in. 6 ft Cap.

JOHNSON CONTROLS

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
[b] Non-corrosive refrigerants include R-12, R-22, R-134A, R-500, R-502 (R)

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

Selection Chart

Code Number	Time Delay	Heater Circuit VAC	Type of Reset	Range psig	Max. Bellows Pressure psig	Factory Setting psig	Pressure 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.

JOHNSON CONTROLS

P70 Series

Single Pole Low Pressure Control

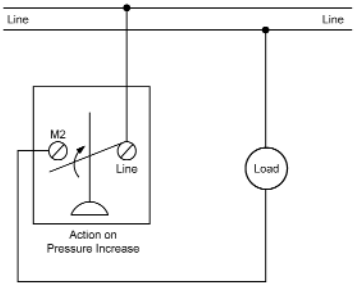
Description
This P70 Series of controls employs a set of switch contacts that are opened and closed by the movement of pressure actuated bellows. The load-carrying contacts provide direct control of AC motors within the control rating. Note the electrical rating chart for specific models. These controls 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 Open Low	12 in. to 80	Min 5 Max 35	36 in. Cap. with 1/4 in. Flare Nut	Cut-out*	525
"ALL RANGE" FOR R-12, R-22, R134A, R-500, R-502 (R)						
P70AB-2C	Close High Open Low	20 in. to 100	Min 7 Max 50	36 in. Cap. with 1/4 in. Flare Nut	Cut-out*	325

* 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

Selection Chart

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 Open Low	0 to 150	Min 12 Max 70	36 in. Cap. with 1/4 in. Flare Nut	None	525
"ALL RANGE" FOR R-12, R-22, R134A, R-500, R-502 (R)						
P70CA-3C	Close High Open Low	50 to 500	Min 60 Max 150	36 in. Cap. with 1/4 in. Flare Nut	None	525

JOHNSON CONTROLS

P70 Series

Single Pole Dual Pressure Control

P70LB-1
Universal Mounting
Bracket Included

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

Selection Chart

Code Number	Switch Action	Low Pressure psig		High Pressure psig		Pressure Connector	Limited Knob Adjustment	Maximum Over-pressure psig
		Range	Diff	Range	Diff (Non-Adj)			
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 RANGE" 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
[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 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

Selection Chart

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)					
P72AA-27C*	DPST 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.

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

Code Number	Switch Action	Low Pressure psig		High Pressure psig		Pressure Connector	Limited Knob Adjustment	Maximum Over-pressure psig
		Range	Diff	Range	Diff (Non-Adj)			
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

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V46 Series

Pressure Actuated Water Regulating Valve

V46AA-1 **V46AB-1**

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

Kit Number	Water Valve Size (in.)
KIT14A-612*	1-1/2
KIT14A-613*	2
KIT14A-614*	2-1/2

* For commercial valves only

Selection Chart

Code Number	Pipe Size (In.)	Inlet and Outlet	Opening Point Range – psig	Pressure Element Style	Seat Repair Kit	Replacement Power Elements
COMMERCIAL TYPE, STANDARD FLOW – NON CORROSIVE REFRIGERANTS (R)						
V46AA-1C	3/8 NPT	Threaded	70 to 260 Max 35	30 in Capillary 1/4 in. Flare Nut (Style 45)	STT14A-600R	SEP91A-600R and SEC99AA-36C*
V46AB-1C	1/2 NPT				STT15A-602R	SEP91A-602R and SEC99AA-36C*
V46AC-1C	3/4 NPT				STT16A-601R	SEP91A-601R and SEC99AA-36C*
V46AD-1C	1 NPT				STT17A-609R	SEP91A-603R and SEC99AA-36C*
V46AE-1C	1 1/4 NPT				STT17A-610R	

* Replacement element suppplied with 1/4 in. male SAE connector. Order SEC99AA capillary kit with 2 flare nuts separately, if needed.

WHITE-RODGERS

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

97 Series

95 Series

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).

SPECIFICATIONS

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)
Anticipation, Heating	Adjustable
Anticipation, Cooling	Adjustable
Rated Differential Single Stage	Heat 0.5 to 1.5°F Cool 0.8 to 2.2°F
Rated Differential Staging	Heat 0.5 to 1.5°F Cool 0.5 to 2.2°F
Operating Ambient	32 to +110°F (0 to +43°C)
Operating Humidity	90% non-condensing max.
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

F145-1328
Indoor Remote Sensor

F145-1378
Outdoor Remote Sensor

STAGING THERMOSTATS

Stages		Program	MODEL	Application				Performance Features								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	1F95-371	X		X		X	X	X	X	3	1	H	X	①	X	②	X	R,C,G,Y1,Y2,W1, W2,W3,O,B,L,PH, SA,SB,SC,OT

SINGLE STAGE THERMOSTATS

1	1	7-day 5+1+1	1F97-1277		X(1)	X		X	X	X	X	X	1	P/S	X	①		②		RC,RH,W,Y,G, O,B,W/E,L,6,S

MS = Multi-Stage
HP = Heat Pump
① Comfort View™
② Permanent
(1) = Single Stage Heat Pump
B = Battery Power
H= Hardwired (Requires Common)
H/B = Hardwired or Battery option
P/S = Power Stealing with Battery Back-Up

WHITE-RODGERS

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

1F80-361

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.

