

UNI-LINE®

product catalog



Robertshaw

ARANGO

PARAGON

SMARTSENSE

The brands you trust **delivering** **comprehensive** **solutions.**



Robertshaw®

Easy and efficient

Robertshaw® Heating Controls are Simply the Right Choice™. Robertshaw Heating products offer kitted solutions and universal features that enable a single product to replace hundreds.



RANCO®

Solutions-driven innovation

Ranco® Controls have been an industry standard for 100 years with a full line of refrigeration products. Our quality and features make Ranco an easy choice, with universal controls to reduce inventory and features like the Super Cap® to reduce breakage and costly callbacks.



PARAGON®

Increased versatility

Paragon® Defrost Controls lead the pack in versatility with the only multi-voltage timer engineered to refrigeration standards. At four defrosts a day, the Paragon Universal Defrost Timer is rated to last 16 years longer than competitive offerings.



SMARTsense® PERFECTsense™

The Smarter Choice

SmartSense® and PerfectSense™ by Uni-Line® wall thermostats, zoning and sensor modules are Simply the SMART Choice™ for flexible, easy to use and install, residential and commercial heating and air conditioning controls.

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New Catalog Feature:

This Catalog now includes a region code if a product is designed specifically for a region. These codes are included in the Part Number column.

- ANZ = Australia and New Zealand
- EU = Europe
- MEX = Mexico
- CAN = Canada
- SA = South America



Selecting the table setting is as important as the cooking controls used to deliver uncompromising excellence.

The Robertshaw® electromechanical and electronic controls offer reliability and custom solutions for setting, controlling and monitoring temperatures in commercial cooking applications.

Energy Regulators.....	A2
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Cooking





Cooking

Robertshaw®



M32314K



5500-200M

ENERGY REGULATORS

M Series

The Robertshaw® M Series Energy Regulators are a rotary switch which controls the power dissipated by a heating element.

The M Series are designed to have the lowest terminal height, in the smallest physical package while still providing a fully featured control.

This regulator achieves greater efficiency and reduction of heat for smaller spaces with its controllable range of 5% to 85% power output with a 100% continuous power position. Applications include electric ranges, ceramic cooktops, hot water urns, benchtop grills, oven grills, solid and coil element controls and many applications which call for a proportionate control of a resistive load.

Features and Benefits

- Smaller compact design with very low profile
- Design flexibility and material savings
- Push-to-Turn option
- Low internal energy consumption offers lower operating temperatures in small spaces
- Multiple mounting options
- Single or dual outputs

Specifications

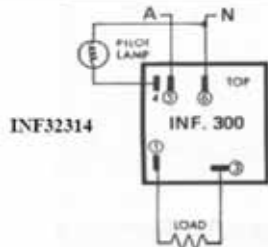
Part Numbers	Description	% Input at Low	Dial Shaft Type	Dial Shaft Length	Mounting Type	Voltage	Electrical Rating
M32314K (ANZ)	Energy Regulator Universal Kit Single Load with Pilot and Neutral Break	2% to 9% (45° arc)	Plastic D	14mm + 8mm Bushing	M10 Bushing	230/240V AC 15 Amps	100 to 3600 Watts
M55314K (ANZ)	Energy Regulator Universal Kit Single Load with Phase Break	2% to 9% (45° arc)	Metal Square	17.4mm + 8mm Bushing	M10 Bushing	230/240V AC 15 Amps	100 to 3600 Watts
M58314K (ANZ)	Energy Regulator Universal Kit Single Load with Isolated Pilot	2% to 9% (45° arc)	Metal Square	17.4mm + 8mm Bushing	M10 Bushing	230/240V AC 15 Amps	100 to 3600 Watts
M82314K (ANZ)	Energy Regulator Universal Kit Dual Load with Phase Break	2% to 9% (30° arc)	Metal Square	17.4mm + 8mm Bushing	M10 Bushing	230/240V AC 15 Amps	100 to 3600 Watts
MP101K (ANZ)	Energy Regulator Universal Kit Single Load with Pilot Switch	2% to 9% (45° arc)	Plastic D	14mm + 8mm Bushing	M10 Bushing	230/240V AC 15 Amps	100 to 3600 Watts
M601 (EU)	Energy Regulator with Single Load with Isolated Pilot and Neutral Break with Double Wire Connections L1 and L2	2% to 9% (52° arc)	Metal D	23mm	M4 Screws (x2), 28mm Centerline	230/240V AC 13 Amps	100 to 3100 Watts
M602 (EU)	Energy Regulator with Single / Dual Load Change Over with Isolated Pilot and Neutral Break with Double Wire Connections L1 and L2	2% to 9% (52° arc)	Metal D	23mm	M4 Screws (x2), 28mm Centerline	230/240V AC 13 Amps	100 to 3100 Watts
M01 (EU)	Energy Regulator with Single Load and Isolated Pilot and Neutral Break	2% to 9% (52° arc)	Metal D	23mm	M4 Screws (x2), 28mm Centerline	230/240V AC 13 Amps	100 to 3100 Watts
5500-200M	Energy Regulator Uni-Kit Push-To-Turn	5%	A	2" Break-Off	Universal	240V AC	100 Watts to 3600 Watts at 240V AC, 15 Amps max @ 210°F (100°C)





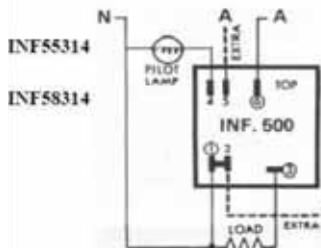
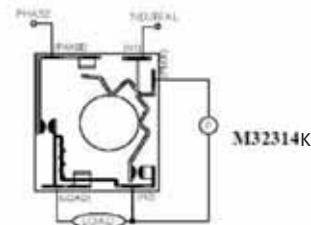
Product Drawings

Wiring Diagrams (Includes Infinite Reference Guide)



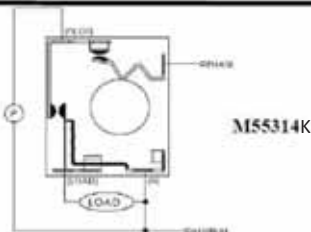
INF32314 to M32314K

Terminal "1" equals "N2"
Terminal "3" equals "LOAD"
Terminal "4" equals "PILOT"
Terminal "5" equals "PHASE"
Terminal "6" equals "N1"



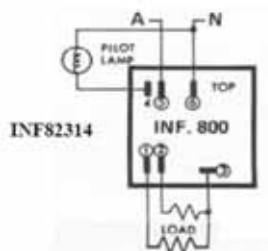
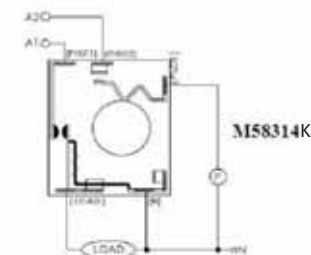
INF55314 to M55314K

Terminal "1" equals "N"
Terminal "3" equals "LOAD"
Terminal "4" equals "PILOT"
Terminal "6" equals "PHASE"



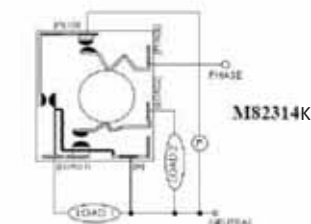
INF58314 to M5831K

Terminal "1" equals "N"
Terminal "3" equals "LOAD"
Terminal "4" equals "PILOT"
Terminal "5" equals "PHSE2"
Terminal "6" equals "PHSE1"



INF82314 to M82314K

Terminal "1" equals "LOAD1"
Terminal "2" equals "LOAD2"
Terminal "3" equals "N"
Terminal "4" equals "PILOT"
Terminal "5" equals "PHASE"
Terminal "6" equals "N"



Part Numbers	Replaces	Factory Number
M32314K	INF-32314	MPA-101-M
M55314K	INF-55314	M3-158-M
M58314K	INF-58314	MS-158-M
M82314K	INF-82314	MD3-157-M
MP101K	NA	MP-101-M
M601	NA	MST-Z601-M
M602	NA	MSCT-Z601-M
M01	NA	MSA-V01-M

1 Year
Limited
Warranty

A3



Cooking

Robertshaw®



5500-134

ELECTRIC INFINITE SWITCHES

5500 Series

The Robertshaw® 5500 Series Infinite Switch is a rotary switch which controls the power dissipated by a heating element. It is used on electric ranges, hot plates, warming drawers and zones, barbecue grills, space heaters, quartz heaters and many applications which call for proportionate control of a resistive load.

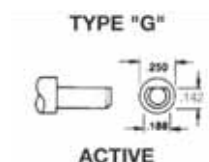
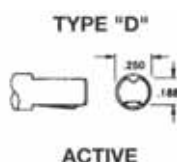
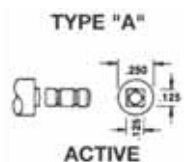
Features and Benefits

- Small compact design
- Clockwise or counterclockwise rotation
- Variety of shaft lengths and configurations
- Screw mount or bushing mount
- Push-To-Turn (PTT) or Non-Push-To-Turn (Non-PTT)

Specifications

Part Numbers	Description	% Input at Low	Dial	Dial Shaft Type	Dial Shaft Length	Mounting Type	Voltage	Electrical Rating
5500-134	Commercial Uni-Kit®	5%	Black	D	2-1/8"	Universal	120V AC	100 Watts to 3600 Watts at 240V AC, 15 Amps max @ 210°F (100°C)
5500-135	Commercial Uni-Kit	5%	White	D	2-1/8"	Universal	120V AC	100 Watts to 3600 Watts at 240V AC, 15 Amps max @ 210°F (100°C)
5500-200	Infinite Controls Uni-Kit Push-To-Turn	5%	None	A	2" Break-Off	Universal	240V AC	100 Watts to 3600 Watts at 240V AC, 15 Amps max @ 210°F (100°C)
5500-202	Infinite Controls Uni-Kit	5%	None	A	2" Break-Off	Universal	240V AC	100 Watts to 3600 Watts at 240V AC, 15 Amps max @ 210°F (100°C)
5500-212	G.E./Hotpoint Uni-Kit	5%	None	G	2" Break-Off	Universal	240V AC	100 Watts to 3600 Watts at 240V AC, 15 Amps max @ 210°F (100°C)
5500-234	Commercial Uni-Kit	5%	Black	D	2-1/8"	Universal	240V AC	100 Watts to 3600 Watts at 240V AC, 15 Amps max @ 210°F (100°C)
5500-235	Commercial Uni-Kit	5%	White	D	2-1/8"	Universal	240V AC	100 Watts to 3600 Watts at 240V AC, 15 Amps max @ 210°F (100°C)
5500-287	Whirlpool Uni-Kit Push-To-Turn	5%	None	D	1-3/8", 7/8" & 11/16" Break-Offs	4 Position Screw	240V AC	100 Watts to 3600 Watts at 240V AC, 15 Amps max @ 210°F (100°C)

Product Dimensions - Dimensions are in inches.



CE

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A4

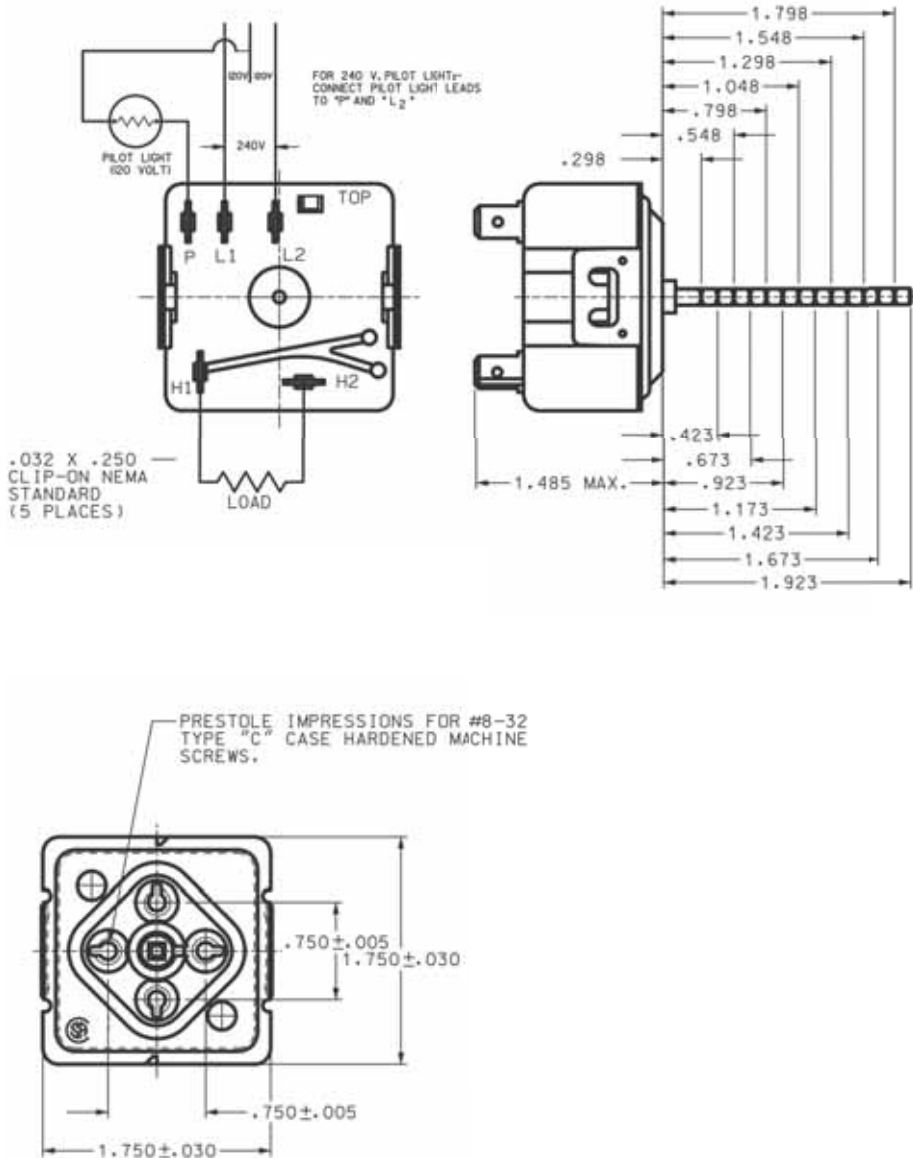
www.Uni-Line.com

Customer Service 1.800.304.6563



Product Drawings

Product Dimensions - Dimensions are in inches.



Robertshaw[®]

1 Year
Limited
Warranty



Cooking

Robertshaw®



A6



5300-614



5300-401

ELECTRIC THERMOSTATS

5300 Series

The Robertshaw® 5300 Series Electric Thermostat is a snap-acting, single pole single throw (SPST) type thermostat. Most thermostats use silver contacts and have heavy-duty terminals for durability and sustained accuracy. The snap-action mechanism is precise and reliable. This direct acting series of thermostats is suitable for the commercial cooking industry.

Features and Benefits

- KN models are NAK filled diastats with temperature ranges up to 975°F (524°C)
- Rugged and compact design for versatility and long life
- Bulb and capillary available in copper, nickel plated copper and stainless steel (most models)
- Plastic coating available for protection against moisture, dust, etc. (most models)
- Dials of heat resistant plastic available
- RX millivolt models with hermetically sealed reed switch
- Stem flat in down position
- Ambient temperature 200°F (93°C)

Specifications

Part Numbers	Description	Temperature Range	Capillary Length	Bulb Size	Stem Length	Mounting Bracket	Dial Type	Mechanical Differential	Stuffing Box	Electrical Rating
5300-146	SJ Pilot Duty Model with Auxiliary Switch	100°F to 450°F	36"	3/16" x 11-1/8" Nickel	13/16"	#1, 1-3/4"	4-Way	12°F	NA	30 Amp @ 277V AC 20 Amp @ 480V AC 18 FLA, 72 LRA @ 250V AC 125 VA Pilot Duty at 120/277 Volts
5300-175	S Model	100°F to 325°F	36"	3/16" x 11-3/4" Nickel	13/16"	#1, 1-3/4"	NA	12°F	NA	30 Amp @ 277V AC 20 Amp @ 480V AC 18 FLA, 72 LRA @ 250V AC 125 VA Pilot Duty at 120/277 Volts
5300-219	SP Model	60°F to 240°F	36"	1/4" x 6-7/16" Copper	3/8"	#1, 1-3/4"	NA	8°F	NA	30 Amp @ 277V AC 20 Amp @ 480V AC 18 FLA, 72 LRA @ 250V AC 125 VA Pilot Duty at 120/277 Volts
5300-401	RX Millivolt Model with Hermetically Sealed Reed Switch	200°F to 400°F	36"	3/8" x 5-5/8" Nickel	13/16"	#1, 1-3/4"	4-Way	8°F	1/4" Nickel	0.67 Amp @ 5V DC



Specifications - continued

Part Numbers	Description	Temperature Range	Capillary Length	Bulb Size	Stem Length	Mounting Bracket	Dial Type	Mechanical Differential	Stuffing Box	Electrical Rating
5300-406	RX Millivolt Model with Hermetically Sealed Reed Switch	200°F to 375°F	36"	3/8" x 5-5/8" Nickel	13/16"	#1, 1-3/4"	4-Way	8°F	3/8" Nickel	0.67 Amp @ 5V DC
5300-502	KNP Model with 1-10 Dial (Wide)	250°F to 960°F	36"	5/32" x 8-3/4" Stainless Steel	1"	#5, 1-1/4"	4-Way	25°F	NA	27 Amp @ 208V AC 25 Amp @ 240V AC 22.5 Amp @ 277V AC 20 Amp @ 480V AC 125 VA Pilot Duty at 120/277 Volts
5300-612	SP Model Uni-Kit®	60°F to 250°F	60"	1/4" x 9-1/4" Copper	2" Kit	#6, Kit	4-Way	8°F	NA	30 Amp @ 277V AC 20 Amp @ 480V AC 18 FLA, 72 LRA @ 250V AC 125 VA Pilot Duty at 120/277 Volts
5300-614	SP Model Uni-Kit	60°F to 250°F	60"	3/8" x 4-1/2" Nickel	2" Kit	#6, Kit	4-Way	8°F	NA	30 Amp @ 277V AC 20 Amp @ 480V AC 18 FLA, 72 LRA @ 250V AC 125 VA Pilot Duty at 120/277 Volts
5300-618	SP Model Uni-Kit	100°F to 450°F	60"	3/16" x 11-1/8" Nickel	2" Kit	#6, Kit	4-Way	12°F	NA	30 Amp @ 277V AC 20 Amp @ 480V AC 18 FLA, 72 LRA @ 250V AC 125 VA Pilot Duty at 120/277 Volts
5300-641	SP Model Uni-Kit	200°F to 400°F	36"	5/16" x 7-1/2" Nickel	2" Kit	#6, Kit	4-Way	8°F	3/8" Nickel	30 Amp @ 277V AC 20 Amp @ 480V AC 18 FLA, 72 LRA @ 250V AC 125 VA Pilot Duty at 120/277 Volts
5300-651	SP Model Uni-Kit	175°F to 550°F	60"	3/16" x 11-5/8" Nickel	2" Kit	#6, Kit	4-Way	12°F	NA	30 Amp @ 277V AC 20 Amp @ 480V AC 18 FLA, 72 LRA @ 250V AC 125 VA Pilot Duty at 120/277 Volts
5300-671	SP Model Uni-Kit	300°F to 700°F	60"	3/16" x 12-1/4" Nickel	2" Kit	#6, Kit	4-Way	12°F	NA	30 Amp @ 277V AC 20 Amp @ 480V AC 18 FLA, 72 LRA @ 250V AC 125 VA Pilot Duty at 120/277 Volts
5300-711	KX Pilot Duty Model Dip Sealed	200°F to 400°F	36"	3/8" x 5-5/8" Nickel	13/16"	#1, 1-3/4"	4-Way	8°F	1/4" Nickel	50 VA Pilot Duty at 120 / 277 Volts
5300-735	KXP Pilot Duty Model Uni-Kit	175°F to 550°F	60"	3/16" x 11-5/8" Nickel	2" Kit	#6, Kit	4-Way	12°F	NA	50 VA Pilot Duty at 120 / 277 Volts
5300-766	KX Pilot Duty Model	200°F to 400°F	24"	5/16" x 5-5/8" Stainless Steel	13/16"	#1, 1-3/4"	4-Way	8°F	3/8" Nickel	50 VA Pilot Duty at 120 / 277 Volts

Robertshaw®

1 Year
Limited
Warranty

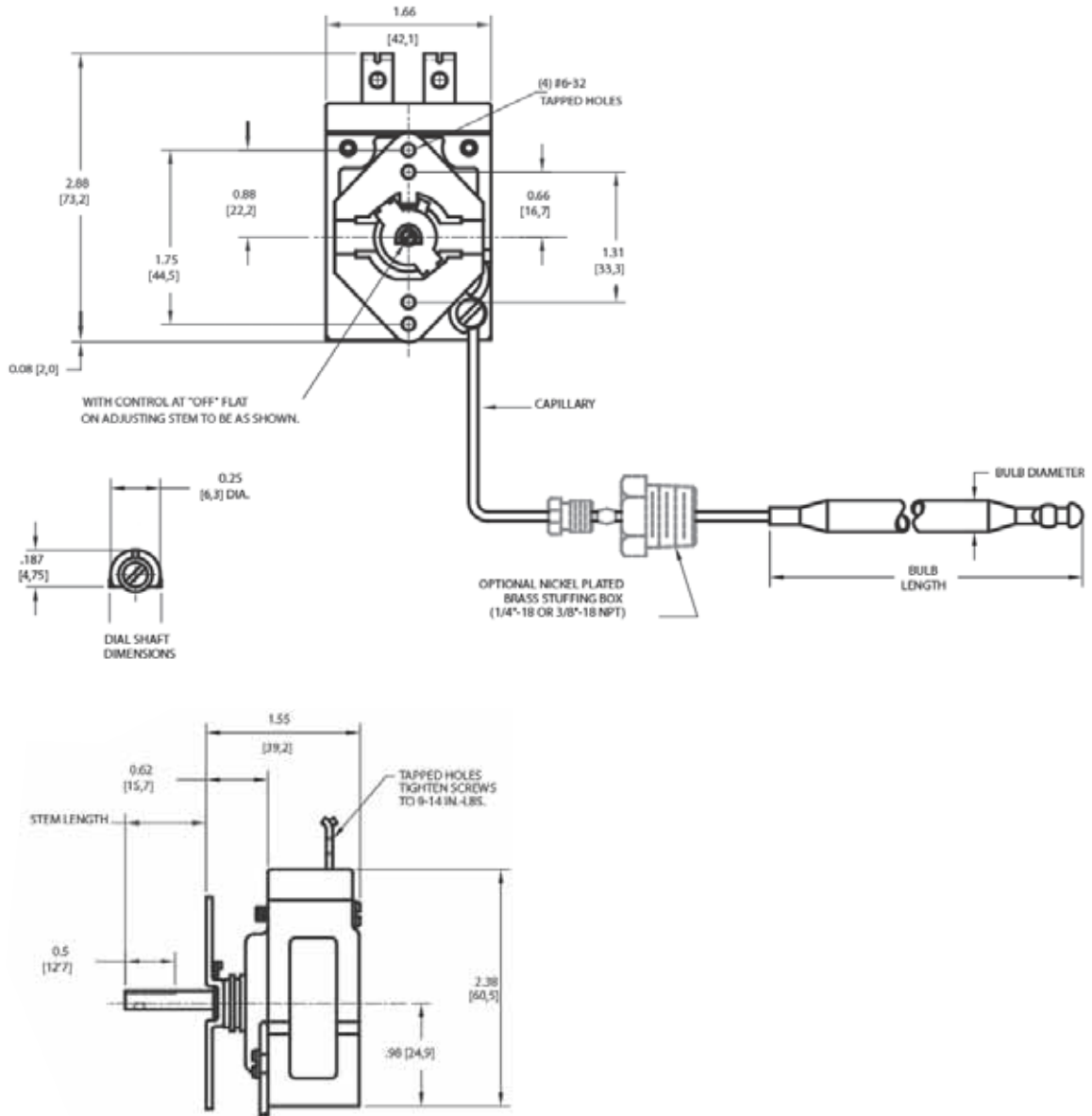


Cooking

Robertshaw®

Product Drawings

Product Dimensions - Dimensions are inches and [millimeters].





ELECTRIC THERMOSTATS - LIMIT CONTROLS

5225 Series

The Robertshaw® 5225 Series Limit Control is designed for any appliance where temperature protection is needed. All 5225 Series controls are non-adjustable, factory calibrated, and feature negative biased power element diaphragms. The 5225 Series is a proven safety control for commercial and specialty applications. They are available in automatic or manual reset versions with temperature settings from 425°F to 600°F (218°C to 316°C).

Features and Benefits

- Bulb and capillary assemblies available in nickel plated copper
- Available in manual reset or automatic operation
- Control function is designed to interrupt power in the appliance circuit at the calibrated temperature



5225-112

Robertshaw
®

Specifications

Part Numbers	Description	Fixed Temperature	Capillary Length	Bulb Size	Mounting Bracket	Stuffing Box
5225-009	LCH Manual Reset Limit Control	450°F	30"	5/16" x 3-5/8" Nickel	#1	NA
5225-010	LCC Automatic Reset Limit Control	450°F	60"	3/16" x 4-7/8" Nickel	#1	3/8"
5225-047	LCH Manual Reset Limit Control	450°F	24"	3/16" x 7-5/8" Nickel	#1	3/8"
5225-054	LCH Manual Reset Limit Control	440°F	30"	1/4" x 4-7/8" Nickel	#7	Panel Nut
5225-112	LCH Manual Reset Limit Control	450°F	30"	1/4" x 4-7/8" Nickel	#3	1/4"

Model	Description	UL Rating	CSA Rating	European
LCH	SPST - Break on Temperature Rise Manual Reset. Type M2*	30 A, 250V AC @ 125-480 V AC 35 VA PD @ 24 V, 60 Hz	30 A @ 125-480V AC	30 A @ 480V AC
LCC	SPDT - Make and / or Break on Temperature Rise. Automatic Reset	25 A, 250 VA @ 125-480 V, 60 Hz 35 A @ 24V AC	25 A, 250 V AC @ 125-480V AC 35 VA PD @ 24 V, 60 Hz	25 A @ 480V AC

*M2 switch - trip free - will not recycle if reset button is depressed





Cooking

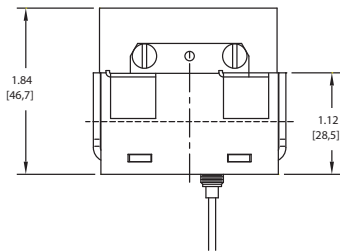
Robertshaw®

Product Drawings

Product Dimensions - Dimensions are inches and [millimeters].

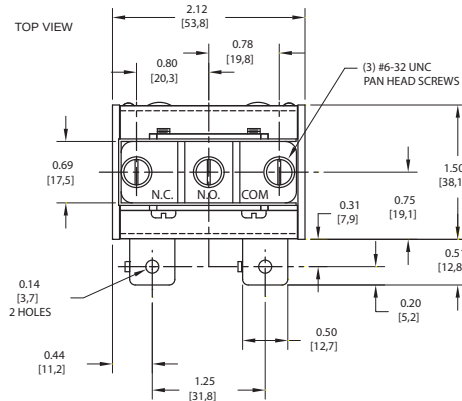
MODEL LCC

FRONT VIEW

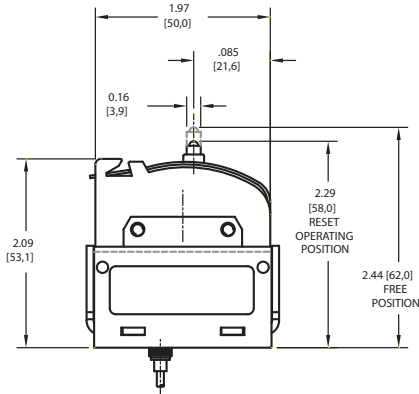


MODEL LCC

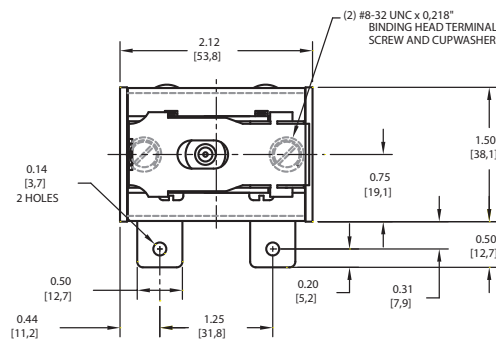
TOP VIEW



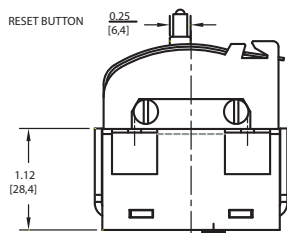
MODEL LCH



MODEL LCH



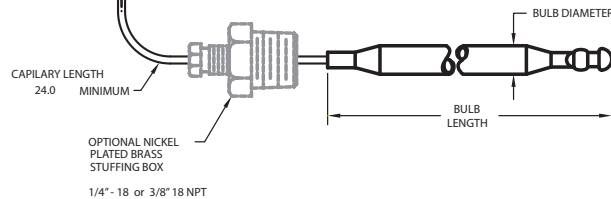
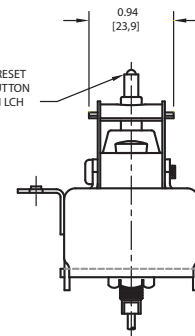
MODEL LCH



Panel Nut



MODEL LCH

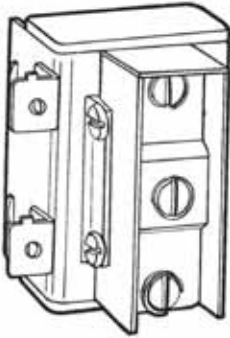




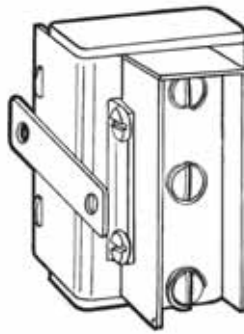
Product Drawings

Mounting Bracket Types

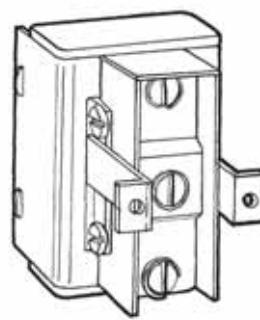
Type #1



Type #3



Type #7



Robertshaw[®]

1 Year
Limited
Warranty

A11



Cooking

Robertshaw®



5210-125

ELECTRIC THERMOSTATS

5210 Series

The Robertshaw® 5210 Series Electric Thermostat is a direct acting, single pole, slow make and break type thermostat. Typical applications are for incubators, laboratory ovens, water baths, sterilizers, dishwashers, steam tables, scalding tanks and other equipment where a close temperature differential is required.

Features and Benefits

- Temperature ranges to 550°F (288°C)
- Single pole, slow make and break design
- Very sensitive to temperature change
- Small temperature differential between make and break
- Fine silver contacts to assure consistent switch action and long life
- Rugged and compact design for versatility of application
- Bulb and capillary available in copper or nickel plated copper

Specifications

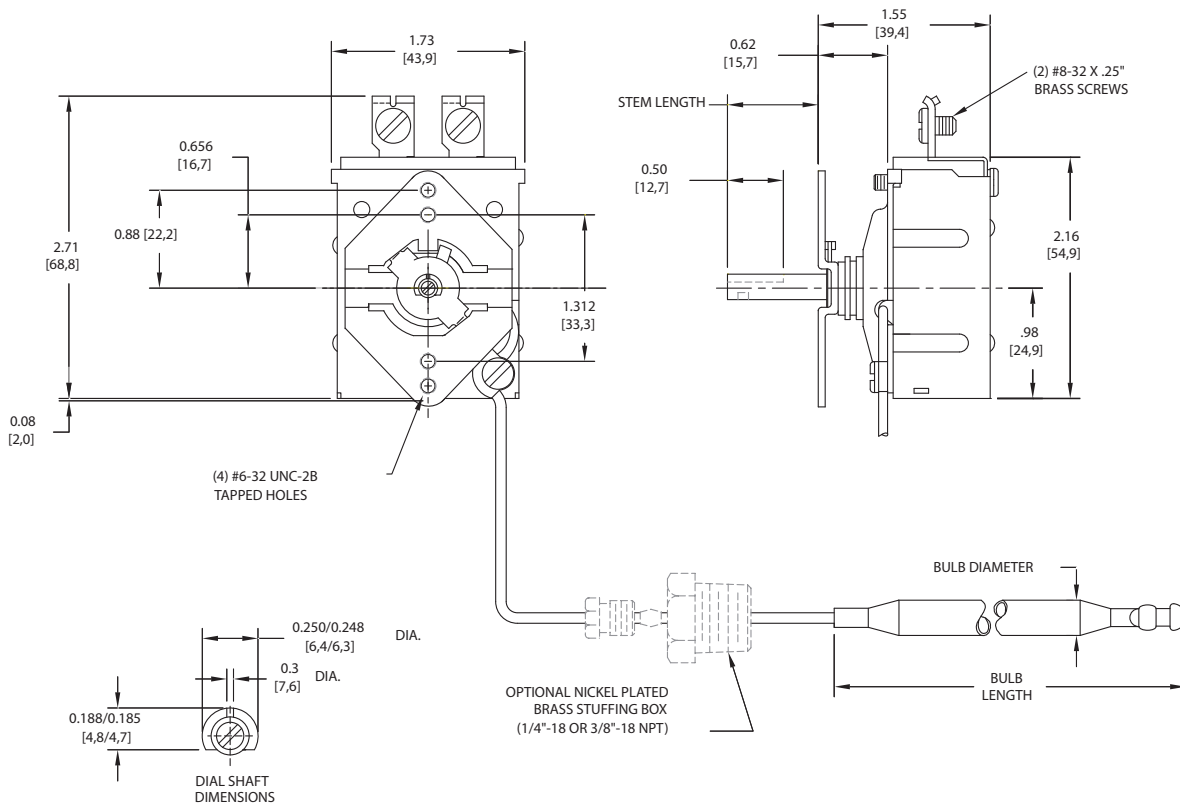
Part Numbers	Description	Dial Temperature Range	Ambient Temperature	Capillary Length	Bulb Size	Electrical Rating
5210-125	B-10 Commercial Direct Acting Thermostat	60°F to 200°F (15°C to 93°C)	32°F to 150°F (0°C to 60°C)	42"	3/16" x 15-3/8" Nickel	20 Amps @ 125V AC 15 Amps @ 250V AC 125VA PD @ 125V AC





Product Drawings

Product Dimensions - Dimensions are inches and [millimeters].



Robertshaw

1 Year
Limited
Warranty

A13



Cooking

Robertshaw®



5000-851

ELECTRIC THERMOSTATS

5000 Series

The Robertshaw® 5000 Series Electric Thermostat is a heavy-duty thermostat designed for use in harsh applications where precise temperature control is required. The control uses a double pole single throw (DPST) snap-action mechanism with a positive OFF switch. It is recommended for use on applications that require double pole operation and accurate temperature control.

Features and Benefits

- DPST with positive OFF
- Mechanical snap-action is instantaneous, positive and non-fatiguing
- Reacts to exceedingly small movements of the diaphragms for very close temperature differential
- Diaphragm assembly features two stainless steel diaphragms electrically welded together
- Maximum sensitivity without over-stressing the metal
- Supplied with terminals mounted in four different positions
- Bulb and capillary available in copper, nickel plated copper, or stainless steel

Specifications

Part Numbers	Description	Dial Temperature Range	Capillary Length	Bulb Size	Dial Type	Mechanical Differential	Electrical Rating
5000-811	D1 & D18 Commercial Electric Thermostat with Pilot Light, 4-Way Bezel, Uni-Kit®	60°F to 250°F (15°C to 121°C)	60"	3/8" x 4-1/2"	4-Way	6°F (3°C)	120, 277V AC @ 30A 480V AC @ 10A 277V AC @ 250VA 125V AC @ 125VA
5000-851	D1 & D18 Commercial Electric Thermostat with Pilot Light, 4-Way Bezel, Uni-Kit	100°F to 550°F (38°C to 288°C)	60"	3/16" x 13" Nickel	4-Way	6°F (3°C)	120, 277V AC @ 30A 480V AC @ 10A 277V AC @ 250VA 125V AC @ 125VA

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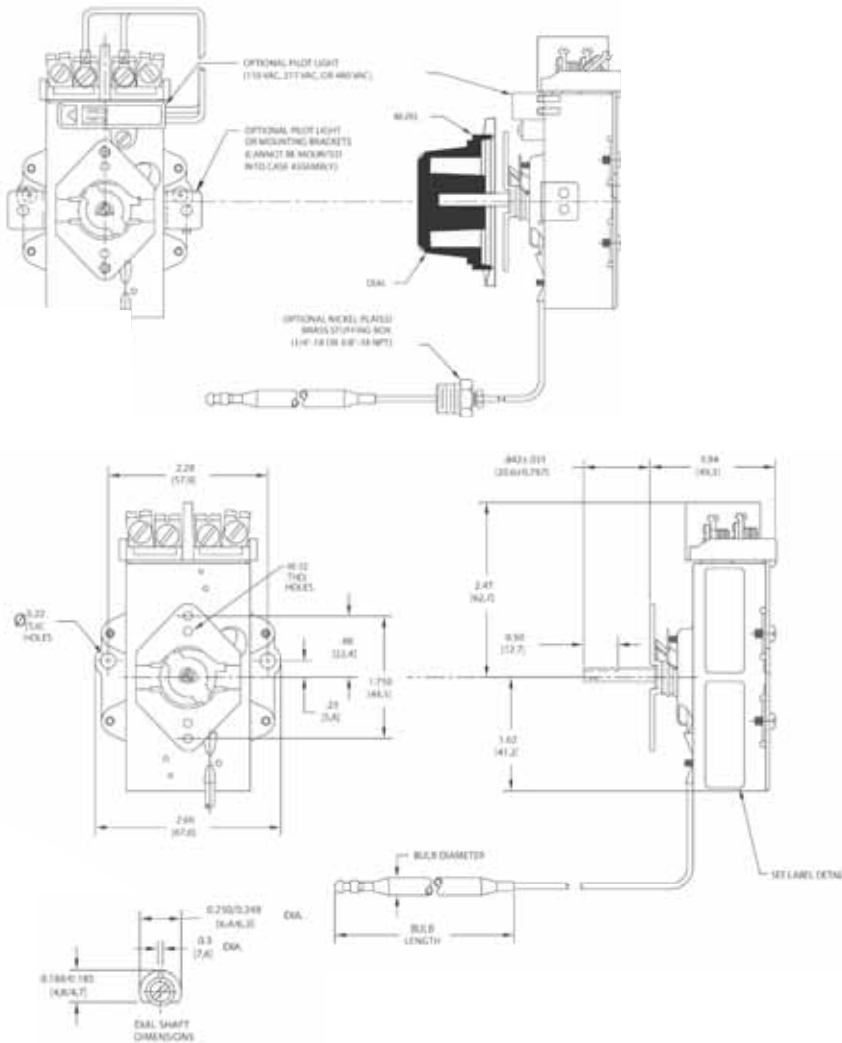
www.Uni-Line.com

Customer Service 1.800.304.6563

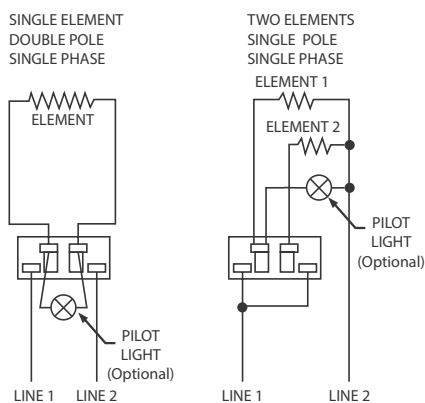


Product Drawings

Product Dimensions - Dimensions are inches and [millimeters].



Wiring Diagram



1 Year
Limited
Warranty

A15



Cooking

Robertshaw®



4350-028



4590-705

GAS THERMOSTATS

4350 Series

The Robertshaw® 4350 Series Gas Thermostat is a combination gas cock and by-pass type thermostat. It is available with both by-pass and pilot adjustments. With these thermostats, the gas is turned on and the temperature setting made with a single turn of the dial. The 4350 Series is available for a wide variety of applications, especially ranges and griddles.

Features and Benefits

- Highly adaptable because of multiple orientations and number of outlets
- Mounted, via flange nipple, above or below the manifold
- Available with various temperature ranges
- Front adjustment for pilot and by-pass
- Modulating seat action
- Bulb and capillary available in copper, nickel plated copper and stainless steel

Specifications

Part Numbers	Description	Max Inlet Pressure	Main Outlet Size	Main Outlet Position	Housing Rotated	Pilot Outlet	Flange Type	Capillary Length	Sensing Bulb	Capacity (Natural Gas)	Temperature Range
4350-015	BJWA Control for Ovens	0.5 PSI	1/4" Pipe	B	180°	Plug	Narrow	48"	3/16" x 11-3/16"	70,000 BTU/HR	250°F to 500°F (121°C to 260°C)
4350-027	BJWA Kit for Ovens	0.5 PSI	1/4" Pipe	A, B, C, D	No	Yes	Wide	48"	3/16" x 11-3/16"	70,000 BTU/HR	250°F to 550°F (121°C to 288°C)
4350-028	BJWA Kit for Griddles	0.5 PSI	1/4" Pipe	A, B, C, D	No	Yes	Wide	36"	3/16" x 8-5/8"	70,000 BTU/HR	150°F to 400°F (66°C to 205°C)
4350-029	BJWA Kit for Ovens	0.5 PSI	7/16" Tubing	C	No	Yes	Wide	48"	3/16" x 11-3/16"	70,000 BTU/HR	250°F to 550°F (121°C to 288°C)
4350-040	BJWA Control for Ovens	0.5 PSI	1/4" Pipe	D	90° Clockwise	Plug	Narrow	48"	3/16" x 11-3/16"	70,000 BTU/HR	250°F to 550°F (121°C to 288°C)
4350-127	BJWA Kit for Ovens	0.5 PSI	1/4" Pipe	A, B, C, D	180°	No	Wide	48"	3/16" x 11-3/16"	70,000 BTU/HR	250°F to 550°F (121°C to 288°C)
4350-128	BJWA Kit for Griddles	0.5 PSI	1/4" Pipe	A, B, C, D	180°	No	Wide	48"	3/16" x 8-5/8"	70,000 BTU/HR	150°F to 400°F (66°C to 205°C)

Accessories

Part Numbers	Description
4590-705	BJ Stem Extension (Package of 6)

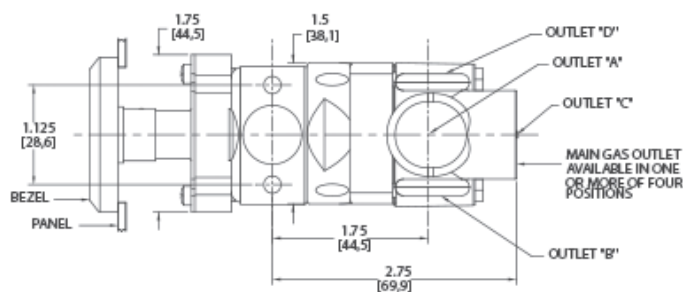
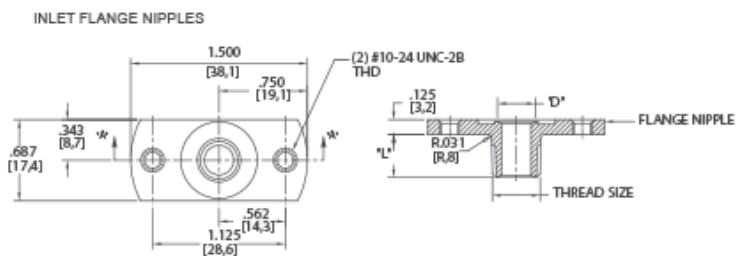
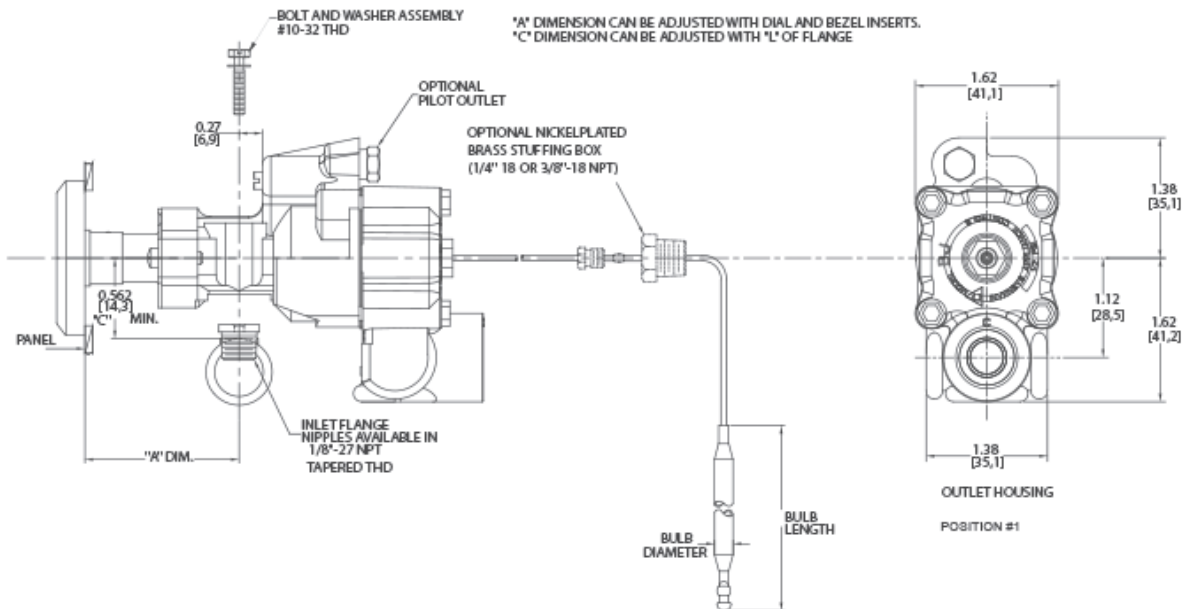
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Product Drawings

Product Dimensions - Dimensions are inches and [millimeters].



1 Year
Limited
Warranty



Cooking

Robertshaw®



4290-008

GAS THERMOSTATS

4290 Series

The Robertshaw® 4290 Series Gas Thermostat is a snap-acting hydraulic thermostat and used to provide temperature control by interrupting gas flow to the burner. The 4290 Series gas thermostat is available for a wide variety of applications including small ovens, griddles, brooders, warming cabinets, and fryers.

Features and Benefits

- Capable up to 30,000 BTUs
- Available in various temperature ranges, with temperature control up to 600°F (316°C)
- Snap-acting from Off position to full gas flow
- Adjustable bypass key and bypass settings are optional
- Applicable to use with high capacity gas operated diaphragm valves (700-800 Series)
- Adapts to limited mounting space
- Bulb and capillary assemblies supplied in nickel plated copper or stainless steel
- Dials in heat resistant plastic are included
- Ambient temperature is 300°F (149°C)

Specifications

Part Numbers	Description	Capillary Length	Bulb Size	Inlet Size	Outlet Size	Stuffing Box	Pilot Outlet	Stem Flat	Temperature Range
4290-006	GS Gas Snap-Action Hydraulic Control	30"	3/8" x 5-3/8" Nickel	1/4" Tubing	1/4" Tubing	1/4" Nickel	NA	Down	200°F to 410°F (93°C to 210°C)
4290-008	GS Gas Snap-Action Hydraulic Control	60"	3/8" x 4-1/2" Nickel	3/8" Pipe	3/8" Pipe	3/8" Nickel	NA	Down	60°F to 250°F (16°C to 121°C)
4290-020	GS Gas Snap-Action Hydraulic Control	36"	3/16" x 13" Nickel	1/4" Tubing	1/4" Tubing	NA	NA	Down	200°F to 550°F (93°C to 288°C)

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Customer Service 1.800.304.6563

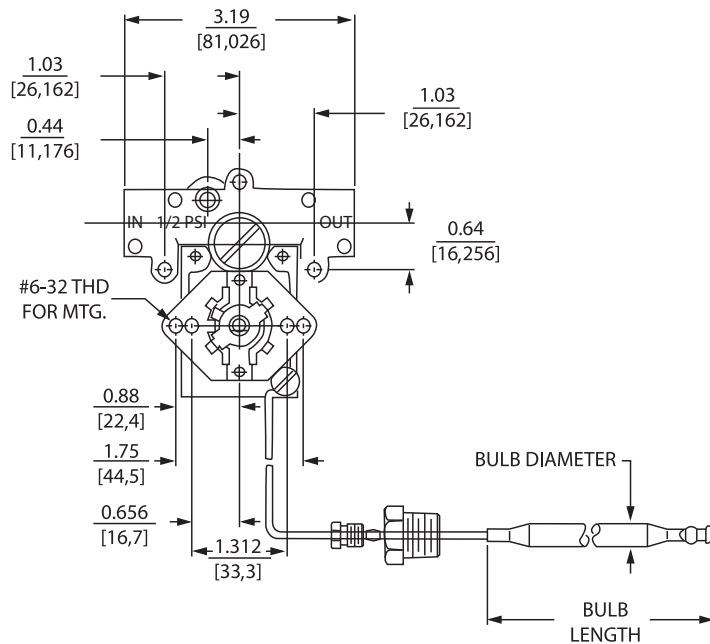


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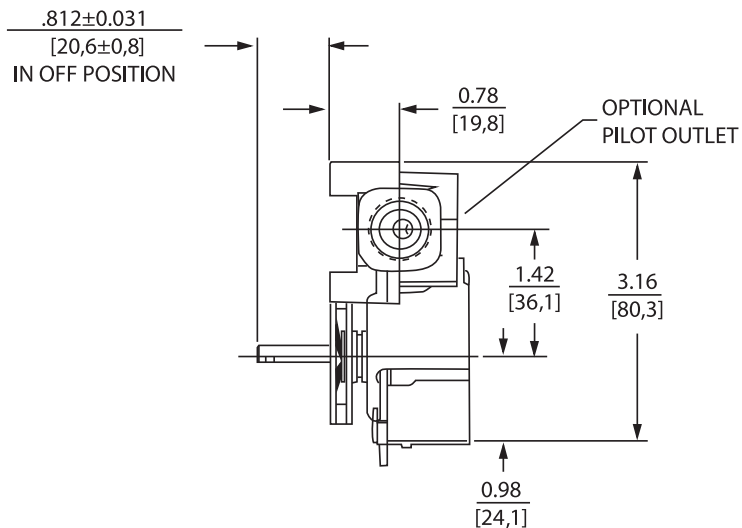
Product Drawings

Product Dimensions - Dimensions are inches and [millimeters].

Front View



Right View



1 Year
Limited
Warranty



Cooking

Robertshaw®

GAS THERMOSTATS



4200-005
Type #2 Body



4200-025
Type #1 Body

4200 Series

The Robertshaw® 4200 Series Gas Thermostat is a heavy-duty, high capacity gas thermostat. These units are available with modulating only or with modulating snap-acting bypass. Both pilot and bypass adjustments are provided. Pilot outlets and customized settings are optional. They are available for a wide variety of applications such as deck ovens, convection ovens, baking ovens, and ranges.

Features and Benefits

- Heat resistant materials and rugged design
- The pilot and bypass keys are accessible and the pilot and keys are slotted for easy adjustment from the front of the control
- Provides temperature control on most gas appliance systems
- Allows for low temperature control
- Modulates the main gas supply and controls the bypass gas with a snap under the same thermostatic action
- Bulb and capillary assemblies supplied in copper, nickel plated copper or steel
- 4-Way mounting position
- RoHS Compliant

Specifications

Part Numbers	Description	Inlet Side "F"	Inlet Rear "H"	Outlet Side "E"	Outlet Rear "G"	Pilot Outlet	Capillary Length	Bulb Size	Temperature Range
4200-005	FDO Gas Thermostat, Body Type #2	1/2" Pipe	NA	1/2" Pipe	NA	Side	48"	3/16" x 14-3/4" Nickel	150°F to 550°F (66°C to 288°C)
4200-007	FDO Gas Thermostat Body Type #1	1/2" Pipe	NA	1/2" Pipe	NA	Side	48"	1/4" x 8-7/16" Nickel	150°F to 550°F (66°C to 288°C)
4200-011	FDTG Gas Thermostat, Body Type #2	1/2" Pipe	NA	1/2" Pipe	NA	Side	48"	3/16" x 14-3/4" Nickel	200°F to 550°F (93°C to 288°C)
4200-025	FDO Gas Thermostat Uni-Kit® Body Type #1	3/8" Pipe	3/8" Pipe	3/8" Pipe	3/8" Pipe	Side & Rear	54"	3/16" x 14-3/4" Nickel	150°F to 550°F (66°C to 288°C)
4200-026	FDTG Gas Thermostat Uni-Kit Body Type #1	3/8" Pipe	3/8" Pipe	3/8" Pipe	3/8" Pipe	Side & Rear	54"	3/16" x 14-3/4" Nickel	200°F to 550°F (93°C to 205°C)
4200-503	FDTH Gas Thermostat Body Type #1	1/2" Pipe	NA	1/2" Pipe	NA	Side	48"	3/16" x 15-3/8" Nickel	300°F to 650°F (149°C to 343°C)
4200-505	FDTH Gas Thermostat, Body Type #2	1/2" Pipe	NA	1/2" Pipe	NA	Side	48"	3/16" x 14-3/4" Nickel	300°F to 650°F (149°C to 343°C)
4200-508	FDH Gas Thermostat, Body Type #2	1/2" Pipe	NA	1/2" Pipe	NA	Side	48"	3/16" x 14-3/4" Nickel	300°F to 650°F (149°C to 343°C)

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Customer Service 1.800.304.6563

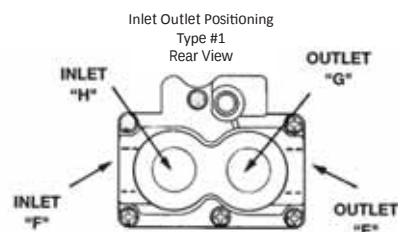
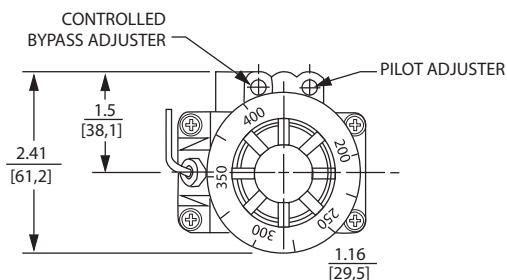


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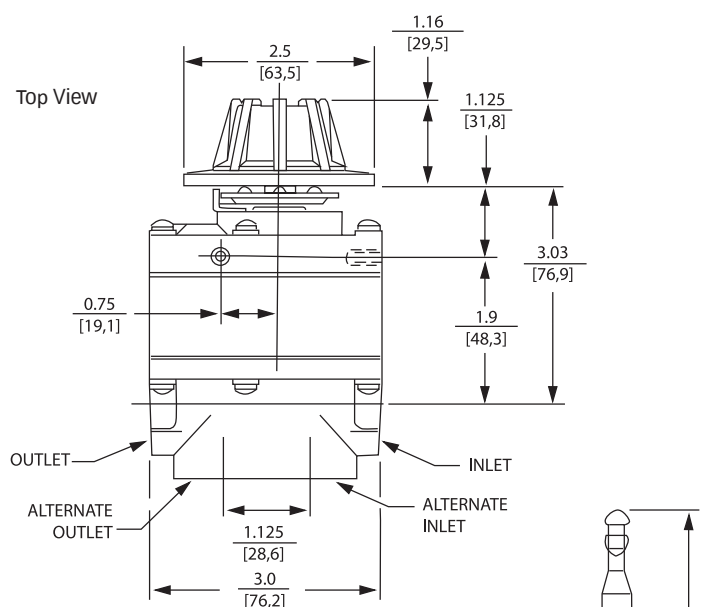
Product Drawings

Product Dimensions - Dimensions are inches and [millimeters].

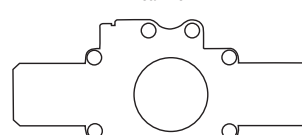
Front View



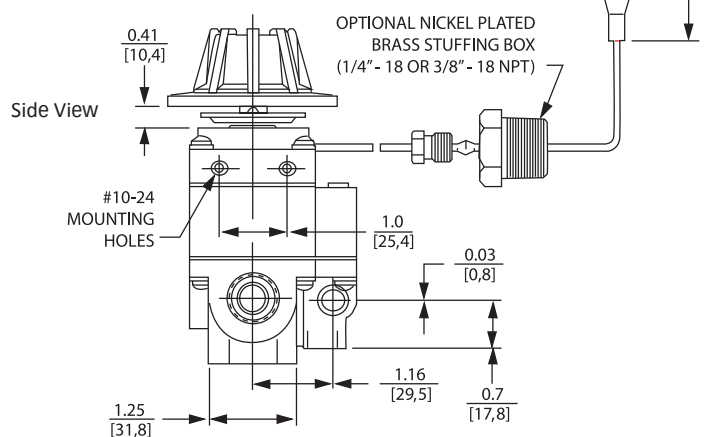
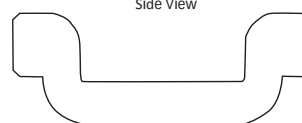
Top View



Inlet Outlet Positioning
Type #2
Rear View



Side View





Cooking

Robertshaw®



700-886

GAS VALVES - BLEED CONTROL

700 Series

The Robertshaw® Unitrol® 700 Series Bleed Control Gas Valves combine a manual main and pilot gas valve, a separate automatic safety pilot valve, pilot adjustment valve, and a diaphragm valve. The regulated models also feature “straight line” gas pressure regulation. Robertshaw diaphragm gas valves are single function, and are excellent replacements for solenoid gas valves. Models are available with or without a gas cock and regulated or non-regulated. Standard features include pilot outlet, pilot gas filter and pilot adjustment key.

Features and Benefits

- Normally closed solenoid
- Compact size with high flow rates
- Standard NEMA terminals
- Inlet filtered screen
- Various gas types: natural, manufactured, mixed, LP, and LP/air mixtures
- Multiple actuators available
- ROHS compliant

Specifications

Part Numbers	Description	Capacity	Inlet Size	Outlet Size	Pressure Regulation	Reducer Bushings Included	Comments
700-803	Bleed Control Gas Valve	305,000 BTU	3/4"	3/4"	NA	NA	Can be used on regulated LP systems and is Thermocouple driven
700-804	Bleed Control Gas Valve	305,000 BTU	3/4"	3/4"	3.5" WC Natural Gas	NA	Has slow opening feature which can be removed and is Thermocouple driven
700-886	Bleed Control Gas Valve	305,000 BTU	3/4"	3/4"	3.5" WC Natural Gas	1/2" (x2)	Thermopile driven
700-887	Bleed Control Gas Valve	240,000 BTU	1/2"	1/2"	4.0" WC Natural Gas	NA	Thermopile driven

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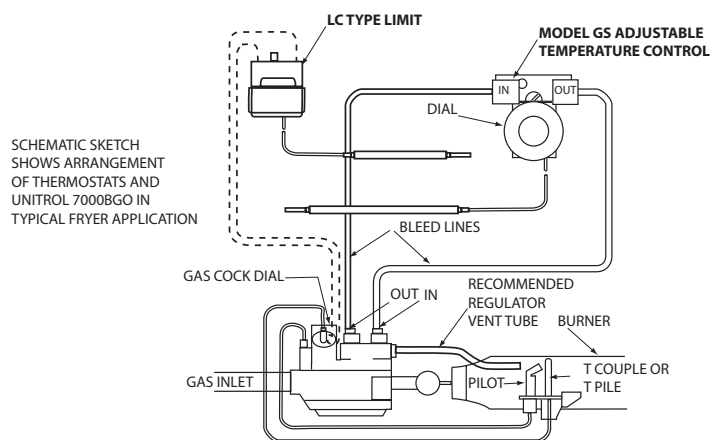
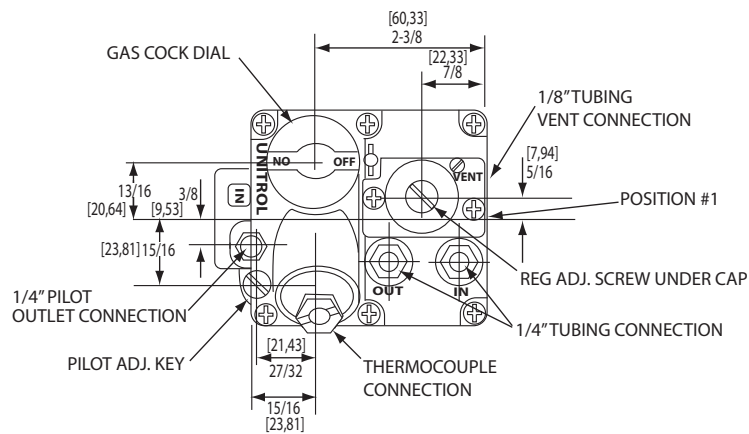
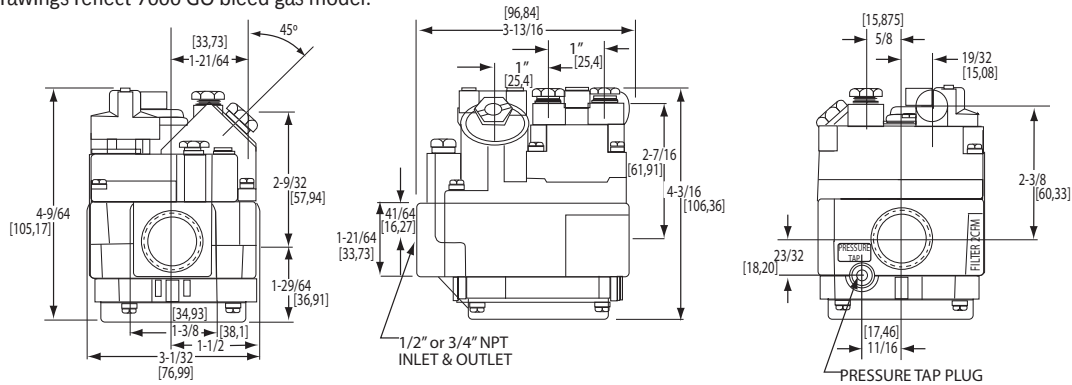
Customer Service 1.800.304.6563



Product Drawings

Product Dimensions - Dimensions are inches and [millimeters].

Drawings reflect 7000 GO bleed gas model.



1 Year
Limited
Warranty

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Cooking

Robertshaw®



4075-029



4075-200

GAS VALVES - SOLENOID

4075 Series

The Robertshaw® 4075 Series Gas Solenoid is designed to control the flow of gas in cooking appliances. Both single FJT and dual FJTDO models are available for a wide variety of applications such as ovens, griddles and fryers.

Features and Benefits

- Normally closed solenoid
- Multiple inlet/outlet configurations
- 1/8" side pilot outlets available
- Compact size with high flow rates
- Standard NEMA terminals
- Inlet filtered screen
- Gas types: natural, manufactured, fixed, LP and LP/air mixtures
- RoHS compliant
- AC rectification for silent operation

Specifications

Part Numbers	Description	Inlet	Outlet	Pilot Outlet	Max Pressure	Capacity	Ambient Temperature	Electrical Rating	Comments
4075-029	FJT Single Gas Solenoid Valve	3/8" Pipe	3/8" Pipe	Left and Right	0.5 PSI	119,000 BTU	-40°F to 275°F (-40°C to 135°C)	24 / 120 / 240 Volts @ 50/60 Hz	Includes (2) 1/8" plugs
4075-200	FJTDO Dual Gas Solenoid Valve	3/8" Pipe	3/8" Pipe	NA	0.5 PSI	165,000 BTU both 110,000 BTU each	-40°F to 275°F (-40°C to 135°C)	24 / 120 / 240 Volts @ 50/60 Hz	0.10 Amp Coil

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Customer Service 1.800.304.6563

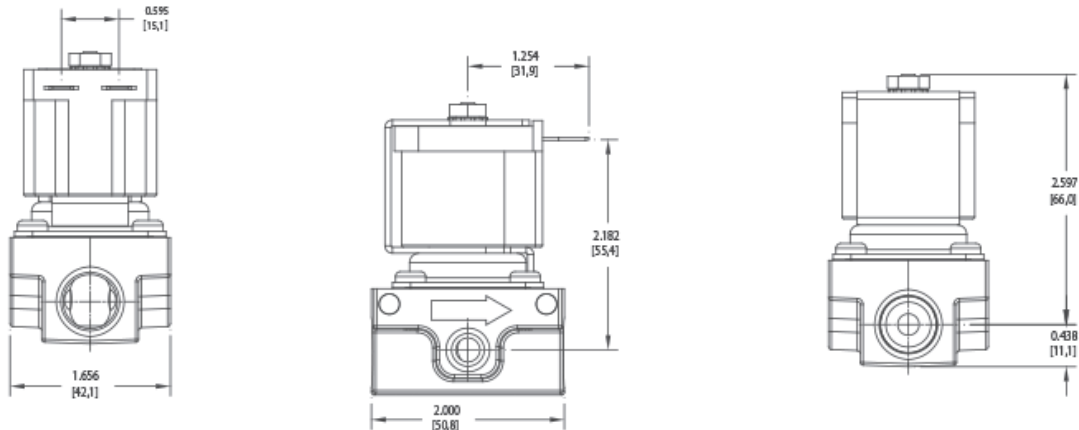


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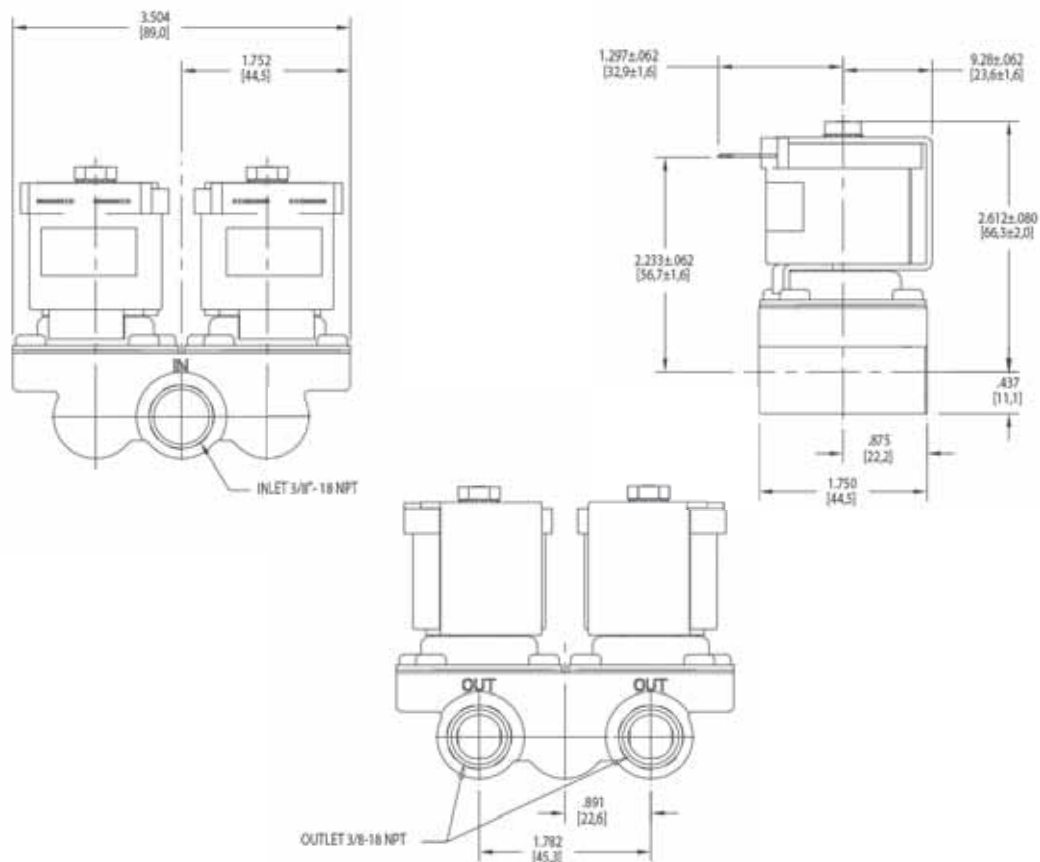
Product Drawings

Product Dimensions - Dimensions are inches and [millimeters].

Single



Dual



1 Year
Limited
Warranty



Cooking

Robertshaw®

GAS VALVES - THERMOMAGNETIC SAFETY



1720-004



1720-801

1720 Series

The Robertshaw® 1720 Series Thermomagnetic Safety Valve is a control used to cut off the flow of gas to the burner in the event of a pilot outage. The magnet assembly is energized by voltage generated by a thermocouple that is heated by the pilot flame. When this flame is extinguished, the thermocouple voltage decreases until a spring overcomes the magnetic force and closes off both the pilot and main gas. This control can be used for commercial and residential ovens, infrared heaters, chicken and pig brooders, recreational vehicle gas appliances and many more applications requiring automatic safety valves.

Features and Benefits

- 300°F (149°C) ambient temperature rated and 350°F (177°C) versions available
- J models available with separate pilot inlet/outlet tube connections
- K models are pilot outlet only
- Compatible with other Robertshaw models such as the BJWA, FD, and GS series thermostats
- RoHS compliant

Specifications

Part Numbers	Description	Body Inlet & Outlet	Head Pilot Inlet & Outlet	Ambient Temperature	Max Pressure
1720-004	TS11J Complete Magnet and Body Assembly	7/16" Tube	1/4" Tube	32°F to 300°F (0°C to 149°C)	0.5 PSI
1720-005	TS11J Complete Magnet and Body Assembly	1/4" Pipe	3/16" Tube	32°F to 300°F (0°C to 149°C)	0.5 PSI
1720-007	TS11J Complete Magnet and Body Assembly	1/2" Pipe	1/4" Tube	32°F to 300°F (0°C to 149°C)	0.5 PSI
1720-008	TS11J Complete Magnet and Body Assembly	1/4" Pipe	1/4" Tube	32°F to 300°F (0°C to 149°C)	0.5 PSI
1720-801	TS11J J Magnet Head Only - Inlet and Outlet	NA	Kit, 1/8" Pipe, 3/16" Tubing, 1/4" Tubing	32°F to 300°F (0°C to 149°C)	0.5 PSI
1720-802	TS11K K Magnet Head Only - Outlet Only	NA	Kit, 1/8" Pipe, 3/16" Tubing, 1/4" Tubing	32°F to 300°F (0°C to 149°C)	0.5 PSI

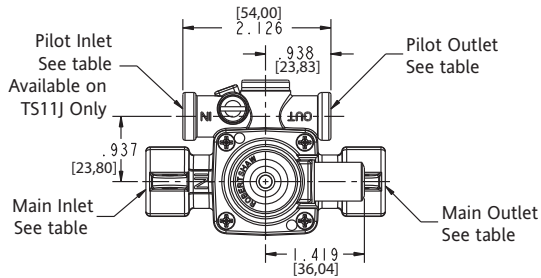




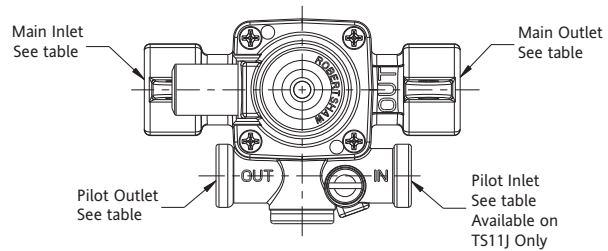
Product Drawings

Product Dimensions - Dimensions are inches and [millimeters].

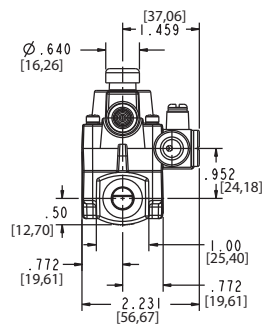
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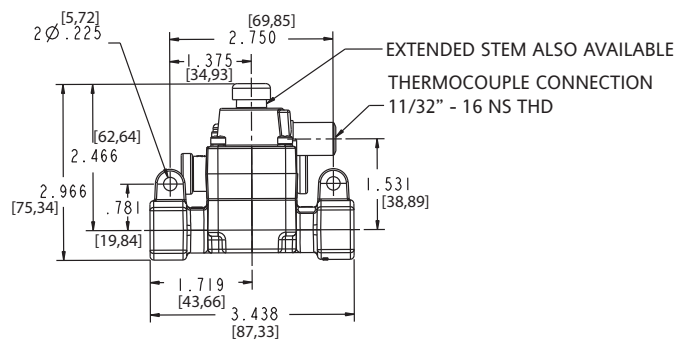
Top (rotated 180°)



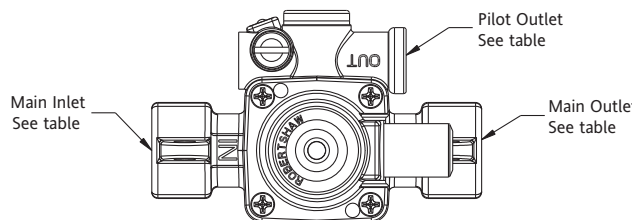
Side



Front



K Model Top with No Pilot Inlet



1 Year
Limited
Warranty

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Cooking

Robertshaw®



HOT SURFACE IGNITORS

41-200 Series

The Robertshaw® 41-200 Series Hot Surface Ignitors are engineered to meet all your gas range and oven needs. These ignitors are used in the ranges of most major appliance original equipment manufacturers. In addition, most ignitors are designed to match the Robertshaw bi-metal gas valves.

Features and Benefits

- High physical and thermal strength
- Easy mounting
- Silent ignition
- Kits include two (2) porcelain nuts

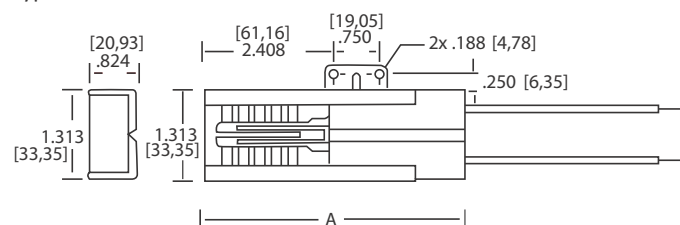
Specifications

Part Numbers	Description	Length A	Lead Length	Type	Amp Rating	Operating Voltage
41-204	Hot Surface Ignitor	4-1/2"	14-1/2"	501A	3.2 to 3.6 A	120V AC
41-205	Hot Surface Ignitor	3-1/2"	19"	501A	3.2 to 3.6 A	120V AC
41-206	Hot Surface Ignitor, No Shield, 5 1/2" Ceramic	7-1/4"	8-3/8"	501	3.2 to 3.6 A	120V AC
41-209	Hot Surface Ignitor with Plug Adaptor	3-1/2"	16-3/4"	501A	3.2 to 3.6 A	120V AC
41-224	Hot Surface Ignitor	NA	36"	401XM	1.4 to 2.1 A	24V AC

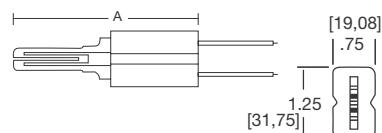
Product Drawings

Product Dimensions - Dimensions are inches and [millimeters].

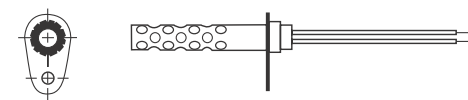
Type 501A



Type 501



Type 401 XM



1 Year
Limited
Warranty

A28

www.Uni-Line.com

Customer Service 1.800.304.6563



OVEN SPARK IGNITION MODULES

41-500 Series

The Robertshaw® 41-521 is an 0+1 Oven Spark Ignition Module designed for oven re-ignition. A spark is generated for as long as the appropriate input terminal is energized.

Features and Benefits

- Spark generator with 2,000,000 sparks
- Strong dielectric strength tested up to 1500 Volts RMS at 60 Hz for one second
- Spark frequency ranges from 1.0 to 5.0 Hz
- Humidity tested to 90% RH relative humidity for 48 hours
- AGA listed



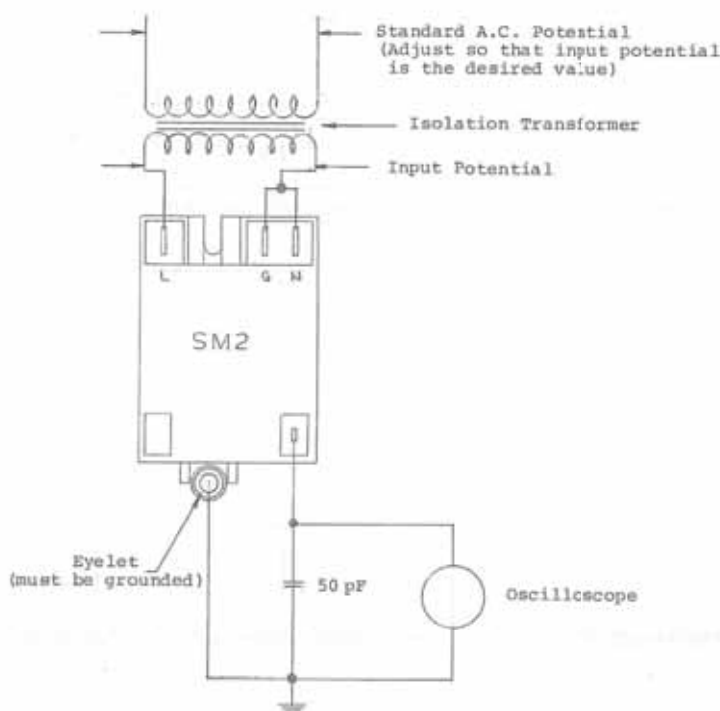
41-521

Specifications

Part Numbers	Description	Spark Frequency	Spark Gap	Ambient Temperature	Electrical Rating
41-521	SM2 Electronic Re-Ignition Oven Spark Module	2.5 Hz to 4.5 Hz	1/8" max	32°F to 200°F (0°C to 93°C)	120V AC, 18 kV peak across 50 pF (picoFarad) capacitance load

Product Drawings

Product Dimensions - Dimensions are inches and [millimeters].



1 Year
Limited
Warranty

A29



Cooking

Robertshaw®



LED145



LED193

ELECTRONIC TIMERS

LED145-11 LED193-009

The Robertshaw® Electronic Cooker Clock uses colored LEDs to program various time durations with audible alarms.

Mostly found in stove applications where functions include minute minder, duration, end time, and time of day.

Features and Benefits

- Easy to set duration and end time
- Audible alarm to indicate end time
- Quality relays are normally closed
- 6.3mm Faston connectors

Specifications

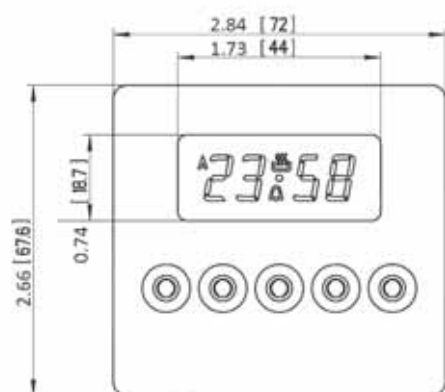
Part Numbers	Description	Buttons	Temperature Settings	Standard LED	Electrical Rating
LED145-11 (EU)	Electronic Cooker Clock	5	105°F (40.5°C) or 120°F (49°C)	Red	230V AC 16A, 50/60 Hz
LED193-009 (EU)	Electronic Cooker Clock	3	105°F (40.5°C) or 120°F (49°C)	Red	230V AC 16A, 50/60 Hz



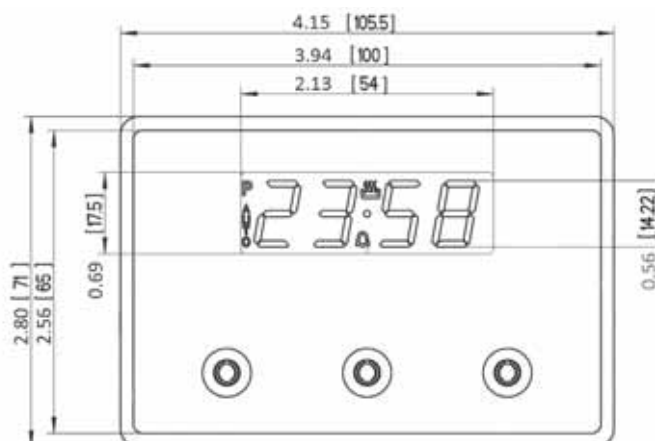
Product Drawings

Product Dimensions - Dimensions are inches and [millimeters].

LED-145



LED-193

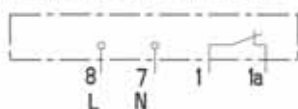


Wiring Diagrams

LED-145

ANSCHLUSSSCHEMA/OUTLET DIAGRAM

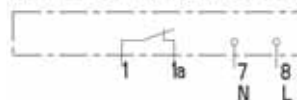
UHR IN HANDSTELLUNG (STROMLOS)
MANUAL POSITION (UNDER NO CURRENT SUPPLY)



LED-193

ANSCHLUSSSCHEMA/OUTLET DIAGRAM

UHR IN HANDSTELLUNG (STROMLOS)
MANUAL POSITION (UNDER NO CURRENT SUPPLY)





Heating, ventilation and air conditioning contractors value quality performance products, while consumers welcome dependable comfort. With Robertshaw® heating products, both are achievable while delivering productivity and environmentally responsible results. Robertshaw heating products offer kitted and universal solutions designed to replace hundreds of products.

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Heating





GAS VALVES

700 Series - Pilot, Hot Surface and Direct Spark

The Robertshaw® 700 Series Universal Gas Valves are designed for intermittent pilot ignition applications. These universal models include all the necessary parts to adapt the valves to direct spark or hot surface applications. Each valve incorporates a manual valve, pilot valve, and a main gas pressure regulator (optional by model). These valves are designed for many residential and commercial applications such as central heating units, wall heaters, boilers and mobile home furnaces.

Features and Benefits

- Universal models with pilot, hot surface and direct spark ignition systems
- Maximum inlet pressure 14" WC (0.5 PSI)
- Ambient temperature of -40°F to 175°F
- Standard NEMA terminals
- Inlet filtered screen
- Various gas types: natural, manufactured, mixed, LP, and LP/air mixtures
- Multiple actuators available
- RoHS compliant

Specifications

Part Numbers	Description	Capacity	Inlet Size	Outlet Size	Pressure Regulator Setting	Electrical Rating	Comments
700-048	Universal Model	720,000 BTU	1"	1"	3.5" WC Natural Gas	24V AC @ 60 Hz	High capacity
700-049	Universal Model	300,000 BTU	1/2"	1/2"	3.0" WC Natural Gas	24V AC @ 60 Hz	Includes pilot plug
700-056	Universal Model	350,000 BTU	3/4"	3/4"	3.5" WC Natural Gas	24V AC @ 60 Hz	Straight-thru with slow opening feature for soft ignition. Can be field removed.
700-057	Universal Model	720,000 BTU	1"	1"	4.0" WC Natural Gas	24V AC @ 60 Hz	Straight-thru
700-059	Universal Model	720,000 BTU	1"	1"	4.0" WC Natural Gas	24V AC @ 60 Hz	Straight-thru with slow opening feature for soft ignition. Can be field removed.



1 Year
Limited
Warranty

GAS VALVES

700 Series - Millivolt

The Robertshaw® 700 Series Millivolt Gas Valves are wall thermostat actuated combination controls which provide installation flexibility from furnaces to swimming pool applications. The complete line of 700-500 millivolt gas valves offers a wide range of replacements from small capacity 3/8" pipe to high capacity 1" pipe up to 720,000 BTU usage.

Features and Benefits

- Gas cock dial marking Off - Pilot - On
- Pilot outlet 1/4" tubing
- Ambient temperature of -40°F to 175°F
- Terminal type combination screw/spade
- Maximum inlet pressure 14" WC (0.5 PSI)
- Standard NEMA terminals
- Inlet filtered screen
- Various gas types: natural, manufactured, mixed, LP, and LP/air mixtures
- RoHS compliant



Specifications

Part Numbers	Description	Capacity	Inlet Size	Outlet Straight-Thru (FPT)	Outlet Side (FPT) With Plugs	Reducer Bushing (NPT)	Pressure Regulator Setting	Electrical Rating	Compatible with
700-501	Millivolt Nonregulated	100,000 BTU	1/2"	1/2"	1/2"	2	NA	250mV to 750mV	NA
700-502	Millivolt	100,000 BTU	1/2"	1/2"	1/2"	2	3.5" WC Natural Gas	250mV to 750mV	Coaxial and two lead thermopile
700-504	Millivolt	240,000 BTU	1/2"	3/4"	1/2"	1	3.5" WC Natural Gas	250mV to 750mV	Coaxial and two lead thermopile
700-505	Millivolt Nonregulated	300,000 BTU	3/4"	3/4"	Straight-thru	2	NA	250mV to 750mV	NA
700-506	Millivolt	300,000 BTU	3/4"	3/4"	Straight-thru	2	3.5" WC Natural Gas	250mV to 750mV	Coaxial and two lead thermopile
700-509	Millivolt	100,000 BTU	1/2"	1/2"	Straight-thru	2	4.0" WC Natural Gas	250mV to 750mV	Coaxial and two lead thermopile
700-511	Pool Heater	400,000 BTU	3/4"	3/4"	Straight-thru	2	Uni-Kit® Natural Gas	250mV to 750mV	Teledyne-Lars coaxial and two lead thermopile
700-515	Millivolt	485,000 BTU	3/4"	3/4"	Straight-thru	2	10.0" WC L.P. Gas	250mV to 750mV	NA
700-516	Millivolt	240,000 BTU	1/2"	1/2"	Straight-thru	NA	4.0" WC Natural Gas	250mV to 750mV	NA

Robertshaw®



1 Year
Limited
Warranty



Robertshaw®



700-402

GAS VALVES

700 Series - 24 Volt Combination

The Robertshaw® 700 Series 24 Volt Combination Gas Valves offer replacement flexibility. With capacities ranging to 720,000 BTU, three-position outlets and multi-positional capability, these combination gas valves offer unlimited replacement possibilities. The 24 Volt Uni-Kit® models are suitable for either natural or LP gas. The valve is factory set at 3.5" WC natural gas. A regulator cover plate is included to convert to LP gas.

Features and Benefits

- Gas cock dial marking Off - Pilot - On
- Pilot outlet 1/4" tubing
- Ambient temperature of -40°F to 175°F
- Combination screw/spade terminal type
- Maximum inlet pressure 14" WC (0.5 PSI)
- Standard NEMA terminals
- Inlet filtered screen
- Various gas types: natural, manufactured, mixed, LP, and LP/air mixtures
- Multiple actuators available
- RoHS compliant

Specifications

Part Numbers	Description	Capacity	Inlet Size	Outlet Size	Side Outlets	Pressure Regulator Setting	Electrical Rating	Comments
700-400	24 Volt Combination	240,000 BTU	1/2"	3/4"	Straight-thru	Uni-Kit® Natural Gas	24V AC @ 0.2 Amps, 12V DC @ 0.18 Amps	
700-402	24 Volt Combination	240,000 BTU	1/2"	3/4"	1/2"	Uni-Kit Natural Gas	24V AC @ 0.2 Amps, 12V DC @ 0.18 Amps	
700-406	24 Volt Combination	300,000 BTU	3/4"	3/4"	Straight-thru	Uni-Kit Natural Gas	24V AC @ 0.2 Amps, 12V DC @ 0.18 Amps	
700-409	24 Volt Combination	240,000 BTU	1/2"	1/2"	Straight-thru	3.5" WC Natural Gas	24V AC @ 0.2 Amps, 12V DC @ 0.18 Amps	Thermopile type safety magnet
700-426	24 Volt Combination	300,000 BTU	3/4"	3/4"	Straight-thru	3.5" WC Natural Gas	24V AC @ 0.2 Amps, 12V DC @ 0.18 Amps	Slow opening feature for soft ignition
700-442	24 Volt Combination	720,000 BTU	1"	1"	Straight-thru	3.5" WC Natural Gas	24V AC @ 0.2 Amps, 12V DC @ 0.18 Amps	Slow opening feature for soft ignition



1 Year
Limited
Warranty

GAS VALVES

700 Series - Line Voltage

The Robertshaw® 700 Series Line Voltage Gas Valves offer the same replacement flexibility as the 24 Volt combination controls. Line Voltage models are available in 120 and 240 Volts AC. Features include three-position outlets, multi-positional capability and capacities ranging up to 720,000 BTU.

Features and Benefits

- Slotted safety magnet
- Gas cock dial marking Off - Pilot - On
- Ambient temperature of -40°F to 175°F
- Pilot outlet 1/4" tubing
- Cover type for conduit connection
- Inlet filtered screen
- RoHS compliant



700-454

Specifications

Part Numbers	Description	Capacity	Inlet Size	Outlet Straight-Thru (FPT)	Outlet Side (FPT) With Plugs	Reducer Bushings Included (NPT) 3/4" x 1/2"	Pressure Regulator Setting	Lead Length	Electrical Rating
700-452	Line Voltage Valve	240,000 BTU	1/2"	3/4"	1/2"	1	3.5" WC Natural Gas	32"	120V AC @ 0.034 Amps
700-454	Line Voltage Valve	300,000 BTU	3/4"	3/4"	Straight-thru	2	3.5" WC Natural Gas	32"	120V AC @ 0.034 Amps



1 Year
Limited
Warranty

B5



Robertshaw®



700-513

GAS VALVES

700 Series - Diaphragm/Solenoid

The Robertshaw® 700 Series Diaphragm/Solenoid Gas Valves are single function, diaphragm types and are excellent replacements for solenoid gas valves. Models are available with or without a gas cock, and in regulated or non-regulated configurations. 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.

Features and Benefits

- Pilot outlet 1/4" tubing
- Maximum inlet pressure 14" WC (0.5 PSI)
- Ambient temperature of -40°F to 175°F
- Standard NEMA terminals
- Inlet filtered screen
- Various gas types: natural, manufactured, mixed, LP, and LP/air mixtures
- Multiple actuators available
- RoHS compliant

Specifications

Part Numbers	Description	Capacity	Inlet Size	Outlet Size	Side Outlets	Pressure Regulator Setting	Electrical Rating
700-422	24 Volt Diaphragm Solenoid	240,000 BTU	1/2"	3/4"	1/2"	3.5" WC Natural Gas	12V DC @ 0.18 Amps, 24V AC @ 0.2 Amps
700-513	Millivolt Diaphragm Solenoid without Gas Cock	240,000 BTU	1/2"	1/2"	Straight-thru	NA	250 - 750 mV



1 Year
Limited
Warranty



Robertshaw
®

GAS VALVES

700 Series - 2-Stage 24 Volt

The Robertshaw® 2-Stage 24 Volt Gas Valves - standing pilot as well as intermittent pilot models - feature reliability, performance, flexibility and easy installation all in one compact control. These valves feature a manual valve (gas cock), inlet/outlet screens, pilot gas filter, and pilot adjustment key. Models have a slotted automatic pilot safety magnet to provide gas shut-off in case of a pilot outage.

Features and Benefits

- Pilot outlet 1/4" tubing
- Terminal type 1/4" quick-connect
- Ambient temperature of -40°F to 175°F
- Maximum inlet pressure 14" WC (0.5 PSI)
- Standard NEMA terminals
- Inlet filtered screen
- Various gas types: natural, manufactured, mixed, LP, and LP/air mixtures
- RoHS compliant



700-064

Specifications

Part Numbers	Description	Capacity	Inlet Size	Outlet Size	Reducer Bushing (NPT)	Pressure Regulator Setting	Electrical Rating	Comments
700-064	Universal 2-Stage	720,000 BTU	1"	1"	2	1.3" WC low-fire, 3.5" WC high-fire for Natural Gas, 2.8" WC low-fire, 11.0" WC high-fire for LP	24V AC @ 50/60 Hz, 0.2 Amps low-fire, 0.4 Amps high-fire	Slow opening feature for soft ignition. Can be field removed.



1 Year
Limited
Warranty

B7



Robertshaw®



GAS VALVES

700 Series - Snap-Throttle Hydraulic

The Robertshaw® 700 Series Snap-Throttle Hydraulic Combination Gas Valves are thermostatically operated by a remote temperature sensing bulb. Models are available with single capillary or remote dial-in snap-action and snap-throttle types. Valves can be mounted in any position except upside down.

Features and Benefits

- Gas cock dial marking Off - Pilot - On
- Pilot outlet 1/4" tubing
- Ambient temperature of 32°F to 175°F
- Maximum inlet pressure 14" WC (0.5 PSI)
- Standard NEMA terminals
- Inlet filtered screen
- Various gas types: natural, manufactured, mixed, LP, and LP/air mixtures
- Multiple actuators available
- RoHS compliant

Specifications

Part Numbers	Description	Capacity	Inlet Size	Outlet Side (FPT) With Plugs	Pressure Regulator Setting	Capillary Length	Bulb Outer Diameter	Bulb Length	Dial Temperature	Remote Temperature
700-205	Snap-Throttle Hydraulic	100,000 BTU	1/2"	1/2"	3.5" WC Natural Gas	36"	1/4"	8"	58°F to 90°F	45°F to 95°F



1 Year
Limited
Warranty



GAS VALVES

700 Series - Actuators

The Robertshaw® 700 Series Gas Valves are the industry standard with capacity ranges from 5,000 to 1,150,000 BTUs. Several actuator types are available depending upon the application such as 24 Volts, Line Voltage, Millivolt and Hydraulic.