1F86-0244

SPECIFICATIONS

Electrical Rating Single Stage:	
Dual Power or Battery Power Model	mV to 30 VAC, NEC Class II, 50/60 Hz or DC
Input-Hardwire Model	20 to 30 VAC
Electrical Rating Staging	20 to 30 VAC, NEC Class II
Terminal Load	1.0 A per terminal, 1.5A maximum all terminals combined
Setpoint Range	45 to 90°F (7 to 32°C)
Rated Differential (Single Stage)	Heat 0.6° or 1.5°F 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

STAGING THERMOSTATS

Stages		Program	MODEL	Application				Performance Features								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	
2	2	5+1+1 day	1F81-261	X		X	X		X					H/B	X	X		①		R,C,Y,Y2,W,W2,G
2	2	Ø	1F83-261	X		X	X							H/B		X		①		R,C,Y,Y2,W,W2,G

SINGLE STAGE THERMOSTATS

1	1	5+1+1 day	1F80-361		X(1)	X	X		X					H/B	X	X		①		RC,RH,C,W,Y, G,O,B
1	1	Ø	1F86-0244		X(1)	X	X							H/B		X		①		R,C,Y,W,G, O,B

MS = Multi-Stage
HP = Heat Pump
① Comfort View™
② Permanent
(1) = Single Stage Heat Pump

B = Battery Power
H= Hardwired (Requires Common)
H/B = Hardwired or Battery option
P/S = Power Stealing with Battery Back-Up

WHITE-RODGERS

70 SERIES THERMOSTATS

1E78-144

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.

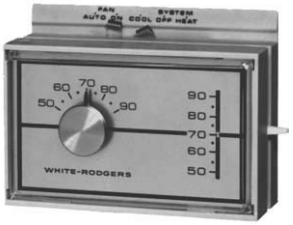
FEATURES
- Fossil fuel or electric heat compatible.
- Large LCD with backlight.
- Selectable Celsius or Fahrenheit temperature display.
- Includes B/O terminals.
- Electronic accuracy.

Stages		Program	MODEL	Application				Performance Features								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	
1	1	5+2	1E78-151		X	X	X		X					B	X	X		B		Rc,Rh,W,Y,G,O,B
1	1	Ø	1E78-144		X	X	X							B		X		B		Rc,Rh,W,Y,G,O,B
1	Ø	Ø	1E78-140			X	X							B		X		B		Rh,W

SINGLE STAGE LOW VOLTAGE THERMOSTATS

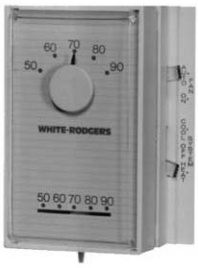
HEATING/COOLING AND COOLING ONLY — WITH SELECTOR SWITCHES

Reliable Performance Combined With Thin-Profile Subbase Mounting Plate. Entire Unit Only Extends 1-5/8" From Wall



1F56-444

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.



1E56W-444

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

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

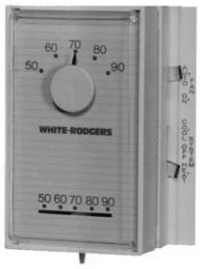
② Electric Heat/Cool

WHITE-RODGERS

SINGLE STAGE LOW VOLTAGE THERMOSTATS

VERTICAL THERMOSTATS WITH MERCURY CELL SWITCH

Vertical Thermostat Model For Control Of Low Voltage Heating, Cooling And Zoning Installations



1E30-910

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)
Anticipation, Cooling	Fixed
Differential, Heating	1°F
Differential, Cooling	1.5°F
Differential, Millivolt Heating	3°F
Dimensions	4-1/2"H x 2-3/4"W x 1-1/2"D
Electrical Rating	30 VAC maximum, NEC Class II

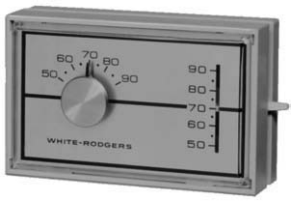
Model Number	Typical Application	Color	Stages Heat/Cool	System Switch	Fan Switch	Contacts	Anticipation Heat/Cool	Range	Shape	Terminals
1E30-373	Heat Only	Beige	1	None	None ①	Mercury Cell	Adjustable	40-75°F ②	Vertical	2 Unmarked Terminals Open on Rise
1E35-910	3 Wire Zone Valve Heat Only	Beige	1	None	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



1F35-910

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.

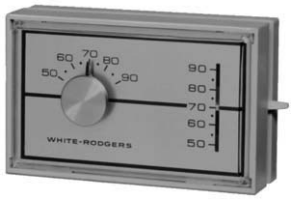
SPECIFICATIONS

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
Dimensions	2-3/4"H x 4-1/2"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
1F35-910	3-Wire Zone	Beige	1	None	None	Mercury Cells	Fixed	50-90°F	Horizontal	R5, Y6, 4

WHITE-RODGERS

SINGLE STAGE LOW VOLTAGE THERMOSTATS



1D30-316

THERMOSTATS WITH SNAP-ACTION SWITCH

For Low Voltage Heating, Cooling And Zoning Installations Where a Snap-Action Control Is Desired

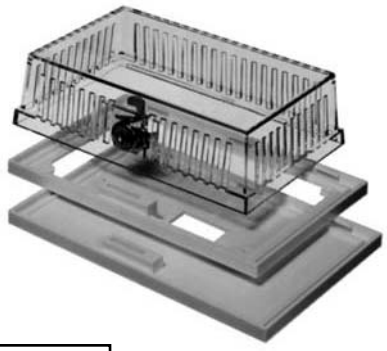
FEATURES
- Snap-Action contacts with dust cover.
- Not affected by jarring or vibrations.
- Ideal for mobile home use.
- Heating and cooling anticipators provide narrow differential control of room temperature.
- Beige or Classic White color.