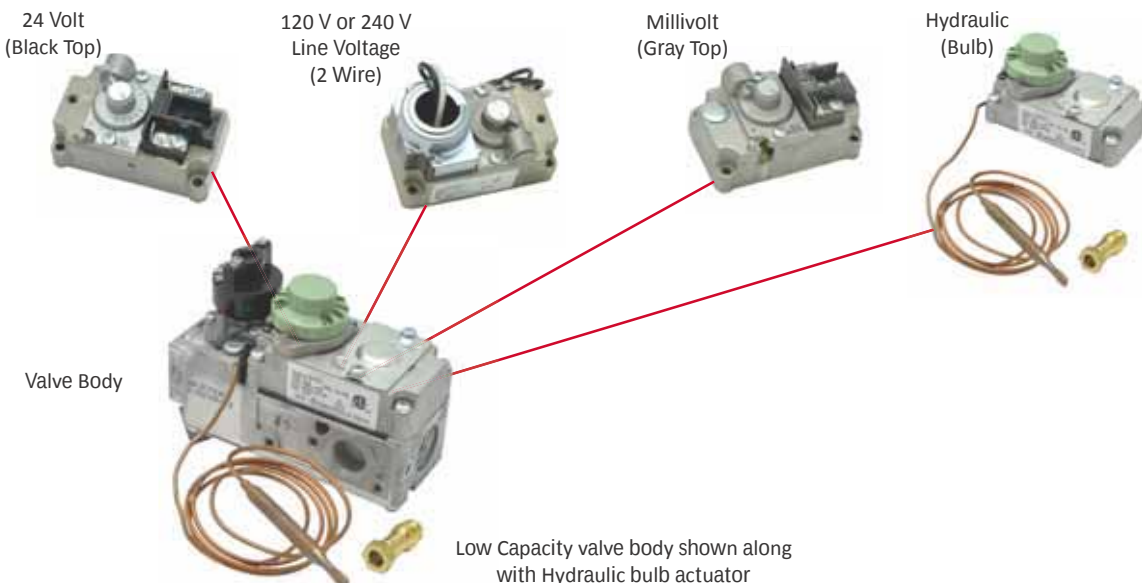


Standard 700 shown with Millivolt gray top actuator

Actuators available for 700 series gas valves

Part Number	Description	Gas Valve Model	Pressure Regulator Setting	Ambient Temperature Rating	Thermostat Temperature Range	Electrical Rating	NEC
705-205	Hydraulic Actuator	7000STR-4	3.5" WC	32°F to 175°F (0°C to 80°C)	58°F to 90°F (14°C to 32°C) 36" Capillary	NA	NA
705-401	12V DC/24V AC Actuator	7000E	NR	-40°F to 175°F (-40°C to 80°C)	NA	12V DC, 0.18 Amps 24V AC, 0.2 Amps	Class 2
705-402	12V DC/24V AC Actuator	7000ER	3.5" WC	-40°F to 175°F (40°C to 80°C)	NA	12V DC, 0.18 Amps 24V AC, 0.2 Amps	Class 2
705-404	24V AC 2-Stage Actuator	7000ER2-4	Hi-Lo Adjustable 1.3" to 3.5" WC	-40°F to 175°F (-40°C to 80°C)	NA	24V AC, 0.2 Amps 2-Stage 24V AC, 0.4 Amps	Class 2
705-451	12V AC Actuator	7000E-120	NR	-40°F to 175°F (-40°C to 80°C)	NA	120V AC, 0.034 Amps	Class 1
705-452	12V AC Actuator	7000ER-120	3.5" WC	-40°F to 175°F (-40°C to 80°C)	NA	120V AC, 0.034 Amps	Class 1
705-461	24V AC Actuator	7000E-240	NR	-40°F to 175°F (-40°C to 80°C)	NA	240V AC, 0.017 Amps	Class 1
705-462	24V AC Actuator	7000ER-240	3.5" WC	-40°F to 175°F (-40°C to 80°C)	NA	240V AC, 0.017 Amps	Class 1

Note: All the above models are available in regulated (R), high/low (RB) or convertible (RC).





Robertshaw®



710-502

GAS VALVES

710 Series - Low Capacity

The Robertshaw® 710 Series Low Capacity Gas Valves feature an extremely compact control designed for low capacity and limited space applications. Features include three-position outlets, multi-positional capability and component replaceability.

Features and Benefits

- Low capacity with 3-13/16"H x 4-21/32"L x 1-29/32" W dimensions
- Gas cock dial marking Off - Pilot - On
- Ambient temperature of -40°F to 175°F
- Pilot outlet 1/4" tubing
- Maximum inlet pressure 14" WC (0.5 PSI)
- Standard NEMA terminals
- Inlet filtered screen
- Various gas types: natural, manufactured, mixed, LP, and LP/air mixtures
- Multiple actuators available
- RoHS compliant





Specifications

Part Numbers	Description	Application	Capacity	Inlet Size	Outlet Size	Reducer Bushing (NPT)	Pressure Regulator Setting
710-203	Hydraulic Snap-Action Low Capacity	Recreational vehicles	70,000 BTU Natural Gas, 112,000 BTU LP	1/2"	1/2"	(2) 1/2" x 3/8"	NA
710-205	Hydraulic Snap-Action Low Capacity	Wall furnaces	70,000 BTU Natural Gas, 112,000 BTU LP	1/2"	1/2"	(2) 1/2" x 3/8"	3.5" WC Natural Gas
710-402	24 Volt Low Capacity	Wall furnaces	70,000 BTU	1/2"	1/2"	(2) 1/2" x 3/8"	3.5" WC Natural Gas
710-501	Millivolt Low Capacity	Space heaters	70,000 BTU	1/2"	1/2"	(2) 1/2" x 3/8"	NA
710-502	Millivolt Low Capacity	Space heaters	70,000 BTU	1/2"	1/2"	(2) 1/2" x 3/8"	3.5" WC Natural Gas
710-503	Millivolt Low Capacity	Fireplace control	70,000 BTU	1/2"	3/8"	NA	Hi-Lo Adjustable 1.7" to 3.5" WC Natural Gas
710-511	Millivolt Low Capacity	Fireplace control	70,000 BTU	1/2"	3/8" Straight-thru	NA	Hi-Lo Adjustable 1.7" to 3.5" WC Natural Gas

Specifications continued

Part Numbers	Capillary Length	Electrical Rating	Comments
710-203	36"	NA	
710-205	36"	NA	
710-402	NA	24V DC @ 0.2 Amps, 12V AC @ 0.18 Amps	
710-501	NA	250mV to 750mV	Use two lead thermopiles only
710-502	NA	250mV to 750mV	Use two lead thermopiles only
710-503	NA	250mV to 750mV	Use two lead thermopiles only
710-511	NA	250mV to 750mV	Special dropout safety magnet to meet Canadian specifications used with quick-dropout pilot assembly 1819-100. Use two lead thermopiles only.



Robertshaw®



720-402

GAS VALVES

720 Series - 24 Volt Dual

The Robertshaw® 720 Series 24 Volt Dual Gas Valve is a six-function gas valve incorporating a manual valve, safety shut-off magnet, dual automatic valves, main gas regulator, and pilot adjustment. Models are available with and without a pressure regulator. Uni-Kit® models are factory set at 3.5" WC for natural gas, but can be converted to LP by installing the regulator conversion kit included.

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. Valve can be mounted in any position except upside down.

Features and Benefits

- Gas cock dial marking Off - Pilot - On
- Pilot outlet 1/4" tubing
- Ambient temperature of -40°F to 175°F
- Combination screw/spade terminal type
- Maximum inlet pressure 14" WC (0.5 PSI)
- Standard NEMA terminals
- Inlet filtered screen
- Various gas types: natural, manufactured, mixed, LP, and LP/air mixtures
- Multiple actuators available
- RoHS compliant

Specifications

Part Numbers	Description	Capacity	Inlet Size	Outlet Size	Side Outlets	Pressure Regulator Setting	Reducer Bushings Included (NPT) 3/4" x 1/2"	Reducer Bushings Included (NPT) 1/2" x 3/8"	Electrical Rating	Comments
720-400	24 Volt Dual	150,000 BTU	1/2"	3/4"	None	Uni-Kit® Natural Gas	1	1	24V AC, 0.5 Amps, 50/60 Hz	
720-402	24 Volt Dual	150,000 BTU	1/2"	3/4"	1/2" FPT with plugs	Uni-Kit Natural Gas	1	NA	24V AC, 0.5 Amps, 50/60 Hz	
720-406	24 Volt Dual	150,000 BTU	3/4"	3/4"	None	Uni-Kit Natural Gas	2	NA	24V AC, 0.5 Amps, 50/60 Hz	
720-472	24 Volt Dual	150,000 BTU	1/2"	1/2"	1/2" FPT with plugs	3.5" WC Natural or 11.0" LP Convertible	NA	1	24V AC, 0.5 Amps, 50/60 Hz	Step-opening to 40% of full flow within 30 seconds for mobile home
720-474	24 Volt Dual	150,000 BTU	1/2"	1/2"	1/2" FPT with plugs	3.5" WC Natural or 11.0" LP Convertible	NA	1	24V AC, 0.5 Amps, 50/60 Hz	Step-opening for mobile home



1 Year Limited Warranty



GAS VALVES

720 Series - Lever Actuated

The Robertshaw® 720 Series Lever Actuated Gas Valves are designed for intermittent pilot ignition applications. This series incorporates a manual valve, pilot valve, dual automatic valves (2), and a main gas pressure regulator. Uni-Kit® models are factory set at 3.5" WC for natural gas, but can be converted to LP by installing the regulator conversion kit included. The 720 Series is designed for many residential applications such as central heating units, space heaters, wall heaters, boilers, and mobile home furnaces. This valve has a compact swing radius of only 3-9/16" to enable it to fit a wide range of OEM replacement applications.

Features and Benefits

- Pilot outlet 1/4" tubing
- 1/4" quick connect terminal type
- Ambient temperature of -40°F to 175°F
- Maximum inlet pressure 14" WC (0.5 PSI)
- Standard NEMA terminals
- Rated as NEC Class 2
- Inlet filtered screen
- Various gas types: natural, manufactured, mixed, LP, and LP/air mixtures
- RoHS compliant



720-079

Specifications

Part Numbers	Description	Capacity	Inlet Size	Outlet Size	Pressure Regulator Setting	Electrical Rating	Comments
720-070	Slow Opening Model	150,000 BTU	1/2"	3/4"	Uni-Kit® Natural Gas	24V AC , 50/60 Hz, 45 Amps, 5 Watts	Has slow-opening feature for soft ignition. Not normally used on hot surface applications
720-079	Universal Model	150,000 BTU	1/2"	3/4"	Uni-Kit Natural Gas	24V AC , 50/60 Hz, 45 Amps, 5 Watts	



1 Year
Limited
Warranty

B13



GAS VALVES



722-079

722 Series - Low Capacity Dual

The Robertshaw® 722 Series Low Capacity Dual Gas Valve Uni-Kit® models are designed for a wide variety of intermittent pilot, direct spark or hot surface heating applications.

They incorporate dual automatic valves (redundant) that are pressure regulated and come factory set at 3.5" WC for natural gas. They can be converted to LP by installing the regulator conversion kit that is included.

Features and Benefits

- Small, compact size, 3-9/16" swing radius, and 90° flanged outlet for side outlet applications allow for greater flexibility of installation
- Incorporates a manual selector valve (On-Off), dual automatic valves, main gas regulator and inlet/outlet pressure taps
- Easily accessible wiring connections, manual selector, and adjustments designed to replace many OEM valves
- Multi-positional and can be mounted in any position except upside down
- As a safety feature, special screws are used and replacement parts are not available to prevent unsafe attempts at repair

Specifications

Part Numbers	Description	Capacity	Inlet Size	Outlet Size	Pressure Regulator Setting	Comments
722-051	Hot Surface and Direct Spark Low Capacity Dual	170,000 BTU	1/2"	1/2"	Uni-Kit® Natural Gas	Straight-thru
722-079	Universal Low Capacity Dual	170,000 BTU	1/2"	1/2"	Uni-Kit Natural Gas	Straight-thru, 1/2" flanged outlet adapts for side outlet applications



1 Year
Limited
Warranty

WATER HEATING GAS VALVES

110 Series

The Robertshaw® 110 Series Water Heating Gas Valves are designed for universal replacement applications in water tanks. All models feature a built-in, non-cycling Energy Cut-Off (ECO) system to shut off all gas to the water heater in case of excessive water temperatures. The ECO is designed to detect over-temperature conditions and to open. Once opened, the control will not function and a new replacement will be required.

Features and Benefits

- Models include 5-1/2" sensing element
- Various inlet size, outlet size, regulator settings and shank lengths
- Right hand or left hand threads
- Multiple BTU capacities available
- Domestic, commercial and recreational vehicle applications



110-202

Specifications

Part Numbers	Description	Flow Setting	Inlet Size	Outlet Size	Shank Length	Pressure Regulator Setting	Temperature
110-202	Water Heater Thermostat Uni-Kit®	45,000	1/2" Pipe	1/2" Inverted Flare	1-3/8"	4.0" WC Natural Gas	160°F (71°C)
110-326	Water Heater Thermostat Uni-Kit	45,000	1/2" Pipe	1/2" Inverted Flare	1-3/8"	3.5" WC Natural Gas	160°F (71°C)
110-262	Water Heater Thermostat Uni-Kit	38,000	1/2" Pipe	1/2" Inverted Flare (Right Hand Threads)	1-3/8"	9" WC to 12" WC LP	160°F (71°C)
110-265	Water Heater Thermostat Uni-Kit	38,000	1/2" Pipe	1/2" Inverted Flare (Left Hand Threads)	1-3/8"	9" WC to 12" WC LP	160°F (71°C)



1 Year
Limited
Warranty

B15



ELECTRIC WATER HEATING THERMOSTATS

ST Series

The Robertshaw® ST Series Electric Water Heating Thermostats are designed for replacement on domestic and commercial water heaters.

Features and Benefits

- Automatic cycling
- High limit manual reset
- Compact design assures firm clamp to tank
- Snap-action operation controls
- Fast and easy wiring
- Adjustable temperature ranges

Specifications

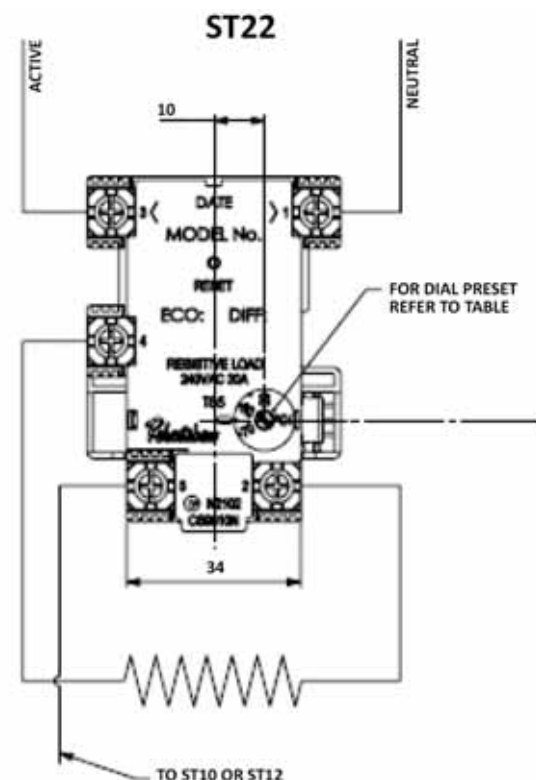
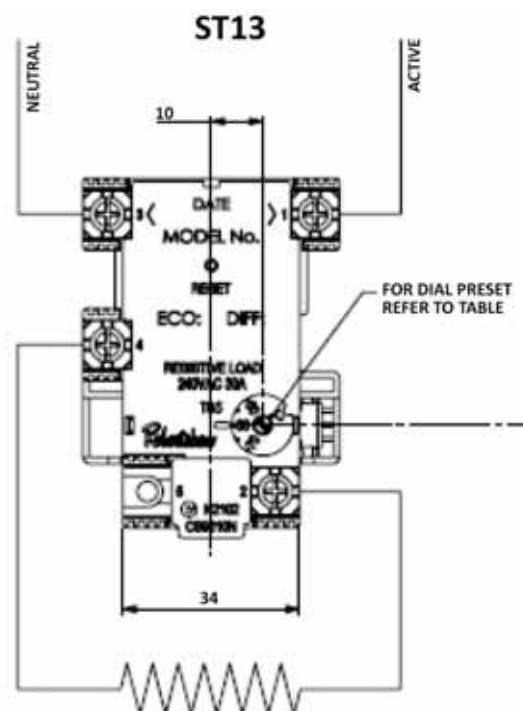
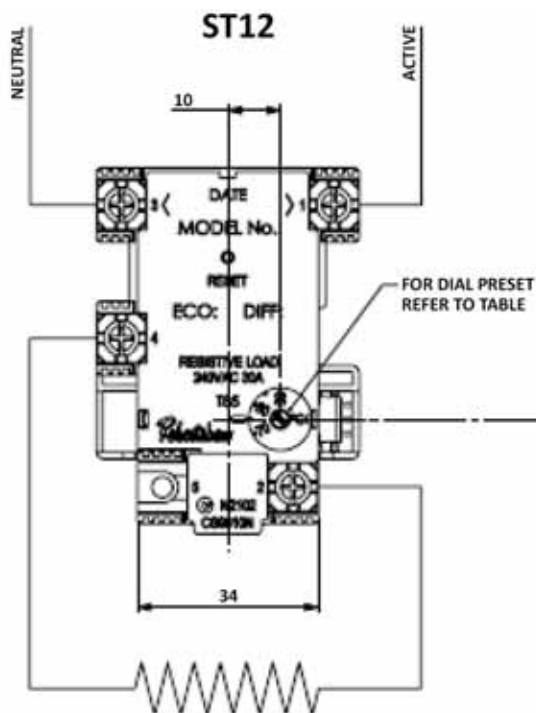
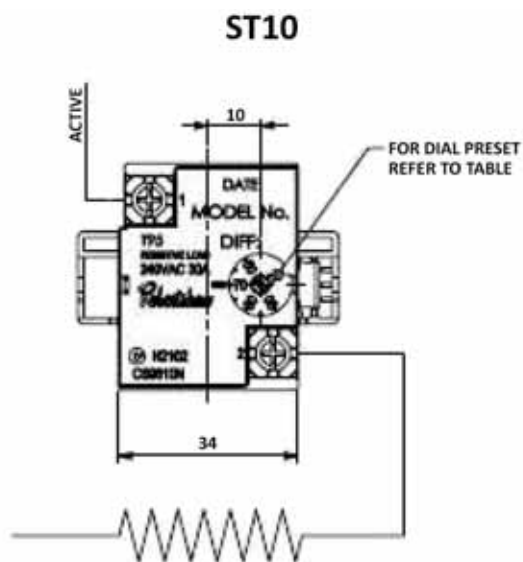
Part Numbers	Description	Replaces	Typical Application	Switch Type	Temperature Range	High Limit	Differential	Electrical Ratings	Power
ST10-80K (ANZ, EU)	Hot Water Surface Thermostat	EWT-1	Single	SPST	60°C to 80°C	NA	8°C (± 4°C)	240V AC 30 Amps	7200 Watts
ST10-90K (ANZ, EU)	Hot Water Surface Thermostat	EWT-1	Single	SPST	60°C to 90°C	NA	8°C (± 4°C)	240V AC 30 Amps	7200 Watts
ST12-70K (ANZ, EU)	Hot Water Surface Thermostat with High Limit	EWT-1L2	Single	SPST/DPST	50°C to 70°C	84°C ± 5°C	8°C (± 4°C)	240V AC 30 Amps	7200 Watts
ST12-80K (ANZ, EU)	Hot Water Surface Thermostat with High Limit	EWT-1L2	Single	SPST/DPST	60°C to 80°C	84°C ± 5°C	8°C (± 4°C)	240V AC 30 Amps	7200 Watts
ST13-70K (ANZ, EU)	Hot Water Surface Thermostat with High Limit	EWT-1L2S	Single	SPST/DPST	50°C to 70°C	84°C ± 5°C	8°C (± 4°C)	240V AC 30 Amps	7200 Watts
ST22-60K (ANZ, EU)	Hot Water Surface Thermostat with High Limit	EWT-2L2	Double /Off Peak*	SPDT/DPST	50°C to 70°C	84°C ± 5°C	8°C (± 4°C)	240V AC 30 Amps	7200 Watts
ST22-80K (ANZ, EU)	Hot Water Surface Thermostat with High Limit	EWT-2L2	Double /Off Peak*	SPDT/DPST	50°C to 70°C	84°C ± 5°C	8°C (± 4°C)	240V AC 30 Amps	7200 Watts

* Off Peak power in Australia ST22 coupled to ST12 for two element system.



Product Drawings

Robertshaw[®]





HEATIn g

Robertshaw®

HEATING KITS



710-296

710 Series - Millivolt Kit

The Robertshaw® 710-296 Millivolt Kit includes a low profile millivolt actuated gas valve, a pilot generator kit and an easy-to-use mechanical wall thermostat. The kit includes the Robertshaw gas valve cross reference pocket guide.

Features and Benefits

- Most common parts needed in retrofit millivolt applications
- Reduces inventory with most common parts
- Easy-to-select, use and install

Specifications

Part Numbers	Description	Hood Type	Thermostat	Gas Valve
710-296	Millivolt Kit	1820-009 Pilot Kit	986-1R Thermostat	710-502 Low Profile

HEATING KITS



712-017

712 Series - Pilot Kits

The Robertshaw® 712 Series Intermittent Pilot Ignition System Kit 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 pilot ignition systems are available with one of four different gas valve types to fit a wide range of furnace applications.

Caution: Do not use on LP gas applications

Features and Benefits

- Quick and easy installation
- Complete in-depth instructions and trouble shooting information
- Used on natural gas systems only

Specifications

Part Numbers	Description	Gas Valve	Inlet	Outlet	Capacity	Restart	Pressure Regulator Setting	Ignition Control
712-017	Intermittent Pilot Ignition System Kit	720-070	1/2"	3/4"	200,000 BTU	Nonlockout	3.5" WC Natural Gas Only	780-715 (Nonlockout)

1 Year
Limited
Warranty

B18

www.Uni-Line.com

Customer Service 1.800.304.6563



HEATING KITS

Hot Surface Uni-Kit360

The Robertshaw® Uni-Kit360 Heating Kit has you covered 360° with universal products all in one box for use with HSI (Hot Surface Ignition) gas systems. Kit includes the following:

- Universal gas valve
- Universal ignition control
- Universal nitride ignitor
- Universal flame sensor
- Universal air pressure sensing switch
- Gas valve cross reference pocket book, screwdriver and toolbag

Features and Benefits

- Universal controls with the necessary parts included for most hot surface heating applications
- Reduces inventory with one easy-to-order SKU
- Trusted brand in heating controls for over 100 years



UNI-KIT360

Specifications

Part Numbers	Description	Gas Valve	Inlet	Outlet	Capacity	Hot Surface Ignitor	Flame Pattern	Ignition Control	Air Sensing Switch
UNI-KIT360	Universal Hot Surface Heating Repair Kit	720-079	1/2"	3/4"	150,000 BTU	41-802N	10-760	780-910	2374-510

HEATING KITS

Regulator Kits

The Robertshaw® 1751 Series Add-on Pressure Regulator Kits are available for use on the following factory model types; 7000, 7010, 7100, 7200 and 7222. Each 1751 pressure regulator kit provides straight-line regulation and includes all the necessary parts including instructions to convert a specific factory model gas valve.

Features and Benefits

- Converts natural gas to LP and vice versa
- Not for use with hydraulic models which cannot be field converted
- Includes all necessary parts for easy regulation conversion



1751-003

Specifications

Part Numbers	Description	Suitable For	Series	Regulator Type	Adjustable WC Pressure Low/High
1751-003	Add-On Pressure Regulator Kit	Natural Gas	700 & 710 Series (Models 7000 & 7000LC)	3.5" WC Natural Gas	3" / 7"
1751-013	Add-On Pressure Regulator Kit	LP	700 & 710 Series (Models 7000 & 7000LC)	11.0" WC LP Gas	8" / 12"
1751-021	Add-On Pressure Regulator Kit	LP	700 & 710 Series (Models 7000 & 7000LC)	Hi-Low Adjustable Output LP Gas	2.7" / 11"

1 Year
Limited
Warranty



780-001

IGNITION CONTROLS

780 Series - Pilot Controls Uni-Kits

The Robertshaw® 780 Series Pilot Controls 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. 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.

The Robertshaw lockout version kits include the capability to shut off all gas to the furnace, should pilot ignition fail to occur after a predetermined time period. The 780-002 provides three tries for ignition. Each ignition period is 90 seconds followed by a six minute time delay between ignition attempts. If the pilot flame is not sensed after three tries, the unit goes into lockout and must be reset at the thermostat.

Features and Benefits

- Replaces one rod and/or two rod systems
- Reduces truck stock inventory, saving space and money
- Includes vent damper adapter assembly
- Easy-to-install with complete in-depth installation instructions
- Pilot and main valves draw 1 Amp at 0.5 power factor
- Combined load at 1.5 Amps at 0.4 power factor
- 95% relative humidity noncondensing at 104°F

Specifications

Part Numbers	Description	Spark Rate	Flame Sense Current	Max Total Current Load	Flame Failure Re-Ignition Time	Thermostat Anticipator Setting	Temperature Range	Trans-former	Input Voltage
780-001	Gas ignition control - nonlockout	3 to 4 per second	0.7mA DC @ 25°C	1.5 Amps	0.8 seconds	0.7 Amps	-40°F to 175°F	24V AC, 20 VA	24V AC @ 50/60 Hz
780-002	Gas ignition control - lockout	3 to 4 per second	0.7mA DC @ 25°C	1.5 Amps	0.8 seconds	0.7 Amps	-40°F to 175°F	24V AC, 20 VA	24V AC @ 50/60 Hz



IGNITION CONTROLS

780 Series - Pilot Controls

The Robertshaw® 780 Series Pilot Controls feature flame rectification with solid-state logic and flame sensing to provide automatic sequencing that will ensure proper operation of an intermittent pilot ignition device. When the thermostat calls for heat, the 780 series control simultaneously initiates ignition sparking and opens the pilot valve portion of the gas valve. Pilot flame recognition stops ignition sparking and opens the main valve portion of the gas valve. Pilot burner flame is continuously monitored at a synchronous frequency for the duration of the heating cycle. Should the pilot flame fail during the heating cycle, the control will shut off the main valve until the pilot flame is established.

The Robertshaw 780-845 lockout ignition control provides 90 seconds of spark, followed by a six minute time delay (purge) between ignition attempts. If the pilot flame is not sensed after three tries, the control goes into a one-hour lockout period. At the end of the lockout period, if the demand for heat is still present, the unit will repeat the three tries for ignition.

Features and Benefits

- Reduces truck stock inventory, saving space and money
- Easy-to-install with complete in-depth installation instructions
- Pilot and main valves draw 1 Amp at 0.5 power factor
- Combined load at 1.5 Amps at 0.4 power factor
- 95% relative humidity noncondensing at 104°F



780-715

Specifications

Part Numbers	Description	Spark Rate	Flame Sense Current	Max Total Current Load	Flame Failure Re-Ignition Time	Thermostat Anticipator Setting	Safety Lockout Timing	Temperature Range	Transformer	Input Voltage
780-715	Intermittent Pilot - Nonlockout	3 to 4 per second	0.7mA DC @ 25°C	1.5 Amps	0.8 seconds	0.7 Amps	NA	-40°F to 175°F	24V AC, 20 VA	24V AC @ 50/60 Hz
780-735	Intermittent Pilot - Lockout	3 to 4 per second	0.7mA DC @ 25°C	1.5 Amps	0.8 seconds	0.7 Amps	NA	-40°F to 175°F	24V AC, 20 VA	24V AC @ 50/60 Hz
780-845	Intermittent Pilot - Lockout	4 to 15 per second	0.7mA DC @ 25°C	1.5 Amps	2 seconds	0.7 Amps	90 seconds	-40°F to 175°F	24V AC, 20 VA	24V AC @ 50/60 Hz



1 Year Limited Warranty



780-910

IGNITION CONTROLS

780 Series - Universal Hot Surface Control Uni-Kit®

The Robertshaw® 780 Series Universal Hot Surface Control Uni-Kit® is designed for use on gas fired systems. These controls are 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). This kit provides all the necessary instructions and hardware needed to replace most hot surface modules.

Features and Benefits

- Reduces truck stock inventory, saving space and money
- Easy-to-install with complete in-depth installation instructions
- Local (sense through the hot surface ignitor) or remote flame sensors
- Single or three ignition attempts or 7 second ignition trial time
- Ignitor warm-up time is 17 or 34 seconds
- 34 seconds or less pre-purge
- Natural or LP gas controls
- Works with 120V AC hot surface ignitors
- Maximum valve current at 1.5 Amps at 24V AC
- 95% relative humidity noncondensing at 104°F

Specifications

Part Numbers	Description	Max Ignitor Current	Flame Failure Re-Ignition Time	Thermostat Anticipator Setting	Temperature Range	Control Input Voltage	Supply Voltage
780-910	Universal Hot Surface Ignition Uni-Kit	5 Amps	0.8 seconds	1 Amp	-40°F to 176°F	24V AC	120V AC @ 50/60 Hz



1 Year
Limited
Warranty

IGNITION CONTROLS

780 Series - Hot Surface Controls

The Robertshaw® 780 Series Hot Surface Controls are designed for use on gas fired systems. The system acts on a demand for heat by a switch or thermostat to supply power to the ignition control. On non pre-purge models, the ignitor will be energized immediately and remain on for either of two optional selected ignitor heat-up times: approximately 17 or 34 seconds. For models with the prepurge option, there is a time delay equal to the heat-up time selected before the ignitor is energized. At the end of the ignitor heat-up time, the gas valve is opened supplying gas to the main burner. After several seconds, the ignitor is turned off and the sensor is energized. As long as flame is sensed, the system continues to operate.

Features and Benefits

- Reduces truck stock inventory, saving space and money
- Easy-to-install with complete in-depth installation instructions
- Molded-in terminal barriers between terminals
- Models available for local and remote sense application
- Mounting screw provides a positive ground connection
- Small compact size provides no hassle installation
- Main valve current is 1.5 Amps at 24V AC
- 95% relative humidity noncondensing at 104°F



780-785

Robertshaw®

Specifications

Part Numbers	Description	Valve Trial Time	Supply Voltage	Ignition Attempts	Pre-Purge Timer	Ignitor Warm-Up Timer	Sensor Type	Max Ignitor Current	Thermostat Anticipator Setting	Temperature Range
780-783	Hot Surface Ignition Control	8 seconds	120V AC	3	34 seconds	34 seconds	Local	5 Amps	0.1 Amps	-40°F to 176°F
780-785	Hot Surface Ignition Control	6 seconds	120V AC	3	NA	34 seconds	Local	5 Amps	0.1 Amps	-40°F to 176°F
780-790	Hot Surface Ignition Control	4 seconds	120V AC	1	NA	17 seconds	Local	5 Amps	0.1 Amps	-40°F to 176°F

Specifications continued

Part Numbers	Input Voltage	Supply Voltage
780-783	24V AC @ 50/60 Hz	120, 208/240, 277V AC
780-785	24V AC @ 50/60 Hz	120, 208/240, 277V AC
780-790	24V AC @ 50/60 Hz	120, 208/240, 277V AC



1 Year
Limited
Warranty

B23



HEATing

Robertshaw®



780-502

IGNITION CONTROLS

780 Series - Direct Spark Controls

The Robertshaw® 780 Series Direct Spark Controls are applicable to commercial cooking equipment, gas fired heating, and water heating systems of many types. The system acts on a demand for heat by a switch or thermostat to open the gas valve. At the same time, the 780 series ignition control supplies a spark to the electrode which ignites the gas. After the gas is lit, an electronic circuit proves the presence of flame using flame rectification. When the thermostat is satisfied, the gas valve will be closed to shut off the main burner gas.

Features and Benefits

- Replaces one rod and/or two rod systems
- Reduces truck stock inventory, saving space and money
- Easy-to-install with complete in-depth installation instructions

Specifications

Part Numbers	Description	Type	Supply Voltage	Ignition Attempts	Valve Trial Time
780-502	Direct Spark Ignition Controls	Non Pre-Purge, Enclosed	24V AC	1	4 seconds
780-511	Direct Spark Ignition Controls	Pre-Purge, Remote, Enclosed, 1/4 Q.C.	24V AC	3	7 seconds



1 Year
Limited
Warranty

B24

www.Uni-Line.com

Customer Service 1.800.304.6563

IGNITION CONTROLS

785 Series - Automatic Pilot Relight Kits

The Robertshaw® 785 Series Automatic Pilot Relight Kits are designed for use on rooftop heating equipment, water heaters, boilers, space heaters, unit heaters, dryers, and other commercial, industrial, and residential appliances where the problem of pilot outage may occur. It should only be applied to those systems which already incorporate the necessary pilot-safety control system.

Features and Benefits

Kit Includes:

- Ignitor assembly
- Mounting bracket



785-001

Specifications

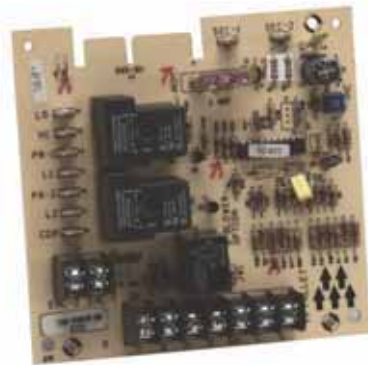
Part Numbers	Description	Spark Gap	Temperature Range	High Voltage Output	Electrical Rating
785-001	Pilot Relight Kit	1/8"	-40°F to 185°F	15kV	24/120V AC, 0.1 Amp

Robertshaw
®



1 Year
Limited
Warranty

B25



695-101

IGNITION CONTROLS

695 Series - Fan Control

The Robertshaw® 695-101 Series Fan Control is a solid state control designed and engineered for the replacement market. It replaces the Carrier / BDP Gas Furnace Control Center that has been used in new equipment for many years. This control center is an exact replacement. No modification to the original wiring or to the appliance sheet metal is required.

Features and Benefits

- Easy-to-install with complete in-depth installation instructions
- 95% relative humidity non-condensing at 50°C
- Reduces truck stock inventory, saving space and money

Specifications

Part Numbers	Description	Cool Off Time	Heat Off Time (Adjustable)	Temperature Range	Control Voltage	Input Voltage
695-101	Replacement Circuit Board for Fan Control Centers	90 seconds	80 to 240 seconds	-40°F to 176°F	18 - 30V AC	120V AC @ 60 Hz



IGNITION CONTROLS

35 Series - Fenwal® Intermittent Pilot Controls

The Fenwal 35 Series Pilot Controls are a 24V AC intermittent pilot ignition control. The microprocessor circuit design provides precise, repeatable timing and operating sequences. The on-board diagnostics with LED output provide assistance with troubleshooting to ensure safe and efficient operation.

Features and Benefits

- Quick connect terminals for easy connection
- Easy-to-install with complete in-depth installation instructions
- Pilot valve draws 2.0 Amps maximum
- Main valve draws 2.0 Amps maximum
- Gray enclosure (Noryl N-190) of fire retardant plastic
- Reduces truck stock inventory, saving space and money



35-630501-001

Specifications

Part Numbers	Description	Flame Sense Method	Auto Reset	Ignition Tries Before Lockout	Trial For Ignition	Pre-Purge	Inter-Purge	Gas Valve Rating (Main and Pilot)	Control Voltage	Electrical Rating
35-630501-001	Intermittent Pilot Ignition Control	Remote	No	1	15	0 seconds	0 seconds	2.0 Amps @ 24V AC	18 - 30V AC	24V AC @ 300mA



1 Year Limited Warranty

B27



35-655800-003

IGNITION CONTROLS

35 Series - Fenwal® Hot Surface Controls

The Fenwal 35 Series Hot Surface Controls are designed to perform many gas-fired 24V AC appliance functions in a single control, resulting in lower system costs. This series monitors the demand for heat, ignites and maintains the flame during heating, and provides diagnostic support.

The on-board diagnostics with LED output provide assistance with troubleshooting and ensures safe and efficient burner operation. The microprocessor circuit design provides precise, repeatable timing sequences for ignition and pre-purge and inter-purge times, as well as multiple tries for ignition.

Features and Benefits

- Edge connector type for easy connection
- Easy-to-install with complete in-depth installation instructions
- Gray enclosure (Noryl N-190) of fire retardant plastic
- Reduces truck stock inventory, saving space and money

Specifications

Part Numbers	Description	Flame Sense Method	Auto Restart	Ignition Tries Before Lockout	Trial for Ignition	Pre-Purge	Inter-Purge	Hot Surface Ignitor	Gas Valve Rating	Control Voltage	Electrical Rating
35-655800-003	Hot Surface Ignition Control, Field Selectable Line Voltage Capability	Local / Remote	Yes	1	7	0 seconds	0 seconds	40 second Heat Up, 120/240V AC, 5 Amps Max	2.0 Amps @ 24V AC	18 - 30V AC 50/60 Hz	24V AC @ 300mA, 120 or 240V AC (L1 and L2 only)
35-655801-013	Hot Surface Ignition Control, Field Selectable Line Voltage Capability	Local / Remote	Yes	3	7	0 seconds	15 seconds	40 second Heat Up, 120/240V AC, 5 Amps Max	2.0 Amps @ 24V AC	18 - 30V AC 50/60 Hz	24V AC @ 300mA, 120 or 240V AC (L1 and L2 only)



1 Year
Limited
Warranty



IGNITION CONTROLS

35 Series - Fenwal® Direct Spark Controls

The Fenwal 35 Series Direct Spark Ignition Controls utilize a microprocessor to continually analyze and control the proper operation of the gas burner.

The microprocessor circuit design provides precise, repeatable timing sequences for ignition times and purge times, one hour automatic reset and flame sensing during pre-purge.

The 35 Series includes on-board diagnostics with LED output to provide assistance with troubleshooting, and to ensure safe and efficient burner operation.

Features and Benefits

- Various connection and construction types available
- Easy-to-install with complete in-depth installation instructions
- Gray enclosure (where applicable Noryl N-190) of fire retardant plastic
- Reduces truck stock inventory, saving space and money



35-605606-223

Specifications

Part Numbers	Description	Flame Sense Method	Auto Reset	Ignition Tries Before Lockout	Trial For Ignition	Pre-Purge	Inter-Purge	Connection	Construction	Gas Valve Rating	Control Voltage	Electrical Rating
35-605606-111	Direct Spark Ignition Control	Remote	Yes	3	4	15	15	Edge Connector	Gray Noryl	2.0 Amps @ 24V AC	18 - 30V AC, 50/60 Hz	24V AC @ 300mA
35-605606-223	Direct Spark Ignition Control	Remote	Yes	3	7	30	30	Edge Connector	Gray Noryl	2.0 Amps @ 24V AC	18 - 30V AC, 50/60 Hz	24V AC @ 300mA
35-704600-005	Direct Spark Ignition Control	Local	No	1	10	0	0	Quick Connect Terminals	Open Board	1.5 Amps @ 120V AC	102 to 138V AC, 50/60 Hz	120V AC @ 350mA
35-725206-117	Direct Spark Ignition Control	Remote	Thermostat Power Off	3	15	15	15	Multi-Pin Connector	Potted	1.5 Amps @ 120V AC	102 to 138V AC, 50/60 Hz	120V AC @ 50mA



1 Year
Limited
Warranty





41-401

IGNITORS

Carbide Series

The Robertshaw® Carbide Series Hot Surface Ignitors deliver dependable ignition in heating systems of every description: furnaces, boilers, rooftop heaters, infrared burners, unit heaters, water heaters, and many other types of HVAC equipment.

Features and Benefits

- Made from high-purity recrystallized silicon carbide (Crystar™) which combines physical and thermal strength with stable electrical properties
- Designed to reach ignition temperature(s) within 17 seconds
- Have 18-gauge nickel chrome lead wires embedded and metalized in place for maximum holding strength and electrical conductivity
- Manufactured with lead wires enclosed in a special high-temperature fiberglass insulation providing electrical protection
- Operate at 120V AC. Some modules are rated for 208/240V input, however, the voltage to the ignitor is stepped down to 120V AC

Specifications

Part Numbers	Description	Ceramic Block Style	Lead Wire Length	Terminal Connector Type	Comments
41-401	Hot Surface Carbide Ignitors	A	4-1/2"	A	Includes a gasket
41-402	Hot Surface Carbide Ignitors	B	19"	NA	
41-403	Hot Surface Carbide Ignitors	C	5-1/2"	NA	
41-404	Hot Surface Carbide Ignitors	C	4-1/2"	D	Includes special mounting adaptors
41-405	Hot Surface Carbide Ignitors	D	5-1/2"	NA	
41-406	Hot Surface Carbide Ignitors	E	10-1/2"	NA	Includes a gasket
41-407	Hot Surface Carbide Ignitors	C	4-1/2"	B	
41-408	Hot Surface Carbide Ignitors	B	5"	C	
41-409	Hot Surface Carbide Ignitors	C	4-1/2"	D	
41-410	Hot Surface Carbide Ignitors	B	4-1/2"	B	
41-411	Hot Surface Carbide Ignitors	B	4-1/2"	C	Includes special mounting adaptors
41-412	Hot Surface Carbide Ignitors	F	5-1/4"	D	
41-414	Hot Surface Carbide Ignitors	F	5-1/4"	D	Includes special mounting adaptors
41-418	Hot Surface Carbide Ignitors	B	5-1/4"	C	Includes bracket
41-419	Hot Surface Carbide Ignitors	G	5"	D	



41-402



41-403



41-404



41-405



41-406



41-407



41-408



41-409



41-410



41-411



41-412



41-414

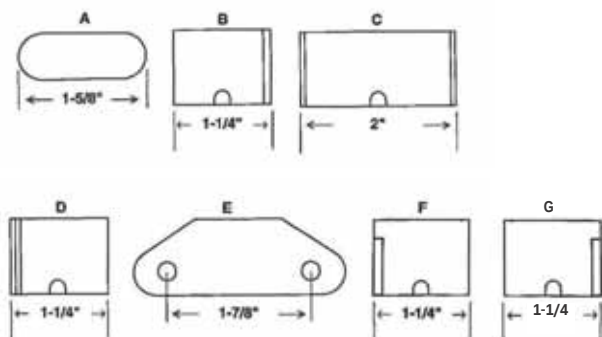


41-418

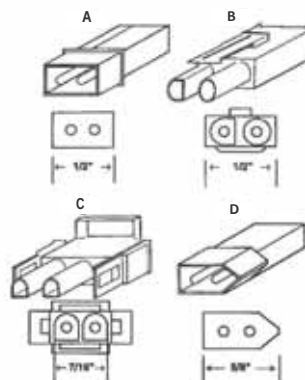


41-419

Ceramic Block Styles



Terminal Block Styles



1 Year
Limited
Warranty

B31



IGNITORS

Hot Surface Mini-Ignitor Series

The Robertshaw® 41-600 Series Hot Surface Mini-Ignitors deliver dependable ignition in all heating systems. The mini-ignitor's three-second heat-up time, in combination with its small size, have been embraced by gas furnace OEMs.

Features and Benefits

- Engineered for easy handling, simple installation and trouble-free operation
- Made of a unique, non-porous, high strength material
- Operates at 120V AC



Specifications

Part Numbers	Description	Ceramic Block Style	Replaces
41-604	Hot Surface Furnace Mini-Ignitor	4"	Armstrong #44744-2
41-605	Hot Surface Furnace Mini-Ignitor	2.5"	York Conversion Kit #473-20937-001

IGNITORS

Universal Ignitor Series

The Robertshaw® Universal Ignitors are the perfect truck stock item. All universal ignitors replace over 130 ignitors currently used in the field. To allow for universal applications, mounting brackets and hardware are included.

Robertshaw Universal Ignitors are recommended for operating voltage of 120V AC. Two models are available. The 41-802N is the best model available with the highest level of durability. The 41-803 offers good durability.

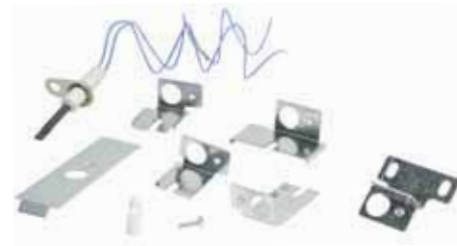
Features and Benefits

41-802N

- The ultimate in silicon nitride with technology from Kyocera™ for the best durability
- Flat blade heating element for best heat dissipation

41-803

- High density silicon carbide for good physical strength and durability
- Flat blade heating element for best heat dissipation



41-802N



41-803

Specifications

Part Numbers	Description	Heating Element	Warranty Duration
41-802N	Universal Hot Surface Ignitor	Flat blade	3 years
41-803	Universal Hot Surface Ignitor	Flat blade	1 year

Robertshaw
®

1 Year
Limited
Warranty

3 Year
Limited
Warranty

B33



1820-009



1830-490

PILOTS

1820 and 1830 Series

The Robertshaw® 1820 Series Pilot Uni-Kit® models are designed to replace hard-to-find ITT-General PG9 type pilots. A special 1/4" tubing adaptor is typically provided with nut and ball sleeve. Uni-Kits are available with and without a 32" [810mm] thermopile.

The 1830 Series Pilot Uni-Kit models are designed to be used with all Robertshaw and most competitive thermocouples. Uni-Kit models include an adaptor that converts a threaded thermocouple/thermopile model 2CH to a snap-in thermocouple type, model 2C.

Features and Benefits

- Many flame pattern types available
- Thermocouple or thermopile options
- Spark electrode available
- Horizontal or vertical gas inlet
- Several mounting bracket types available
- Aerated pilots with non-linting characteristics

Specifications

Part Numbers	Description	Hood Type	Mounting Bracket Type	Flame Pattern Type	Lead Lengths	Includes
1800-100	9B Replacement Pilot Uni-Kit®	NA	NA	NA	NA	Orifices
1830-702	9B Replacement Pilot Uni-Kit®	STD	NA	NA	NA	Orifices
1830-113	9B Replacement Pilot Uni-Kit®	180 STD	NA	NA	NA	Orifices
1820-009	PG9 Replacement Pilot Uni-Kit®	NA	NA	90° Right Hand	36"	1950-532 Thermopile and Orifices
1820-019	PG9 Replacement Pilot Uni-Kit	NA	NA	90° Left Hand	36"	1950-532 Thermopile and Orifices
1830-001	2CH & 2C Incinerator-Target Pilot Uni-Kit	2	6	Standard	NA	Orifices
1830-210	2CH & 2C Incinerator-Target Pilot Uni-Kit	2	2	Standard	NA	Orifices
1830-489	2CH & 2C Incinerator-Target Pilot Uni-Kit	6	6	3-Way	NA	Orifices
1830-490	2CH & 2C Incinerator-Target Pilot Uni-Kit	6	6	3-Way	NA	Orifices
1830-491	2CH & 2C Incinerator-Target Pilot Uni-Kit	6	6	3-Way	NA	Orifices



Hood Type



TYPE 6



TYPE 2

Mounting Bracket Type

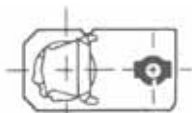


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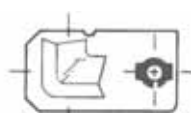


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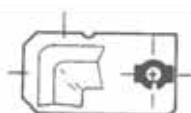
Flame Pattern Type



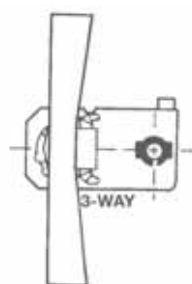
STANDARD



90° LEFT HAND



90° RIGHT HAND



3-WAY

1 Year
Limited
Warranty

B35



1980-030

THERMOCOUPLES

1900 Series

The Robertshaw® 1900 Series Thermocouples include either a special low-mass or quick dropout thermocouple. It is usually found on applications that require an oxygen depletion system on the thermo safety. It is also found on many LP gas applications that require a quick dropout of the thermo safety if there is a loss of pilot flame.

⚠ ATTENTION: The 1960-027 has standard thermocouple threads, and WILL NOT fit applications with metric threads.

The Robertshaw 1970 Series Uni-Couple® design allows for installation to virtually all pilot burners. The versatile zip nut may be pushed, pulled or threaded onto the thermocouple's rolled threads for proper positioning in every application.

The Robertshaw 1980 Series Snap-Fit Thermocouples offer easy installation into the majority of pilot burners. They are manufactured without complicated adaptors, but with extra insulation that the brass sheath provides under high ambient temperatures.