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



F29-0231

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 Number	Description	Horizontal (Ring) Inside Dimensions			Horizontal (Solid) Inside Dimensions		
		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"

THERMOSTAT GUARDS – METAL

F29-0222

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 Number	Description	Horizontal (Ring) Inside Dimensions			
		Length	Height	Depth	Comments
F29-0220	Solid base	7-1/8"	4-5/8"	3-1/4"	–

WHITE-RODGERS

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

176-6

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

Model Number	Range	Differential	Action	Full Electrical Rating	Motor Rating (Full Load)		Resistive (Non-Inductive)	
					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

152-9

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.
- 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

Model Number	Range	Differential	Action	Full Electrical Rating	Motor Rating (Full Load)		Resistive (Non-Inductive)		
					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

WHITE-RODGERS

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

36C Series

SPECIFICATIONS

Electrical Rating	0.6 amps
End to End Dimensions	3-15/16"
Ambient Operating Range	-40 to +175°F (-40 to 79°C)
Maximum Pressure Rating	1/2 PSI (14.0" W.C.)
Agency	A.G.A. and C.G.A. design certified

Pipe Size	1" Pressure Drop Capacity BTU/HR		Rated Range of Regulation BTU/HR	
	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

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

Fig. 4

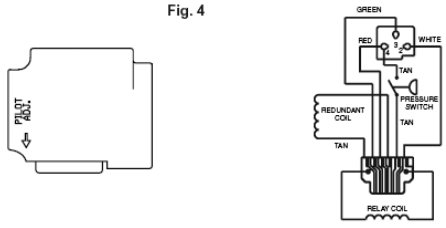


Fig. 7

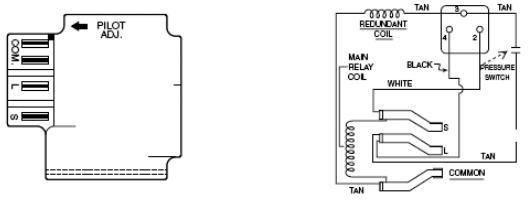


Fig. 8

Cycle pilot with 4 terminal panel

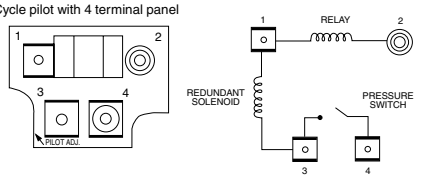


Fig 12

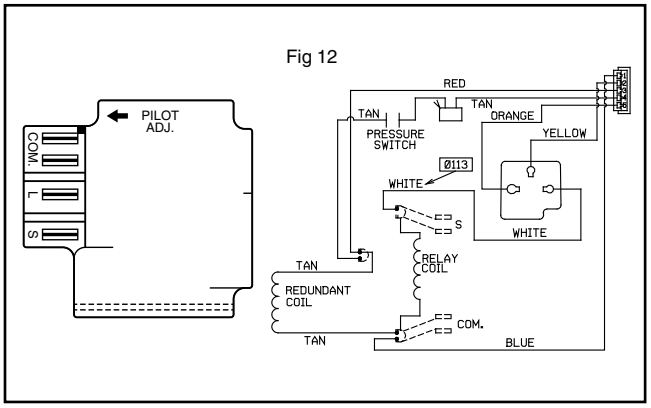
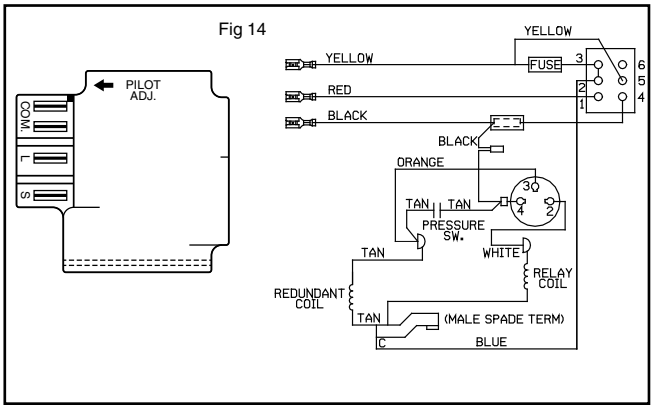


Fig 14



WHITE-RODGERS

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)
Swing Radius	3-9/16"
Agency	A.G.A. and C.G.A. design certified

36E36-304

36E86-302

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.)
Agency	24 VAC

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

WHITE-RODGERS

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").

36J24-214

SPECIFICATIONS

Ambient Temperature..... -40 to 175°F
Maximum Pressure Rating..... 1/2" PSI (14.0" W.C.)
Capacity (1" P.D.)..... Natural 140,000 Btu/Hr.
L.P. 226,800 Btu/Hr.
Electrical Rating . . . . . Single stage 24V, 50 / 60Hz at .3A
Two stage at .43A
Swing Radius . . . . . 2.75"
Agency . . . . . C.S.A. approved

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	
50D47-120	50E47-10	50E47-860	780-788	HS780-17NR-304A	HS780-34NR-308A	S890H1028	
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	

WHITE-RODGERS

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

764-702

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
764-742	20 to 30 mV	1/2" x 1/2"	142,000	Thermocouple

PILOT RELITE CONTROL: MODEL 5059

Generates Spark Until a Pilot Flame is Sensed

5059-23
Pilot Relite Control

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 Number	Input Voltage	Electrical Rating	Description
5059-23	24 VAC	0.03 amps	Spark plug and 1/4" spade connectors

IGNITION ELECTRODE ASSEMBLIES

Use Type 760-56 to Replace Cycle-Pilot® Ignition Electrodes and Cable Assemblies

760-56

Model Number	Description
760-56	24" lead with slip on bracket. Also includes perforated mounting strap for varyingapplications
760-310	Same as 760-56 except with universal mounting bracket

WHITE-RODGERS

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

Ambient Temperature Rating	20 to +165°F (–29 to +74°C)
Terminals	Dual 1/4" male quick connects
Main Switches (available with):	One, two or three SPST switches
Auxiliary Switches	Low voltage – SPST to pull in additional sequencers
Bimetal Heater	Input – 24 VAC, 60 Hz Current draw – .16 Amps

COMBINED LOAD RATING (ALL MODELS)

Model Number	Number of Switches	APPROXIMATE TIMING (SECONDS)							
		ON Times				OFF Times			
		Main SW1	Main SW2	Main SW3	Aux. SW	Main SW1	Main SW2	Main SW3	Aux. 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

24A34-3

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°F
Agency	U.L. component recognized

COMBINED LOAD RATING TABLE (ALL MODELS)

Model Number	Timings	Switches	Timings – ON					Timings – OFF				
			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 F_1 - F_2 instead of M_1 - M_2
♦ These contacts switch simultaneously

WHITE-RODGERS

MERCURY FLAME SENSORS

Prevent Gas Flow to Main Burner if Pilot Flame is Not Burning or Is Insufficient to Properly Ignite Main Burner

3046-5

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.

SPECIFICATIONS

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 Number	Element Length	Electrical Rating		
		120 VAC	240 VAC	30 VAC
3046-5	48"	125 VA	125 VA	90 VA

PLUG-IN TYPE MERCURY FLAME SENSORS

Designed for use with White-Rodgers Diaphragm, “Cushioned Power” or “Silent Knight” Gas Valves having Plug-In Receptacle

30A46-5

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

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

Model Number	Element Length	Electrical Rating			Comments
		120 VAC	240 VAC	30 VAC	
30A46-5	48"	125 VA	125 VA	90 VA	stud mount element

WHITE-RODGERS

MERCURY FLAME SENSORS

For Proving Pilot Flame and Controlling Main Valve in Cycle Pilot Applications

3049-64

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"	B	#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.

FLUSH MOUNT FAN OR LIMIT CONTROLS/ATTIC FAN CONTROL

Ideal for Replacement of Similar Type Controls

757-1

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

Model Number	Description	Range	Differential	Switch Action	Motor Rating – Full Load		Pilot Duty
					120 VAC	240 VAC	
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)

WHITE-RODGERS

ADJUSTABLE SNAP DISC FAN & LIMIT CONTROLS

3F05-1

3L05-1

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

VAC	Resistive (Non-Inductive)	Motor Rating (Inductive)		Pilot Duty
		Full Load	Locked Rotor	
120	25.0A	14.0A	72.0A	125 VA
240	25.0A	10.0A	60.0A	125 VA

Model Number	Temperature Range	Differential	Switch Action	Function	Accessories	Therm-O-Disc	
						Style	Type
3F05-1	90 to 130°F	20°F	SPST	Fan Controls (Close on Rise) Limit Controls (Open on Rise)	Includes thermostat and tab-to-screw terminals.	74T12	310708
3F05-2	140 to 180°F	20°F	SPST			74T12	310709
3L05-1	135 to 175°F	40°F	SPST			74T11	310710
3L05-2	175 to 215°F	40°F	SPST			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

3F01-140

For Regulation of Fan or Blower Control

FEATURES

- Designed for quick on-job replacement.
- 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

Model	Motor Rating (Full Load)		Resistive (Non-Inductive)		Pilot Duty
	120VAC	240VAC	120/240VAC	277VAC	120/240/277VAC
3F01, 3F02	10.0A	5.0A	25.0A	21.6A	125 VA

FAN CONTROLS

Model Number	Fixed Temperature Settings		Switch Action	Therm-O-Disc	
	Cut-in	Cut-out		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

WHITE-RODGERS

SNAP DISC FAN OR LIMIT CONTROLS

For Regulation of Fan, Blower or High Limit Safety Control

3L01-180

SPECIFICATIONS

ELECTRICAL RATING (AC)

For Model #	Motor Rating (Full Load)		Resistive (Non-Inductive)		Pilot Duty
	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

LIMIT CONTROLS

3L02-190

Model Number	Fixed Temperature Settings		Switch Action	Therm-O-Disc	
	Cut-in	Cut-out		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 Number	Fixed Temperature Settings		Switch Action	Therm-O-Disc	
	Cut-in	Cut-out		Style	Type
3L02-160	Manual Reset	160°F	Open on Rise	60T15	330534
3L02-180		180°F	Open on Rise	60T15	330536
3L02-190		190°F	Open on Rise	60T15	330537

3L03-140

SPDT CONTROLS

Model Number	Fixed Temperature Settings				Switch Action	Therm-O-Disc	
	Terminal 1 & 3		Terminal 1 & 2				
	Cut-in	Cut-out	Cut-in	Cut-out		Style	Type
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

WHITE-RODGERS

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.

OIL TYPE BEARINGS WITH INSULATOR

SEALED TYPE BEARINGS WITH INSULATOR
Sealed Bronze

Model Number	To Replace	Dimensions		Bearing Description
		Bore Size	Outside Diameter	
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

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.

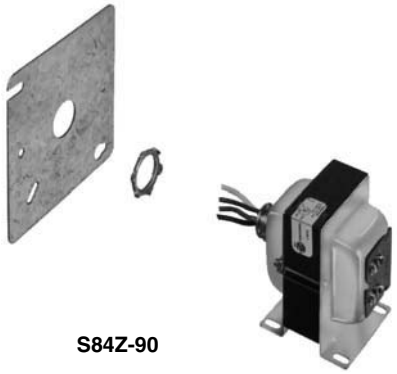
S84Z-401

SKELETON TYPE WITH VERTICAL & HORIZONTAL CHANNEL FRAMES FOR MOUNTING

Model Number	Primary to Secondary Voltages	Output Rating	Terminations	
			Line	Load
S84Z-401	120/208/240v to 25v 60Hz	40 VA	12" leads	12" leads

UNIVERSAL MOUNTED TYPES (Plate, Foot or Hub Mount)

Model Number	Primary to Secondary Voltages	Output Rating	Terminations	
			Line	Load
S84-Z90	120/208/240v to 25v 60Hz	40 VA	10" leads	Screw terminals



S84Z-90

PLATE MOUNTED TYPES

Model Number	Primary to Secondary Voltages	Output Rating	Terminations	
			Line	Load
S84A-410*	120v to 25v 60Hz	40 VA	10" leads	Screw terminals

*Transformer recessed in plate and U.L. recognized.