Features and Benefits

- Easy burner installation with attached threaded nut
- Stainless steel outer jacket for long life and resistance to heat blistering
- Combination of copper and nickel alloys for good electrical conductivity
- Mica washer to insulate from shorting conditions
- Tinnerman clip included
- Various lengths available for multiple applications

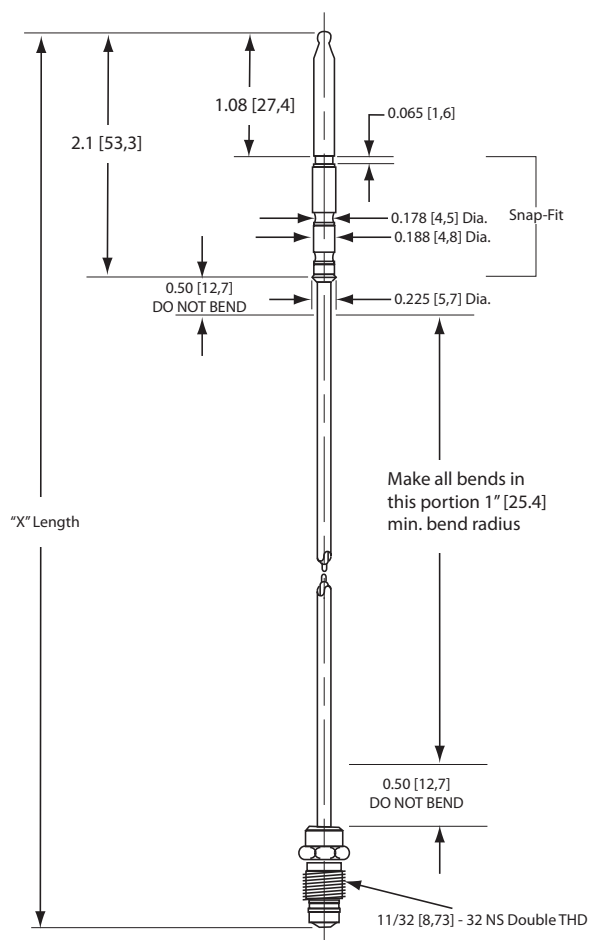
Specifications

Part Numbers	Description	"X" Length
1960-027	Low Mass Thermocouple	27"
1970-018	Uni-Couple® 20 to 30 Millivolts	18"
1970-024	Uni-Couple 20 to 30 Millivolts	24"
1970-036	Uni-Couple 20 to 30 Millivolts	36"
1980-018	Snap-Fit Thermocouple	18"
1980-024	Snap-Fit Thermocouple	24"
1980-030	Snap-Fit Thermocouple	30"
1980-036	Snap-Fit Thermocouple	36"
1980-048	Snap-Fit Thermocouple	48"



Product Drawings

1980 Series



Robertshaw[®]

1 Year
Limited
Warranty

B37



1950-001



1951-001

THERMOPILES

1950 and 1951 Series

The Robertshaw® 1950 and 1951 Series Thermopiles lead the industry for gas appliance applications. Their primary function is to ensure a standing pilot light is operative so that on a call for heat, the main burner gas will be properly ignited. Thermopiles are placed in gas applications to detect the existence of a flame for safety purposes by shutting off the potential gas flow to a burner.

A thermopile is the assembly of many thermocouples to increase the millivolt output.

Robertshaw thermopiles have two types of connections: coaxial and two-wire spade connectors. The 1950 Series Thermopiles, also known as TP-75, are two-wire spade connectors. The 1951 Series Thermopiles, also known as CP-2 (250 to 750 millivolts), are coaxial connectors. The 1950 and 1951 Series Thermopiles (pilot generators) are designed for use on self-powered gas control systems. They can be used to replace similar competitive devices.

Features and Benefits

- Easy burner installation with attached threaded nut
- Stainless steel outer jacket for long life and resistance to heat blistering
- Combination of copper and nickel alloys for good electrical conductivity
- Mica washer to insulate from shorting conditions
- Tinnerman clip included
- Various lengths available for multiple applications

Specifications

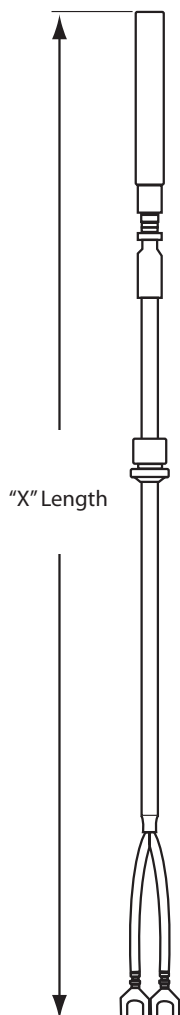
Part Numbers	Description	"X" Length	Includes	Connection Type	Open Circuit Output
1950-001	Thermopile	36"	PG9 Pilot Adaptor	Two Lead	250-750 mV
1950-532	Thermopile	36"		Two Lead	250-750 mV
1951-001	Thermopile	36"	PG9 Pilot Adaptor	Coaxial	250-750 mV
1951-536	Thermopile	36"		Coaxial	250-750 mV



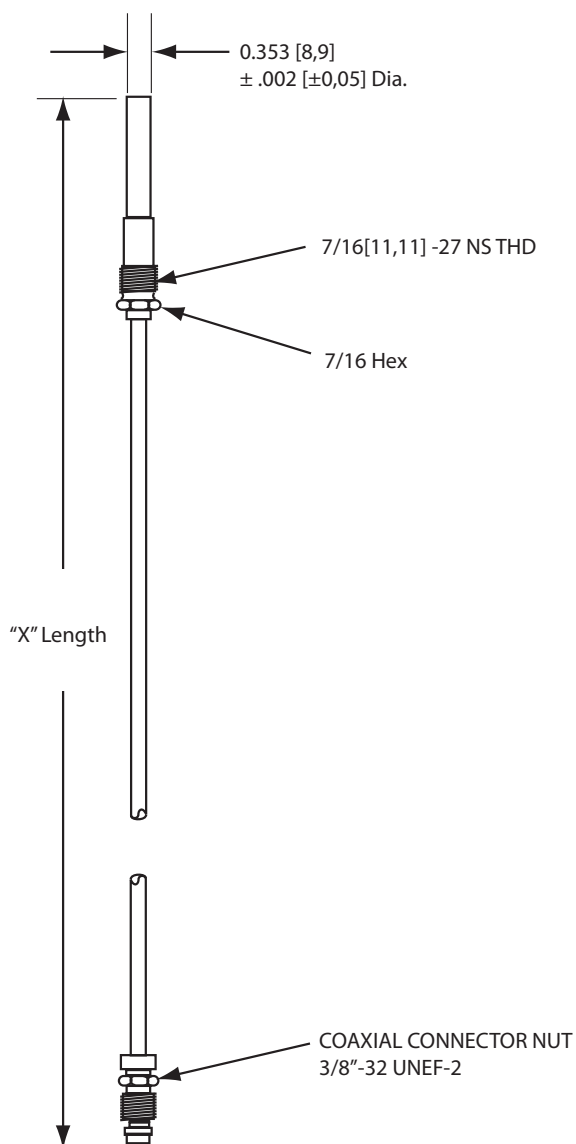
Robertshaw[®]

Product Drawings

1950 Series



1951 Series



1 Year
Limited
Warranty

B39



2374-510



10-650

AIR PRESSURE SENSING SWITCHES

2374 Series - Universal

The Robertshaw® 2374-510 Air Pressure Sensing Switch has a glass-filled polycarbonate housing containing a sensing diaphragm and an integral snap-acting switch with three male 90° quick-connect terminals. The switch can sense positive, negative or differential air pressure. The field adjustable set point range of this switch is 0.10" WC to 10.0" WC. Using the switch accessories contained in this kit, the switch can be applied to a wide variety of residential and light commercial HVAC applications.

2374-510 Kit Contents:

- Air pressure sensing switch
- Calibration springs (5 options)
- Orifice flows (4 options)
- Mounting brackets (2 options)
- Calibration tool (hex wrench)

The Robertshaw 10-650 Sensing Probe Kit provides a simple, practical and standardized approach to sampling air for HVAC air pressure sensing applications. This convenient kit includes a seven inch universal air sample probe suitable for both static and impact applications. The included mounting flange is efficiently installed using the (2) 6# x 3/8" type 25 tap screws. The mounting flange locks the air sample probe in place via a 6# x 1/4" slotted set screw, providing a standard method of controlling the insertion depth of the air sample probe into the air stream. Three feet of clear vinyl tubing is included in the kit for connecting the air sample probe to the air switch. Also provided is a slip-on adaptor for use with an installed air switch equipped with a compression style air sample line connector.

10-650 Kit Contents:

- Universal 7" probe
- Mounting flange
- Flange-locking screw set
- 3' vinyl tubing
- Slip-on adaptor

Specifications

Part Numbers	Description	Switch	Set Point Range	Temperature Range	Connection	Electrical Rating
2374-510	Universal Air Pressure Sensing Switch	SPDT	0.10" to 10.0" WC	-40°F to 190°F (-40°C to 88°C)	Silver Contacts	1/10 Hp @ 120 to 277V AC; 28VA Pilot Duty @ 24V AC; 125VA Pilot Duty @ 120V AC; 5 Amps @ 24, 120, 277V AC
10-650	Sensing Probe Kit with 7" Probe	NA	NA	-40°F to 190°F (-40°C to 88°C)	3/16" Flexible Rubber Tubing	NA



1 Year
Limited
Warranty

B40



AIR PRESSURE SENSING SWITCHES

2374 Series - Adjustable

The Robertshaw® 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 adjustable ranges. 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 (-40°C to 88°C). Each switch includes mounting hardware and an adjustment tool for easy installation and calibration.

Features and Benefits

- Field adjustable control set point
- Air sample line connectors will accept 1/8", 1/4" or 3/8" tubing
- Electrical connection is 1/4" spade
- Vertical operating mounting position for diaphragm
- UL File Number MH6213, CSA File Number LR18754



2374-495

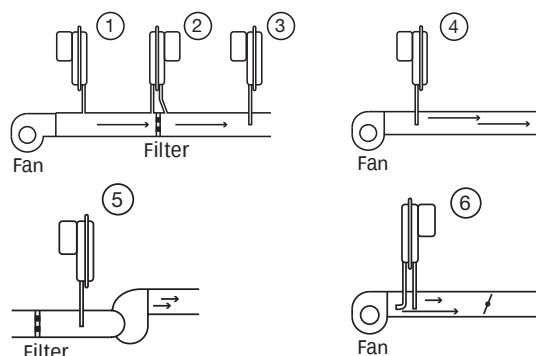
Specifications

Part Numbers	Description	Switch	Set Point Range	Maximum Pressure	Temperature Range	Electrical Rating
2374-495	Adjustable Air Sensing Switch	SPDT	0.25" to 1.0" WC	0.5 PSI	-40°F to 190°F (-40°C to 88°C)	5 Amps @ 120-277V AC, 5 Amps @ 28V DC, 1 Amp Pilot Duty 120 VA
2374-498	Adjustable Air Sensing Switch	SPDT	1.00" to 4.0" WC	0.5 PSI	-40°F to 190°F (-40°C to 88°C)	5 Amps @ 120-277V AC, 5 Amps @ 28V DC, 1 Amp Pilot Duty 120 VA

Typical Applications For Sensing Switch and Sensing Probe Kit

1	Positive static pressure increases as the filter gets dirty.
2*	Differential across filter changes as filter gets dirty.
3	Flow is reduced as filter gets dirty.
4	Fan operation or air flow with little or no static pressure.
5	Negative pressure increases as the filter gets dirty.
6*	Fan operation and true air flow with varying amounts of static pressure. Probes must be perpendicular to the air flow.

* Applications use two (2) Sensing Probe Kits



2 Year
Limited
Warranty



HEATIn g

Robertshaw®



HEATING ACCESSORIES

Flame Sensors

The Robertshaw® Flame Sensor Assembly and Replacement Sensors have high temperature Kanthol sensor rods that will withstand 1800°F (982°C). The sensor rod is 4" long and can be cut and bent to match an original unit. Excellent replacement for most manufacturers' flame sensors.

Features and Benefits

- Includes 30" of Teflon® insulated lead wire with a 482°F (250°C) rating
- Connects to a 1/4" quick connect terminal

Specifications

Part Numbers	Description	Comments
10-227	Replacement S1 Sensor	S1 Sensor has 1/4" quick connect terminal
10-760	Flame Sensor Assembly	Full assembly

HEATING ACCESSORIES



Universal Pilot Ignitor Sensor

The Robertshaw® Universal Pilot Mounting Ignitor Sensor is primarily used with the 712 series intermittent pilot ignition Uni-Kit®. This ignitor and sensor assembly includes mounting bracket, mounting hardware and 24" lead.

Features and Benefits

- Includes all necessary parts for installation
- Quick replacement parts

Specifications

Part Numbers	Description	Length	Comments
1751-729	Universal Pilot Mounting Ignitor Sensor	24"	Includes ignitor/sensor assembly, mounting bracket and hardware

1 Year
Limited
Warranty

B42

www.Uni-Line.com

Customer Service 1.800.304.6563



HEATING ACCESSORIES

Pilot Orifices

The Robertshaw® Pilot Orifices are used as replacement parts in Robertshaw 1820 and 1830 type pilots.

Features and Benefits

- Compatible with 1820, 1830 (2C, 2CH, 2S, 2SH) Pilots
- Orifice can fit into 3/16" or 1/4" tubing



10-021

Specifications

Part Numbers	Description	Type Gas	Tube Size	Orifice Size
10-021	Pilot Orifice for Heating or Cooking	Natural Gas	3/16" or 1/4"	0.018"
10-066	Pilot Orifice for Heating or Cooling	Natural Gas	3/16"	0.018"
10-067	Pilot Orifice for Heating or Cooling	LP	3/16"	0.010"
10-114	Pilot Orifice for Heating or Cooling	LP	3/16" or 1/4"	0.010"
10-166	Pilot Orifice for Heating or Cooling	LP	1/4"	0.011"
10-168	Pilot Orifice for Heating or Cooling	Natural Gas	1/4"	0.018"
10-209	Pilot Orifice for Heating or Cooling	Natural Gas	3/16" or 1/4"	0.026"
10-210	Pilot Orifice for Heating or Cooling	LP	3/16" or 1/4"	0.016"

HEATING ACCESSORIES

Tubing

The Robertshaw® aluminum tubing is versatile for all your replacement needs. It comes in a full range of sizes in 50 and 5 foot lengths.

Features and Benefits

- Aluminum tubing meets ASTM Standard #483
- Uses a 1435 alloy with a 0.035 wall thickness
- Tubing is rated at 90 PSI with an 11,000 tensile, 9500 yield and a 25% elongation



11-193

Specifications

Part Numbers	Description	Length	Diameter Size
11-193	Aluminum Tubing	50'	1/4"
11-195	Aluminum Tubing	50'	3/8"
11-293	Aluminum Tubing with Fittings	5'	1/4"

1 Year
Limited
Warranty

B43



1751-012

HEATING ACCESSORIES

Dial - Gas

The Robertshaw® line of replacement gas dials for gas valves come in many colors with various options. More selections can be viewed at www.uni-line.com.

Features and Benefits

- Replacement dial for use with Unitrol® 7000 gas valves
- Beige color with On, Off and Pilot selections
- Not for use with 700 Series Pilot Ignition gas valves

Specifications

Part Numbers	Description
1751-012	Beige knob dial

HEATING ACCESSORIES

4590 Series - Breakaway Ferrules

The Robertshaw® 4590 Series Breakaway Ferrules are used for attaching tubing to gas valves. Applications include heating, cooking and water heating.

Features and Benefits

- One breakaway ferrule part replaces the need for an additional nut
- Sold in multiple quantities for convenience
- Screw machined brass fittings for quality performance



Robertshaw®

Specifications

Part Numbers	Description	Size	Quantity
4590-065	Breakaway Ferrules For Venting	1/8" Tubing	Package of 15
4590-067	Breakaway Ferrules	3/16" Tubing	Package of 15
4590-069	Breakaway Ferrules	1/4" Tubing	Package of 15
4590-071	Breakaway Ferrules	3/8" Tubing	Package of 6
4590-170	Male Compression Nut & Ball Sleeves	1/4 to 3/16" Reducer	Package of 12
4590-816	Extended Breakaway Ferrules	1/4" Extended	Package of 15

1 Year
Limited
Warranty

B45



Installers prefer a vast selection of quality solutions for commercial refrigeration applications while requiring intuitive installation set-up and dependable performance.

The Ranco® brand is trusted in commercial refrigeration for ease-of-use, performance, reliability and innovation.

Electronic Controls	C2
Temperature Controls - Cold Controls	C6
Temperature Controls.....	C9
Temperature Controls - Specialty Applications.....	C10
Lube Oil Controls	C13
Temperature Controls - Wide Range	C14
Pressure Controls	C16
Refrigeration Accessories	C21
Reversing Valves	C22
Reversing Valves - Solenoid Coils.....	C24
Solenoid Valves.....	C25
Thermostatic Expansion Valves	C26
Regulators.....	C30
Moisture Indicators	C32
Solid Core Filter Driers.....	C34
Ball Valves.....	C36
Electrical Ratings	C37



Refrigeration





REFRIGERATION

PARAGON®



ERC2-212111-370

ELECTRONIC CONTROLS

ERC-2 Series

The Paragon® ERC-2 Electronic Refrigeration Control is a microprocessor-based electronic controller designed to manage both the temperature and the defrost functions of a commercial refrigeration unit.

Features and Benefits

- Real-time clock for defrost control
- Integrated control
- Temperature control function
- 4 relay outputs 120-240V AC @ 50/60 Hz
- Compressor
- Evaporator fan
- Alarm
- Digital display module
- Keypad programming
- Two temperature sensors (supplied)
- Refrigeration cycle
- Safe mode operation
- Continues operation based on performance average in the event sensor fails
- Power failure recovery
- All settings retained in memory
- Time-of-day carried over for 100 hours

Specifications

Part Numbers	Description	Case Type	Temperature Sensor	Defrost Cycles	Temperature Range	Electrical Rating
ERC2-212111-370	ERC-2 Electronic Control with integrated display	NEMA 1	NTC thermistor	1 to 8 per day or 1 every 48 hours	-40°F to 60°F (-40°C to 16°C)	120/208/240V AC (+10, -15%), 50/60 Hz



REFRIGERATION



PARAGON®

Output Relay Rating

Compressor: SPST	120V AC	208V AC	240V AC
Horsepower Rating (HP)	1	1.5	2
FLA/LRA	16/96	12/72	12/72
Pilot Duty (VA)	470	470	470
Defrost: SPST NO	120V AC	208V AC	240V AC
Resistive Amps	16	16	16
Horsepower Rating (HP)	1/2	3/4	1
Pilot Duty (VA)	470	470	470
Evaporator Fan: SPST NC	120V AC	208V AC	240V AC
Resistive Amps	16	16	16
Horsepower Rating (HP)	1/2	3/4	1
FLA/LRA	10/59	8/48	8/48
Pilot Duty (VA)	470	470	470
Alarms: SPST NO	120V AC	208V AC	240V AC
Resistive Amps	5	5	5
Pilot Duty (VA)	240	240	240

1 Year
Limited
Warranty

C3



REFRIGERATION

RANCO®



ETC-111000-000

ELECTRONIC CONTROLS

ETC Series

The Ranco® ETC Series Electronic Temperature Control offers a full-featured electronic replacement for electrical-mechanical temperature controls used in many commercial refrigeration applications. With its wide temperature range, one and two stage capability, selectable heating/cooling modes and multi-voltage input, the ETC is designed to provide application flexibility. Models available include 120/208/240V AC and 24V AC.

Features and Benefits

- Wide temperature range (-30°F to 220°F) (-34.4°C to 104.4°C)
- Wide differential adjustment (1°F to 30°F) (-17°C to -1°C)
- LCD read-out for sensor temperature, control settings, and relay status
- High Amp output relay (FLA 16 Amps @ 120V AC and 8 Amps @ 208/240V AC) single stage
- EEPROM memory retains control settings during power outages
- Keypad lockout to prevent end-user alteration of settings
- 8 foot lead with sensor is extendable up to 400 feet using 18 or 22-gauge thermostat wire
- Easy 4-step set-up
- Heavy-duty relay is 1 HP rated
- Selectable °F or °C heating/cooling modes
- Single and two stage models
- NEMA 1 case and cover
- NEMA 4X models available
- White backlight on display
- Sensor rated IP67 for dust and water (<1m) resistance

Specifications

Part Numbers	Description	Number of Stages	Enclosure Type	Temperature Range	Differential Range	Electrical Rating	0 to 10 Volt Output
ETC-111000-000	Electronic Temperature Control	One	NEMA 1	-30°F to 220°F (-34°C to 104°C)	1°F to 30°F (1°C to 16°C)	120/208/240 V AC	No
ETC-112000-000	Electronic Temperature Control	One	NEMA 1	-30°F to 220°F (-34°C to 104°C)	1°F to 30°F (1°C to 16°C)	24V AC	No
ETC-141000-000	Electronic Temperature Control	One	NEMA 4X	-30°F to 220°F (-34°C to 104°C)	1°F to 30°F (1°C to 16°C)	120/208/240 V AC	No
ETC-211000-000	Electronic Temperature Control	Two	NEMA 1	-30°F to 220°F (-34°C to 104°C)	1°F to 30°F (1°C to 16°C)	120/208/240 V AC	No
ETC-212000-000	Electronic Temperature Control	Two	NEMA 1	-30°F to 220°F (-34°C to 104°C)	1°F to 30°F (1°C to 16°C)	24V AC	No
1309007-044	Thermistor Sensor, 2" long x 1/4" diameter with 8' #22 AWG cable	NA	NA	NA	NA	NA	NA



REFRIGERATION



FRANCO

Relay Electrical Ratings

Single Stage Models			Two Stage Models	
120V AC	208/240V AC	NO Contact	120V AC	208/240V AC
16 Amps	8 Amps	Full-load Amps	9.8 Amps	4.9 Amps
96 Amps	48 Amps	Locked Rotor Amps	58.8 Amps	29.4 Amps
15 Amps	8 Amps	Resistive Amps	9.8 Amps	4.9 Amps
1 HP	1 HP	Horsepower	1/2 HP	1/2 HP
120V AC	208/240V AC	NC Contact	120V AC	208/240V AC
5.8 Amps	2.9 Amps	Full-load Amps	5.8 Amps	2.9 Amps
34.8 Amps	17.4 Amps	Locked Rotor Amps	34.8 Amps	17.4 Amps
5.8 Amps	2.9 Amps	Resistive Amps	5.8 Amps	2.9 Amps
1/4 HP	1/4 HP	Horsepower	1/4 HP	1/4 HP

1 Year
Limited
Warranty

C5



REFRIGERATION

RANCO®



A12-1560

TEMPERATURE CONTROLS - COLD CONTROLS

A12 and 9531 Series - Constant Cut-in

The Ranco® A12 and 9531 Series Constant Cut-in Temperature Controls are designed to switch electrical components of refrigeration systems in response to sensed temperatures.

Features and Benefits

- Laser-welded stainless steel bellows
- Fixed or adjustable temperature settings
- High-amperage contacts
- Pneumatic action provided by vapor-filled capillary or capillary with bulb sensing elements
- Constant On or Off positions available
- Choice of mounting brackets, adjustment ranges and cams, and slotted or flatted shafts
- Standard 1/4" quick-connect terminals with optional screw terminals

Specifications

Part Numbers	Description	Cold Off	Normal Off	Warm Off	Cut-In	Capillary Length
A12-1506	Constant Cut-In Control	9°F	15°F	22°F	38°F	39" x 3/8" x 1-3/8"
A12-1560	Constant Cut-In Control	19°F	24°F	29°F	38°F	72"
A12-700	Constant Cut-In Control	11.5°F	18°F	26°F	37°F	84"
A12-701	Constant Cut-In Control	15°F	23.5°F	31°F	41°F	84"
9531N195	Constant Cut-In Control with Pigtail	5°F	NA	29°F	40°F	58.5"
9531N320	Constant Cut-In Control	11°F	16°F	21°F	40°F	20.5"
9531N395 (MEX, SA)	Constant Cut-In Control with Pigtail	12°F	19°F	25°F	38°F	48.5"

c **RI** us
Recognized
Component

1 Year
Limited
Warranty

C6

www.Uni-Line.com

Customer Service 1.800.304.6563

REFRIGERATION



RANCO

TEMPERATURE CONTROLS - COLD CONTROLS

A22, A30 and 9530 Series - Constant Differentials

The Ranco® A22, A30 and 9530 Series Constant Differential Temperature Controls are designed to switch electrical components of refrigeration systems in response to sensed temperatures.

Features and Benefits

- Laser-welded stainless steel bellows
- Fixed or adjustable temperature settings
- High-amperage contacts
- Pneumatic action provided by vapor-filled capillary or capillary with bulb sensing elements
- Constant On or Off positions available
- Choice of mounting brackets, adjustment ranges and cams, and slotted or flatted shafts
- Standard 1/4" quick-connect terminals with optional screw terminals



A30-2210

Specifications

Part Numbers	Description	Switch	Off Position	Cold Off	Cold On	Normal Off	Normal On	Warm On	Differential	Capillary Length
A22-391	Adaptable Constant Differential Control	SPDT	No	11°F	19°F	27°F	35°F	51°F	8°F	66"
A22-1112	Adaptable Constant Differential Control	SPST	No	25°F	30°F	34°F	39°F	44°F	5°F	72"
A22-1129	Ice Bin Level and Harvest Control	SPDT	NA	NA	NA	35°F	51°F	NA	6°F	48"
A30-180	Adaptable Constant Differential Control	SPST	Yes	-4°F	9°F	9°F	22°F	38°F (3,3°C)	13°F	42"
A30-260	Adaptable Constant Differential Control	SPST	Yes	0.5°F	5.5°F	16°F	22°F	30°F	6°F	72"
A30-261	Adaptable Constant Differential Control	SPST	Yes	32°F	38°F	NA	NA	61°F	6°F	84"
A30-262	Adaptable Constant Differential Control	SPST	Yes	3°F	15°F	20°F	32°F	43°F	12°F	84"
A30-263	Adaptable Constant Differential Control	SPST	Yes	0.5°F	23°F	11°F	33.5°F	47°F	22.5°F	84"
A30-301	Adaptable Constant Differential Control	SPST	No	-24°F	NA	-3°F	5.5°F	20.5°F	8.5°F	84"
A30-2209	Constant Differential Control with Dial	SPST	Yes	35°F	NA	36.5°F	44.5°F	46°F	8°F	48"
A30-2210	Constant Differential Control with Dial	SPST	Yes	30°F	NA	32°F	40°F	42°F	8°F	48"
9530N814	Constant Differential Control with Dial	SPST	Yes	12°F	NA	16°F	40°F	43°F	24°F	30"

CAUS
Recognized
Component

1 Year
Limited
Warranty

C7

Customer Service 1.800.304.6563

www.Uni-Line.com



REFRIGERATION

RANCO®

TEMPERATURE CONTROLS - COLD CONTROLS



K12L-1529-002

K Series

The Ranco® K Controls are used all over the globe to control the temperature in commercial and domestic refrigeration, air conditioning and heating applications. Typical uses include refrigerators, freezers, bottle and liquid coolers, and refrigerator display cases.

Features and Benefits

- Compact size
- Standard mounting configurations
- Constant/fixed differential
- SPST close-on-rise switching
- Various capillary lengths

Specifications

Part Numbers	Description	Country of Origin	Switch	Cold Cut-In	Cold Cut-Out	Normal Cut-Out	Warm Cut-In	Warm Cut-Out	Constant Cut-In	Capillary Length
K12L-1529-002	Cold Control International Models	Czech Republic	SPST	NA	-8.3°C	-4.7°C	NA	-0.8°C	5.5°C	2130mm
K50P-1125-001	Cold Control International Models	Czech Republic	SPST	-9°C	-18°C	NA	9°C	NA	NA	1200mm
K50P-1126-001	Cold Control International Models	Czech Republic	SPST	-18°C	-24°C	NA	-9°C	NA	NA	1200mm
K50P-1127-001	Cold Control International Models	Czech Republic	SPST	5°C	2°C	NA	13°C	NA	NA	1200mm
K50P-6063-001	Cold Control International Models	Czech Republic	SPST	5°C	-6°C	NA	11°C	NA	NA	1200mm
K50Q-1125-001	Cold Control International Models	China	SPST	-9°C	-18°C	NA	9°C	NA	NA	1200mm
K50Q-1126-001	Cold Control International Models	China	SPST	-18°C	-24°C	NA	-9°C	NA	NA	1200mm
K50Q-1127-001	Cold Control International Models	China	SPST	5°C	2°C	NA	13°C	NA	NA	1200mm

1 Year
Limited
Warranty

C8

www.Uni-Line.com

Customer Service 1.800.304.6563

REFRIGERATION



RANCO

TEMPERATURE CONTROLS

Varifix® Series

The Ranco® Varifix International Cold Controls are designed for fast and easy service replacements. They are available for both refrigerator and freezer applications.

Features and Benefits

- Trusted brand
- Capillary is crimped and sealed for maximum reliability
- High level of performance
- Complete kit includes all necessary hardware



VT9

Specifications

Part Numbers	Description	Application	Normal Cut-Out	Normal Cut-In	Capillary Length
VA-2	Cold Control	Absorption Refrigerator	-18°C	-14.5°C	2000mm
VB7	Cold Control	Bottle or Beverage Cooler and Frost Free Refrigerator	3°C	7°C	1200mm
VC1	Cold Control	Refrigerator / Manual Defrost	-14.5°C	-5°C	1200mm
VF3	Cold Control	Freezer and Ice Cream Cabinet	-24°C	-16°C	2000mm
VR-6	Cold Control	Freezer with Reverse Thermostat	-34°C	-16.5°C	1999mm
VS-5	Cold Control	Freezer with Standard Signal Thermostat	-34°C	-16.5°C	2000mm
VT9	Cold Control	Refrigerator Auto Defrost	-18.5°C	33.5°C	1200mm
VX0	Cold Control	Larder Refrigerator	-15°C	-5°C	1999mm
VL1 (ANZ, EU)	Cold Control	Compressor Refrigerator	N/A	N/A	1200mm
VL2 (ANZ, EU)	Cold Control	Absorption Refrigerator	N/A	N/A	2000mm
VL3 (ANZ, EU)	Cold Control	Freezer & Ice Cream Cabinets	N/A	N/A	2000mm
VL4 (ANZ, EU)	Cold Control	Push Button Defrost Refrigerator	N/A	N/A	1200mm
VL5 (ANZ, EU)	Cold Control	Freezer Standard Signal	N/A	N/A	2000mm
VL6 (ANZ, EU)	Cold Control	Freezer Reverse Signal	N/A	N/A	2000mm
VL7 (ANZ, EU)	Cold Control	Bottle Cooler	N/A	N/A	1200mm
VL9 (ANZ, EU)	Cold Control	Larger Refrigerator/ 2 Door Cabinet	N/A	N/A	1200mm
VP4 (ANZ, EU)	Cold Control	Push Button Defrost Refrigerator	N/A	N/A	1200mm
VT93 (ANZ, EU)	Cold Control	Long Capillary Version of VL9	N/A	N/A	3000mm

1 Year
Limited
Warranty



REFRIGERATION

RANCO

TEMPERATURE CONTROLS - SPECIALTY APPLICATIONS



C12-5010

Heat/Cool

The Ranco® Heat / Cool Controls replace many OEM controls which govern the on/off compressor function. Heat and cool controls are found on room air conditioners such as packaged terminal, room and through-the-wall heat and cool units.

Features and Benefits

- Fixed or adjustable temperature settings
- Laser-welded stainless steel sensing elements
- Narrower differentials attainable
- C12 can be used for cool only units or heat/cool units when used with a separate changeover switch
- C17 has two SPDT electrically isolated switches, calibrated at different set points and differentials
- Two stage SPDT switches are staged 3.5°F

Specifications

Part Numbers	Description	Application	Switch	Temperature Range	Differential	Capillary	Sensing Element
C12-5010	Single Stage Heat / Cool Control	Packaged Terminal, Room and Through-the-Wall Heat / Cool Units	SPDT	60°F to 98°F	3°F	36"	3/8" x 9" Bulb
C17-100	Two Stage Heat / Cool Control	Packaged Terminal, Room and Through-the-Wall Heat / Cool Units	2 SPDT	71°F to 101°F (Cooling), 64°F to 94°F (Heating)	3.5°F	26"	3/8 x 8-9/16" Bulb

1 Year
Limited
Warranty

C10

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Customer Service 1.800.304.6563

TEMPERATURE CONTROLS -
SPECIALTY APPLICATIONS

Heat Pump Controls

The Ranco® Heat Pump Controls provide accurate control of temperature and defrost for heat pumps.

The C12-2001 control is an adjustable resistance heat thermostat used to turn on heat in response to outdoor temperature.

The E15-2601 provides field-adjustable timer control for de-icing of heat pump outdoor coils.

Interlock prevents more than one defrost cycle per time period and temperature must be 28°F or lower to start.

Features and Benefits

- Laser-welded stainless steel sensing elements
- Narrower differentials attainable
- Defrost includes field selectable defrost cycles



Specifications

Part Numbers	Description	Application	Switch	Temperature Range	Timing	Differential	Capillary Length	Sensing Element
C12-2001	Resistance Heat Lockout Thermostat	Heat Pump Controls	SPDT	-1°F to 59°F	NA	5°F	30"	3/8" x 6" Bulb
E15-2601	Timer-Initiated Heat Pump De-Ice Control	Heat Pump Controls	SPDT	Adjustable 55°F to 78°F	Field Selectable: 30, 45, or 90 Minutes	NA	60"	5/16" x 5-1/16" Bulb

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1 Year
Limited
Warranty





REFRIGERATION

RANCO®

TEMPERATURE CONTROLS - SPECIALTY APPLICATIONS



F25-107

F Series - Fan Control

The Ranco® Fan Controls terminate defrost, and delay the evaporator fan operation on electric heat, hot gas and reverse cycle commercial refrigeration systems.

Features and Benefits

- Prevents warm, moist air from being circulated into the refrigerated space
- Remote bulb sensing
- Factory-fixed low event for fan delay

Specifications

Part Numbers	Description	Application	Switch	Fan On	Defrost Termination Range	Capillary Length	Sensing Element
F25-107	Defrost Termination / Fan Delay Control	Beverage / Reach-in Medium Temperature	SPDT	20°F Fixed	40°F to 75°F (5°C to 24°C)	60"	3/8" X 4" Cross Ambient Bulb

TEMPERATURE CONTROLS - SPECIALTY APPLICATIONS



K-3001

Water Cooler Control

The Ranco® Water Cooler Control is designed as a universal replacement for water and beverage cooler applications.

Features and Benefits

- Small, compact design
- Laser-welded bellows for reliability
- Computer calibrated
- Patented switch for high performance
- Screwdriver adjustment

Specifications

Part Numbers	Description	Application	Cold Off	Normal Off	Normal On	Warm On	Differential	Capillary Length
K-3001	Direct Replacement Water Cooler Control	Ice Equipment, Thermal Storage and Water Cooler Controls	37°F	46°F	53°F	61°F	7°F	48"

1 Year
Limited
Warranty

C12

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Customer Service 1.800.304.6563

REFRIGERATION



RANCO



P30-5826

LUBE OIL CONTROLS

P30 Series

The Ranco® P30 Series Lube Oil Protection Controls guard pressure-lubricated refrigeration compressors against major damage due to loss of oil pressure.

This control utilizes the built-in P30 Time Delay Switch to start timing when oil pressure drops below operating requirements.

The timer is designed not only to track oil pressure recovery within a set period, but also to alert the control circuit to open and stop the compressor when the recovery period is exceeded.

These controls also feature replaceable time delay modules, Super Cap® capillary protection system and front-located captive cover screw.

Features and Benefits

- Alarm circuit standard
- Ambient temperature compensated
- Super Cap® capillary protection system
- High impact, non-conductive cover
- Field replaceable switch module
- Manual reset
- Industry standard circuitry and terminal identification

Specifications

Part Numbers	Description	Pressure Connection Lube and Suction	Time Delay	Pressure Range	Electrical Rating
P30-3601	P30 Series Lube Oil Protection Control	36" Capillary with Flare Nut	60 seconds	8-60 PSI Adjustable	120V AC or 240V AC, Pilot Duty 720VA
P30-3701	P30 Series Lube Oil Protection Control	36" Capillary with Flare Nut	90 seconds	8-60 PSI Adjustable	120V AC or 240V AC, Pilot Duty 720VA
P30-3702	P30 Series Lube Oil Protection Control	Male Connection 7/16" 20 UNF for a 1/4" Female Flare	90 seconds	8-60 PSI Adjustable	120V AC or 240V AC, Pilot Duty 720VA
P30-3801	P30 Series Lube Oil Protection Control	36" Capillary with Flare Nut	120 seconds	8-60 PSI Adjustable	120V AC or 240V AC, Pilot Duty 720VA
P30-5826	P30 Series Lube Oil Protection Control	36" Capillary with Flare Nut	120 seconds	9 PSID Fixed	120V AC or 240V AC, Pilot Duty 720VA
P30-5839	P30 Series Lube Oil Protection Control	Male Connection 7/16" 20 UNF for a 1/4" Female Flare	120 seconds	9 PSID Fixed	120V AC or 240V AC, Pilot Duty 720VA
P30-5848	P30 Series Lube Oil Protection Control	Male Connection 7/16" 20 UNF for a 1/4" Female Flare	120 seconds	9 PSID Fixed	120V AC or 240V AC, Pilot Duty 720VA



1 Year
Limited
Warranty

C13



REFRIGERATION

RANCO



O10-1409
with Coil Capillary



O10-1418
with Air Coil

TEMPERATURE CONTROLS - WIDE RANGE

O Series

The Ranco® Wide Range O Series Temperature Controls provide a wide selection of controls customized to allow users exact adjustments within manufacturers' limits.

The Ranco O Series features heavy-duty plated steel frames, non-conductive covers with front-located captive cover screws, raised screw terminals for fully accessible wiring, and large easy-to-read scales.

Recognizing the need for flexibility in design of refrigeration equipment, these controls offer a wide selection for such products as self-contained refrigerators, freezers, coolers, walk-in units, and refrigeration display cases.

Features and Benefits

- Maximum adjustment accuracy with 7 revolution range adjustment screws
- NEMA 1 enclosure with non-conductive cover
- Universal mounting and compact design
- Laser-welded bellows for extended life
- Wide range adjustable differential

The O60 Series have these additional features:

- 10 times setting sensitivity of most other wide range controls (O60 series only)
- Gas-filled, nonposition-sensitive bulb (O60 series only)



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Specifications

Part Numbers	Description	Switch	Temperature Range	Differential	Capillary Length	Bulb
010-1408	Low Temperature Control	SPST	-15°F to 40°F	3°F to 20°F	72"	Remote
010-1409	Medium Temperature Control	SPST	0°F to 55°F	3°F to 20°F	72"	Remote
010-1410	High Temperature Control	SPST	25°F to 75°F	3°F to 20°F	72"	Remote
010-1416	Medium Temperature Control	SPST	0°F to 55°F	3°F to 20°F	72"	Cross Ambient
010-1418	Medium Temperature Control	SPST	0°F to 55°F	3°F to 20°F	Air Coil	Remote
060-100	Extra Low-Wide Range Temperature Control	SPDT	-35°F to 95°F	4°F to 50°F	96"	3/8" x 6" Cross Ambient
016-641 or 016-6930 (ANZ)	Extra Low-Wide Range Temperature Control	SPDT	-34°C to 34°C	4°C to 25°C	1.8m	Cross Ambient
016-639 or 016-6950 (ANZ)	Extra Low-Wide Range Temperature Control	SPDT	-35°C to -7°C	1.7°C to 12°C	2m	Coiled
016-636 or 016-6951 (ANZ)	Extra Low-Wide Range Temperature Control	SPDT	-18°C to 13°C	1.7°C to 12°C	2m	Coiled
016-637 or 016-6954 (ANZ)	Extra Low-Wide Range Temperature Control	SPDT	-5°C to 25°C	1.7°C to 12°C	2m	Coiled
016-640 or 016-6980 (ANZ)	Extra Low-Wide Range Temperature Control	SPDT	-18°C to 13°C	1.7°C to 12°C	1.8m	Cross Ambient
016-642 or 016-6981 (ANZ)	Extra Low-Wide Range Temperature Control	SPDT	-5°C to 25°C	1.7°C to 12°C	1.8m	Cross Ambient
016-643 or 016-8900 (ANZ)	Extra Low-Wide Range Temperature Control	SPDT	-18°C to 13°C	4°C to 25°C	2m	Coiled

1 Year
Limited
Warranty

C15

Customer Service 1.800.304.6563

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REFRIGERATION

RANCO



O10-1402

PRESSURE CONTROLS

O Series - Single Low Pressure Controls

The Ranco® O Series Single Low Pressure Controls offer a variety of pressure ranges and switch action to provide maximum application flexibility.

Features and Benefits

- Controls available for most refrigerant types
- High-amp rated switch (SPST) design (O10-1402/O10-1483)
- Super Cap® capillary vibration protection system
- Non-conductive front cover with captive screw
- Adjustable differential and range
- Easy-to-read scale plate
- Vibration cone (absorbs and reduces vibration away from brazed joint)
- Low mass copper alloy capillary tube (reduces capillary stress caused by equipment vibration)

The O16-624 control has additional features:

- Compatible with refrigerants 134A, 401A, 401B, 402A, 402B, 403A, 403B and 404A
- Originally designed for use with obsolete refrigerants R12, R22, R500 and R502

Specifications

Part Numbers	Description	Reset	Switch	Pressure Range PSI (bar)	Differential PSI (bar)	Pressure Connection	Capillary Length Inches (meters)	Replaces
O10-1402	Low Pressure Control	Auto	SPST	12" Hg to 50 (0.4 to 3.5)	5 to 35 (0.3 to 2.4)	1/4" SAE Flare Nut	36" (0.9m)	
O10-1483	Low Pressure Control	Auto	SPST	10" Hg to 100 (0.3 to 7)	10 to 40 (1 to 3)	1/4" SAE Flare Nut	36" (0.9m)	
O16-527	Low Pressure Control	Auto	SPDT	10" Hg to 100 (0.3 to 7)	10 to 40 (1 to 3)	1/4" SAE Flare Nut	36" (0.9m)	
O16-528	Low Pressure Control	Auto	SPDT	10" Hg to 100 (0.3 to 7)	10 to 40 (1 to 3)	Male Connection 7/16" - 20 UNF for a 1/4" Female Flare	NA	O16-H6703-101
O16-8706 (ANZ)	Low Pressure Control	Auto	SPDT	-33 to 700 kPa	68 to 275 kPa	Male Connection 7/16" - 20 UNF for a 1/4" Female Flare	NA	O16-528
O16-8713 (ANZ)	Low Pressure Control	Auto	SPDT	-33 to 700 kPa	68 to 275 kPa	1/4" SAE Flare Nut	36" (0.9m)	O16-529
O16-624	Low Pressure Control	Auto	SPST	12" Hg to 80 (0.4 to 5.5)	5 to 38 (0.3 to 2.6)	1/4" SAE Flare Nut	36" (0.9m)	
O16-638	Low Pressure Control	Manual	SPDT	10" Hg to 100 (0.3 to 7)	9 (0.6) Fixed	Male Connection 7/16" - 20 UNF for a 1/4" Female Flare	NA	O16-H6705-101
O16-8705 (ANZ)	Low Pressure Control	Manual	SPDT	-33 to 700 kPa	60 kPa Fixed	Male Connection 7/16" - 20 UNF for a 1/4" Female Flare	NA	O16-638



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1 Year
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Warranty

C16

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REFRIGERATION



RANCO

PRESSURE CONTROLS

O Series - Single High Pressure Controls

The Ranco® O Series Single High Pressure Controls offer a variety of pressure ranges and switch action to provide maximum application flexibility.

Features and Benefits

- NEMA 1 enclosure with non-conductive cover
- Front-located captive cover screw
- Large, easy-to-read scale plate
- Super Cap® capillary protection system
- Universal mounting and compact design
- Screw terminals are raised and fully accessible for easy wiring
- Laser-welded bellows for extended life
- Heavy-duty plated steel frame
- Suitable for R12, R22, and R502 applications



O16-108

Specifications

Part Numbers	Description	Reset	Switch	Pressure Range PSI (bar)	Differential PSI (bar)	Pressure Connection	Capillary Length Inches (meters)	Replaces
010-2054	Single High Pressure Control	Auto	SPST	100 to 400 (7 to 27)	40 to 150 (3 to 10)	1/4" SAE Flare Nut	36" (0.9m)	
016-108	Single High Pressure Control	Auto	SPDT	100 to 400 (7 to 27)	40 to 150 (3 to 10)	1/4" SAE Flare Nut	36" (0.9m)	
016-200	Single High Pressure Control	Manual	SPDT	150 to 450 (10 to 31)	40 (3) Fixed	1/4" SAE Flare Nut	48" (1.2m)	
020-7006	Single High Pressure Control	Auto	DPST	100 to 400 (7 to 27)	40 to 150 (3 to 10)	1/4" SAE Flare Nut	36" (0.9m)	
016-530	Single High Pressure Control	Auto	SPDT	100 to 400 (7 to 27)	40 to 150 (3 to 10)	Male Connection 7/16" - 20 UNF for a 1/4" Female Flare	NA	016-H6750-101
016-8750 (ANZ)	Single High Pressure Control	Auto	SPDT	700 to 2800 kPa	275 to 1000 kPa	Male Connection 7/16" - 20 UNF for a 1/4" Female Flare	NA	016-530
016-531	Single High Pressure Control	Manual	SPDT	150 to 450 (10 to 31)	40 (3) Fixed	Male Connection 7/16" - 20 UNF for a 1/4" Female Flare	NA	016-H6751-101
016-8751 (ANZ)	Single High Pressure Control	Manual	SPDT	1000 to 3100 kPa	276 kPa Fixed	Male Connection 7/16" - 20 UNF for a 1/4" Female Flare	NA	016-531



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1 Year
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Warranty

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REFRIGERATION

RANCO



O12-1506

PRESSURE CONTROLS

O Series - Dual Pressure

The Ranco® Dual Pressure Controls combine the functions of a single high-pressure limit control and a single low-pressure control in one unit with a single pole, single throw (SPST) switch.