S84A-410

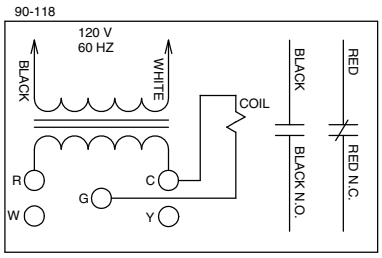
WHITE-RODGERS

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 90-118E, 90-119, 90-130 Plug-in Relay	DPDT Universal

Model Number	Mars Number	Transformer						Relay	Contact Ratings			
		Primary			Secondary				120 VAC (amps)		240 VAC (amps)	
		Voltage	Hz	Connections	Voltage	VA	Connections		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

36C Series

SPECIFICATIONS

Temperature Range	-40°F to 130°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 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, 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

TWO POLE DOUBLE THROW (2PDT) Fits Receptacles

Model Number	Coil Voltage (50/60 Hz)	Terminals 1-2-3	Terminals 4-5-6	COIL DATA			
				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

WHITE-RODGERS

1 POLE DEFINITE PURPOSE CONTACTOR

Straight-Through Wiring, Replaces 11/2 Pole Devices Used Primarily in Residential Central Air Conditioning

40 Amp Model (with cover)

Approximate Overall Dimensions 3-1/4" x 2" x 2-1/2"

FEATURES

- Replaces many Type 117 contactors used by OEM's.
- Universal style mounting bracket fits existing mounting holes.
- Screw terminals and 1/4" quick 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)
Termination	Screw and Double 1/4" Q.C.
Operate	85% of nominal coil voltage; 110% maximum safe operate
Duty Cycle	Continuous

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

** 40 amp models have cover on top as in picture above

2 POLE DEFINITE PURPOSE CONTACTOR

Designed for Air Conditioning and Heating Equipment

40 Amp Model (with cover)

Approximate Overall Dimensions 3-1/4" x 2" x 2-5/8"

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
Mechanical Life	Conforms to UL and ARI specifications
Electrical Life	Conforms to UL and ARI specifications
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.
Operate	85% of nominal coil voltage; 110% maximum safe operate
Duty Cycle	Continuous

COIL DATA

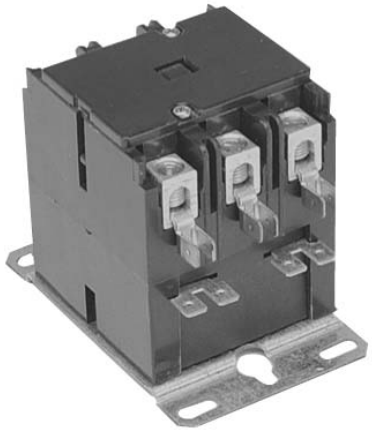
Model Number		Voltage	Res DC	Current	Nominal	Max. Inrush
30 Amp	40 Amp	AC	OHMS	MA	VA	VA
90-244	90-247	24	11	250	6	32
90-245		120	224	50	6	32
90-246		208/240	997	25	6	32

WHITE-RODGERS

3 POLE CONTACTOR

Designed for Central Air Conditioning and Heating Equipment

40 Amp with Cover



Approximate Overall Dimensions
3-3/4" x 2-3/8" x 3"

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
Mechanical Life	Conforms to UL and ARI specifications
Electrical Life	Conforms to UL and ARI specifications
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.
Operate	85% of nominal coil voltage; 110% maximum safe operate
Duty Cycle	Continuous

COIL DATA

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

Approximate Overall Dimensions
3-3/4" x 2-5/8" x 3-1/2"
(92-459 thru 92-465)

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

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

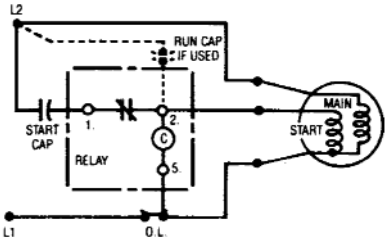
75 Amp.	90 Amp.	Voltage A.C.	Res. D.C. OHMS	Current Ma.	Nominal VA	Max. Inrush VA
92-468		120	15.5	225	27	240
92-469		208/240	63.5	112	27	240

WHITE-RODGERS

PONTENTIAL RELAY

Unmatched Versatility

90-63



MOTOR START APPLICATION PRO PAC

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
Mechanical Life (no load)	500,000 operations, 60 operations/min
Electrical Life (rated load)	Meets U.L. and ARI specifications
Weight (approximate)	6.5 oz each
Agency	U.L. file number SA1984
	C.S.A. file number LR13360
Class Insulation	Class B
Duty Cycle	Continuous

Model Number	Mars Number	Continuous Coil Voltage	Pick-up		Drop Out	Coil Data			
			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

Approximate Overall Dimensions
2-3/8" x 1-5/8" x 1-1/2"

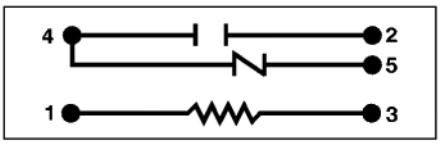
FEATURES
- Compact, totally enclosed design.
- For heating and cooling applications and general switching.
- Quiet, reliable and economical.