Features and Benefits

- Convertible feature allows selection of manual or reset function when operating at high pressure (O12-4833/O12-4834)
- A wide range of high-pressure manual or automatic reset controls can be replaced (O12-4833 or O12-4834)
- A high-pressure limit is combined with suction pressure sensing to provide temperature control and/or pumpdown
- High-limit adjustment screw
- Low-pressure differential and range adjusting screws
- Selector screw for manual or automatic
- Reset button
- Low-pressure scale plate
- High-impact plastic cover with center mount screw
- High-pressure scale plate
- Super Cap® capillary protection system
- Color-coded for easy identification of pressure line
- High-side capillary flare nut (silver)
- Low-side capillary flare nut (brass)



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REFRIGERATION



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Specifications

Part Numbers	Description	Switch	Low Reset	Low Cut-In PSI (bar)	Low Differential PSI (bar)	High Reset	High Cut-Out PSI (bar)	High Differential PSI (bar)	Pressure Connection	Capillary Length Inches (meters)	Replaces
012-1502	Dual Pressure Control	SPST	Auto	12" Hg to 50 (0.4 to 3.5)	5 to 35 (0.3 to 2.4)	Auto	150 to 450 (10 to 31)	70 (5) Fixed	1/4" SAE Flare Nut	36" (0.9m)	
012-1506	Dual Pressure Control	SPST	Auto	12" Hg to 50 (0.4 to 3.5)	5 to 35 (0.3 to 2.4)	Auto	100 to 250 (7 to 17)	50 (3.5) Fixed	1/4" SAE Flare Nut	36" (0.9m)	
012-1549	Dual Pressure Control	SPST	Auto	10" Hg to 100 (0.3 to 7)	10 to 40 (1 to 3)	Auto	150 to 450 (10 to 31)	70 (5) Fixed	1/4" SAE Flare Nut	36" (0.9m)	
012-4154	Dual Pressure Control	SPST	Manual	10" Hg to 100 (0.3 to 7)	10 (1) Fixed	Manual	150 to 450 (10 to 31)	70 (5) Fixed	Male Connection 7/16" - 20 UNF for a 1/4" Female Flare	NA	017-H6703-101 017-H4703-101
017-8703 (ANZ)	Dual Pressure Control	SPdT	Manual	-33 to 700 kPa	60 kPa Fixed	Manual	1000 to 3000 kPa	480 kPa Fixed	Male Connection 7/16" - 20 UNF for a 1/4" Female Flare	NA	012-4154
012-4833	Dual Pressure Control	SPST	Auto	12" Hg to 50 (0.4 to 3.5)	5 to 35 (0.3 to 2.4)	Convert-ible	150 to 450 (10 to 31)	70 (5) Fixed	1/4" SAE Flare Nut	48" (1.2m)	
012-4834	Dual Pressure Control	SPST	Auto	10" Hg to 100 (0.3 to 7)	10 to 40 (1 to 3)	Convert-ible	150 to 450 (10 to 31)	70 (5) Fixed	1/4" SAE Flare Nut	48" (1.2m)	
012-4860	Dual Pressure Control	SPST	Auto	10" Hg to 100 (0.3 to 7)	10 to 40 (1 to 3)	Convert-ible	150 to 450 (10 to 31)	70 (5) Fixed	Male Connection 7/16" - 20 UNF for a 1/4" Female Flare	NA	017-H4705-101 017-H6705-101
017-8705 (ANZ)	Dual Pressure Control	SPST	Auto	-33 to 700 kPa	68 to 275 kPa	Convert-ible	1000 to 3000 kPa	480 kPa Fixed	Male Connection 7/16" - 20 UNF for a 1/4" Female Flare	NA	012-4860
012-4900	Dual Pressure Control	SPST	Auto	10" Hg to 100 (0.3 to 7)	10 to 40 (1 to 3)	Auto	150 to 450 (10 to 31)	70 (5) Fixed	Male Connection 7/16" - 20 UNF for a 1/4" Female Flare	NA	017-H6701-101
017-8701 (ANZ)	Dual Pressure Control	SPST	Auto	-33 to 700 kPa	100 to 300 kPa	Auto	1000 to 3000 kPa	480 kPa Fixed	Male Connection 7/16" - 20 UNF for a 1/4" Female Flare	NA	012-4900
012-4902	Dual Pressure Control	SPST	Auto	10" Hg to 100 (0.3 to 7)	10 to 40 (1 to 3)	Auto	145 to 435 (10 to 30)	70 (5) Fixed	1/4" SAE Flare Nut	36" (0.9m)	017-8711
017-8711 (ANZ)	Dual Pressure Control	SPST	Auto	-33 to 700 kPa	68 to 275 kPa	Auto	1000 to 3000 kPa	480 kPa Fixed	1/4" SAE Flare Nut	36" (0.9m)	012-4902

1 Year Limited Warranty



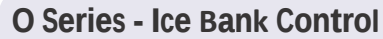
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PRESSURE CONTROLS



Specifications

Part Numbers	Description	Switch	Cut-In	Cut-Out	Temperature	Capillary Length	Sensing Element
018-100	Ice Bank Control	SPST	34.5°F	27.5°F	Fixed 32°F	76"	Bulb

C20

REFRIGERATION



RANCO

REFRIGERATION ACCESSORIES

Refrigerant Hoses

The Ranco® refrigerant hose is a heavy-duty hose designed for critical applications such as commercial refrigeration.

Made of Teflon® tubing and surrounded by a braided 304 stainless steel wire, the hose is designed to resist breakage from compressor vibration.

Features and Benefits

- Hose inner diameter - 3/16"
- Hose outer diameter - 5/16"
- Maximum operating pressure - 3,000 PSI
- Minimum burst pressure - 12,000 PSI
- Minimum bend radius - 2"
- Vacuum - 28" Hg



Specifications

Part Numbers	Description	Hose Length	Fittings (1/4 SAE)
1290132-A24	Refrigerant Hose	24"	One straight and one 90° elbow. Both ends have 7/16" - 20 Female Flare Connector
1290132-A36	Refrigerant Hose	36"	One straight and one 90° elbow. Both ends have 7/16" - 20 Female Flare Connector

1 Year
Limited
Warranty

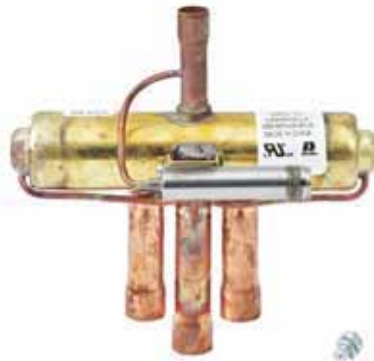
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REFRIGERATION

RANCO®

REVERSING VALVES



V2-408060-170

V Series

The Ranco® 4-Way Reversing Valves are designed for heat pump applications such as window-type, unitary and split systems.

They are the key component to provide heating and cooling from the heat pump system by reversing the flow direction of the refrigerant.

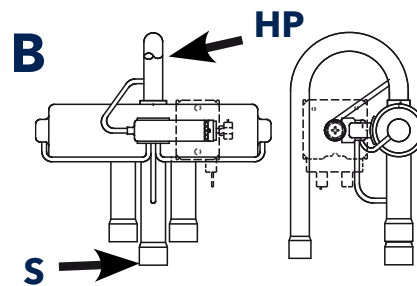
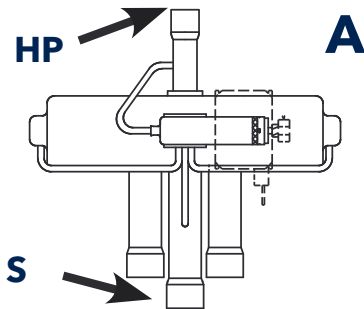
These solenoid operated valves are slide type with a 4-way pilot valve, and operate under the full pressure of the heat pump system.

Note: Solenoid coils are not included.

Specifications

Part Numbers	Description	Capacity Nominal	Capacity R-22	Capacity R-410A	Tube Size Suction	Tube Size Discharge	Style
V2-408060-170	4-Way Reversing Valve	1 ton	0.75 to 2.0 tons	0.9 to 2.2 tons	1/2"	3/8"	A
V2-408060-270	4-Way Reversing Valve	2 tons	0.75 to 2.0 tons	0.9 to 2.2 tons	1/2"	3/8"	B
V2-410060-470	4-Way Reversing Valve	2 tons	1.0 to 2.5 tons	1.3 to 2.5 tons	5/8"	3/8"	D
V2-4100F0-370	4-Way Reversing Valve	2 tons	1.0 to 2.5 tons	1.3 to 2.5 tons	5/8"	3/8" Outer Diameter	C
V3-410080-770	4-Way Reversing Valve	3 tons	1.0 to 2.8 tons	1.3 to 3.1 tons	5/8"	1/2"	E
V3-412080-870	4-Way Reversing Valve	3 tons	1.0 to 3.0 tons	1.3 to 3.5 tons	3/4"	1/2"	E
V6-412080-170	4-Way Reversing Valve	6 tons	1.0 to 5.5 tons	1.3 to 6.7 tons	3/4"	1/2"	A
V6-414080-170	4-Way Reversing Valve	6 tons	1.0 to 5.5 tons	1.3 to 6.7 tons	7/8"	1/2"	A
V10-414080-170	4-Way Reversing Valve	10 tons	3.0 to 9.9 tons	3.8 to 11.9 tons	7/8"	1/2"	A
V10-418140-170	4-Way Reversing Valve	10 tons	3.0 to 11.2 tons	3.8 to 13.5 tons	1-1/8"	7/8"	A
V12-4220T0-270	4-Way Reversing Valve	12 tons	6.0 to 14.0 tons	6.3 to 16.8 tons	1-3/8"	1-1/8" Outer Diameter	F

Product Drawings

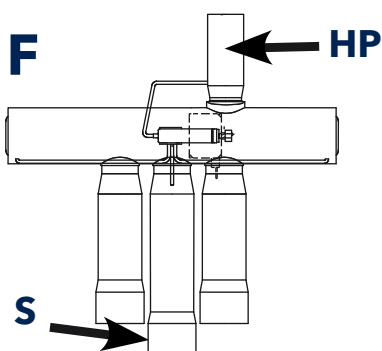
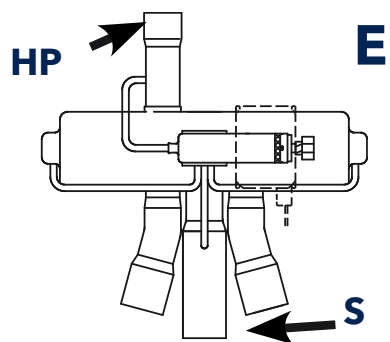
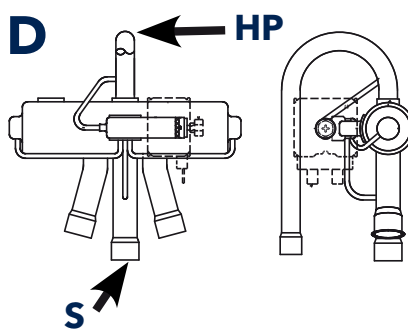
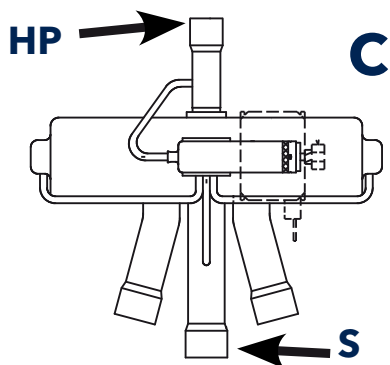


REFRIGERATION



BRANCO

Product Drawings



Legend

HP: High Pressure

S: Suction

1 Year
Limited
Warranty

C23

Customer Service 1.800.304.6563

www.Uni-Line.com



REFRIGERATION

RANCO®



LDK-110000-070

REVERSING VALVES - SOLENOID COILS

LDK Series

The Ranco® LDK Series Solenoid Coils are designed for use with current production (Generation 4) V0, V1, V2, V3, V6, V10 and V12 Ranco 4-way Reversing Valves.

These color-coded, encapsulated, continuous duty, moisture resistant electro-magnetic coils are designed to operate the pilot valve that controls these reversing valves.

A W29 wiring harness with 48" leads is included with the solenoid coil.

Features and Benefits

- Epoxy encapsulated
- Continuous duty
- Moisture resistant magnetic coils
- Includes wiring harness

Specifications

Part Numbers	Description	Color Code	Lead Length	Electrical Rating	Power
LDK-110000-070	Solenoid Coils for Reversing Valves	Red	48"	24V AC	5 Watts at 50 Hz, 4 Watts at 60 Hz
LDK-310000-070	Solenoid Coils for Reversing Valves	Black	48"	120V AC	5 Watts at 50 Hz, 4 Watts at 60 Hz
LDK-410000-070	Solenoid Coils for Reversing Valves	Green	48"	208/240V AC	5 Watts at 50 Hz, 4 Watts at 60 Hz

1 Year
Limited
Warranty

C24

www.Uni-Line.com

Customer Service 1.800.304.6563

REFRIGERATION



RANCO

SOLENOID VALVES

1000 Series

The Ranco® 1000 Series Solenoid Valves are designed for installation on commercial refrigerating systems using various refrigerant fluids to stop the flow of those fluids. When the coil is energized by a cold control with setpoint, the plunger opens the valve seat connecting the inlet to the outlet to allow open flow. Additional coils are sold separately.

Features and Benefits

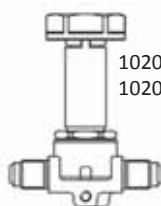
- Normally closed (NC) solenoid valves without coils
- Direct acting and diaphragm pilot operated versions available
- Direct acting valves operate on magnetic field and can open with zero pressure differential



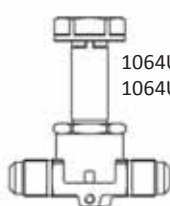
Specifications

Part Numbers	Description	Connection Type	Connections	Flow kV [m3/h]	Pressure PSI (Bar)	Temperature Range Min To Max
1020UL/2S	Solenoid Valve, Direct Acting	SAE	1/4"	0.18	652 (45)	-31°F To 230°F (-35°C To 110°C)
1020UL/3S	Solenoid Valve, Direct Acting	SAE	3/8"	0.23	652 (45)	-31°F To 230°F (-35°C To 110°C)
1064UL/3S	Solenoid Valve, Diaphragm Pilot Operated	SAE	3/8"	0.80	652 (45)	-31°F To 230°F (-35°C To 110°C)
1064UL/4S	Solenoid Valve, Diaphragm Pilot Operated	SAE	1/2"	0.80	652 (45)	-31°F To 230°F (-35°C To 110°C)
1070UL/4S	Solenoid Valve, Diaphragm Pilot Operated	SAE	1/2"	2.20	652 (45)	-31°F To 230°F (-35°C To 110°C)
1070UL/5S	Solenoid Valve, Diaphragm Pilot Operated	SAE	5/8"	2.61	652 (45)	-31°F To 230°F (-35°C To 110°C)
1028UL/2S	Solenoid Valve, Direct Acting	ODS	1/4"	0.15	652 (45)	-31°F To 230°F (-35°C To 110°C)
1028UL/3S	Solenoid Valve, Direct Acting	ODS	3/8"	0.23	652 (45)	-31°F To 230°F (-35°C To 110°C)
1068UL/3S	Solenoid Valve, Diaphragm Pilot Operated	ODS	3/8"	0.80	652 (45)	-31°F To 230°F (-35°C To 110°C)
1068UL/4S	Solenoid Valve, Diaphragm Pilot Operated	ODS	1/2"	0.80	652 (45)	-31°F To 230°F (-35°C To 110°C)
1078UL/5S	Solenoid Valve, Diaphragm Pilot Operated	ODS	5/8"	2.61	652 (45)	-31°F To 230°F (-35°C To 110°C)
1099UL/9S	Solenoid Valve, Diaphragm Pilot Operated	ODS	1-1/8"	5.70	652 (45)	-31°F To 230°F (-35°C To 110°C)
9105/RA4	Coil Hm2 - 110-120V 60 Hz					
9105/RA6	Coil Hm2 - 220-230V 60 Hz					

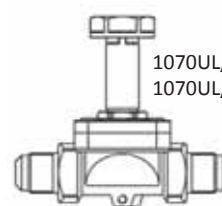
Product Drawings



1020UL/2S
1020UL/3S



1064UL/3S
1064UL/4S



1070UL/4S
1070UL/5S

UL
LISTED
Listed
Product

1 Year
Limited
Warranty

C25

Customer Service 1.800.304.6563

www.Uni-Line.com



REFRIGERATION

RANCO®



2230/4S



2203/S



2271/2S

THERMOSTATIC EXPANSION VALVES

2000 Series

The Ranco® 2000 Series Thermostatic Expansion Valves (TXVs) are designed for installation on commercial refrigerating systems using various refrigerant fluids to regulate the flow of refrigerant liquid into evaporators. These TXVs are designed to work with interchangeable orifice assemblies to provide flexibility in selection of capacities and can be used in a wide range of applications including refrigeration, air conditioning, heat pump and chiller systems.

Features and Benefits

- Accurate throttle device to control superheat to the setpoint
- Body is made of hot forged brass in angle configuration
- Interchangeable orifice assembly can easily be replaced through the inlet connection
- Quality materials to ensure proper functionality of diaphragm and seating
- Includes bulb bracket to enable proper placement of bulb to the pipe
- Stainless steel bulb, capillary tubing, diaphragm casing and rod
- Copper tube for solder connection
- Solder adaptors sold separately

REFRIGERATION



BRANCO

Specifications

Part Numbers	Description	SAE Flare In	SAE Flare Out	SAE Flare Equal	ODS Out Inches (mm)	ODS Equal Inches (mm)	Refrigerant	Evaporating Temperature Range Min to Max	Pressure PSI (Bar)	Temperature Range Min to Max
2210/4	Thermostatic Expansion Valve, SAE, R22	3/8"	1/2"	NA	NA	NA	R22 - R407C	-40°F to 50°F (-40°C to 10°C)	493 (34)	-76°F to 248°F (-60°C to 120°C)
2210/4E	Thermostatic Expansion Valve, SAE, R22	3/8"	1/2"	1/4"	NA	NA	R22 - R407C	-40°F to 50°F (-40°C to 10°C)	493 (34)	-76°F to 248°F (-60°C to 120°C)
2210/4S	Thermostatic Expansion Valve, ODS, R22	3/8"	NA	NA	1/2" (NA)	NA	R22 - R407C	-40°F to 50°F (-40°C to 10°C)	493 (34)	-76°F to 248°F (-60°C to 120°C)
2210/4SE	Thermostatic Expansion Valve, ODS, R22	3/8"	NA	NA	1/2" (NA)	1/4" (NA)	R22 - R407C	-40°F to 50°F (-40°C to 10°C)	493 (34)	-76°F to 248°F (-60°C to 120°C)
2220/4	Thermostatic Expansion Valve, SAE, R134a	3/8"	1/2"	NA	NA	NA	R134a	-40°F to 50°F (-40°C to 10°C)	493 (34)	-76°F to 248°F (-60°C to 120°C)
2220/4E	Thermostatic Expansion Valve, SAE, R134a	3/8"	1/2"	1/4"	NA	NA	R134a	-40°F to 50°F (-40°C to 10°C)	493 (34)	-76°F to 248°F (-60°C to 120°C)
2220/4S	Thermostatic Expansion Valve, ODS, R134a	3/8"	NA	NA	1/2" (NA)	NA	R134a	-40°F to 50°F (-40°C to 10°C)	493 (34)	-76°F to 248°F (-60°C to 120°C)
2220/4SE	Thermostatic Expansion Valve, ODS, R134a	3/8"	NA	NA	1/2" (NA)	1/4" (NA)	R134a	-40°F to 50°F (-40°C to 10°C)	493 (34)	-76°F to 248°F (-60°C to 120°C)
2230/4	Thermostatic Expansion Valve, SAE, R404A	3/8"	1/2"	NA	NA	NA	R404A-R507	-40°F to 50°F (-40°C to 10°C)	493 (34)	-76°F to 248°F (-60°C to 120°C)
2230/4E	Thermostatic Expansion Valve, SAE, R404A	3/8"	1/2"	1/4"	NA	NA	R404A-R507	-40°F to 50°F (-40°C to 10°C)	493 (34)	-76°F to 248°F (-60°C to 120°C)
2230/4S	Thermostatic Expansion Valve, ODS, R404A	3/8"	NA	NA	1/2" (NA)	NA	R404A-R507	-40°F to 50°F (-40°C to 10°C)	493 (34)	-76°F to 248°F (-60°C to 120°C)
2230/4SE	Thermostatic Expansion Valve, ODS, R404A	3/8"	NA	NA	1/2" (NA)	1/4" (NA)	R404A-R507	-40°F to 50°F (-40°C to 10°C)	493 (34)	-76°F to 248°F (-60°C to 120°C)

1 Year
Limited
Warranty



REFRIGERATION

RANCO

Specifications - continued

Part Numbers	Description	Connector Type	Capacity R22/R407C -40°F to 50°F (-40°C to 10°C) Tons (kW)	Capacity R134A -40°F to 50°F (-40°C to 10°C) Tons (kW)	Capacity R404A/R507 -40°F to 50°F (-40°C to 10°C) Tons (kW)	Capacity R404A/R507 -76°F to -13°F (-60°C to -25°C) Tons (kW)
220X	Orifice Assembly, SAE	SAE	0.1 (0.5)	0.1 (0.4)	0.1 (0.38)	0.1 (0.38)
2200	Orifice Assembly, SAE	SAE	0.3 (1)	0.3 (0.9)	0.2 (0.7)	0.2 (0.7)
2201	Orifice Assembly, SAE	SAE	0.7 (2.5)	0.5 (1.8)	0.5 (1.6)	0.5 (1.6)
2202	Orifice Assembly, SAE	SAE	1.0 (3.5)	0.7 (2.6)	0.6 (2.1)	0.6 (2.1)
2203	Orifice Assembly, SAE	SAE	1.5 (5.2)	1.3 (4.6)	1.2 (4.2)	1.0 (3.5)
2204	Orifice Assembly, SAE	SAE	2.3 (8)	1.9 (6.7)	1.7 (6)	1.4 (4.9)
2205	Orifice Assembly, SAE	SAE	3.0 (10.5)	2.4 (8.6)	2.2 (7.7)	1.7 (6)
2206	Orifice Assembly, SAE	SAE	4.4 (15.5)	3.0 (10.5)	2.6 (9.1)	1.9 (6.6)
220X/S	Orifice Assembly, ODS	ODS	0.1 (0.5)	0.1 (0.4)	0.1 (0.38)	0.1 (0.38)
2200/S	Orifice Assembly, ODS	ODS	0.3 (1)	0.3 (0.9)	0.2 (0.7)	0.2 (0.7)
2201/S	Orifice Assembly, ODS	ODS	0.7 (2.5)	0.5 (1.8)	0.5 (1.6)	0.5 (1.6)
2202/S	Orifice Assembly, ODS	ODS	1.0 (3.5)	0.7 (2.6)	0.6 (2.1)	0.6 (2.1)
2203/S	Orifice Assembly, ODS	ODS	1.5 (5.2)	1.3 (4.6)	1.2 (4.2)	1.0 (3.5)
2204/S	Orifice Assembly, ODS	ODS	2.3 (8)	1.9 (6.7)	1.7 (6)	1.4 (4.9)
2205/S	Orifice Assembly, ODS	ODS	3.0 (10.5)	2.4 (8.6)	2.2 (7.7)	1.7 (6)
2206/S	Orifice Assembly, ODS	ODS	4.4 (15.5)	3.0 (10.5)	2.6 (9.1)	1.9 (6.6)

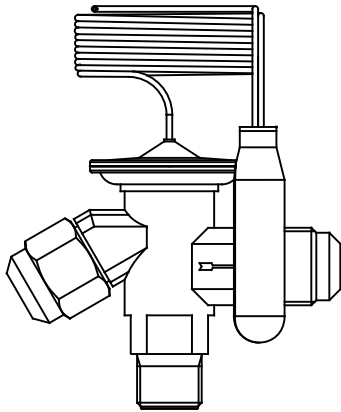
Part Numbers	Description	Flare end
2271/2S	Solder Adaptor	1/4"
2271/3S	Solder Adaptor	3/8"

REFRIGERATION

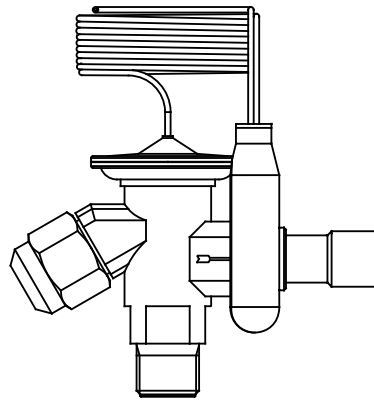


RANGO

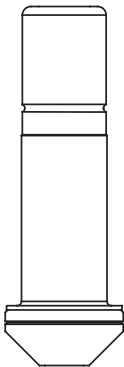
Product Drawing



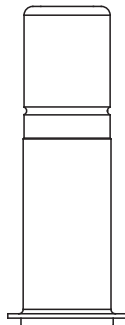
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2220/4, 2220/4E,
2230/4, 2230/4E



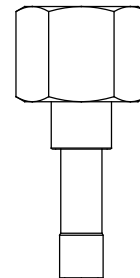
2210/4S, 2210/4SE,
220/4S, 2220/4SE,
2230/4S, 2230/4SE



220X, 2200, 2201,
2202, 2203, 2204,
2205, 2206



220X/S, 2200/S,
2201/S, 2202/S,
2203/S, 2204/S,
2205/S, 2206/S



2271/2S, 2271/3S





REFRIGERATION

RANCO®

REGULATORS



3310/4S



3330/5S

3000 Series

The Ranco® 3000 Series Pressure Regulators are designed for installation on commercial refrigerating systems using various refrigerant fluids to modulate the flow of refrigerant at a constant pressure from the sensing point to the outlet of the regulator. There are various regulators designed for use in multiple locations depending on application.

Features and Benefits

- Provides constant flow of refrigerant for a wide range of loads
- Basic operations for compressor, evaporator and hot gas bypass systems
- Simple settings
- Low pressure drop
- Excellent seat seal in closed position eliminates leaking
- High quality materials used to provide long regulator life

REFRIGERATION

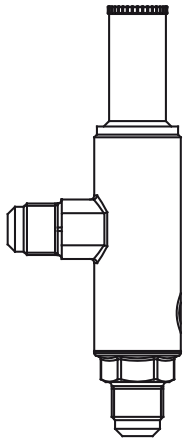


FRANCO

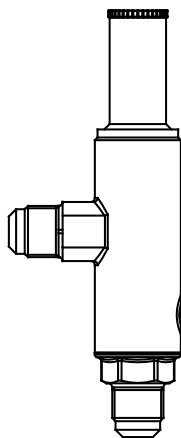
Specifications

Part Numbers	Description	Connection Types	Connection Inches (mm)	Regulation Range PSI (Bar)	Flow Kv [m3/h]	Pressure PSI (Bar)	Temperature Range Min to Max
3310/4S	Hot Gas Bypass Capacity Regulator	ODS	1/2" (NA)	2.9 to 87 (0.2 to 6)	0.70	406 (28)	-40°F to 230°F (-40°C to 110°C)
3310/5S	Hot Gas Bypass Capacity Regulator	ODS	5/8" (16)	2.9 to 87 (0.2 to 6)	1.26	406 (28)	-40°F to 230°F (-40°C to 110°C)
3310/7S	Hot Gas Bypass Capacity Regulator	ODS	7/8" (22)	2.9 to 87 (0.2 to 6)	1.84	406 (28)	-40°F to 230°F (-40°C to 110°C)
3320/4S	Crankcase Pressure Regulator	ODS	1/2" (NA)	2.9 to 87 (0.2 to 6)	3.30	261 (18)	-40°F to 230°F (-40°C to 110°C)
3320/5S	Crankcase Pressure Regulator	ODS	5/8" (16)	2.9 to 87 (0.2 to 6)	3.30	261 (18)	-40°F to 230°F (-40°C to 110°C)
3320/7S	Crankcase Pressure Regulator	ODS	7/8" (20)	2.9 to 87 (0.2 to 6)	3.30	261 (18)	-40°F to 230°F (-40°C to 110°C)
3330/4S	Evaporating Pressure Regulator	ODS	1/2" (NA)	0 to 79 (0 to 5.5)	2.70	261 (18)	-40°F to 230°F (-40°C to 110°C)
3330/5S	Evaporating Pressure Regulator	ODS	5/8" (16)	0 to 79 (0 to 5.5)	2.70	261 (18)	-40°F to 230°F (-40°C to 110°C)
3330/7S	Evaporating Pressure Regulator	ODS	7/8" (22)	0 to 79 (0 to 5.5)	2.70	261 (18)	-40°F to 230°F (-40°C to 110°C)

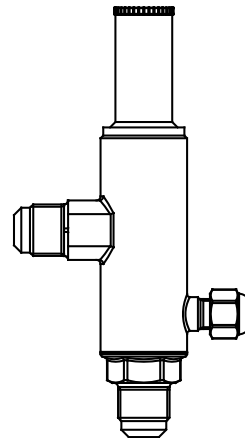
Product Drawing



3310/4S, 3310/5S, 3310/7S



3320/4S, 3320/5S, 3320/7S



3330/5S, 3330/7S

1 Year
Limited
Warranty

C31



REFRIGERATION

RANCO®



3950/22



3940/3

MOISTURE INDICATORS

3900 Series

The Ranco® 3900 Series Moisture / Liquid Indicators are designed for installation on commercial refrigerating systems using various refrigerant fluids to indicate the amount of moisture in the system. The moisture indicator consists of a sensitive element ring, which changes color passing from green to yellow according to the percentage of moisture. When the sensitive element becomes “yellow”, it’s time to replace the dehydrator filter. If the charge and working condition are normal, the refrigerant fluid appears perfectly liquid underneath the “lens” of the indicator.

Features and Benefits

- Provides instant feedback about the state of the refrigerant
- Total hermetic construction to avoid possible refrigerant leaks
- Hot forged brass body
- Copper tube for solder connections
- Easy to view glass lens

REFRIGERATION



BRANCO

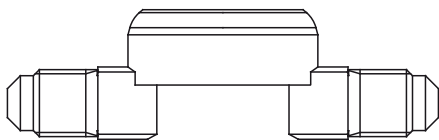
Specifications

Part Numbers	Description	Connection Type	Connection Inches (mm)	Pressure PSI (Bar)	Temperature Range Min to Max
3910/33	Moisture/Liquid Indicator, SAE, Male-Male	SAE	3/8" (NA)	653 (45)	-22°F to 230°F (-30°C to 110°C)
3950/22	Moisture/Liquid Indicator, SAE, Male-Female	SAE	1/4" (NA)	653 (45)	-22°F to 230°F (-30°C to 110°C)
3950/33	Moisture/Liquid Indicator, SAE, Male-Female	SAE	3/8" (NA)	653 (45)	-22°F to 230°F (-30°C to 110°C)
3940/2	Moisture/Liquid Indicator, ODS, Copper Brazen	ODS	1/4" (NA)	653 (45)	-22°F to 230°F (-30°C to 110°C)
3940/3	Moisture/Liquid Indicator, ODS, Copper Brazen	ODS	3/8" (NA)	653 (45)	-22°F to 230°F (-30°C to 110°C)
3940/5	Moisture/Liquid Indicator, ODS, Copper Brazen	ODS	5/8" (16)	653 (45)	-22°F to 230°F (-30°C to 110°C)
3940/7	Moisture/Liquid Indicator, ODS, Copper Brazen	ODS	7/8" (22)	653 (45)	-22°F to 230°F (-30°C to 110°C)

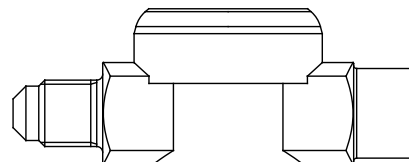
Moisture Contained in Fluid Table (ppm)

Color	R22	R134a	R404A	R407C	R410A	R507
Green	<60	<75	<30	<30	<30	<30
Green-Yellow	60	75	30	30	30	30
Yellow	>60	>75	>30	>30	>30	>30

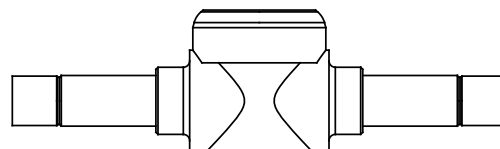
Product Drawing



3910/33



3950/22, 3950/33



3940/2, 3940/3,
3940/5, 3940/7

1 Year
Limited
Warranty

C33



REFRIGERATION

RANCO®



4305/2



4308/3

SOLID CORE FILTER DRIERS

4300 Series

The Ranco® 4300 Series Solid Core Filter Driers are designed for installation on commercial refrigerating systems using various refrigerant fluids to ensure the internal filtering of additives. These solid core filter driers have efficient dehydration with minimum charge loss while blocking oil by-products dragged into the system. Impurities accumulate in the ring between the metal shell and the block to prevent filter clogging.

Features and Benefits

- Filter completely manufactured in steel
- Nickel plated flare threaded or copper plated solder connections
- Solder connections made of copper tubing
- Blocks are molded from a blend of dehydrating charge, totally made of 3 Å molecular sieves, and a special binding agent in appropriate proportions
- Good deacidifying characteristics with superlative capacity of water absorption
- Compacted and stout manufacturing process making product resistant to shock and abrasions
- Uniform wall thickness for linear flow through the block
- Block is chemically inert and does not react with refrigerant fluids

REFRIGERATION

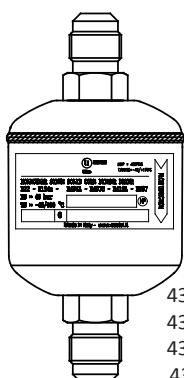


BRANCO

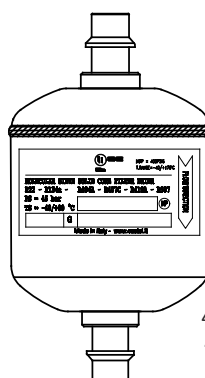
Specifications

Part Numbers	Description	International Code	Connection Type	Connections Inches	ODM Connection Inches	Volume Inches ³ (cm ³)	Pressure PSI (Bar)	Temperature Range Min to Max
4303/2	Solid Core Filter Drier SAE, 1/4", small	032	SAE	1/4"	NA	3.05 (50)	653 (45)	-40°F to 176°F (-40°C to 80°C)
4303/3	Solid Core Filter Drier SAE, 3/8", small	033	SAE	3/8"	NA	3.05 (50)	653 (45)	-40°F to 176°F (-40°C to 80°C)
4305/2	Solid Core Filter Drier SAE, 1/4", medium	052	SAE	1/4"	NA	4.88 (80)	653 (45)	-40°F to 176°F (-40°C to 80°C)
4308/2	Solid Core Filter Drier SAE, 1/4", large	082	SAE	1/4"	NA	7.93 (130)	653 (45)	-40°F to 176°F (-40°C to 80°C)
4308/3	Solid Core Filter Drier SAE, 3/8", large	083	SAE	3/8"	NA	7.93 (130)	653 (45)	-40°F to 176°F (-40°C to 80°C)
4316/3	Solid Core Filter Drier SAE, 3/8", larger	163	SAE	3/8"	NA	15.26 (250)	653 (45)	-40°F to 176°F (-40°C to 80°C)
4316/4	Solid Core Filter Drier SAE, 1/2", larger	164	SAE	1/2"	NA	15.26 (250)	653 (45)	-40°F to 176°F (-40°C to 80°C)
4316/5	Solid Core Filter Drier SAE, 5/8", larger	165	SAE	5/8"	NA	15.26 (250)	653 (45)	-40°F to 176°F (-40°C to 80°C)
4303/2S	Solid Core Filter Drier ODS, 1/4", small	032S	ODS	1/4"	3/8"	3.05 (50)	653 (45)	-40°F to 176°F (-40°C to 80°C)
4303/3S	Solid Core Filter Drier ODS, 3/8", small	033S	ODS	3/8"	1/2"	3.05 (50)	653 (45)	-40°F to 176°F (-40°C to 80°C)
4305/2S	Solid Core Filter Drier ODS, 1/4", medium	052S	ODS	1/4"	3/8"	4.88 (80)	653 (45)	-40°F to 176°F (-40°C to 80°C)
4308/3S	Solid Core Filter Drier ODS, 3/8", large	083S	ODS	3/8"	1/2"	7.93 (130)	653 (45)	-40°F to 176°F (-40°C to 80°C)
4316/5S	Solid Core Filter Drier ODS, 5/8", larger	165S	ODS	5/8"	3/4"	15.26 (250)	653 (45)	-40°F to 176°F (-40°C to 80°C)
4341/7S	Solid Core Filter Drier ODS, 7/8", largest	417S	ODS	7/8"	1-1/8"	40.89 (670)	653 (45)	-40°F to 176°F (-40°C to 80°C)

Product Drawing



4303/2, 4303/3,
4305/2, 4308/2,
4308/3, 4316/3,
4316/4, 4316/5



4303/2S,
4303/3S, 4305/2S,
4308/3S, 4316/5S

1 Year
Limited
Warranty



REFRIGERATION

RANCO

BALL VALVES



6590/3

6590 Series

The Ranco® 6590 Series Ball Valves are designed for installation on commercial refrigerating systems using various refrigerant fluids to ensure the internal equilibrium of pressures when the valve is closed.

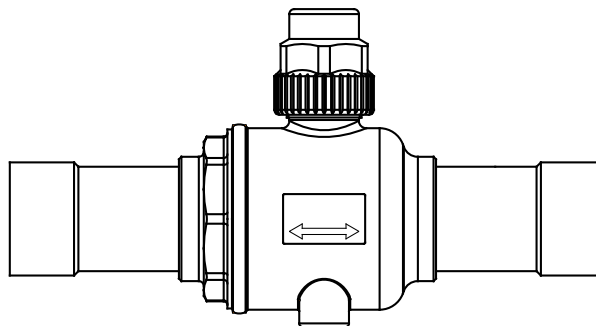
Features and Benefits

- Permits bi-directional flow of the refrigerant
- Prevents risk of ejection or explosion of the spindle
- Body is hot forged brass
- Ball is chromium plated, hot forged brass
- Copper tube solder connections
- Spindle is steel with proper surface protection
- Chloroprene rubber for outlet seal gaskets
- Glass reinforced cap covers the spindle

Specifications

Part Numbers	Description	Ball Port	ODS Connections Inches (mm)	Capacity Tons (Kv [m3/h])	Pressure PSI (Bar)	Temperature Range Min to Max
6590/3	Ball Valve 3/8", 0.8 Tons	10	3/8" (NA)	0.8 (3)	652 (45)	-40°F to 302°F (-40°C to 150°C)
6590/4	Ball Valve 1/2", 1.4 Tons	10	1/2" (NA)	1.4 (5)	652 (45)	-40°F to 302°F (-40°C to 150°C)
6590/5	Ball Valve 5/8", 1.4 Tons	15	5/8" (16)	1.4 (5)	652 (45)	-40°F to 302°F (-40°C to 150°C)
6590/6	Ball Valve 3/4", 4.1 Tons	15	3/4" (NA)	4.1 (14.5)	652 (45)	-40°F to 302°F (-40°C to 150°C)
6590/7	Ball Valve 7/8", 6.8 Tons	19	7/8" (22)	6.8 (24)	652 (45)	-40°F to 302°F (-40°C to 150°C)
6590/9	Ball Valve 1-1/8", 11.4 Tons	25	1-1/8" (NA)	11.4 (40)	652 (45)	-40°F to 302°F (-40°C to 150°C)
6590/11	Ball Valve 1-3/8", 19.3 Tons	32	1-3/8" (35)	19.3 (68)	652 (45)	-40°F to 302°F (-40°C to 150°C)

Product Drawing



6590/3

REFRIGERATION



BRANCO

ELECTRICAL RATINGS

Control Type	V AC	Motor Load Rating Maximum Full Load Amps	Motor Load Rating Maximum Locked Rotor Amps	Resistive Load Maximum Amps	Pilot Duty Maximum Volt Amps	Switch Action
A12	120	16	80	NA	240	SPST
	208	16	80	NA	240	
	240	16	80	NA	240	
A22	120	20	80	25	500	SPDT
	240	20	80	25	500	
	277	16	60	NA	500	
A30	24	NA	NA	NA	240	SPST
	120	20	80	NA	240	
	240	20	80	NA	240	
	277	16	60	16	240	
C12-2001	24	NA	NA	NA	240	SPDT
	120	20	85	25	240	
	240	20	85	25	240	
	277	16	60	20	240	
C12-5010	125	20	80	25	240	SPDT
	240	20	80	NA	240	
	277	16	60	16	240	
C17-100	120	20	80	NA	240	2 SPDT
	240	20	80	NA	240	
	277	16	60	16	240	
E15	24	NA	NA	NA	240	SPDT
	120	10	40	25	240	
	240	10	40	25	240	
	277	10	40	16	240	
F25	120	20	80	NA	360	SPDT
	240	20	80	25	360	
K	120	10	40	NA	240	SPST
	250	6	36	6	240	
O10	24	NA	NA	NA	144	SPST
	120	24	144	24	720	
	240	24	144	24	720	
	241/600	NA	NA	NA	125	
O16, O60	24	NA	NA	NA	144	SPDT
	120	17	102	24	720	
	240	17	102	24	720	
	241/600	NA	NA	NA	125	
P30	120	NA	NA	NA	720	NA
	240	NA	NA	NA	720	



Timers, whether used for defrost or electrical systems, are essential for the longevity and energy saving functionality of important equipment.

The Paragon® defrost and the Tork® electric timers offer versatility and unbeatable quality to control power and compressor defrost cycles. Defrost products include electromechanical and electronic timers for commercial and residential applications.

Defrost Timers - Auto Voltage	D2
Defrost Timers - Electromechanical.....	D8
Defrost Timers - Electronic	D11
Electric Timers - Electromechanical.....	D14
Electric Timers - Electronic	D18
Residential Defrost Timers	D19



Time r s





TIMERS

PARAGON®



8145-AV

Replacement Information

Supco	Grasslin/Intermatic	Precision	Paragon
S804100	G8045-00	6045-0	9045-00
S804120	G8045-20	6045-20	9145-00
S804500	G8145-00	6145-20	8141-00
S804520	G8145-20	6141-20	8143-00
S814100	DTAV40	6045-20	8043-00
S814120	DTAV40IM	6141-0	8045-00
S814500	DTAV40M	6041-0	8046-00
S814520			8047-00
			8143-20
			8145-20
			8041-20
			8043-20
			8046-20
			8047-20
			8245-20
			8243-20
			8145-00
			8141-20
			8045-20
			8247-20
			8041-00

Specifications

Part Numbers	Description
8145-AV	Auto Voltage Defrost timer in Metal Casing
8145-AV-M	Auto Voltage Defrost Timer Mechanism Only

DEFROST TIMERS - AUTO VOLTAGE

8000 Series

The Paragon® 8000 Series Auto Voltage Defrost Timer is designed for commercial freezers and refrigerators. Paragon Defrost Controls have provided reliable automatic defrost capability for decades. They accommodate various types of defrost systems including electric defrost heaters, hot gas, and compressor off cycle.

This all-in-one auto voltage defrost timer replaces over 40 competitive voltage-specific mechanical defrost timers, eliminating the need for a separate short cycle timer and single-phase voltage monitor. The 8145-AV will become a mainstay in any contractor's truck. The 8145-AV reduces installation time, and minimizes the number of SKUs to stock.

Features and Benefits

- Replaces over 40 competitive models
- Auto Voltage automatically adjusts for 120-277V AC
- Compressor Contacts 3HP
- Heater/Fan Contacts 2HP
- LED indicators for defrost and refrigeration cycles
- Built-in permanent housing protects components from damage
- Mounts into existing enclosures, no tools required
- Real time clock face for easy accurate settings
- Defrost times programmable in 15-minute intervals with captive trippers
- Heavy-duty steel enclosure with knockout (on the bottom, back and side) and hasp
- Mechanism only model available 8145-AV-M

Ratings Terminal 3 and 5

40A	Resistive	120-277V AC
3HP	Motor	240V AC
1.5HP	Motor	120V AC
720VA	Pilot Duty	120-240V AC

Ratings Terminal F and 2

30A	Resistive	120-277V AC
2HP	Motor	240V AC
1/4HP	Motor	120V AC
290VA	Pilot Duty	120-240V AC

UL
LISTED
Listed
Product

D2

www.Uni-Line.com

Customer Service 1.800.304.6563

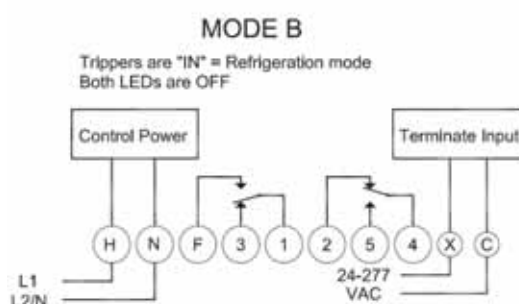
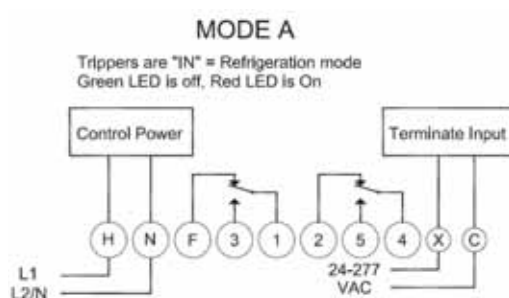
TIMERS



Product Drawings

8145-AV

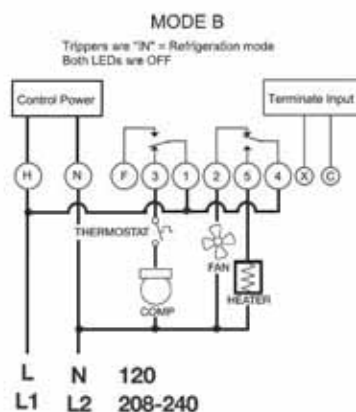
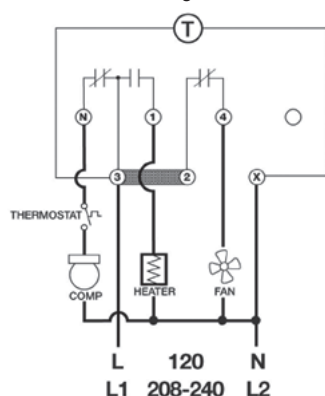
NO Contacts (Terminals 3 & 5)			NC Contacts (Terminals F & 2)		
40A	Resistive	120-240V AC (or 277V AC)	30A	Resistive	120-240V AC (or 277V AC)
3HP	Motor	240V AC	2HP	Motor	240V AC
1.5HP	Motor	120V AC	1/4HP	Motor	120V AC
720VA	Pilot Duty	120-240V AC	290VA	Pilot Duty	120-240V AC



Applying power (24-277VAC) between Terminate Input terminals "X" and "Y" causes the unit to return to Refrigeration Mode. If the Terminate input voltage is removed while the trippers are ON, the unit remains in the Refrigeration Mode. The unit remains in Refrigeration until both the Terminate input voltage is removed and the trippers cycle OFF then ON again.