SPECIFICATIONS

Temperature Range	-40°F to 150°F
Mechanical Life (no load)	1,000,000 operations, 60 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 (0.64 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, 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

WIRING DIAGRAMS

SPNO



SPDT

SINGLE POLE NORMALLY OPEN (SPNO), SINGLE POLE DOUBLE THROW (SPDT)

Model Number		Coil Voltage AC (50/60 Hz)	Res DC OHMS	Coil Data		Inrush VA
SPNO	SPDT			Nom. Current MA	Nominal VA Sealed	
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

WHITE-RODGERS

HEAVY DUTY ENCLOSED FAN RELAY

Heavy-Duty General Purpose Relay Operates in Any Position

FEATURES

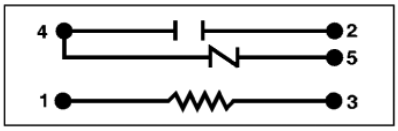
- Compact, totally enclosed design.
- For heating and cooling applications and general switching.
- Quiet, reliable and economical.

SPECIFICATIONS

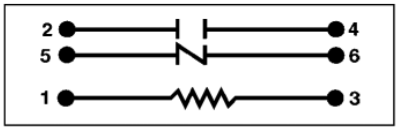
Temperature Range	-40°F to 150°F
Mechanical Life (no load)	1,000,000 operations, 120 operations/min.
Electrical Life (rated load)	100,000 operations, 6 operations/min. Load test making inrush rating (0.4 to 0.5 P.F.); breaking 100% continuous rating (0.65 to 0.8 P.F.)
Weight (approximate)	2.3 oz
Agency	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



SPDT



SPNO/SPNC

SINGLE POLE NORMALLY OPEN, SINGLE POLE DOUBLE THROW (SPDT) ISOLATED CONTACTS (SPNO/SPNC)

Model Number		Coil Voltage AC	Res DC	Coil Data		Inrush
				Nom. Current	Nominal	
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

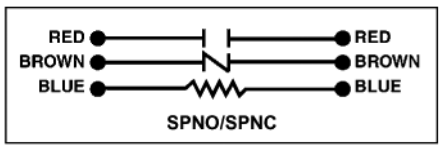
Base with a Bushing, Locknuts and Position Locking Plate to Mount this Relay in Standard Electric Box with 1/2" "Knock Out". Relay has Double Break Silver Alloy Contacts and is Completely Enclosed. Operates in Any Position

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
Coils, Operate	85% of nominal coil voltage; 110% maximum safe operate
Coils, Duty Cycle	Continuous

90-123

Approximate Overall Dimensions
2-45/64" x 2-38/64" x 3-6/64"



SPNO/SPNC

Model Number	Coil Voltage (60 Hz.)	Coil Data			
		DC Res.	MA	Nom. VA	Inrush VA
90-123	24	45.7	167	4	8
90-124	120	761	33	4	8

OLD Model Number	NEW Model Number
90-120	90-123
90-121	90-124

WHITE-RODGERS

HYDRONIC ZONE VALVES

1311-102

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

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.
② 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.)

"D" VALVE

ORIFICES

UNI-LINE ORDER NO.	TYPE GAS	TUBE SIZE	ORIFICE SIZE
10-021	NAT.	3/16" OR 1/4"	.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.

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.

90-222

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

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.

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

GAS VALVES

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 ORDER NO.	FACTORY MODEL	INLET SIZE (FPT)	OUTLET SIZE (FPT)	STRAIGHT THRU	SIDE OUTLET 1/2" FPT WITH PLUGS	PRESSURE REGULATOR SETTING	CAPACITY	REDUCER BUSHINGS 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

GAS VALVES

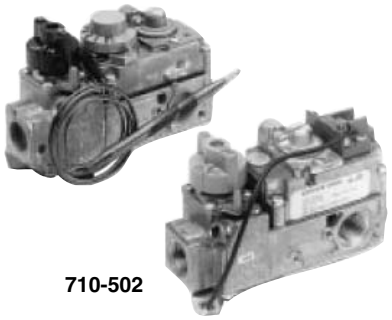
710 LOW PROFILE GAS HEATING VALVES

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)

710-205



710-502

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 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 MODELS							
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 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 "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.

GAS VALVES

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 operating range
Pressure regulator (optional by model)	factory set @ 3.5" W.C.
Pilot outlet	1-1/4" tubing
Gas cock dial marking	off-pilot-on
Terminal type	1/4" spade
Ambient temperature	–40° to 175°F
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.

UNI-LINE ORDER NO.	FACTORY MODEL	INLET SIZE (FPT)	3 POSITION OUTLET STRAIGHT THRU (FPT)	3 POSITION OUTLET SIDE (FPT) WITH PLUGS	PRESSURE REGULATOR SETTING	CAPACITY	REDUCER BUSHINGS INCLUDED (NPT) 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 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 individual control specifications.

SPECIFICATIONS

Electrical rating	120 VAC–.034 Amp, 50/60 Hz 240 VAC–.017 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)

UNI-LINE ORDER NO.	FACTORY MODEL	INLET SIZE (FPT)	3 POSITION OUTLET STRAIGHT THRU (FPT)	3 POSITION OUTLET SIDE (FPT) WITH PLUGS	PRESSURE 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.

GAS VALVES

700 DIAPHRAGM/SOLENOID VALVES

SPECIFICATIONS

Electrical rating	12 VDC – 0.18 Amps
24 Volt Models	24 VAC–0.2 Amps, 50/60 Hz 120 VAC–.034 Amp, 50/60 Hz 240 VAC–.017 Amp, 50/60 Hz 240 MV to 750 MV operating range
Pressure regulator	factory set @ 3.5" W.C.
Pilot outlet	1/4" tubing
Gas cock dial marking (optional)	off-pilot-on
Terminal type	combination screws/spade
Ambient	–40° to 175°F
Maximum inlet pressure	14" W.C. (1/2 PSI)

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 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 THRU (FPT)	3 POSITION OUTLET SIDE (FPT) WITH PLUGS	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	
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.
** Has slow opening feature for soft ignition.
† Has no gas cock.
†† A separate pressure regulator may be required for the system.

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 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.

700-402 UNI-KIT

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)

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.