8041-00 and 8041-20

Electric Heat Defrosting



8145-AV	H (L/L1)	N (N/L2)	F	3 COMP	1 (L/L1)	2 FAN	5 HEATER	4 (L/L1)	X	C
8041-00 8041-20	3 (L/L1)	X (N/L2)		N	3 (L/L1)	4	1	3 (L/L1)		
DTAV40	3 (L/L1)	X (N/L2)		4	2 (L/L1)	N	1	3 (L/L1)		

1 Year
Limited
Warranty



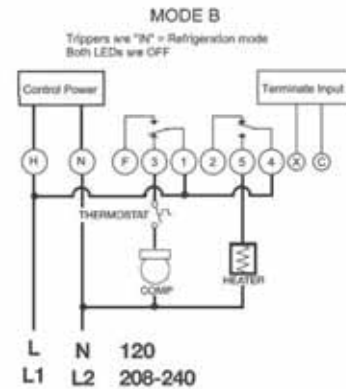
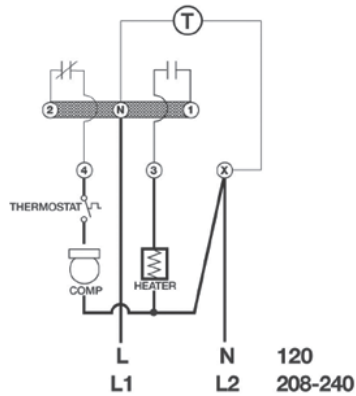
TIMERS

PARAGON®

Product Drawings

8045-00 and 8045-20

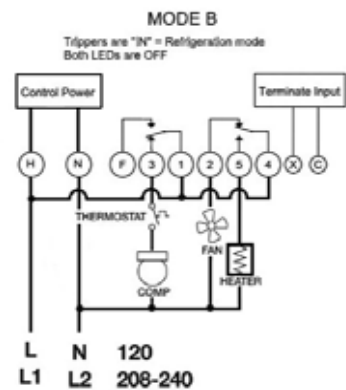
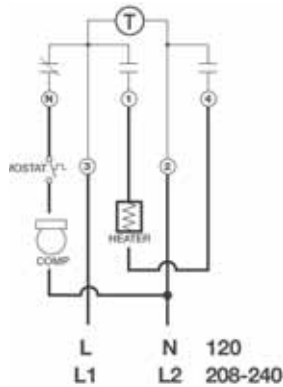
Electric Heat Defrosting



8145-AV	H (L/L1)	N (N/L2)	F	3 COMP	1 (L/L1)	2	5 HEATER	4 (L/L1)	X	C
8045-00 8045-20	N (L/L1)	X (N/L2)		4	N (L/L1)		3	N (L/L1)		
DTAV40	1-N (L1)	X (L2)		4	1-N (L1)		3	2 (L1)		

8047-00 and 8047-20

Electric Heat Defrosting



8145-AV	H (L/L1)	N (N/L2)	F HEATER	3 COMP	1 (L/L1)	2	5 HEATER	4 (N/L2)	X	C
8047-00 8047-20	3 (L/L1)	2 (N/L2)	1 HEATER	N COMP	3 (L/L1)		4 HEATER	2 (N/L2)		
DTAV40	3 (L/L1)	2 (N/L2)	1 HEATER	N COMP	3 (L/L1)		4 HEATER	2 (N/L2)		

TIMERS

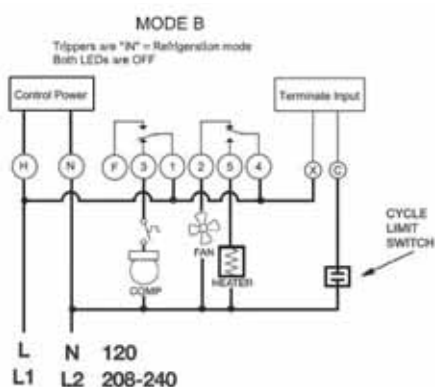
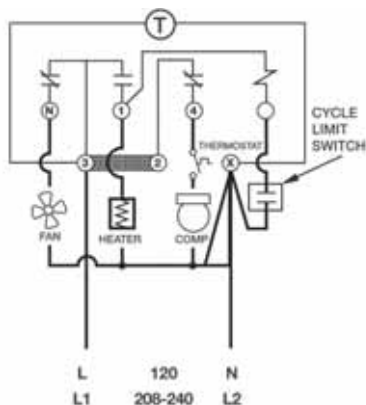


PARAGON

Product Drawings

8141-00 and 8141-20

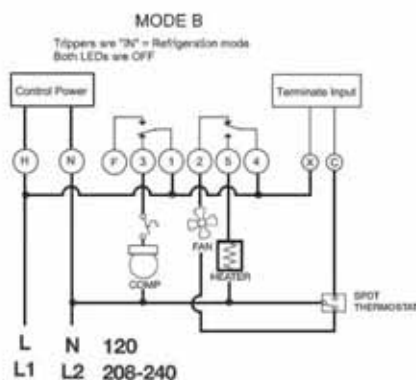
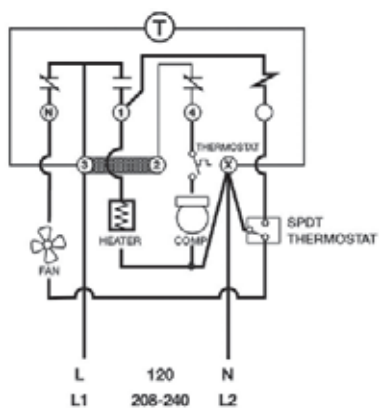
Electric Heat Defrosting (Cycle Limit Switch)



8145-AV	H (L/L1)	N (N/L2)	F	3 COMP	1 (L/L1)	2 FAN	5 HEATER	4 (L/L1)	X (L/L1)	C LIMIT
8141-00	3	X		4	3	N	1	3	3	INPUT
8141-20	(L/L1)	(N/L2)		COMP	(L/L1)	FAN	HEATER	(L/L1)	(L/L1)	LIMIT

8141-00 and 8141-20

Electric Heat Defrosting (SDPT Thermostat)



8145-AV	H (L/L1)	N (N/L2)	F	3 COMP	1 (L/L1)	2 FAN	5 HEATER	4 (L/L1)	X (L/L1)	C SPDT
8141-00	3	X		4	3	N	1	3	3	INPUT
8141-20	(L/L1)	(N/L2)		COMP	(L/L1)	FAN	HEATER	(L/L1)	(L/L1)	SPDT
DTAV40	3	X		4	2	N	1	3	3	INPUT
	(L/L1)	(N/L2)		COMP	(L/L1)	FAN	HEATER	(L/L1)	(L/L1)	SPDT



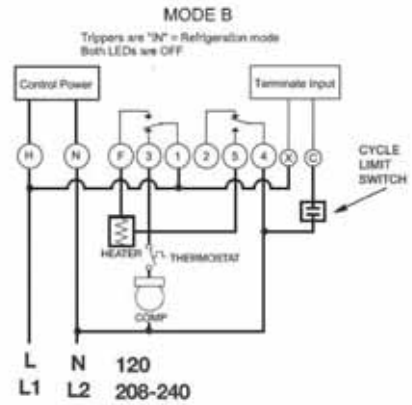
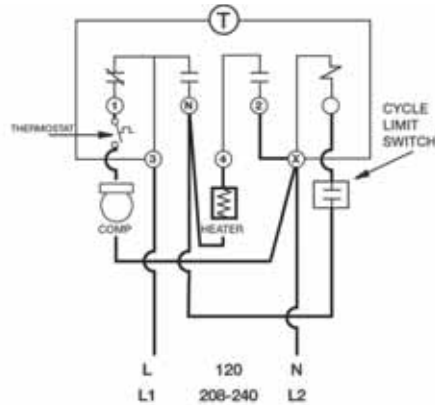
TIMERS

PARAGON®

Product Drawings

8143-00 and 8143-20

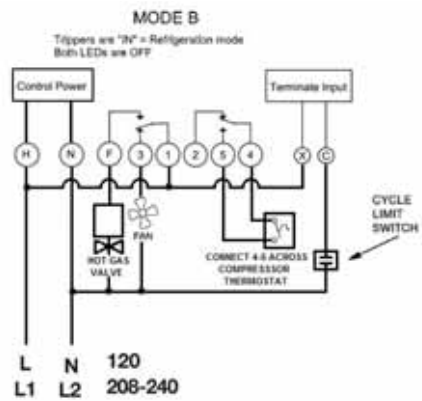
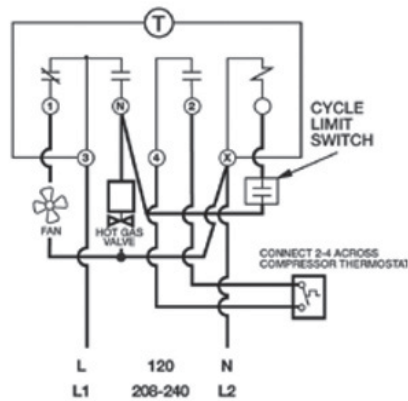
Electric Heat Defrosting (Cycle Limit Switch)



8145-AV	H (L/L1)	N (N/L2)	F HEATER	3 COMP	1 (L/L1)	2	5 HEATER	4 (N/L2)	X (L/L1)	C LIMIT
8143-00	3 (L/L1)	X (N/L2)	N HEATER	1 COMP	3 (L/L1)		4 HEATER	X (N/L2)	3 (L/L1)	INPUT LIMIT
DTAV40	3 (L/L1)	X (N/L2)	N HEATER	1 VALVE	3 (L/L1)		4 HEATER	2 (N/L2)	3 (L/L1)	INPUT STAT

8143-00 and 8143-20

Hot Gas Defrosting (Cycle Limit Switch)



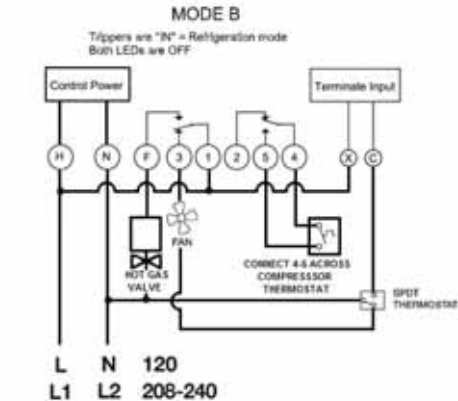
8145-AV	H (L/L1)	N (N/L2)	F H GAS	3 FAN	1 (L/L1)	2	5 TSTAT	4 TSTAT	X (L/L1)	C LIMIT
8143-00	3 (L/L1)	X (N/L2)	N H GAS	1 FAN	3 (L/L1)		2 TSTAT	4 TSTAT	3 (L/L1)	INPUT LIMIT
8143-20										



Product Drawings

8143-00 and 8143-20

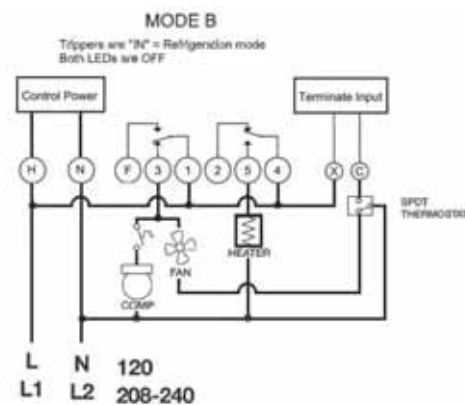
Hot Gas Defrosting (SPDT Thermostat)



8145-AV	H (L/L1)	N (N/L2)	F H GAS	3 FAN	1 (L/L1)	2	5 TSTAT	4 TSTAT	X (L/L1)	C SPDT
DTAV40	3 (L/L1)	X (N/L2)	N H GAS	1 FAN	3 (L/L1)	2	2 TSTAT	4 TSTAT	3 (L/L1)	INPUT SPDT

8145-00 and 8145-20

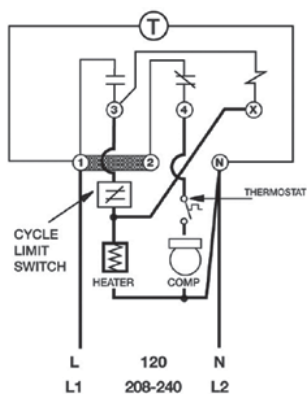
Electric Heat Defrosting (SPDT Thermostat)



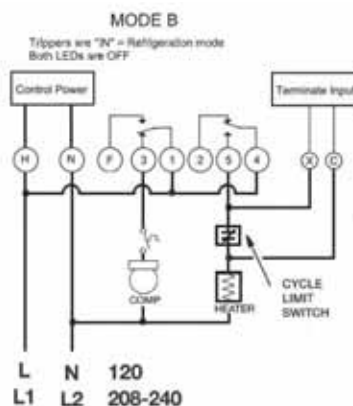
8145-AV	H (L/L1)	N (N/L2)	F COMP FAN	3 COMP FAN	1 (L/L1)	2	5 HEAT- ER	4 (L/L1)	X (L/L1)	C SPDT
DTAV40	1 (L/L1)	N (N/L2)	4 COMP FAN	4 COMP FAN	2 (L/L1)	3	3 HEAT- ER	1 (L/L1)	1 (L/L1)	X SPDT

8145-00 and 8145-20

Electric Heat Defrosting (Cycle Limit Switch)



8145-AV	H (L/L1)	N (N/L2)	F	3 COMP	1 (L/L1)	2	5 LIMIT	4 (L/L1)	X 5/LIMIT	C HEATER/ LIMIT
8145-00	1 (L/L1)	N (N/L2)		4 COMP	1 (L/L1)		3 LIMIT	1 (L/L1)		X HEATER/ LIMIT
8145-20										





TIMERS

PARAGON®



8045-00



8245-20

DEFROST TIMERS - ELECTROMECHANICAL

8000 Series

The Paragon® 8000 Series Commercial Defrost Controls are designed for commercial freezers and refrigerators to provide automatic defrost capability. They accommodate various types of defrost systems including electric defrost heaters, hot gas, and compressor off cycle.

Features and Benefits

- Time initiated; temperature, pressure or time terminated models available
- High-amp switch contacts: 40 amps, 2 HP
- Positive slider bar switch design assures positive electrical contact and wipes the contact surface of contaminants
- Temperature or pressure terminated models are designed for defrost termination using an external temperature or pressure device
- Safety back-up – mechanical time-driven defrost termination
- Heavy-duty synchronous design drive motor
- Choice of three contact arrangements
- Adjustable frequency of defrost initiation from 1 to 6 cycles per day with a minimum of 4 hours between successive operations
- Adjustable back-up defrost termination from 4 to 110 minutes in 2 minute increments
- Heavy-duty steel enclosure with knockouts (on the bottom, back and sides) and hasp and staple padlock
- All 8240 models have an adjustable cut-in pressure dial calibrated from 36-110 pounds for R12, R22, R502



TIMERS



PARAGON

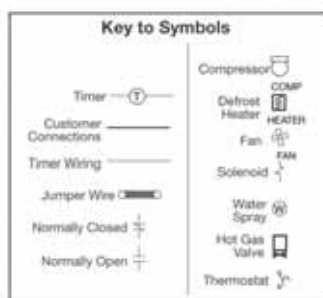
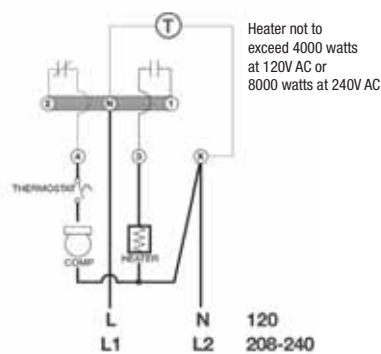
Specifications

Part Numbers	Description	Switch Arrangement Contacts 2-4	Switch Arrangement Contacts 1-3	Switch Arrangement Contacts 3-N	Termination Type	Electrical Rating
8041-00	Electric Heat	Closed	Open	Closed	Time	120V AC 60 Hz
8045-00	Electric Heat, Hot Gas or Compressor Shutdown	Closed	Open	None	Time	120V AC 60 Hz
8045-20	Electric Heat, Hot Gas or Compressor Shutdown	Closed	Open	None	Time	208-240V AC 60 Hz
8141-00	Electric Heat, Hot Gas or Compressor Shutdown	Closed	Open	Closed	Temperature or Pressure	120V AC 60 Hz
8141-20	Electric Heat, Hot Gas or Compressor Shutdown	Closed	Open	Closed	Temperature or Pressure	208-240V AC 60 Hz
8145-00	Electric Heat, Hot Gas or Compressor Shutdown	Closed	Open	None	Temperature or Pressure	120V AC 60 Hz
8145-20	Electric Heat, Hot Gas or Compressor Shutdown	Closed	Open	None	Temperature or Pressure	208-240V AC 60 Hz
8145-20B	Electric Heat, Hot Gas or Compressor Shutdown	Closed	Open	None	Temperature or Pressure	208-240V AC 60 Hz
8245-20	Electric Heat, Hot Gas or Compressor Shutdown	Closed	Open	None	Pressure	208-240V AC 60 Hz
D81-8145-00EX (ANZ, EU, MEX, SA)	Electric Heat, Hot Gas or Compressor Shutdown	Closed	Open	None	Temperature or Pressure	120V AC 60 Hz
D81-8145-20EX (ANZ, EU, MEX, SA)	Electric Heat, Hot Gas or Compressor Shutdown	Closed	Open	None	Temperature or Pressure	208-240V AC 60 Hz
D81-8145-21EX (ANZ, EU, MEX, SA)	Electric Heat, Hot Gas or Compressor Shutdown	Closed	Open	None	Temperature or Pressure	208-240V AC 50 Hz

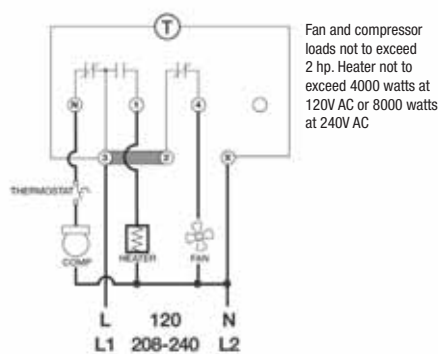
Product Drawings

Electric Heat Defrosting

Models 8045-00 and 8045-20 -
Wiring Diagram



Models 8041-00 and 8041-20 -
Wiring Diagram



1 Year
Limited
Warranty

D9

Customer Service 1.800.304.6563

www.Uni-Line.com



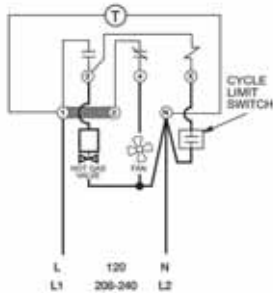
TIMERS

PARAGON®

Product Drawings

Hot Gas Defrosting

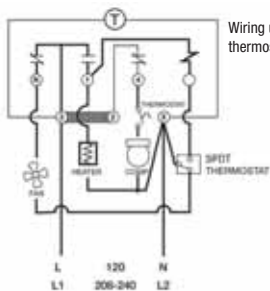
Models 8145-00, 8145-20, E357-00, D81-8145-ZIEX Wiring Diagram



Wiring using 120V or 240V single phase line with compressor thermostat closed during defrost.

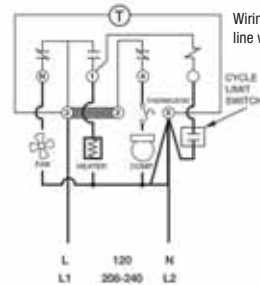
Electric Heat Defrosting

Models 8141-00 and 8141-20 - Wiring Diagram



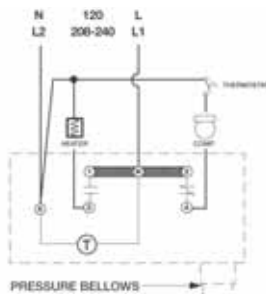
Wiring using differential of SPDT thermostat to delay fan after defrosting

Models 8141-00, 8141-20 - Wiring Diagram

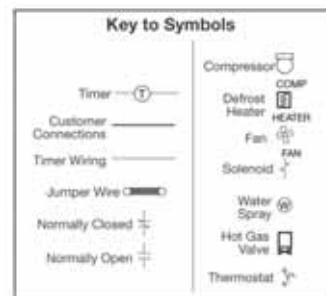


Wiring using 120V or 240V single phase line with auxiliary fan circuit

Models 8245-00 and 8245-20 - Wiring Diagram



Wiring for electric heat system without magnetic starter



TIMERS



PARAGON
®

DEFROST TIMERS - ELECTRONIC

9000 Series

The Paragon® 9045-00 and 9145-00 Universal Defrost Timers (UDT) are the only multi-voltage defrost timers engineered to industry refrigeration standards.

Designed to withstand the most rigorous refrigeration applications, this control offers a real-time clock and 100 hours of power loss protection for both time and defrost schedules. Mechanism-only models also are available to fit in standard defrost timer enclosures.

Features and Benefits

- Certified to UL873 standard for temperature-indicating and regulating equipment
- Wires directly to 120V AC, 208V AC or 240V AC power sources without jumpers or switches
- Rated to 30,000 cycles for refrigeration controllers with switches
- Easy programming, easy set-up, set time, set defrost start and defrost end
- Initiate 15 minute manual defrost
- 100 hours of power loss protection for both time and defrost schedule
- Real-time clock
- Lighted display shows defrost start time and duration
- System status indicators



9045-00



9045-00M

UL US
LISTED
Listed
Product

RA US
Recognized
Component

1 Year
Limited
Warranty

D11



TIMERS

PARAGON®

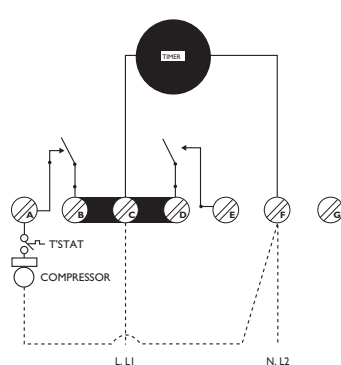
Specifications

Part Numbers	Description	Relay Switch	Initiation Type	Termination Type	Voltage
9045-00	Universal Defrost Timer	SPST	Time	Time	120-208-240V AC
9045-00M	Mechanism Only	SPST	Time	Time	120-208-240V AC
9145-00	Universal Defrost Timer	SPDT	Time	Time, Temp or Pressure	120-208-240V AC
9145-00M	Mechanism Only	SPDT	Time	Time, Temp or Pressure	120-208-240V AC

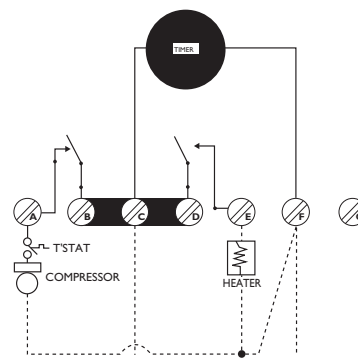
9045 Terminal Data	A	B	C	D	E	F	G
Relay Contact	SPST #1 NC Contact	SPST #1 Common Contact	L1 Power in to Timer	SPST #2 No Contact	SPST #2 Common Contact	L2/N Power in to timer	No Connection
Relay Rating	30 A resistive @ 120 to 240V AC 1 HP @ 120V AC, 2 HP @ 208 to 240V AC				30 A resistive @ 120 to 240V AC 1 HP @ 120V AC, 2 HP @ 208 to 240V AC		
Device Connections	Compressor (Typical)				Defrost Device (Typical)		Defrost Termination Switch

9145 Terminal Data	A	B	C	D	E	F	G
Relay Contact	SPDT NC Contact	SPDT NO Contact	SPDT Common Contact	SPST NO Contact	SPST Common Contact	L2/N Power in to timer	Defrost Termination Device Input L2/N side
Relay Rating	15 A resistive @ 120 to 240V AC 1/4 HP @ 120V AC, 1/2 HP @ 208 to 240V AC	30 A resistive @ 120 to 240V AC 1 HP @ 120V AC 2 HP @ 208 to 240V AC			30 A resistive @ 120 to 240V AC 1 HP @ 120V AC, 2 HP @ 208 to 240 AC		
Device Connections	Fan (Typical) Compressor (Optional)	Defrost Device (Typical)		L1 Power to Timer and to Defrost Termination Device	Compressor (Typical) Fan (Optional)		Defrost Termination Switch

Product Drawings



9045 AIR DEFROST - Time Initiated
Time Terminated - Wiring Diagram



9045 ELECTRIC DEFROST - Time Initiated
Time Terminated - Wiring Diagram

PARAGON®

Convert 8041 to 9145



9045	A	B	C	D	E	F	
------	---	---	---	---	---	---	--

9145	A	B	C	D	E	F	G
------	---	---	---	---	---	---	---

9145	A	B	C	D	E	F	G
------	---	---	---	---	---	---	---



TIMERS

TORK®



1102



P47

ELECTRIC TIMERS - ELECTROMECHANICAL

1100 Series - 24 Hour Time Switches

The Tork® 1100 Series Electric Timers offer 24 hour time switches with automatic On-Off control when operation is required at the same time every day, seven days a week.

Applications include On-Off control of heating, air conditioning, display lighting, ventilating, pumps and fans.

Tork Electric Timers are sold exclusively through Robertshaw to HVACR wholesalers.

Features and Benefits

- Heavy-duty synchronous, self-starting high torque timing motor
- Power consumption: 3 watts maximum
- Automatic operation for 24 hour timers with one pair of On-Off trippers supplied – accommodates up to 12 pairs
- Multilingual dial markings – English, French and Spanish
- Temporary manual override
- General purpose (NEMA 1) metal enclosure of deep-drawn steel, enamel coated and lockable hasp
- Combination 1/2" and 3/4" knockouts on both sides, bottom and back



TIMERS

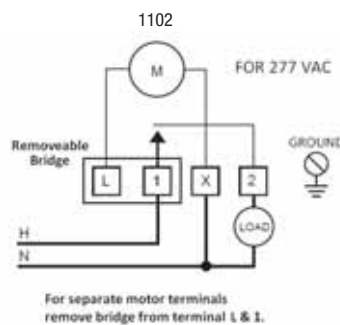
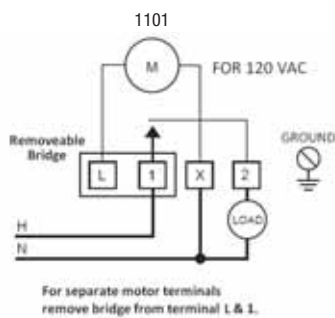


Specifications

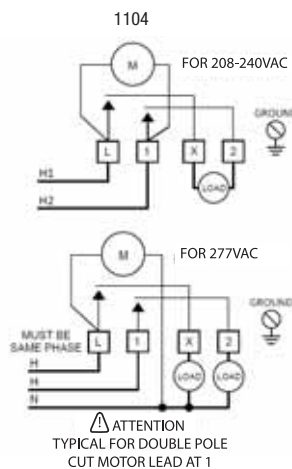
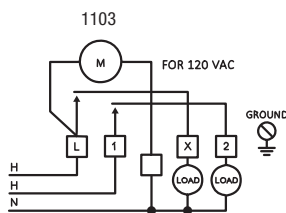
Part Numbers	Description	Contact Ratings	Automatic Operation	Operating Temperature	Enclosure	Switch	Voltage
1101	24 Hour Electromechanical Timer	40 A Resistive 20 A Inductive 1000 VA Pilot Duty 2HP (24 FLA) 120V AC	Minimum ON 20 minutes; OFF 75 minutes	-40°F to 165°F (-40°C to 74°C)	Metal	SPST	120V AC
1102	24 Hour Electromechanical Timer	40 A Resistive 20 A Inductive 1000 VA Pilot Duty 2HP (24 FLA) 120V AC	Minimum ON 20 minutes; OFF 75 minutes	-40°F to 165°F (-40°C to 74°C)	Metal	SPST	208-277V AC
1103	24 Hour Electromechanical Timer	40 A Resistive 20 A Inductive 1000 VA Pilot Duty 2HP (24 FLA) 120V AC	Minimum ON 20 minutes; OFF 75 minutes	-40°F to 165°F (-40°C to 74°C)	Metal	DPST	120V AC
1104	24 Hour Electromechanical Timer	40 A Resistive 20 A Inductive 1000 VA Pilot Duty 2HP (24 FLA) 120V AC 5HP 240V AC	Minimum ON 20 minutes; OFF 75 minutes	-40°F to 165°F (-40°C to 74°C)	Metal	DPST	208-277V AC
P47	Accessory trippers for 1100 Series Timers	NA	NA	NA	NA	NA	NA

Product Drawings

Single Pole - Wiring Diagrams



Double Pole - Wiring Diagrams



1 Year
Limited
Warranty



TIMERS

TORK®



W220

ELECTRIC TIMERS - ELECTROMECHANICAL

W Series - 7 Day Time Switches

The Tork® W Series - 7 day time switches offer the easiest and most accurate setting of any 7 day time switch through its unique combination of On-Off trippers, distinctive time indicator, and trigger action switch tripping mechanism.

Applications include On-Off control of heating, air conditioning, display lighting, ventilating, pumps and fans. Tork Electric Timers are sold exclusively through Robertshaw to HVACR wholesalers.

Features and Benefits

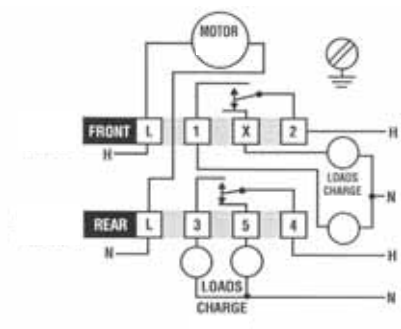
- Heavy-duty synchronous, self-starting high torque timing motor
- Power consumption: 3 watts maximum
- Keeps dial on time up to 24 hours during power outage
- Automatic operation with 7 day calendar dial accommodates up to 2 pairs of On-Off removable Trippers per day – 7 pairs are supplied
- Multilingual dial markings – English, French and Spanish
- General purpose (NEMA 1) metal enclosure of deep-drawn steel, enamel coated and lockable hasp

Specifications

Part Numbers	Description	Contact Ratings	Automatic Operation	Operating Temperature	Enclosure	Switch	Voltage
W220	7 Day Electromechanical Timer	40 A Resistive 20 A Inductive 1000 VA Pilot Duty 2HP (24 FLA) 120V AC	Minimum ON 1 hour OFF 2 hours	-40°F to 165°F (-40°C to 74°C)	Metal	DPDT	120V AC

Product Drawings

W220 (DPDT) - Wiring Diagram



1 Year
Limited
Warranty

D16

www.Uni-Line.com

Customer Service 1.800.304.6563



ELECTRIC TIMERS - ELECTROMECHANICAL

TU40 Series - Universal 24 Hour Time Switches

The Tork® TU40 Series - Universal 24 hour time switches with multi-voltage options offer automatic On-Off control when operation is required at the same time every day, seven days a week.

Applications include On-Off control of heating, air conditioning, display lighting, ventilating, pumps, fans and security systems. Tork Electric Timers are sold exclusively through Robertshaw to HVACR wholesalers.

Features and Benefits

- Automatic input voltage detection without DIP switches
- LED indicators for load and power
- Includes On/Off/Auto switch
- Power consumption: 6 VA maximum
- Temporary manual override is standard
- Combination 1/2" and 3/4" knockouts on both sides, bottom and back
- Enclosure includes indoor/outdoor NEMA 3R plastic



TU40

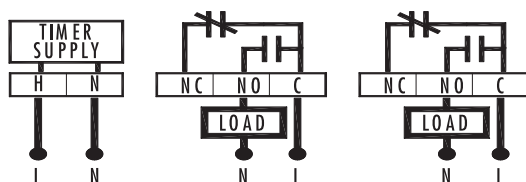
Specifications

Part Numbers	Description	Contact Ratings (Normally Open)	Automatic Operation	Temperature Range	Enclosure	Switch	Voltage
TU40	24 Hour Electromechanical Timer	40 A Resistive 30 A Inductive 720 VA Pilot Duty 1HP 120V AC 2HP 240V AC	Minimum setting: 15 minutes	-31°F to 116°F (-35°C to 47°C)	Plastic	4 in 1 DPDT, SPST, SPDT, DPST	Universal Multi-Voltage 120/208- 240/277V AC

Product Drawings

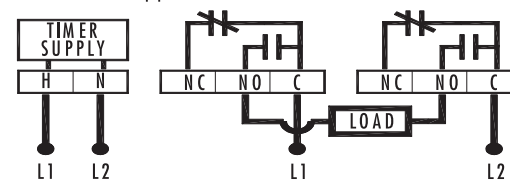
TU40 - 120/277V AC Application - Wiring Diagram

120/277VAC Application



TU40 - 208/240V AC Application - Wiring Diagram

208/240VAC Application



1 Year
Limited
Warranty

D17



TIMERS

TORK®



E101B

ELECTRIC TIMERS - ELECTRONIC

E100B Series

The Tork® E100B series multipurpose 1 channel control comes with 120 - 277V AC input voltages for 24 hour programming. Standard enclosure for indoor and outdoor settings uses patented 40 Amp contacts. Applications include display lighting, security systems, HVAC, signs, sump pumps and ventilating fans. Tork Electric Timers are sold exclusively through Robertshaw to HVACR wholesalers.

Features and Benefits

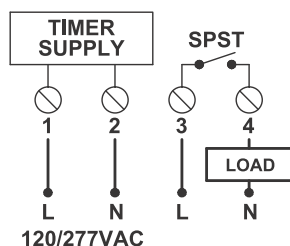
- Automatic input voltage detection without DIP switches
- LCD Display
- Simple programming with brief easy-to-follow instructions
- Power consumption: 6 watts minimum
- Daylight savings time is automatic (can be omitted)
- Manual override until the next regularly scheduled On or Off. Automatic operation then resumes or permanently if desired
- AM/PM clock format
- Power outage back-up with permanent schedule retention. Super-capacitor maintains real-time clock for 100 hours
- Includes load status and power failure indicators

Specifications

Part Numbers	Description	Contact Ratings	Scheduling	Setpoints	Operating Temperature	Enclosure	Switch	Voltage
E101B	24 Hour Electronic Timer	40 A General purpose 40 A Inductive 720 VA Pilot Duty 1HP (120V AC)	Same Everyday	20 with 1 minute minimums	-40°F to 149°F (-40°C to 65°C)	Nema 3R Plastic	SPST	120-277V AC

Product Drawings

E101B Series - Wiring Diagram



1 Year
Limited
Warranty

D18

www.Uni-Line.com

Customer Service 1.800.304.6563



RESIDENTIAL DEFROST TIMERS

Domestic Defrost Timers

The Paragon® 1401 Series Defrost Timers are a synchronous motor control that activates an internal SPDT switch to actuate a defrost heater in a refrigerator. These heavy-duty 15 Amp Paragon timers are used by OEM manufacturers to replace both the older classic design timers and the new OEM versions.

Features and Benefits

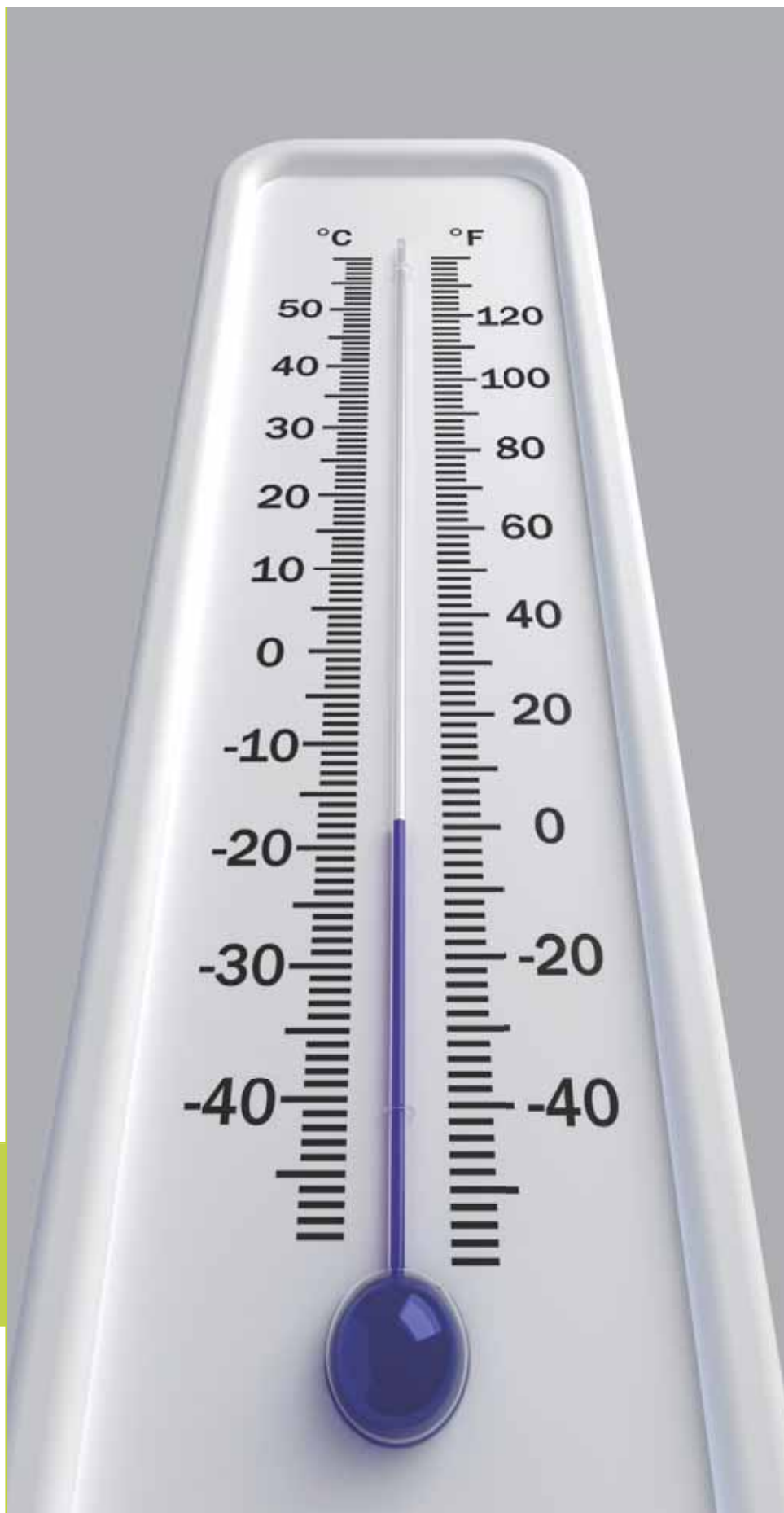
- Bulk quantities must be ordered in multiples of 12
- Quiet - synchronous design provides extremely quiet operation
- Position freedom - timer can be mounted in various locations
- Interchangeability - standard mounting allows use in all applications
- Double insulated - requires no earth grounding
- RoHS compliant



A1401-00

Specifications

Part Numbers	Description	Bulk Quantity	Timing	Electrical Rating
A1401-00	Defrost Timer in Refrigerator	12	6 hours 21 minutes	120V AC 60 Hz 15 Amp 1/2 HP
B1401-00	Defrost Timer in Refrigerator	12	8 hours 20 minutes	120V AC 60 Hz 15 Amp 1/2 HP
G1401-00	Defrost Timer in Refrigerator	12	6 hours 25 minutes	120V AC 60 Hz 15 Amp 1/2 HP
A1401-20	Defrost Timer in Refrigerator	12	6 hours 21 minutes	240V AC 60 Hz 8 Amp 1/2 HP
B1401-20	Defrost Timer in Refrigerator	12	8 hours 20 minutes	240V AC 60 Hz 8 Amp 1/2 HP
G1401-20	Defrost Timer in Refrigerator	12	6 hours 25 minutes	240V AC 60 Hz 8 Amp 1/2 HP
A1401-21	Defrost Timer in Refrigerator	12	6 hours 21 minutes	240V AC 50 Hz 8 Amp 1/2 HP
B1401-21	Defrost Timer in Refrigerator	12	8 hours 20 minutes	240V AC 50 Hz 8 Amp 1/2 HP
G1401-21	Defrost Timer in Refrigerator	12	6 hours 25 minutes	240V AC 50 Hz 8 Amp 1/2 HP



Contractors appreciate smooth HVAC installations while consumers look for a fine balance between temperature comfort and energy savings.

The SmartSense® and PerfectSense™ by Uni-Line® wall thermostats, zoning and accessories are Simply the SMART Choice™ for flexible, easy to use and install, residential and commercial heating and air conditioning controls. Wall thermostats also deliver intuitive, feature-rich and efficient solutions for homeowners and commercial customers.

Smart Thermostats.....	E2
Smart Accessories	E10
Non-Programmable	E12
Programmable.....	E14
Touchscreen Programmable.....	E16
Mechanical	E20



Wall Thermostats





Wall Thermostats

SMARTSENSE®



SMART 1000

SMART THERMOSTAT

Smart 1000

The SmartSense® SMART 1000 Touchscreen Thermostat is a feature-rich thermostat that can be battery powered or 24V AC common wired to the HVAC equipment. Easy-to-use and install, this thermostat is ideally suited for use in residential or light commercial applications.

This installer friendly thermostat is designed for many heating and cooling applications, including heat pump systems, auxiliary and emergency heating, gas and oil systems. It has multiple heating and cooling stages for optimal control.

The SMART 1000 is manufactured with default settings to reduce installation time. These settings include temperature scale (F or C), clock scale (12 or 24 hours), high and low balance points, DIP switch settings, and more. All settings are changed easily. Distributed by Uni-Line®, SmartSense Thermostats are Simply The SMART Choice™.

Features and Benefits

- 7 day programmable, 2 or 4 events per day
- Multi-stage up to 3 heat / 2 cool
- Programmable or non-programmable
- Manual or auto changeover
- Adaptive recovery
- Indoor and outdoor sensor options
- Keypad lockout
- Temperature averaging (with optional indoor sensors)
- Outdoor temperature display (with optional outdoor sensor)
- Short cycle protection

Wall Thermostats



Specifications

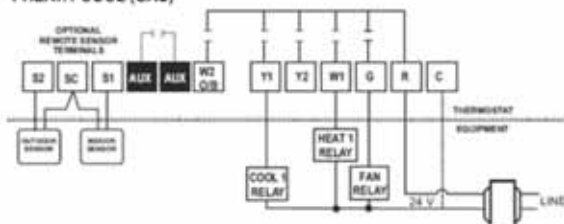
Part Number	SMART 1000
Power	Hardwired 20-30V AC 50/60 Hz or Battery Powered (2) AA 1.5 V
Relay Rating	24V AC @ 1 Amp maximum per relay
Operating Temperature	0°F to 149°F (0°C to 65°C)
Operating RH	0-95% RH (noncondensing)
Storage Temperature	0°F to 149°F (0°C to 65°C)
Backlight	Blue LED
Short Cycle Delay	4 minutes
Setpoint Range	Heating 41°F to 120°F (5°C - 49°C) Cooling 43°F to 122°F (6°C - 50°C)
Size	5.51" X 3.74" X 1.38" (140mm x 95mm x 35mm)
LCD Display Size	1.13" X 2.36" (105mm x 60mm)

Switch Functions

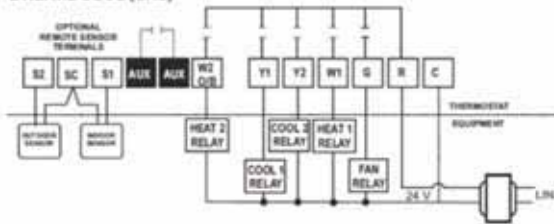
System Switch Functions	Off	On
Switch 1 - Equipment Type	Heat / Cool (Default)	For heat pump equipment
Switch 2 - Fan or Reversing Valve When Switch 1 is OFF (Heat Cool Mode)	Gas Heat - Heater controls fan (Default)	Electric Heat - Thermostat calls fan with heat
When Switch 1 is ON (Heat Pump Mode)	Heat pump 'O' reversing valve in cool	Heat pump 'B' reversing valve in heat
Switch 3 - Equipment Stages	1 heat / cool gas / electric or 2 heat / 1 cool heat pump	2 heat / 2 cool gas / electric or 3 heat / 2 cool heat pump
Switch 4 - Fossil Fuel Mode	Conventional heat pump equipment (Default)	Fossil fuel equipment (Used in the USA mostly)

Product Drawings

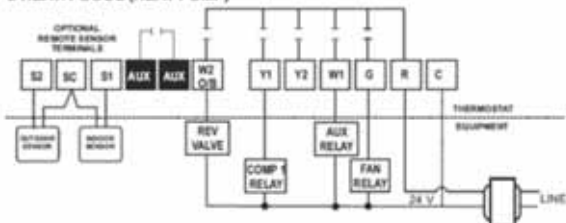
1 HEAT/1 COOL (GAS)



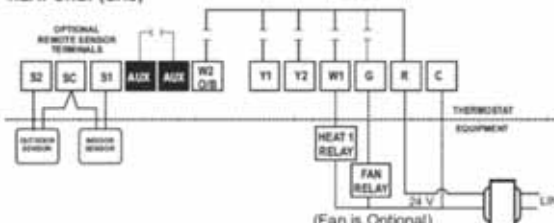
2 HEAT/2 COOL (GAS)



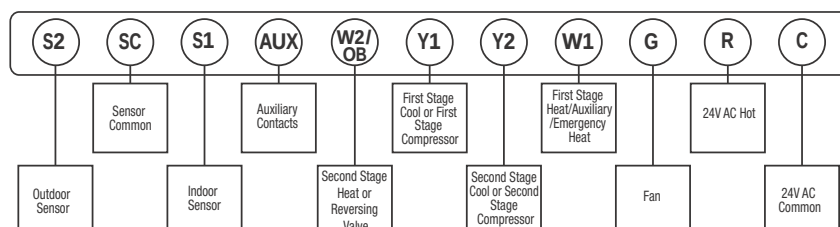
2 HEAT/1 COOL (HEAT PUMP)



HEAT ONLY (GAS)



Terminal Designations



SMART SENSE®

5 Year
Limited
Warranty

E3



Wall Thermostats

SMART SENSE®



SMART 2000

SMART THERMOSTAT

Smart 2000

The SmartSense® SMART 2000 Digital Programmable Thermostat is a versatile, feature rich control for optimum commercial and residential comfort. Easy-to-use and install, this thermostat works with many sensors and module options.

This installer friendly thermostat is designed for many heating and cooling applications. These applications include heat pump systems, auxiliary and emergency heating, gas and oil systems with add-on cooling. Features include multiple heating and cooling stages for optimal control, and single or three fan speeds depending on equipment needs.

The SMART 2000 is manufactured with default settings to reduce installation time. These settings include temperature scale (F or C), clock scale (12 or 24 hours), high and low balance points, DIP switch settings, and more. All settings are changed easily. Distributed by Uni-Line®, SmartSense thermostats are Simply The SMART Choice™.

Features and Benefits

- 3 Heat / 2 cool
- Single or three fan speeds
- Replaces almost all 24V AC thermostats
- Wi-fi and remote sensor options
- Auto season changeover
- Selectable programmable or manual mode
- 7 day programmable - four events
- Heat/cool or heat pump (O/B) logic
- Add-on and emergency heat control
- High and low balance points
- Keyboard and/or temperature lockout
- Programmable occupancy sensor inputs
- Adaptive recovery (optimized start)
- Smart fan logic for commercial control
- PIN protected menus (installer PIN)
- Outside air temperature display
- 24V AC powered with memory back-up
- Volt free (clean contact) relays to 158°F (-40°C to 70°C)

Wall Thermostats



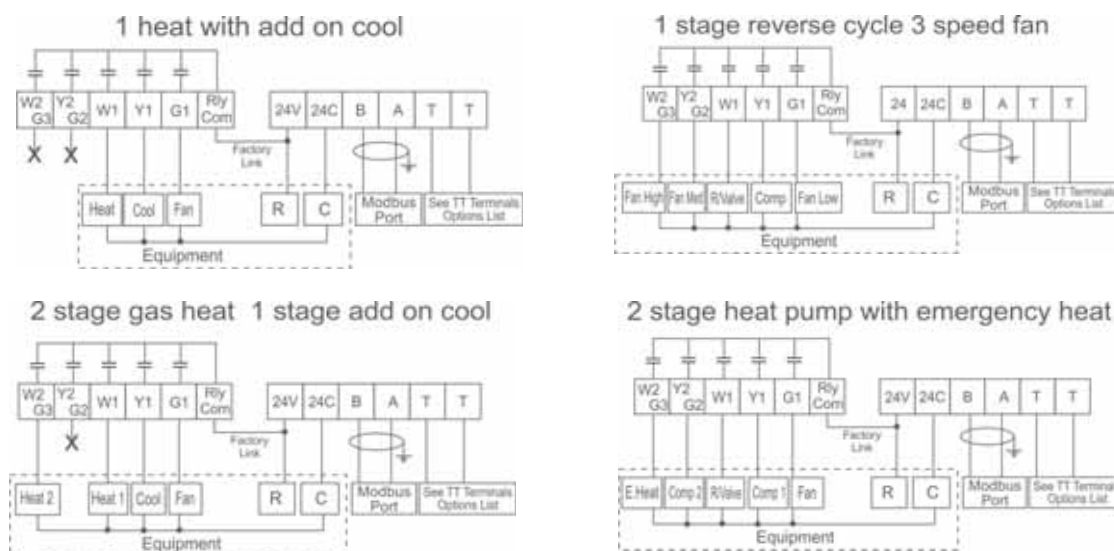
Specifications

Part Number	SMART 2000
Power	24V AC +/- 15% 50/60 Hz
Relay Outputs	5 Relays - Fan Low/Med/Hi/ Heat/Cool
Backlight	Blue
Backlight Life	3,000 hours to half brightness
Operating Temperature	32°F to 122°F (0°C to 50°C)
Operating RH	0 - 95% (Noncondensing)
Relay Voltage	24V AC @ 1 Amp Max
Communications	Modbus
Size	4.5" x 4" x 1" (113mm x 103mm x 23mm)

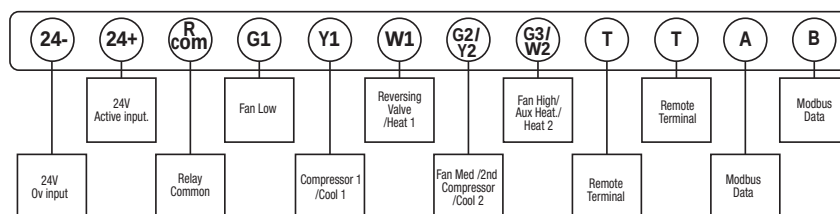
Switch Functions

Switch	Off	On
Sw1 – Fan Speed	1 Speed Fan (2 Heat/2 Cool)	3 speed Fan (1 Heat/1 Cool)
Sw2 – Equipment Type	Heat/Cool	Heat Pump (O/B terminals)
Sw3 – Stages	1 Stage	2 Stages
Sw4 – Reversing Valve If Sw2 = ON – Heat Pump Sw4 – Fan mode If Sw2 = OFF – Heat/Cool	Energyize in cool (O) Fan Control by Heater (HG)	Energyize in heat (B) Fan Control by Thermostat (HE)
Sw5 – Anti-Cycle Timer	Off	4 Minutes
Sw6 – Operation	Manual Thermostat	Programmable Thermostat
Sw7 – Minimum Run	2 Minutes	6 Minutes
Sw8 – Program Type If Sw6 = ON – Programmable Sw8 – Setpoints If Sw6 = OFF – Manual	Commercial Program Single Setpoint	Residential Program Two Setpoints

Wiring Diagrams



Terminal Designations



SMART SENSE®

5 Year
Limited
Warranty

E5



Wall Thermostats

SMARTSENSE®



SMART 3000

SMART THERMOSTAT

Smart 3000

The SmartSense® SMART 3000 Touchscreen Thermostat provides a total solution for heating and cooling control for residential and commercial hospitality applications. This thermostat is equally capable of controlling a small HVAC system in a retirement home as it is at controlling a sophisticated air handling system in a large building. The SMART 3000 is easy-to-use and install, and can be combined with multiple sensors and module options to extend its capabilities.