MODELS NOW HAVE A SLOTTED SAFETY MAGNET

UNI-LINE ORDER NO.	FACTORY MODEL	INLET SIZE (FPT)	3 POSITION OUTLET STRAIGHT THRU (FPT)	3 POSITION OUTLET SIDE (FPT) WITH PLUGS	PRESSURE REGULATOR SETTING	CAPACITY	REDUCER BUSHINGS INCLUDED (NPT) 3/4" x 1/2"	1/2" x 3/8"
24 VOLT COMBINATION MODELS								
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.

GAS VALVES

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".

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 automatic 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

DRIVE ROD ACCESSORIES – GAS COCK
Some applications will require a drive rod for the gas cock dial. Order gas cock drive rod adaptor separately.
Order **1751-009.**

TEMPERATURE DIAL
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.

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 ORDER NO.	FACTORY MODEL	INLET SIZE (FPT)	3 POSITION OUTLET (FPT)	CAPILLARY LENGTH	INTERNAL PRESSURE REGULATOR SETTING	CAPACITY	REDUCER BUSHINGS INCLUDED (NPT) 3/4" x 1/2"	1/2" x 3/8"
SNAP-THROTTLE 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 CAPILLARY MODELS	3.5" W.C. NAT. GAS	100,000		2

GAS VALVES

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 regulation)	
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 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 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
NONLOCKOUT MODELS – CAUTION: DO NOT USE 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.

GAS IGNITION CONTROLS

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

GAS IGNITION CONTROLS

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	.7 amp
Ambient temperature rating	–40 to 175° (–40 to 80°C)

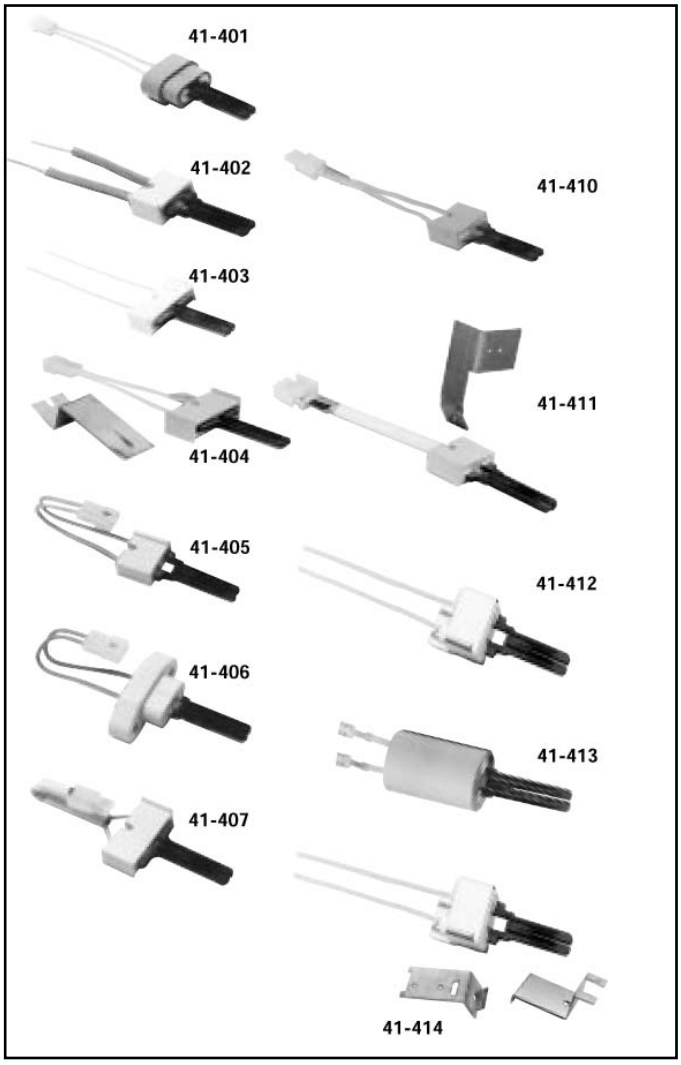
GAS IGNITION CONTROLS

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.

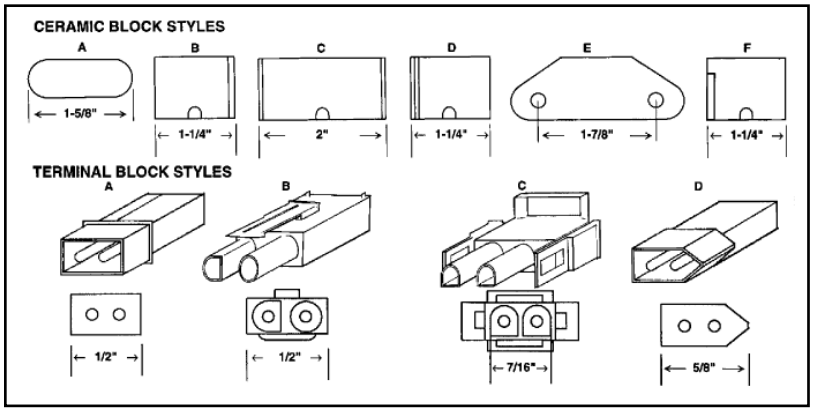
NOTE: All 41-400 series ignitors are 120 VAC models. Some hot surface modules are rated for 208/240 volts input, however they step the voltage to ignitor down to 120 VAC.



ORDERING DATA

UNI-LINE ORDER NO.	FACTORY MODEL	CERAMIC BLOCK STYLE	TERMINAL CONNECTOR TYPE	LEAD WIRE LENGTH
41-401*	271A	A	A	4-1/2"
41-402	271W	B	NONE	19"
41-403	271M	C	NONE	5-1/2"
41-404**	271M	C	D	4-1/2"
41-405	271D	D	NONE	5-1/2"
41-406*	271Y	E	NONE	10-1/2"
41-407	271	C	B	4-1/2"
41-410	271N	B	B	4-1/2"
41-411**	271N	B	C	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 a gasket.
** Includes special mounting adaptors.
† 2" long by 1-3/8" dia.