The SMART 3000 thermostat's options begin with an occupancy module to minimize energy usage while maximizing the comfort level in multiple room installations like hotel rooms or apartment complexes. This module is designed to take inputs from a variety of sources such as PIR (Passive InfraRed) movement detectors as well as window and door detectors to determine comfort level requirements.

Additional options include the SmartSense family of sensors which offer the choice of averaging, outdoor/duct, override, adjustable and wireless sensors. An outside door station display module extends the capability of the SMART 3000 further by providing guests with the ability to post a request for house-keeping or a Do Not Disturb notice. Plus, the SMART 3000 has built-in sophisticated communication protocols such as Modbus.

The SMART 3000 is pre-programmed with default settings such as a temperature scale (F or C degrees), high and low balance points, DIP switch settings, and more. All settings are changed easily. Distributed by Uni-Line®, SmartSense thermostats are Simply The SMART Choice™.

Features and Benefits

- 1 Heat / 1 cool
- Intuitive operation
- Touchscreen with bright white backlight
- Single or three fan speed control
- Easy-to-use commercial applications
- Wi-fi, remote and occupancy sensor options
- Passive InfraRed (PIR), door and window inputs
- Relay and 0-10V equipment control logic outputs
- Heat/cool or heat pump (O/B) logic
- Integrated modbus communications
- Integrated temperature sensor
- Door bell function
- Extensive Installer Options Menu
 - Temperature control limits
 - Auto off timer
 - Deadband adjustment
 - Fan purge period
 - Backlight level
- 24V AC powered with memory back-up
- Volt free (clean contact) relays to 158°F (-40°C to 70°C)

Wall Thermostats



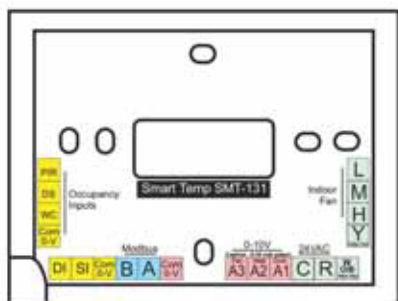
Specifications

Part Number	SMART 3000
Power	24V AC +/- 20% 50/60 Hz
Relay Outputs	5 Relays - Fan Low/Med/Hi/ Heat/Cool
Analog Outputs	Heat/Cool Fan
Touch Method	"XY" Resistive
Backlight Life	40,000 hours to half brightness
Operating Temperature	23°F to 77°F (-5°C to 50°C)
Operating RH	0 - 95% (Noncondensing)
Relay Voltage	24V AC @ 1 Amp Max
0-10V Outputs	5mA Max
Sensor Accuracy	+/-1°F at 77°F (+/1°C at 25°C)
Timer Accuracy	+/-2.5 minutes per year
Communications	Modbus RTU 4.8/9.6/19.2/38.4k
Size	4.44"x 4.05" x 0.98" (113mm X 103mm X 26mm)

Switch Functions

Switch	Function	On	Off
Sw1	Indoor Fan Mode	3 Fan Speeds	1 Fan Speed
Sw2	Equipment Type	Heat Pump	Heat Cool
Sw3	HP Mode (Sw2 = ON) HC Mode (Sw2 = OFF)	Rev Valve Heat (B) HE - Fan With Heat Thermostat Controlled	Rev Valve Cool (O) HG - Heater Fan control by Heater
Sw4	2 / 4 Pipe Mode	2 Pipe Mode	4 Pipe Mode
Sw5	Comp Protection Delay	5 Minute Anti Cycle	Immediate Compressor Start
Sw6	Not Used		
Sw7	Ventilation Mode	Permitted	Not Permitted
Sw8	Door Station (Optional)	Fitted	Door Station Not Used

Terminal Wiring



Yellow Ancillary Inputs

PIR PIR Movement Detector.
DS Door Switch
WC Window Contact
DI Digital Input (Selectable Functions)
SI Sensor input (Selectable Functions)
Com 0-10 Common Reference

Blue Modbus

B Data B
A Data A

Pink 0-10 Volt Outputs

A3 Fan Digital Fan Control
A2 Heat Heat Valve Control
A1 Cool Cool Valve Control
Com 0-10 Common Reference

Green Equipment Relays

L Low Fan Speed
M Medium Fan Speed
H High Fan Speed
Y Cool (or Compressor)
W/O/B Heat (or Reversing Valve)
R Control Active 24+
C Control Common 24+

HVAC System Capabilities



SMART SENSE®

5 Year
Limited
Warranty

E7



Wall Thermostats

SMART SENSE®



SMART 4000

SMART THERMOSTAT

Smart 4000

The SmartSense® SMART 4000 Commercial HVAC Controller Thermostat provides a total solution for heating and cooling control, especially in commercial panel builder applications. This multistage thermostat is equally capable of controlling a small HVAC system as it is at controlling a sophisticated air handling system in a large building. The SMART 4000 is DIN rail mounted making it easy-to-install and use for a variety of applications.

The SMART 4000 thermostat offers unmatched flexibility to meet the toughest installation requirements. The versatile input and output options for the SMART 4000 are designed to help minimize energy usage while maximizing comfort. The thermostat includes practical communication protocols such as Modbus which is especially useful for interfacing with PLCs (Programmable Logic Controllers).

The SMART 4000 is pre-programmed with default settings such as temperature scale (F or C degrees), DIP switch settings, and more. All settings are changed easily. Distributed by Uni-Line®, SmartSense thermostats are Simply The SMART Choice™.

Features and Benefits

- Up to 4 stages
- Intuitive operation
- Manual / 7 day / 365 day operation
- After hours run timer
- 18 to 270 V AC powered
- Five dedicated HVAC equipment control relays
- Volt free relays outputs for fan (10A max)
- 0 to 10V assignable outputs
- Integrated modbus communications
- Bright green backlight
- Wi-fi, remote and occupancy sensor options
- Enthalpy based economy function with sensor
- Digital / analog inputs and outputs with library of functions
- Economy cooling function
- Relay and 0-10V equipment control logic outputs
- Compressor lead-lag function
- Heat / cool or heat pump (O/B) logic

Wall Thermostats

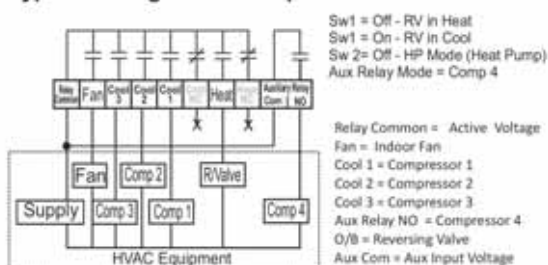


Specifications

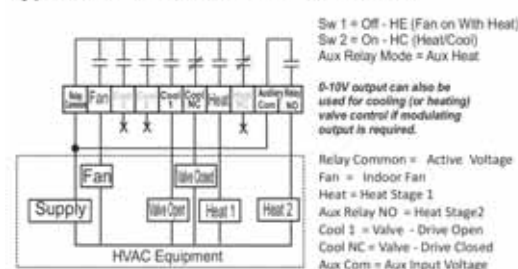
Part Number	SMART 4000
Power	24/120/240V AC +/- 15% 50/60 Hz
Relays	Fan 10A Max All Others 5A Max
Operating Temperature	32°F to 122°F (0°C to 50°C)
Operating RH	0 - 95% (Noncondensing)
Storage Temperature	32°F to 150°F (0°C to 65°C)
Control Range	32°F to 122°F (0°C to 50°C)
Maximum Equipment Stages	4 Compressors (HC Mode = 2 Heat 3 Cool)
Anti Cycle Timer	Off, 2, 3, 4 or 5 Minutes (Installer Adjustable)
After Hours Timer	Off to 12 Hours (Installer Adjustable)
Memory Type	Non Volatile 128K
Clock	12/24 Hour 7 Day with 365 Day Calendar Back-up Battery for Clock (CR1220)
Back-up Battery	4 to 6 years
Life Holiday Events	30 - (Perpetual and/or Self Expiring)
0 - 10V Output	10mA Max Each
Digital Input	Volt Free
0 - 10V Input	Max Voltage 17V DC
Room and Outside Air Sensor	10K NTC Type II (2 Wire Screened)
Communicating Sensor	4 Wire - 1312' (400m) with control function
	10K NTC Type II / RH 10 - 98% RH 2%
Optional RF Sensor	2xAAA Batteries 18 Mth Life 10K NTC Type II Range - 492' (150m) Open Air 130' (40m Indoors Typical)
	Frequency 433MHz - 2 Way With Error Checking
Communications	Modbus RTU Baud Rate 4.8/9.6/19.2K
LCD	1.25" x 5.2" (32 x 132mm)
	Graphical - LED Backlight
Size	4.3" x 4.3" x 2.6" (110mm x 110mm x 65mm)
	4.3" x 7.1" x 2.6" (110mm x 180mm x 65mm) with terminal covers fitted

Wiring Diagrams

Typical 4 Stage Heat Pump



Typical Chilled Water With Electric Heat



Installer Options

Some of the features and functions of the SMART 4000 can be adjusted as an installer are listed below:
 Keyboard locks and temperature control limits
 After Hours Run Period - 0 to 12 Hours
 Individual Compressor Control and Staging 1°F to 9°F (0.5°C to 5°C)
 With Smart Upstage
 Compressor Timing - Minimum Run Time and Anti Cycle Protection
 Communications Settings - Address, Speed and Parity
 Auxiliary Relay Functions

- Economy Output
- Hi or Low Temperature Alarm
- Heat, Cool or Economy Running Indication

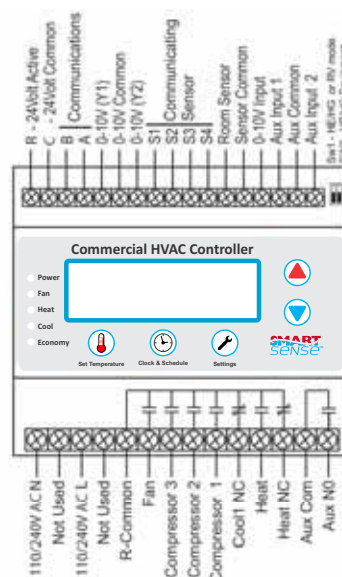
2 Analog (0-10V) Outputs each

- Inside or Outside Economy Damper Control
- Heating or Cooling Valve Control
- Capacity Control for Digital Scrolls

2 Auxiliary (Digital) Inputs each

- Fire and Fault - Normally Open or Closed Logic on Fault
- Force On / Off or Initiate/Cancel After Hours Timer
- Force Ventilation
- If Economy Mode Active

Board Layout



SMART SENSE®

5 Year
Limited
Warranty

E9

Customer Service 1.800.304.6563

www.Uni-Line.com



Wall Thermostats

SMARTSENSE®



SMART-R-01V
SMART-R-02



SMART-R-03



SMART-R-05



SMART-R-06



SMART-M-04



SMART-R-01H

SMART ACCESSORIES

Smart Sensors and Modules

The SmartSense® by Uni-Line® SMART Accessory Series offer many application options to suit a variety of installation needs. Remote sensors allow the thermostat to monitor temperature or humidity in more than one room of your home or business, or to monitor the outdoor temperature. Adding remote sensors provides a simple way to increase the efficiency of your heating and cooling system, as well as added comfort.

Remote Modules can provide more control of HVAC systems. The use of a Wi-Fi module through a smart phone or internet connection allows settings to be changed at anytime from any location. The remote Hospitality Occupancy Outdoor Module is designed for hotel applications.

Features and Benefits

- Quality thermistors used for NTC probes
- Unshielded cables may be used up to 131 feet (40m)
- Non polarity dependent TT terminals for all sensors
- Most compatible with SmartSense thermostats including the SMART 1000, SMART 2000, SMART 3000, and SMART 4000
- Thermostats auto detect connection of sensor(s)
- Averaging feature available with DIP switch (SMART-R-02 only)
- After Hours feature available (SMART-R-02, SMART-R-05 and SMART-R-06 only)
 - After hours feature allows the HVAC program to continue for an additional period pre-set by the installer
- Four wire sensor available with relative humidity (SMART 4000 only)
- Wi-Fi module sold separately (App/SSID: SmartSense by Uni-Line)
- Built in doorbell function and “make room” or “do not disturb” status signals (SMART-R-01V only)

Wall Thermostats



SMART SENSE®

Specifications

Sensors

Part Numbers	Description	Used With
SMART-R-01V	Remote 4-wire Sensor for HVAC Controller with Relative Humidity - No Display	SMART 4000 Only
SMART-R-02	Remote Averaging / After Hours Sensor	SMART 1000, SMART 2000, SMART 3000, SMART 4000
SMART-R-03	Remote Outdoor / Duct Sensor	SMART 1000, SMART 2000, SMART 3000, SMART 4000
SMART-R-05	Remote Adjustable / After Hours Sensor	SMART 1000, SMART 2000, SMART 3000, SMART 4000
SMART-R-06	Remote Wireless RF / After Hours Sensor includes Transmitter and Receiver	SMART 1000, SMART 2000, SMART 3000, SMART 4000

Modules

Part Numbers	Description	Used With
SMART-M-04	Wireless Wi-Fi Module	SMART 2000, SMART 3000, SMART 4000
SMART-R-01H	Remote Hospitality Occupancy Outdoor Module	SMART 3000

Wiring Diagrams

Diagram 1

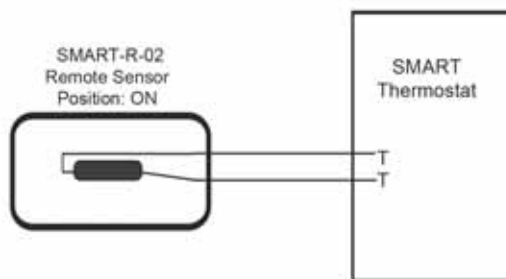


Diagram 2

Two Sensor Averaging

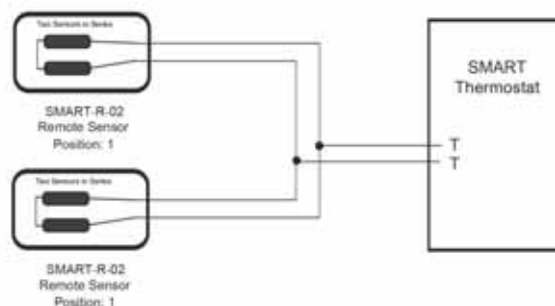


Diagram 3

Three Sensor Averaging

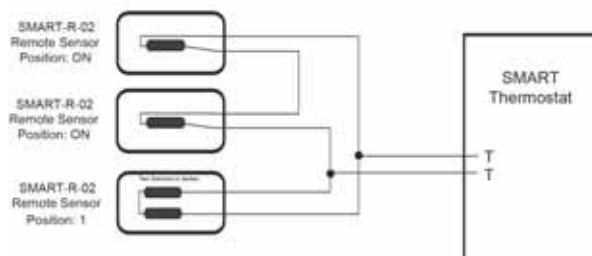
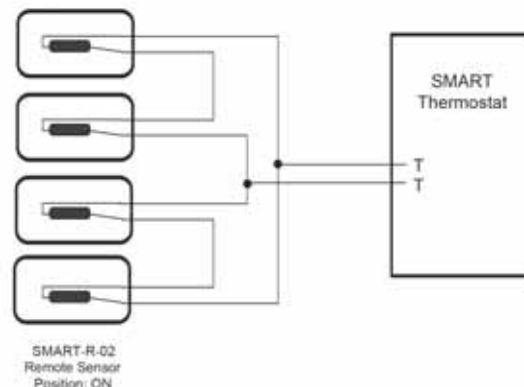


Diagram 4

Four Sensor Averaging



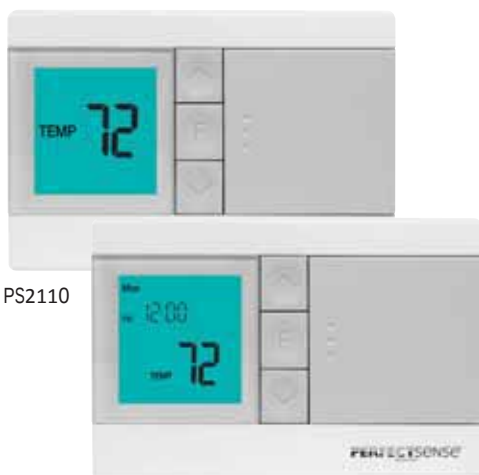
5 Year
Limited
Warranty

E11



Wall Thermostats

PERFECTSENSE™



PS2110

PS2210

NON-PROGRAMMABLE

PS2000 Series

The PerfectSense™ PS2000 thermostat series is the perfect choice when it comes to non-programmable temperature control.

With the comfort, convenience, and efficiency features that homeowners and contractors want, the PS2000 series provides value-packed thermostats for an economical price.

All PS2000 thermostats are fully compatible with all standard 24V AC heating and cooling systems. Additional compatibility with multi-stage and heat pump systems are available in the PS2210 model.

Add in easy installation, expert technical service, and quality you can depend on, the PerfectSense™ PS2000 thermostat series is the perfect choice in temperature control.

Features and Benefits

- Multi-Stage 2 heat / 1 cool – PS2210 only
- Bigger brighter backlight
- Adjustable temperature differential
- Worry-free memory retention – PS2210 only
- Filter Monitor
- Low temperature freeze protection – PS2110 only
- Automatic compressor short cycle protection
- O and B terminals
- Zone system compatible
- Quick wire terminal block

Wall Thermostats

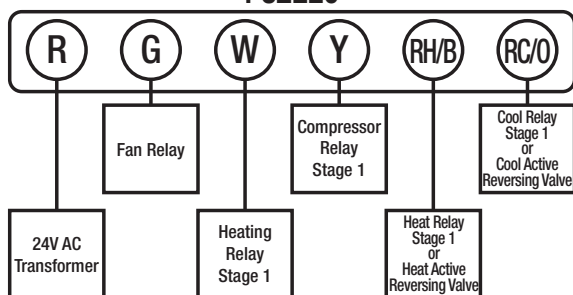


Specifications

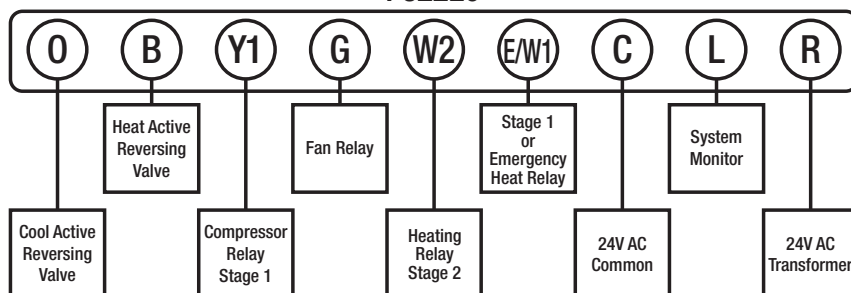
Part Numbers	PS2110	PS2210
Electrical Rating	24V AC (18-30V AC) 1 Amp maximum load per terminal 3 Amp total maximum load (all terminals combined)	24V AC (18-30V AC) 1 Amp maximum load per terminal 3 Amp total maximum load (all terminals combined)
Application	1 Heat / 1 Cool	Multi-Stage 2 Heat / 1 Cool
Temperature Control Range	45°F to 95°F (7°C to 35°C)	45°F to 95°F (7°C to 35°C)
Accuracy	± 1°F (± 0.5°C)	± 1°F (± 0.5°C)
Power	3.0V DC (2 AA alkaline batteries included)	24V AC with battery back-up (2 AA alkaline batteries included)
System Configurations	Single stage electric, gas, oil or millivolt heating or heating/cooling systems including single stage heat pump systems	Multi-stage electric, gas or oil heating or heating/cooling systems including multi-stage heat pump systems
Terminations	R, G, W, Y, RH/B, RC/O	O, B, Y1, G, W2, E/W1, C, L, R
Product Weight	11.2 oz.	11.2 oz.

Product Drawings

PS2110



PS2210



PERFECTSENSE™

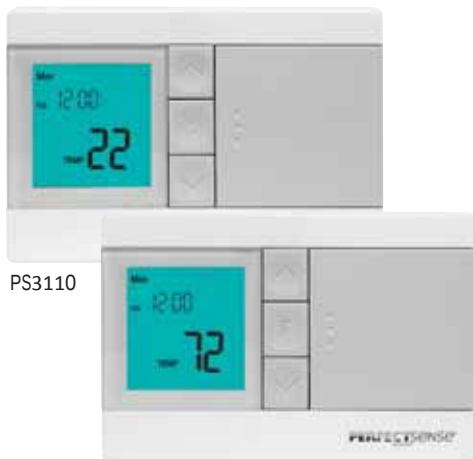
2 Year
Limited
Warranty

E13



Wall Thermostats

PERFECTsense™



PS3110

PS3210

PROGRAMMABLE

PS3000 Series

The PerfectSense™ PS3000 thermostat series is the perfect choice when it comes to programmable temperature control that can help reduce energy costs up to 25%.

With the comfort, convenience, and efficiency features that homeowners and contractors want, the PS3000 series provides custom program options in value-packed thermostats for an economical price.

All PS3000 thermostats are fully compatible with all standard 24V AC heating and cooling systems. The PS3210 offers additional compatibility with single and multi-stage gas/electric furnaces and heat pump systems.

Add in easy installation, expert technical service, and quality you can depend on, the PerfectSense™ PS3000 thermostat series is the perfect choice in temperature control.

Features and Benefits

- 5 - 2 day programming
- Multi-stage 2 heat / 1 cool – PS3210 only
- Bigger brighter backlight
- Adjustable temperature differential
- Worry-free memory retention – PS3210 only
- Filter monitor
- Low temperature freeze protection – PS3110 only
- Automatic compressor short cycle protection
- Temporary program override
- Quick wire terminal block

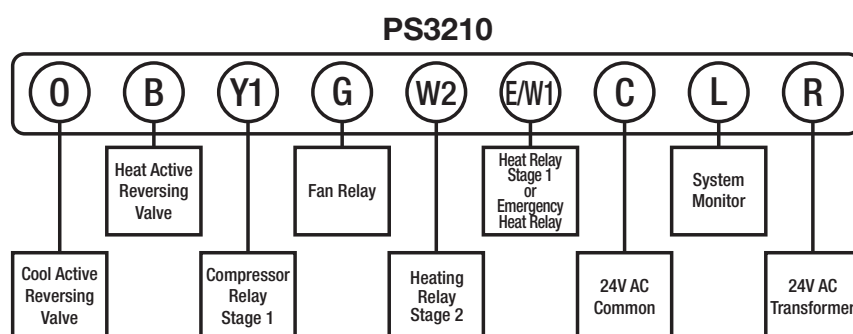
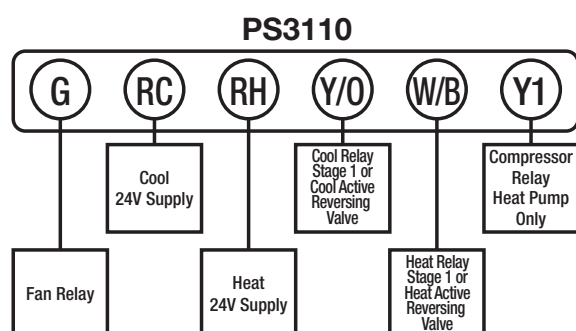
Wall Thermostats



Specifications

Part Numbers	PS3110	PS3210
Electrical Rating	24V AC (18-30V AC) 1 Amp maximum load per terminal 3 Amp total maximum load (all terminals combined)	24V AC (18-30V AC) 1 Amp maximum load per terminal 3 Amp total maximum load (all terminals combined)
Application	1 Heat / 1 Cool	Multi-Stage 2 Heat / 1 Cool
Temperature Control Range	45°F to 95°F (7°C to 35°C)	45°F to 95°F (7°C to 35°C)
Accuracy	± 1°F (± 0.5°C)	± 1°F (± 0.5°C)
Power	3.0V DC (2 AA alkaline batteries included)	24V AC with battery back-up (2 AA alkaline batteries included)
System Configurations	Single stage electric, gas, oil or millivolt heating or heating/cooling systems including single stage heat pump systems	Multi-stage electric, gas or oil heating or heating/cooling systems including multi-stage heat pump systems
Terminations	G, RC, RH, Y/O, W/B, Y1	O, B, Y1, G, W2, E/W1, C, L, R
Product Weight	11.2 oz.	11.2 oz.

Product Drawings



PERFECTSENSE™

2 Year
Limited
Warranty

E15

Customer Service 1.800.304.6563

www.Uni-Line.com



Wall Thermostats

PERFECTSENSE™



PS4000

TOUCHSCREEN PROGRAMMABLE

PS4000 Series

The PerfectSense™ PS4000 Touchscreen Programmable Thermostat is a feature-rich comfort control with universal system compatibility. Easy-to-use and install, the PS4000 has a large backlit touchscreen display requested by homeowners and contractors.

This installer-friendly thermostat is designed for 1 heat / 1 cool systems and can be programmed for 2 or 4 events daily. In addition, it offers Wake, Day, Evening, and Sleep settings giving you precise and affordable comfort. Applications include gas, oil, millivolt, electric and heat pump as well as dual fuel units. The PS4000 is powered by 24V AC common wire or two AA batteries.

With a beautiful design, easy installation, and quality you can depend on, the PerfectSense PS4000 Touchscreen thermostat is the perfect choice in temperature control.

Features and Benefits

- 7 day programmable, 2 or 4 events per day
- 1 Heat / 1 Cool
- Touchscreen with large backlit display
- Manual or auto changeover
- Adaptive recovery
- Indoor and outdoor sensor options
- Programmable fan option
- Filter change indicator
- 5 minute compressor delay protection
- Keypad lockout
- Clock display

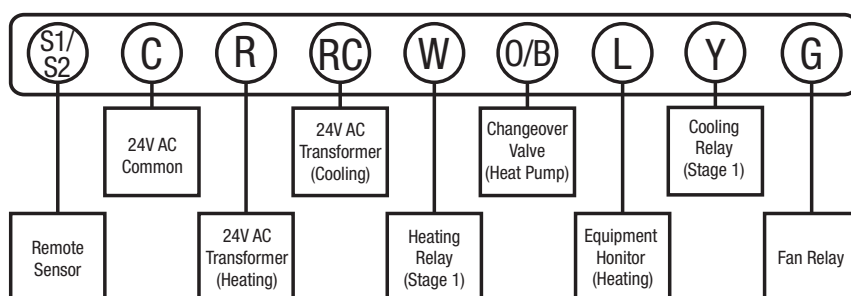
Wall Thermostats



Specifications

Part Numbers	PS4000
Temperature Range	Heating: 40°F to 90°F (4°C to 32°C) Cooling: 50°F to 99°F (10°C to 37°C)
Operating Temperature	32°F to 120°F (0°C to 49°C)
Electrical Rating	W Heating Terminal 20 – 30V AC, 1 Amp max, 50/60 Hz
	W Heating (Power pile) 750 mV DC, 100 mA max, 50/60 Hz
	Y Cooling 20 – 30V AC, 1 Amp max, 50/60 Hz
	G Fan 20 – 30V AC, 1 Amp max, 50/60 Hz

Product Drawings



PERFECTsense™

5 Year
Limited
Warranty

E17



Wall Thermostats

PERFECTSENSE™



PS5000

TOUCHSCREEN PROGRAMMABLE

PS5000 Series

The PerfectSense™ PS5000 Touchscreen Programmable Thermostat is a feature-rich comfort control with universal system compatibility. Easy-to-use and install, the PS5000 has a large backlit touchscreen display requested by homeowners and contractors.

This installer-friendly thermostat is designed for 3 heat / 2 cool systems and can be programmed for 2 or 4 events daily. In addition, it offers Wake, Day, Evening, and Sleep settings giving you precise and affordable comfort. Applications include gas, oil, millivolt, electric and heat pump as well as dual fuel units. The PS5000 is powered by 24V AC common wire or two AA batteries.

With a beautiful design, easy installation, and quality you can depend on, the PerfectSense PS5000 Touchscreen thermostat is the perfect choice in temperature control.

Features and Benefits

- 7 day programmable, 2 or 4 events per day
- 3 Heat / 2 Cool
- Touchscreen with large backlit display
- Manual or auto changeover
- Adaptive recovery
- Indoor and outdoor sensor options
- Programmable fan option
- Filter change indicator
- 5 minute compressor delay protection
- Keypad lockout
- Clock display

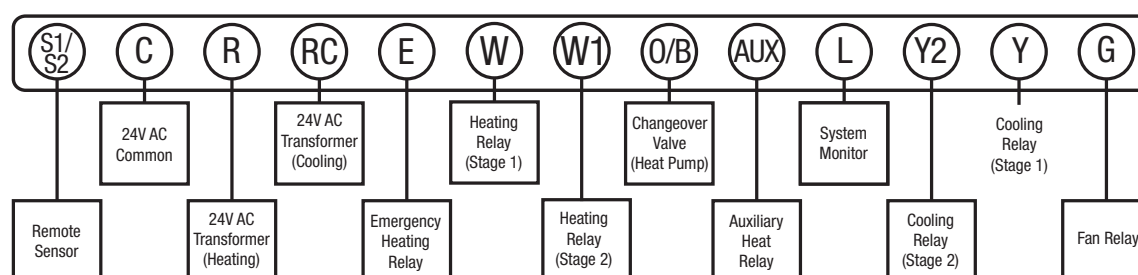
Wall Thermostats



Specifications

Part Numbers	PS5000
Temperature Range	Heating: 40°F to 90°F (4°C to 32°C) Cooling: 50°F to 99°F (10°C to 37°C)
Operating Temperature	32°F to 120°F (0°C to 49°C)
Electrical Rating	W Heating Terminal 20 – 30V AC, 1 Amp max, 50/60 Hz
	W Heating (Power pile) 750 mV DC, 100 mA max, 50/60 Hz
	Y Cooling 20 – 30V AC, 1 Amp max, 50/60 Hz
	G Fan 20 – 30V AC, 1 Amp max, 50/60 Hz

Product Drawings



PERFECTsense™

5 Year
Limited
Warranty

E19



Wall Thermostats

PERFECTSENSE™



PS984-1R

MECHANICAL

900 Series

The PerfectSense™ PS900 Series Mechanical Thermostats are a simple two-piece design, so you save time at installation. The large display offers accurate room temperature measurement. Wall plates are available to mask any unsightly marks left by previous thermostats. Install it with confidence.

Features and Benefits

- Accurate room temperature
- Adjustable heat anticipator
- No sub-base required speeds installation.
- Mercury-free means no leveling or special disposal required
- J-box compatible
- Positive off switch assured shutdown of HVAC system
- Fixed cooling anticipation (on PS984-1R, PS988-1R only)
- Dual temperature scale in Fahrenheit and Celsius

1 Year
Limited
Warranty

E20

www.Uni-Line.com

Customer Service 1.800.304.6563

Wall Thermostats

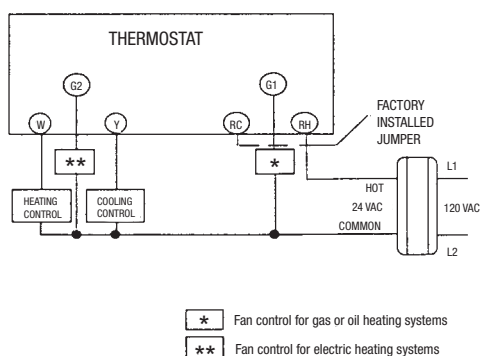


Specifications

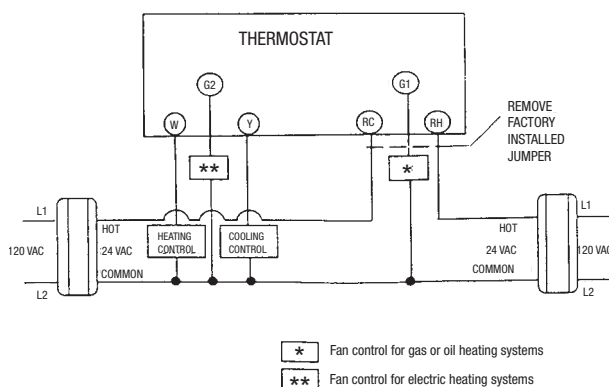
Part Numbers	PS984-1R	PS986-1R	PS988-1R
Electrical Rating	24V AC (24-30V AC) and 250-750 mV 1.5 Amp maximum load (all terminals combined)	24V AC (24-30V AC) and 250-750 mV 1.5 Amp maximum load (all terminals combined)	24V AC (24-30V AC) and 250-750 mV 1.5 Amp maximum load (all terminals combined)
Application	24V AC, Cool Only	24V AC, Heat Only	24V AC, 1 Heat/1 Cool
Temperature Control Range	50°F to 90°F (10°C to 30°C)	50°F to 90°F (10°C to 30°C)	50°F to 90°F (10°C to 30°C)
Accuracy	± 2°F	± 2°F	± 2°F
Adjustable Heat Anticipation	0.1 to 1.2 Amp	0.1 to 1.2 Amp	0.1 to 1.2 Amp
Power Consumption	Less than 1 mA @ 24V AC	Less than 1 mA @ 24V AC	Less than 1 mA @ 24V AC
Switch Action	Reed Switch	Reed Switch	Reed Switch
Terminations	Y, G, R	W, R	W, G, Y, Rc, Rh

Product Drawings

One Transformer - Models PS986-1R, PS988-1R



Two Transformers - Models PS988-1R



PERFECTsense™



Water valves are critical to the efficient operation of a variety of residential and commercial appliances.

Robertshaw® water valves are the industry standard for all applications. Whether single, dual or general purpose water valves are needed for refrigeration, laundry, dishwashing or small appliances, Robertshaw produces the products trusted by the leading global appliance manufacturers.

Mixing Water Valves.....	F2
Single Solenoid Water Valves	F8
Dual Water Valves	F14
Direct Acting Solenoid Water Valves	F18
Gravity-Fed Dump Water Valves.....	F20
General Purpose Water Valves	F22
Pressure Sensor	F26



WATER VALVES





WATER VALVES

Robertshaw®



CW-164

MIXING WATER VALVES

E-1, E-2 and E-2T Series

The Robertshaw® E-1, E-2 and E-2T Mixing Water Valve Series is designed for laundry clothes washer applications. The E-1 models are non-regulated, the E-2 models have flow control in the outlet, and the E-2T models have an additional thermistor added for temperature monitoring.

Features and Benefits

- Pilot-operated diaphragm provides high flow capacity with minimum power requirements
- Compact design compared to predecessor valves to allow more flexibility for applications
- Flange mounting with screw boss is molded into the body for ease of installation
- Design uses a staked coil L frame with drawn pole sleeves to eliminate loose or missing pole pieces
- Improved coil bobbin design reduces problems
- Slow closing operators reduce water hammer and extend valve life
- Spin-weld assembly minimizes problems caused by loose or missing screws
- Suitable for applications using liquids up to 160°F (71°C)
- Quiet operation
- Stainless steel inlet screens with 60 x 60 mesh (60 holes/inch in both x and y directions)

Replacement Information

Part Numbers	Replaces	Factory Number
CW-001	GE 189D1664G001, Whirlpool 13X86, Whirlpool 13X10024, 175D2937P001	K-76249
CW-164	Whirlpool 3952164	K-69046
CW-333	Whirlpool 22004333	K-76103
CW-346	Whirlpool 3979346	K-75161
CW-347	Whirlpool 3979347	K-75398
CW-349	Whirlpool W10337349	K-77684-2
CW-400	Electrolux 134211400	K-75712
CW-402	Alliance 201402	K-72626
CW-468	Alliance 201468	K-75933
CW-471	Whirlpool 461970229471	K-76422
CW-551	Whirlpool 461970201551	K-74969
CW-600	Electrolux 134890600	K-76755
CW-673	Whirlpool 3955673	K-75180
CW-751	Whirlpool 8540751	K-75806
CW-932	Maytag 35-6693, Maytag 21001932	K-76373
CW-E2	Whirlpool 3952163	K-72633



WATER VALVES



Specifications

Part Numbers	Description	Flow Rate	Inlet	Outlet	Operating Pressure	Terminals	Body Material	Thermistor	Electrical Rating	Power
CW-001	Laundry Valve	4 GPM to 7.3 GPM	3/4" 11.5 NHT	1/2" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro	NA	120V AC 60Hz	5 Watts
CW-164	Residential Clothes Washer Mixing Water Valve E-1	1.0 GPM to 6.0 GPM	3/4" 11.5 NHT	1/2" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro	NA	120V AC 60 Hz	5 Watts
CW-333	Laundry Valve	2 GPM to 8.2 GPM	3/4" 11.5 NHT	1/2" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro	NA	120V AC 60Hz	5 Watts
CW-346	Laundry Valve with thermistor	2 GPM to 2.8 GPM	3/4" 11.5 NHT	1/2" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro	50K Ohms at 25°C	120V AC 60Hz	5 Watts
CW-347	Residential Clothes Washer Mixing Water Valve E-2T	1.0 GPM to 6.0 GPM	3/4" 11.5 NHT	3/8" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro	50K Ohms at 25°C	120V AC 60 Hz	5 Watts
CW-349	Laundry Valve	8 GPM	3/4" 11.5 NHT	1/2" ID Hose	21 PSI to 120 PSI	1/4" Male	Polypro	NA	120V AC 60Hz	5 Watts
CW-400	Residential Clothes Washer Mixing Water Valve E-1	1.8 GPM to 14.6 GPM	3/4" 11.5 NHT	1/2" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro	NA	120V AC 50/60 Hz	5 Watts
CW-402	Laundry Valve	11 GPM	3/4" 11.5 NHT	1/2" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro	NA	120V AC 60Hz	5 Watts
CW-468	Laundry Valve	2.4 GPM to 4.5 GPM	3/4" 11.5 NHT	1/2" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro	NA	120V AC 60Hz	5 Watts
CW-471	Residential Clothes Washer Mixing Water Valve E-2	1.69 GPM to 2.54 GPM	3/4" 11.5 NHT	3/8" ID Hose	7.5 PSI to 147 PSI	1/4" Male	Polypro	NA	120V AC 50/60 Hz	5 Watts
CW-551	Residential Clothes Washer Mixing Water Valve E-2	1.69 GPM to 2.54 GPM	3/4" 11.5 NHT	3/8" ID Hose	7.5 PSI to 147 PSI	1/4" Male	Polypro	NA	120V AC 60 Hz	5 Watts
CW-600	Laundry Valve with thermistor	1.3 GPM to 14.6 GPM	3/4" 11.5 NHT	1/2" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro	50K Ohms at 25°C	120V AC 60Hz	5 Watts
CW-673	Laundry Valve	1.9 GPM to 3.5 GPM	3/4" 11.5 NHT	1/2" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro	NA	120V AC 60Hz	5 Watts
CW-751	Laundry Valve	0.8 GPM to 2.2 GPM	3/4" 11.5 NHT	1/2" ID Hose	14.5 PSI to 145 PSI	RAST 2.5	Polypro	NA	120V AC 60Hz	5 Watts
CW-932	Laundry Valve	2.5 GPM to 3.8 GPM	3/4" 11.5 NHT	1/2" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro	NA	120V AC 60Hz	5 Watts
CW-E2	Laundry Valve	2.2 GPM	3/4" 11.5 NHT	1/2" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro	NA	120V AC 60Hz	5 Watts

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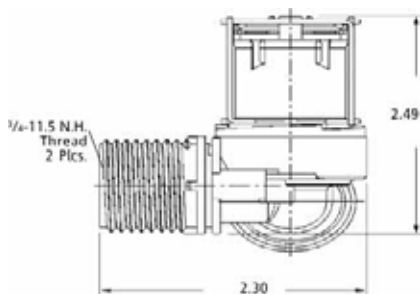
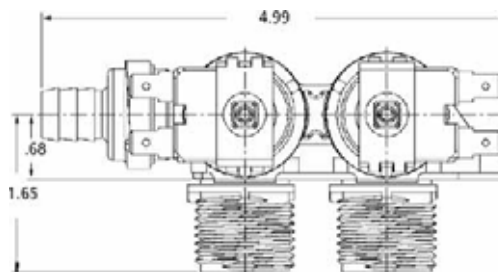
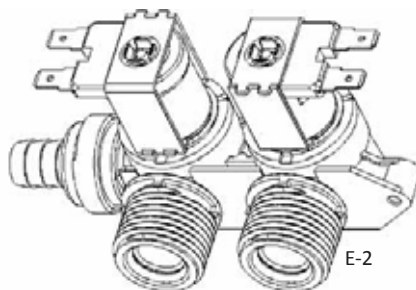
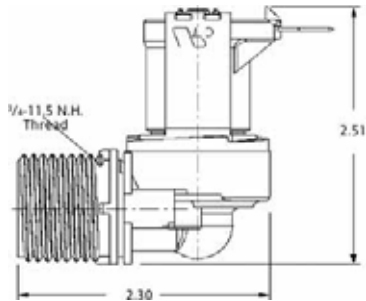
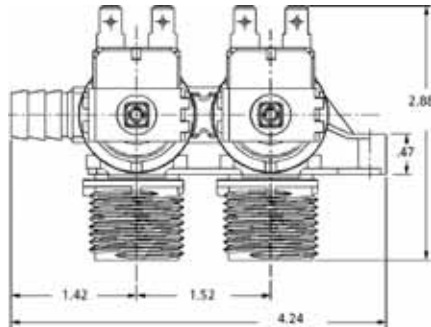
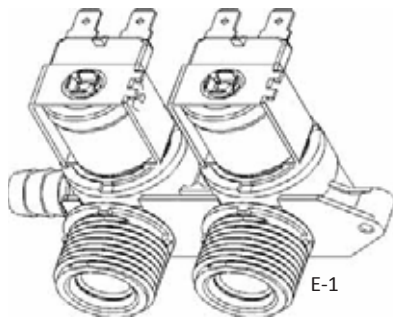
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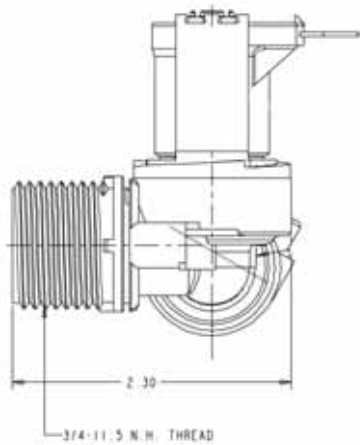
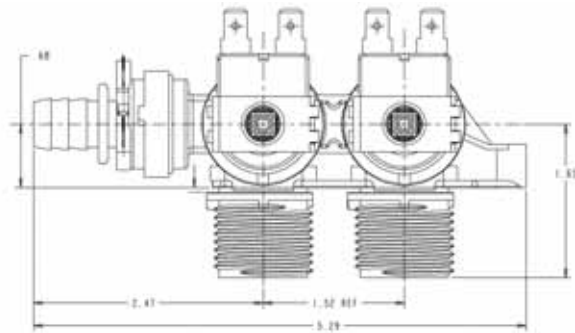
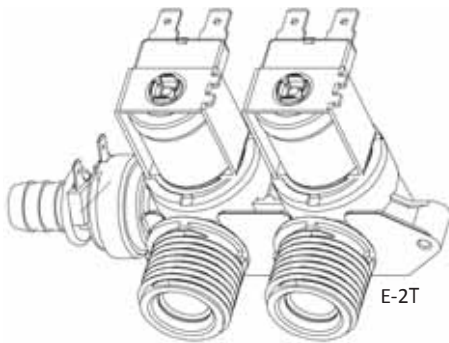
Product Drawings



WATER VALVES



Product Drawings



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F5



WATER VALVES

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CW-300

MIXING WATER VALVES

N-51 Series

The Robertshaw® N-51 Mixing Water Valve Series is designed for laundry clothes washer applications where flow control is required.