GAS IGNITION CONTROLS

REPLACEMENT CONTROLS AND COMPONENTS

UNI-LINE ORDER NO.	FACTORY MODEL	DESCRIPTION	PHOTO
IGNITION CONTROL 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 SOLENOID 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.	
WIRING HARNESSES – 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.	
REPLACEMENT 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.

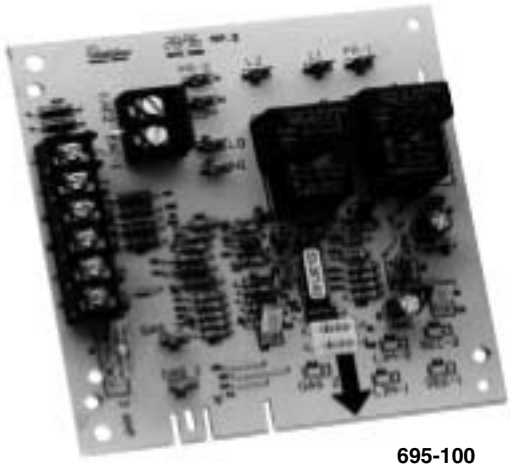
NOTE: The 780-704/705 modernization kits DO NOT include a new gas valve. They are designed to utilize the existing gas valve. The existing gas valve is at least 12 years old or older. We suggest that a complete new 712 series kit with a new gas valve be considered before using the 780-704 or 780-705 modernization kit.

780-704

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.



695-100

CROSS-REFERENCE

CES0110017	695-100	HH84AA013	695-100
CES0110018	695-100	HH84AA014	695-101
HH84AA001	695-101	HH84AA015	695-101
HH84AA003	695-101	HH84AA020	695-100
HH84AA005	695-101	HH84AA021	695-101
HH84AA009	695-101	P771-7002	695-100
HH84AA010	695-100	302075-3	695-100
HH84AA011	695-100	302075-302	695-100
HH84AA012	695-100		

SPECIFICATIONS

695-100

Input voltage	
Terminals; PR-1, PR-2, L1 & L2	120 VAC
Terminals; SEC-1 & SEC-2	18-30 VAC
Line frequency	60 Hz
Operating temperature	– 40° to 176°F
Maximum operating humidity	95% R.H. non-condensing @ 50°C
Time delay timings	
Heat "On"	75 seconds
Heat "Off"	105 seconds
Cool "Off"	90 seconds

695-101

Input voltage	
Terminals; PR-1, PR-2, L1 & L2	120 VAC
Terminals; SEC-1 & SEC-2	18-30 VAC
Line frequency	60 Hz
Operating temperature	– 40° to 176°F
Maximum operating humidity	95% R.H. non-condensing @ 50°C
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.	DESCRIPTION
695-101	REPLACES HH84AA021

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.

TEMPERATURE CONTROLS

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.

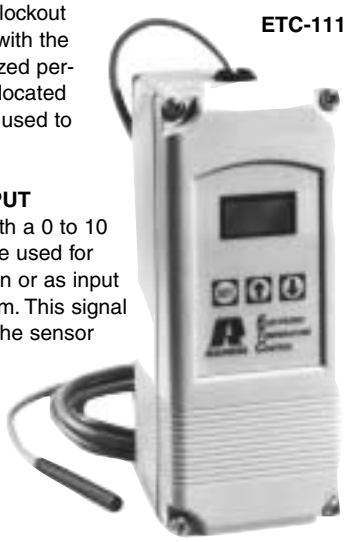
REMOTE TEMPERATURE SENSING
The ETC is capable of remote temperature sensing up to 400 feet away from the control when using standard 22 gauge sensor wire.

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 –30°F and 10 volts = 220°F.

ETC-111000



SPECIFICATIONS

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 120/208/240 VAC			

ORDERING DATA

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

2374-410

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.

2374-498

SPECIFICATIONS

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

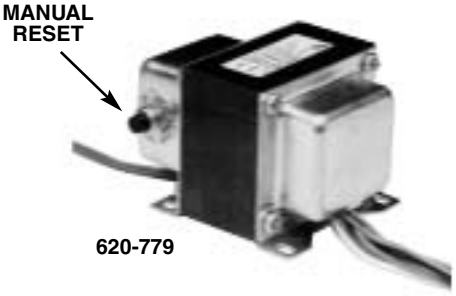
ORDERING DATA

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



620-779

ORDERING DATA

UNI-LINE ORDER NUMBER	RATING (VA)	PRIMARY VOLTAGE (50/60 HZ)	PRIMARY LEAD LENGTH	SECONDARY VOLTAGE (50/60 HZ)	SECONDARY LEAD LENGTH
75 VA FOOT-MOUNTED MODELS					
620-775*	75	120/208/240/480	8"	24	8
620-779**	75	120/208/240/480	8"	24	8

* 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).

900-385

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.

900-387

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 ORIFICES INCLUDED	1950-532	PG9A41JTL020

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

ORDERING DATA

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.

1830-702

1830-704

1830-705

1830-710

1830-711

1830-716

1830-717

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.

ORDERING DATA

UNI-LINE ORDER NO.	LENGTH	INCLUDES PG9 PILOT ADAPTOR	CONNECTION TYPE
1951-001	36"	•	COAXIAL 

250 TO 750 MILLIVOLTS
1951-001

PG9 ADAPTOR IS AVAILABLE SEPARATELY

MAXITROL® company

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.

325-3

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

RUBBER SEAT POPPET MODELS

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.
*Standard spring range: 3.0 - 6.0"wc for RV48.

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.
* Additional sizes available.

RV61

VENT LIMITING DEVICE
When using the vent limiting device, the regulator must be mounted in a horizontal upright position.
12A06 - RV52, RV53, RV61