Features and Benefits

- Dual solenoid valve with a pilot-operated diaphragm that provides high flow capacity with minimum power requirements
- Encapsulated coil provides high mechanical and dielectric strength, and is moisture resistant
- Unique diaphragm design reduces unwanted particles from entering the armature area
- Armature is designed with clearances to minimize jamming due to foreign materials
- Bodies are made of polypro which provides high resistance to corrosion and mineral deposits
- Suitable for applications using water at temperatures up to 160°F (71°C)
- Water hammer suppression
- Includes stainless steel inlet screens with 50 x 40 mesh (50 x 40 holes/inch in both x and y directions)

Replacement Information

Part Numbers	Replaces	Factory Number
CW-300	Electrolux	K-67914
CW-531	GE WH00X531	K-66575
CW-1300	Electrolux 131461300	K-62464

Specifications

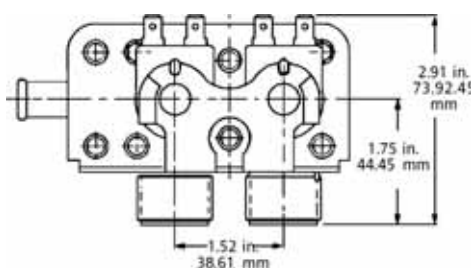
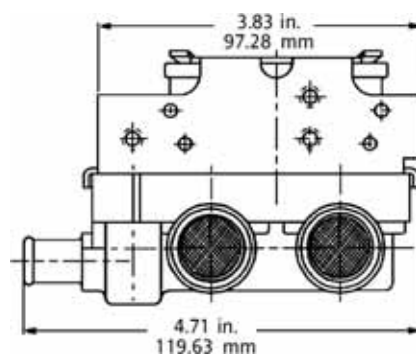
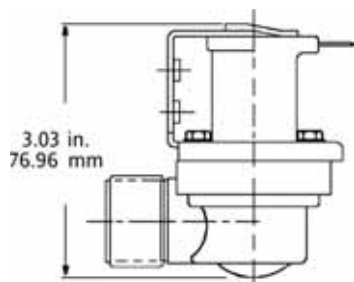
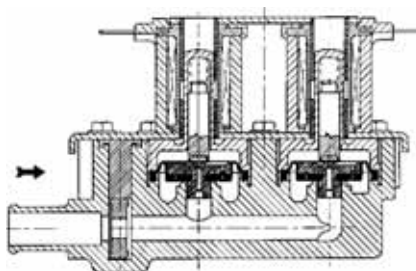
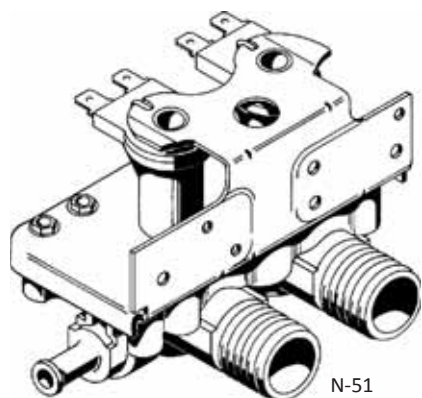
Part Numbers	Description	Flow Rate	Inlet	Outlet	Operating Pressure	Terminals	Body Material	Electrical Rating	Power
CW-300	Residential Clothes Washer Mixing Water Valve N-51	3.0 GPM to 14.6 GPM	3/4" 11 NHT	1/2" ID Hose	30 PSI to 120 PSI	Plain Brass	Polypro (Brown)	120V AC 60 Hz	10 Watts
CW-531	Laundry Valve	5 GPM to 7.5 GPM	3/4" 11.5 NHT	.375 ID Hose	30 PSI to 175 PSI	1/4" Male	Polypro	120V AC 60Hz	10 Watts
CW-1300	Laundry Valve	4.5 GPM to 6.2 GPM	3/4" 11.5 NHT	1/2" ID Hose	30 PSI to 120 PSI	1/4" Male	Polypro	230 V AC 50/60 Hz	7 Watts



WATER VALVES



Product Drawings



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IMV-1304

Replacement Information

Part Numbers	Replaces	Factory Number
CB-104	Grindmaster 61104	K-63310-28
IMV-529	Star - Wells Manufacturing 46529	K-63315-18
IMV-604	Scotsman 12-1646-04	K-63314-12
IMV-605	Scotsman 12-1646-05	K-63314-13
IMV-865	Hoshizaki 4A086501	K-63310-21
IMV-1304	Scotsman 12231304	K-63916-9
IMV-3404	Scotsman 12-1434-04	K-63314-14

Specifications

Part Numbers	Description	Flow Rate	Inlet	Outlet	Operating Pressure	Terminals	Body Material	Electrical Rating	Power
CB-104	Laundry Valve	1 GPM	3/4" 11.5 NHT	3/8" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro	120V AC 60Hz	10 Watts
IMV-529	Commercial Ice Machine Water Valve S-30	0.75 GPM	3/4" 11 NHT	1/2" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro	240V AC 50/60 Hz	10 Watts
IMV-604	Laundry Valve	1 GPM	1/4" 18 NPT	1/4" 18 NPT	20 PSI to 120 PSI	1/4" Male	Polypro	240V AC 60Hz	10 Watts
IMV-605	Laundry Valve	1 GPM	1/4" 18 NPT	1/4" 18 NPT	20 PSI to 120 PSI	1/4" Male	Polypro	120V AC 60Hz	10 Watts
IMV-865	Commercial Ice Machine Water Valve S-30	0.75 GPM	3/4" 11 NHT	1/2" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro	24V AC 50/60 Hz	7 Watts
IMV-1304	Commercial Ice Machine Water Valve S-30	0.75 GPM	3/4" 11 NHT	1/2" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro	120V AC 50/60 Hz	10 Watts
IMV-3404	Laundry Valve	.5 GPM	1/4" 18 NPT	1/4" 18 NPT	20 PSI to 120 PSI	1/4" Male	Polypro	120V AC 60Hz	10 Watts

SINGLE SOLENOID WATER VALVES

S-30 Series

The Robertshaw® S-30 Water Valve Series is designed for low flow applications in residential refrigerator icemakers, commercial ice machines, dishwashers, energy-conserving plumbing and heating applications.

Features and Benefits

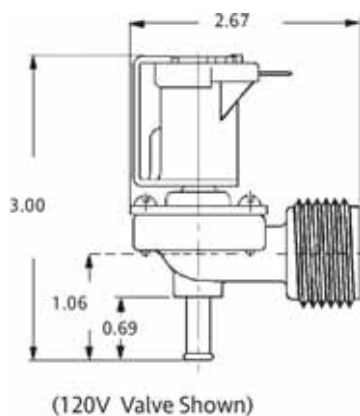
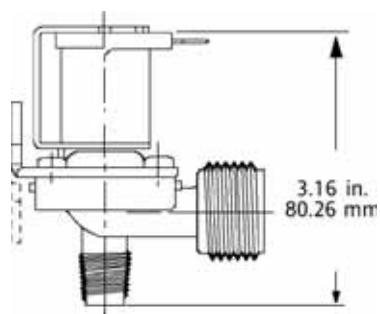
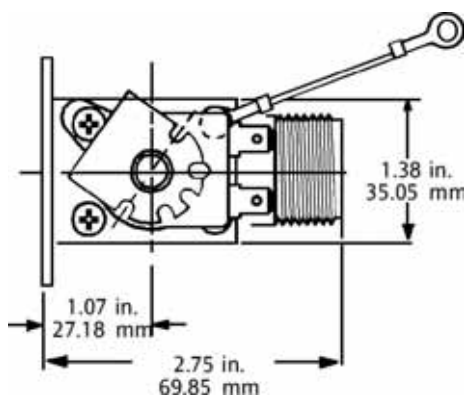
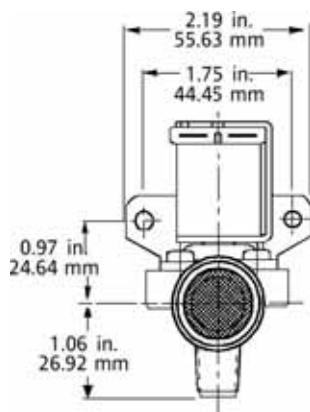
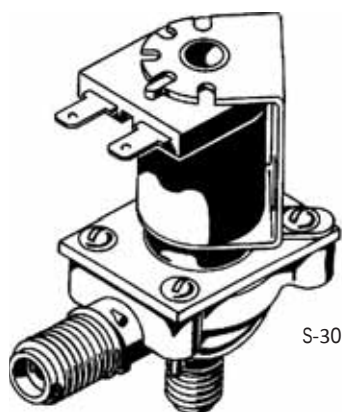
- Single solenoid valve with a pilot-operated diaphragm provides high flow capacity with minimum power requirements
- Encapsulated coil provides high mechanical and dielectric strength, and is moisture resistant
- Unique diaphragm design reduces unwanted particles from entering the armature area
- Armature is designed with clearances which minimize the possibility of jamming due to foreign materials
- Bodies are made of polypro which provides high resistance to corrosion and mineral deposits
- Suitable for applications using water at temperatures up to 160°F (71°C)



WATER VALVES



Product Drawings



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1 Year
Limited
Warranty

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WATER VALVES

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IMV-0402

Replacement Information

Part Numbers	Replaces	Factory Number
DW-721	GE WD00X721	K-56869-8
IMV-003	Manitowoc 2400003	K-74118-13
IMV-0400	Manitowoc 400	K-76167-8
IMV-0402	Manitowoc 000000402	K-76167-10
IMV-202	Scotsman 12-2922-02	K-74118-28
IMV-373	Manitowoc 373	K-76167-4
IMV-399	Manitowoc 399	K-76167-7
IMV-2201	Scotsman 12292201	K-74118-27

Specification

Part Numbers	Description	Flow Rate	Inlet	Outlet	Operating Pressure	Terminals	Body Material	Electrical Rating	Power
DW -721	Residential Dishwasher Water Valve S-53	1.55 GPM to 2.05 GPM	3/8" 18 FNPT	3/8" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro	120V AC 60Hz	10 Watts
IMV-003	Commercial Ice Machine Water Valve S-53	1.7 GPM	3/8" 18 FNPT	3/8" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro	120V AC 60Hz	10 Watts
IMV-0400	Commercial Ice Machine Water Valve S-53	0.50 GPM	1/4" quick connect	3/8" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro	240 V AC 50/60 Hz	10 Watts
IMV-0402	Commercial Ice Machine Water Valve S-53	0.75 GPM to 3.00 GPM	3/8" 18 FNPT	3/8" ID Hose (Yellow)	20 PSI to 120 PSI	1/4" Male	Polypro	240V AC 50/60 Hz	10 Watts
IMV-202	Commercial Ice Machine Water Valve S-53	1.25 GPM	3/8" 18 FNPT	3/8" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro	230 V AC 50/60 Hz	10 Watts
IMV-373	Commercial Ice Machine Water Valve S-53	1.7 GPM	1/4" quick connect	3/8" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro	240 V AC 50/60 Hz	10 Watts
IMV-399	Commercial Ice Machine Water Valve S-53	0.50 GPM	1/4" quick connect	3/8" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro	120V AC 60Hz	10 Watts
IMV-2201	Commercial Ice Machine Water Valve S-53	1.25 GPM	3/8" 18 FNPT	3/8" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro	120V AC 50/60 Hz	10 Watts

SINGLE SOLENOID WATER VALVES

S-53 Series

The Robertshaw® S-53 Water Valve Series is a single solenoid valve for dishwashing machines and commercial icemakers. The S-53 features the design combination of a brass inlet fitting and a mounting bracket, which allows direct connection to the supply plumbing without applying torque to the valve body.

Features and Benefits

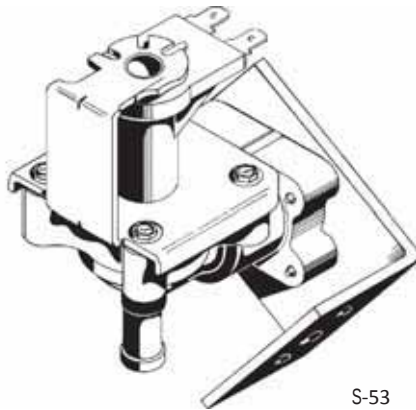
- Pilot-operated diaphragm provides high flow capacity with minimum power requirements
- Unique diaphragm design reduces unwanted particles from entering the armature area
- Armature is designed with clearances which minimize the possibility of jamming due to foreign materials
- Bodies are made of polypro to withstand a variety of harsh water conditions
- Suitable for applications using water at temperatures up to 160°F (71°C)



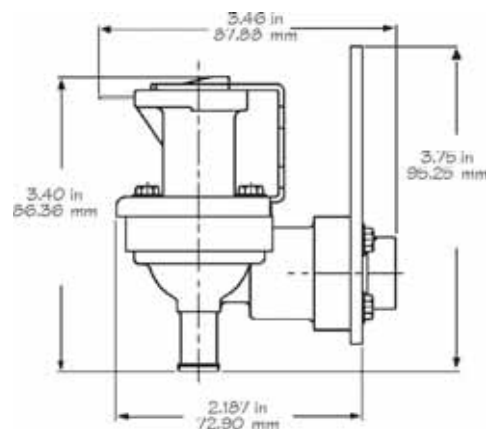
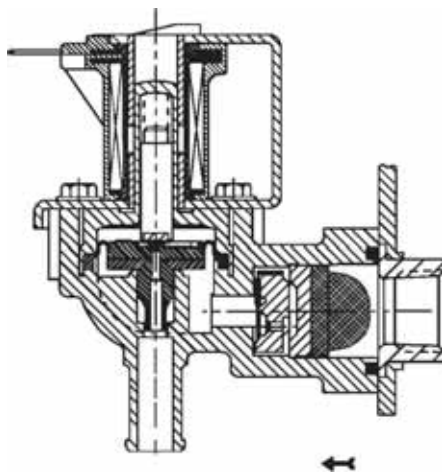
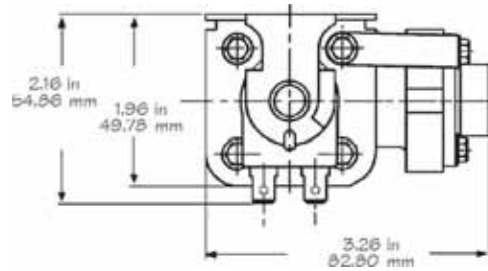
WATER VALVES



Product Drawings



S-53



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Warranty

F11



WATER VALVES

Robertshaw®



DW-003

SINGLE SOLENOID WATER VALVES

S-101 Series

The Robertshaw® S-101 Water Valve Series is a single solenoid valve for dishwashing machines and coffee brewers.

Features and Benefits

- Pilot-operated diaphragm provides high flow capacity with minimum power requirements
- Encapsulated coil provides high mechanical and dielectric strength, and is moisture resistant
- Bodies are made of polypro to withstand a variety of harsh water conditions
- Suitable for applications using water at temperatures up to 160°F (71°C)

Replacement Information

Part Numbers	Replaces	Factory Number
CB-826	Wilbur Curtis WC826L	K-78117
DW-003	GE Parts 165D5792G001	K-78325
DW-101	Electrolux 154476101	K-76076-1
DW-249	Maytag 6918249	K-75634
DW-345	Whirlpool 8283345	K-74396
DW-534	Whirlpool 6920534	K-76466

Specifications

Part Numbers	Description	Flow Rate	Inlet	Outlet	Operating Pressure	Terminals	Body Material	Electrical Rating	Power
CB-826	Commercial Coffee Brewer Water Valve S-101	1.00 GPM to 1.30 GPM	3/8" 18 NPT	3/8" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro (Gray)	120V AC 50/60 Hz	5 Watts
DW-003	Residential Dish Washer Water Valve S-101	1.55 GPM to 2.05 GPM	3/8" 18 NPT	3/8" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro (Blue)	120V AC 60 Hz	5 Watts
DW-101	Residential Dish Washer Water Valve S-101	0.83 GPM	3/8" 18 NPT	3/8" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro (White)	120V AC 50/60 Hz	5 Watts
DW-249	Residential Dish Washer Water Valve S-53	1.13 GPM	3/8" 18 FNPT	3/8" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro	120V AC 60Hz	5 Watts
DW-345	Residential Dish Washer Water Valve S-101	1.08 GPM	3/8" 18 NPT	3/8" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro	120V AC 50/60 Hz	5 Watts
DW-534	Residential Dish Washer Water Valve S-101	1.13 GPM	3/8" 18 NPT	3/8" ID Hose	20 PSI to 120 PSI	1/4" Male	Polypro	120V AC 50/60 Hz	5 Watts

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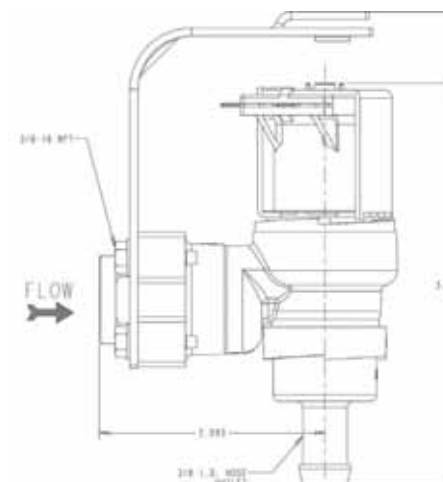


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F13



WATER VALVES

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IMV-576

DUAL WATER VALVES

S-86 and N-86 Series

The Robertshaw® S-86 Single and N-86 Dual Water Valve Series are automatic icemaker valves for residential refrigerator icemakers. Both valve models feature an inlet fitting which connects directly to 1/4" (6.35mm) tubing without an additional adaptor. The N-86 valve allows individual control of water flow through two outlets by using a single inlet for water to the door and for water to fill the icemaker.

Features and Benefits

- Direct acting armature provides high flow capacity with minimum power requirements
- Encapsulated coil provides high mechanical and dielectric strength, and is moisture resistant
- Unique armature and seat design reduce unwanted particles from entering the armature area
- Armature is designed with clearances which minimize the possibility of jamming due to foreign materials
- Bodies are made of polypro which provides high resistance to corrosion and mineral deposits
- Suitable for applications using water at temperatures up to 160°F (71°C)

Replacement Information

Part Numbers	Replaces	Factory Number
IMV-114	Whirlpool 12544114 Whirlpool 67005154	K-75985
IMV-124	Whirlpool 12544124	K-77198
IMV-201	Electrolux 40493201	K-74945
IMV-322	Whirlpool 12956102 Whirlpool 67006322	K-76376
IMV-494	Whirlpool 2210494	K-75973
IMV-542	Whirlpool 2188542	K-74982
IMV-576	Whirlpool 2315576	K-78186
IMV-696	Whirlpool W10312696	K-77623
IMV-701	Electrolux 218859701	K-75425
IMV-708	Whirlpool 2188708	K-75717
IMV-716	Whirlpool 10219716	K-77205
IMV-782	Whirlpool 2188782	K-75978
IMV-990	Whirlpool W10342318 Whirlpool 10498990	K-77999
IMV-2401	Electrolux 218832401	K-75423
IMV-8100	Whirlpool 10238100	K-77473



WATER VALVES



Specifications

Part Numbers	Description	Flow Rate	Inlet	Outlet	Operating Pressure	Terminals	Body Material	Electrical Rating	Power
IMV-114	Residential Ice Machine Water Valve N-86 Dual	115-154 cc in 7.5 seconds, 40-80 cc per second	5/16" quick connect	1/4" quick connect 5/16" quick connect	20 PSI to 120 PSI	1/4" Male 3/16" Male	Polypro	120V AC 60Hz	35 Watts 20 Watts
IMV-124	Residential Ice Machine Water Valve N-86 Dual	115-154 cc in 7.5 seconds, 40-80 cc per second	5/16" quick connect	1/4" quick connect 5/16" quick connect	20 PSI to 120 PSI	1/4" Male 3/16" Male	Polypro	120V AC 60Hz	35 Watts 20 Watts
IMV-201	Residential Ice Machine Water Valve S-86	140 cc in 7.5 seconds	7/16" 24 UNS	7/16" 20 UNF	20 PSI to 120 PSI	1/4" Male	Polypro	120V AC 60Hz	35 Watts
IMV-322	Residential Ice Machine Water Valve N-86 Dual Inline	115-154 cc in 7.5 seconds, 40-80 cc per second	5/16" quick connect	1/4" quick connect 5/16" quick connect	20 PSI to 120 PSI	1/4" Male 3/16" Male	Polypro	120V AC 60Hz	35 Watts 20 Watts
IMV-494	Residential Ice Machine Water Valve S-86	0.06 GPM to 0.60 GPM	1/4" flare, loxit or compression	7/16" 20 UNF	20 PSI to 120 PSI	1/4" Male	Polypro	120V AC 60 Hz	35 Watts
IMV-542	Residential Ice Machine Water Valve N-86 Dual	113-141 cc in 7.5 seconds, 24-58 cc per second	7/16" 20 UNF	7/16" 20 UNF 1/2" 20 UNF	20 PSI to 120 PSI	1/4" Male 3/16" Male	Polypro	120V AC 60Hz	35 Watts 20 Watts
IMV-576	Residential Ice Machine Water Valve S-86	0.06 GPM to 0.60 GPM	1/4" flare, loxit or compression	7/16" 20 UNF	20 PSI to 120 PSI	1/4" Male	Polypro	120V AC 60 Hz	35 Watts
IMV-696	Residential Ice Machine Water Valve N-86 Dual Inline	70 cc in 7.5 seconds, 40-80 cc per second	5/16" quick connect	1/4" quick connect 5/16" quick connect	20 PSI to 120 PSI	1/4" Male 3/16" Male	Polypro	120V AC 60Hz	35 Watts 20 Watts
IMV-701	Residential Ice Machine Water Valve S-86	No flow control	7/16" 24 UNS	7/16" 20 UNF	20 PSI to 120 PSI	1/4" Male	Polypro	120V AC 60Hz	15 Watts
IMV-708	Residential Ice Machine Water Valve N-86 Dual	130 CC in 7.5 seconds, 22-38 CC per second	1/4" flare, loxit or compression	7/16" 20 UNF, 1/2" 20 UNF	20 PSI to 120 PSI	1/4" Male, 3/16" Male	Polypro	120V AC 50/60 Hz	35 Watts 20 Watts
IMV-716	Residential Ice Machine Water Valve S-86	140 cc in 7.5 seconds	7/16" 24 UNS	1/4" quick connect	20 PSI to 120 PSI	1/4" Male	Polypro	120V AC 60Hz	35 Watts
IMV-782	Residential Ice Machine Water Valve S-86	140 cc in 7.5 seconds	7/16" 24 UNS	7/16" 20 UNF	20 PSI to 120 PSI	1/4" Male	Polypro	120V AC 60Hz	35 Watts
IMV-990	Residential Ice Machine Water Valve S-86	180-600 cc in 7.5 seconds	7/16" 24 UNS	5/16" quick connect	20 PSI to 120 PSI	1/4" Male	Polypro	120V AC 60Hz	20 Watts
IMV-2401	Residential Ice Machine Water Valve N-86 Dual	116 cc in 7.5 seconds	7/16" 20 UNF	7/16" 20 UNF	20 PSI to 120 PSI	1/4" Male	Polypro	120V AC 60Hz	35 Watts 15 Watts
IMV-8100	Residential Ice Machine Water Valve S-86	180-600 cc in 7.5 seconds	7/16" 24 UNS	5/16" quick connect	20 PSI to 120 PSI	1/4" Male	Polypro	120V AC 60Hz	20 Watts

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Customer Service 1.800.304.6563

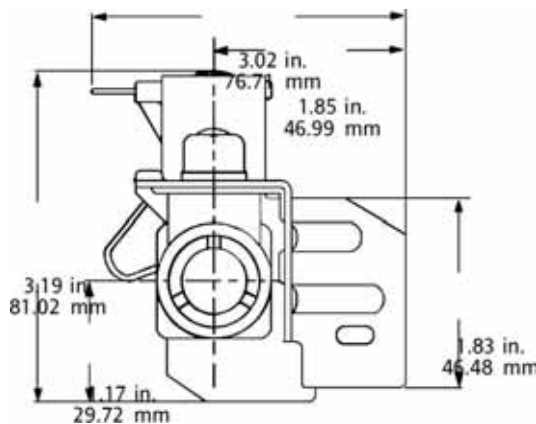
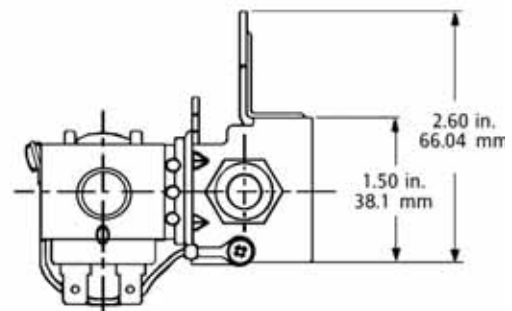
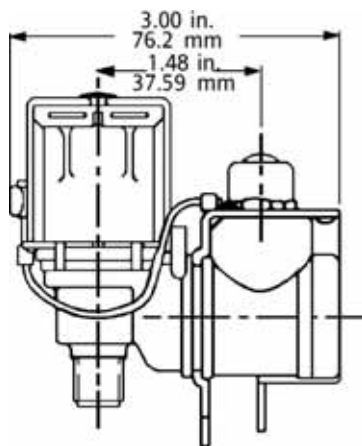
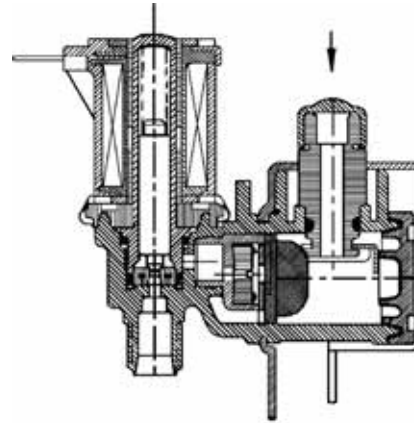
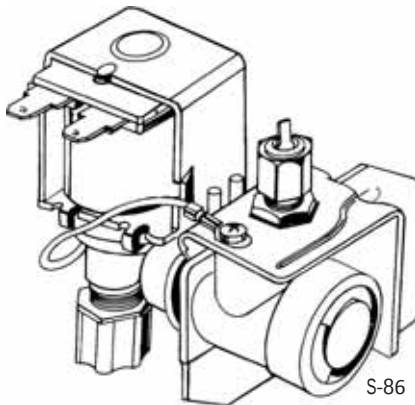
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WATER VALVES

Robertshaw®

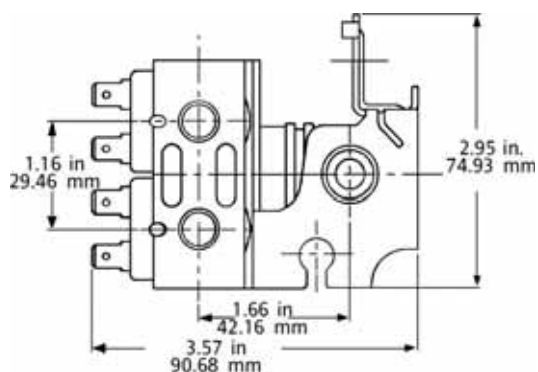
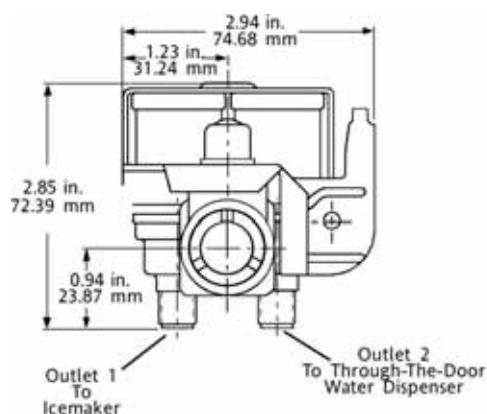
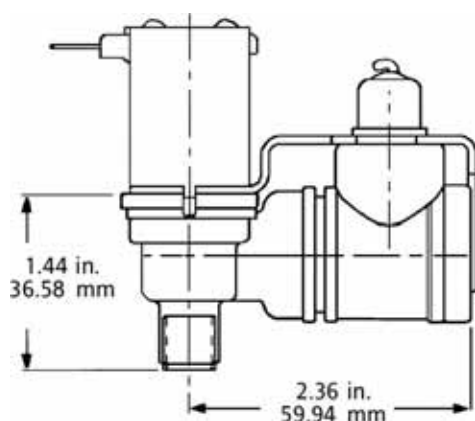
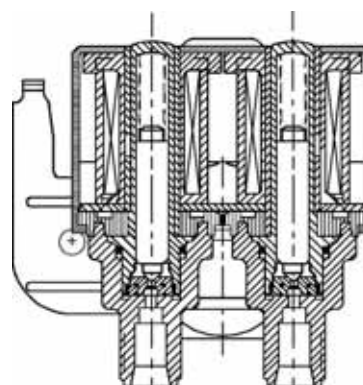
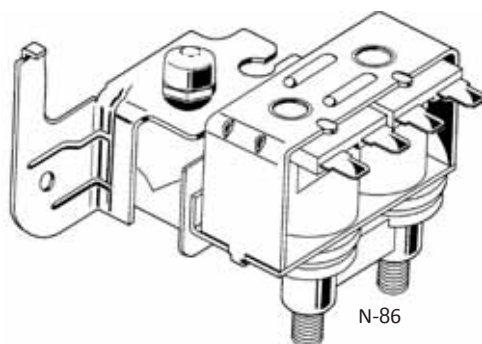
Product Drawings



WATER VALVES



Product Drawings



Robertshaw
®



WATER VALVES

Robertshaw®



IMV-1401

DIRECT ACTING SOLENOID WATER VALVES

S-55 Series

The Robertshaw® S-55 Water Valve Series is designed to prevent foreign material from interfering with the drain function in automatic dishwashers and commercial icemakers.

Features and Benefits

- Direct acting solenoid valves provide high flow at low head pressure
- Encapsulated coil provides high mechanical and dielectric strength, and is moisture resistant
- Bodies are made of polypro to withstand a variety of harsh water conditions
- Suitable for applications using water at temperatures up to 160°F (71°C)

Replacement Information

Part Numbers	Replaces	Factory Number
IMV-1401	Scotsman 11051401	K-55017-9
IMV-1402	Scotsman 11051402	K-55017-11

Specifications

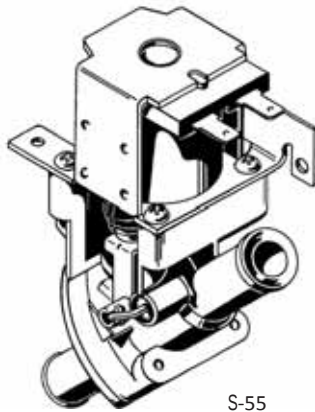
Part Numbers	Description	Flow Rate	Inlet	Outlet	Operating Pressure	Terminals	Body Material	Electrical Rating	Power
IMV-1401	Commercial Ice Machine Water Valve S-55	NA	1 1/16" ID Hose	5/8" ID Hose	0 PSI to 7 PSI	1/4" Male	Polypro	208/230V AC 60 Hz	38 Watts
IMV-1402	Commercial Ice Machine Water Valve S-55	NA	1 1/16" ID Hose	5/8" ID Hose	0 PSI to 7 PSI	1/4" Male	Polypro	120V AC 60 Hz	28 Watts



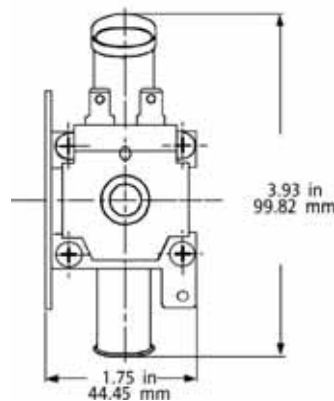
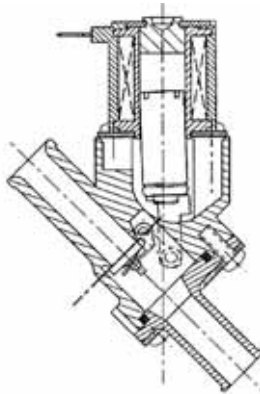
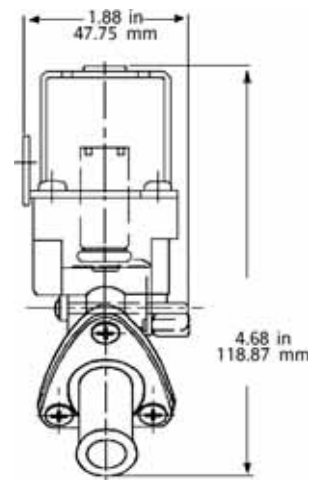
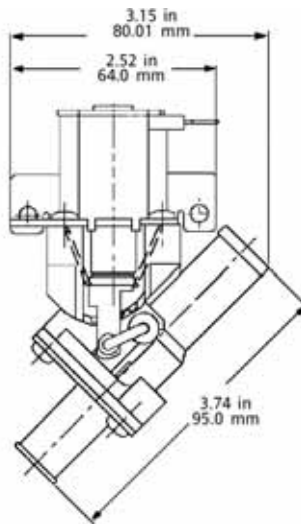
WATER VALVES



Product Drawings



S-55



Robertshaw
®

1 Year
Limited
Warranty



WATER VALVES

Robertshaw®



CB-880

GRAVITY-FED DUMP WATER VALVES

GS-56 Series

The Robertshaw® GS-56 Water Valve Series is designed to dispense water in coffee and other hot beverage vending machines. This direct acting, gravity-fed dump valve is capable of providing low volume liquid flow at a minimum head pressure and a water temperature of 200°F (93°C).

Features and Benefits

- Vent tube
- External flow adjustment screw slotted or hex
- Polysulfone body material for good chemical resistance and high temperature stability
- Maximum water temperature is 200°F (93°C)

Replacement Information

Part Numbers	Replaces	Factory Number
CB-102	Grindmaster 61102	K-56778-41
CB-116	Bunn-O-Matic 26116002	K-56778-51
CB-880	Wilbur Curtis WC880E	K-56778-35

Specifications

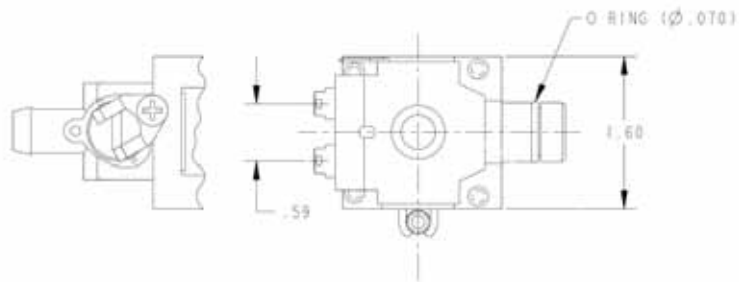
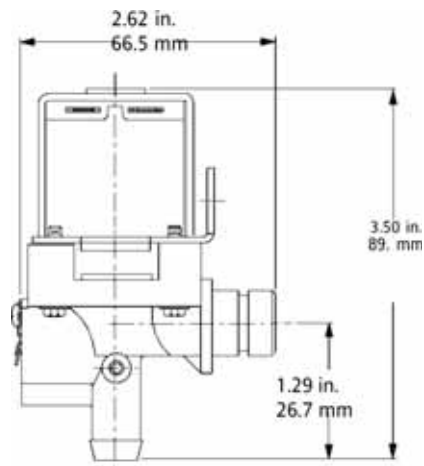
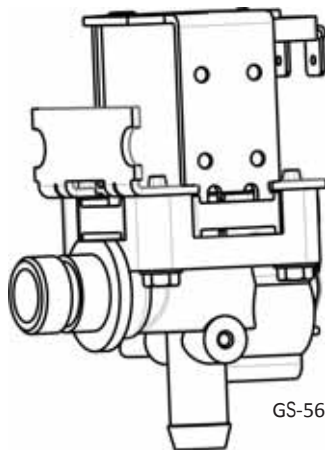
Part Numbers	Description	Flow Rate	Inlet	Outlet	Operating Pressure	Terminals	Body Material	Electrical Rating	Power
CB-102	Commercial Coffee Brewer Water Valve GS-56 with Venting Elbow	1.43 GPM	5/8" OD with O ring groove	1/2" ID Hose	20" Head	1/4" Male	Polysulfone	120V AC 50/60 Hz	12 Watts
CB-116	Commercial Coffee Brewer Water Valve GS-56	1.43 GPM	5/8" OD with O ring groove	1/2" ID Hose	20" Head	1/4" Male, Bent Down 90°	Polysulfone	120V AC 50/60 Hz	12 Watts
CB-880	Commercial Coffee Brewer Water Valve GS-56	1.43 GPM	5/8" OD with O ring groove	1/2" ID Hose	20" Head	1/4" Male	Polysulfone	120V AC 50/60 Hz	12 Watts



WATER VALVES



Product Drawings



Robertshaw[®]

1 Year
Limited
Warranty

F21



WATER VALVES

Robertshaw®



DW-952

GENERAL PURPOSE WATER VALVES

S-45 Series

The Robertshaw® S-45 Water Valve Series is designed as a general purpose valve for energy conserving plumbing and heating applications.

Features and Benefits

- Pilot-operated design provides flow capacity with minimum power requirements
- Serviceable strainer incorporated for the protection of both the valve and the appliance
- Encapsulated coil provides high mechanical and dielectric strength, and is moisture resistant
- UL requirements met for intermittent duty operation
- Suitable for applications using water at temperatures up to 160°F (71°C)

Replacement Information

Part Numbers	Replaces	Factory Number
DW-952	Moyer Diebel 504952	K-62687-44
IMV-001	Scotsman 12-2990-01	K-62687-128
PL-849	Sloan Valve 0305849	K-77634

Specifications

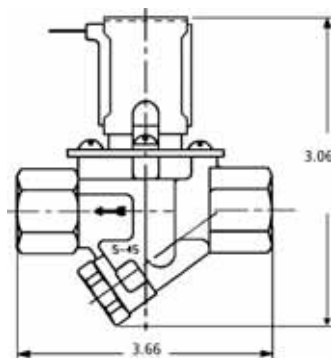
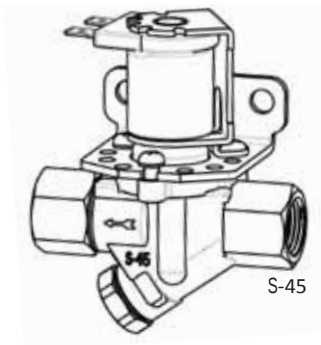
Part Numbers	Description	Flow Rate	Inlet	Outlet	Operating Pressure	Terminals	Body Material	Electrical Rating	Power
DW-952	Commercial Dishwasher Water Valve S-45	Up to 5 GPM	3/8" 18 FNPT	3/8" 18 FNPT	20 PSI to 120 PSI	1/4" Male	Brass	120V AC 50/60 Hz	10 Watts
IMV-001	Commercial Ice Maker Water Valve S-45	0.19 GPM	3/8" 18 FNPT	3/8" ID Hose	20 PSI to 120 PSI	1/4" Male	Brass	120V AC 60Hz	15 Watts
PL-849	Commercial Plumbing Water Valve S-45	NA	3/8" 18 FNPT	3/8" 18 FNPT	20 PSI to 120 PSI	1/4" Male	Low Lead Brass	24V AC 50/60 Hz	7 Watts



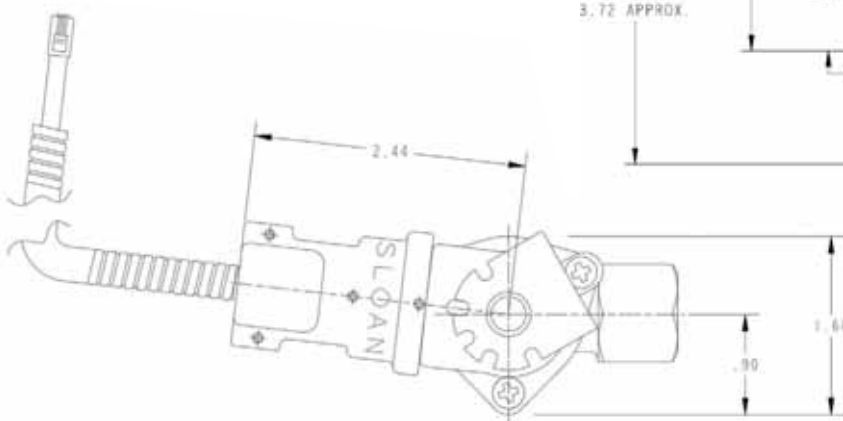
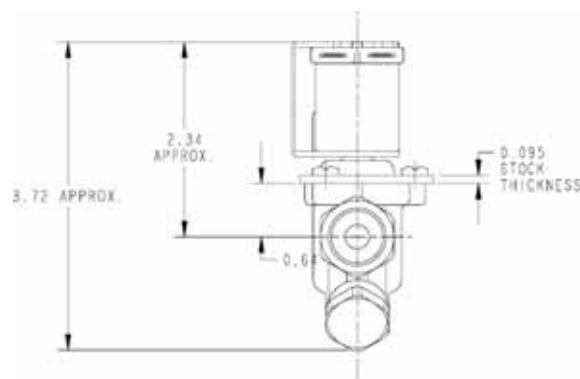
WATER VALVES



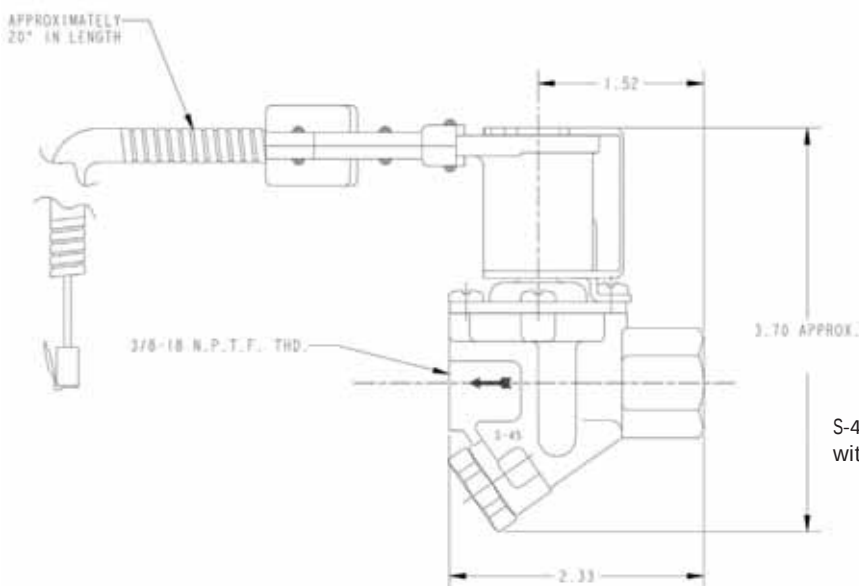
Product Drawings



S-45
with Connector



S-45
with Connector



S-45
with Connector

Robertshaw
®

1 Year
Limited
Warranty

F23



WATER VALVES

Robertshaw®



V180

GENERAL PURPOSE WATER VALVES

V Series

The Robertshaw® V180 and V280 Water Valve Series is designed for use in clothes washers, dishwashers, showers, air conditioning systems and other domestic or commercial applications.

Flexible and designed and produced to meet the stringent requirements of the markets of today and the future.

Features and Benefits

- Easy to rotate, coil to match OEM application
- Flexible mounting with four different positions
- Hose bard connection
- Conversion kit with bracket, screen, popular flow controls, terminals
- IEC certified

Specifications

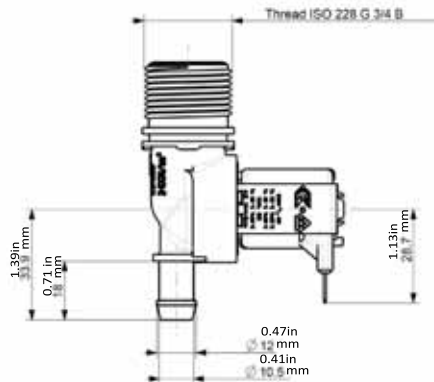
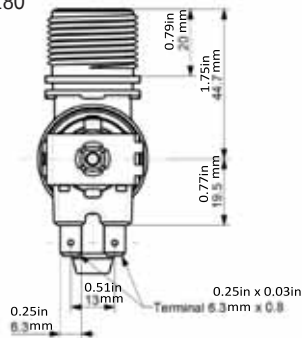
Part Numbers	Description	Flow Regulator	Inlet	Outlet	Operating Pressure	Terminals	Body Material	Thermistor	Outlet Orientation	Electrical Rating	Power
V180 (EU)	Clothes Washer and Dishwasher inlet water valve kit	2.5L/min, 8.0L/min, 10.0L/min	Thread ISO 228 G 3/4 B	10mm	0.02-1 Mpa	6.35mm Male	Polyamide	NA	90°	230V AC 50/60 Hz	6 Watts
V190 (EU)	Clothes Washer and Dishwasher inlet water valve kit	2.5L/min, 8.0L/min, 10.0L/min	Thread ISO 228 G 3/4 B	10mm	0.02-1 Mpa	6.35mm Male	Polyamide	NA	180°	230V AC 50/60 Hz	6 Watts
V280 (EU)	Clothes Washer and Dishwasher inlet water valve, dual kit	2.5L/min, 8.0L/min, 10.0L/min	Thread ISO 228 G 3/4 B	10mm	0.02-1 Mpa	6.35mm Male	Polyamide	NA	180°	230V AC 50/60 Hz	6 Watts
V290 (EU)	Clothes Washer and Dishwasher inlet water valve, dual kit	2.5L/min, 8.0L/min, 10.0L/min	Thread ISO 228 G 3/4 B	10mm	0.02-1 Mpa	6.35mm Male	Polyamide	NA	90°	230V AC 50/60 Hz	6 Watts

WATER VALVES

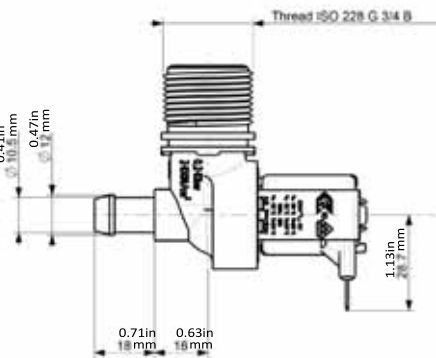
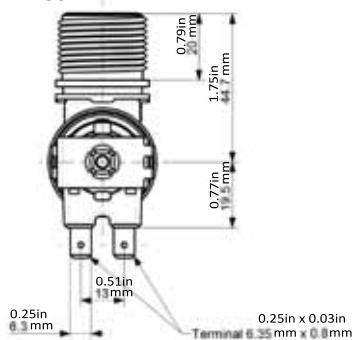


Product Drawings

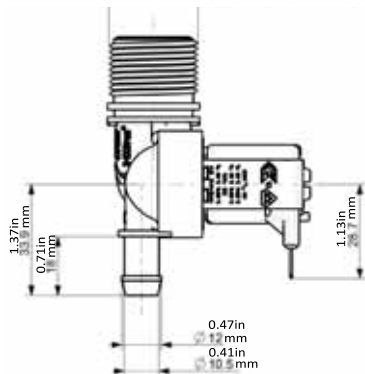
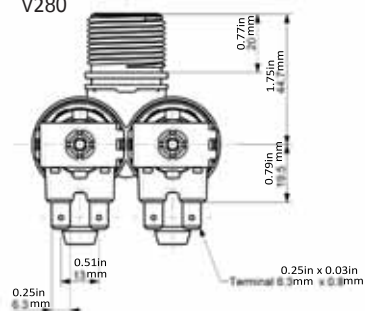
V180



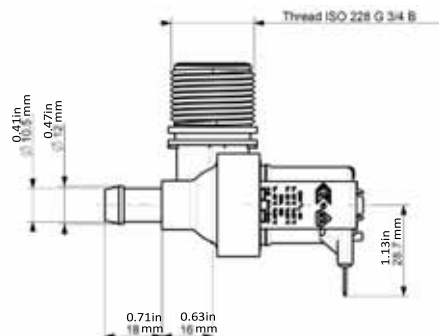
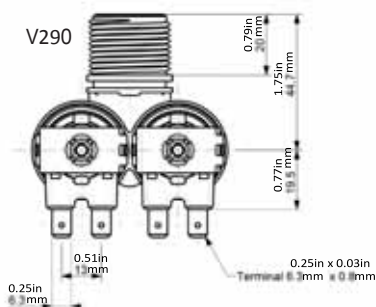
V190



V280



V290



Robertshaw[®]

1 Year
Limited
Warranty

F25



WATER VALVES

Robertshaw®



F3

PRESSURE SENSOR

F3 Series

The Robertshaw® F3 Linear Pressure Sensor is a transducer for pressure measurement. It has been developed to measure the level of water in the tank of the washing machine. The sensor continuously informs the main electronic control about the water level, allowing the water management control during all phases of the wash program.

Features and Benefits

- Replaces previous water level switch without any change in the machine structure
- Allows for use by main electronic control units of washing machines by being PEC (Protective Electronic Circuit)
- Strong immunity from internal and external interference like EMI and induced magnetic fields

Specifications

Part Numbers	Description
F3	Pressure Sensor

1 Year
Limited
Warranty

F26

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Customer Service 1.800.304.6563

10-021	B43	700-502	B3	1720-007	A26
10-066	B43	700-504	B3	1720-008	A26
10-067	B43	700-505	B3	1720-801	A26
10-114	B43	700-506	B3	1720-802	A26
10-209	B43	700-509	B3	1751-003	B19
10-210	B43	700-511	B3	1751-012	B44
10-227	B42	700-513	B6	1751-013	B19
10-650	B40	700-515	B3	1751-021	B19
10-760	B42	700-516	B3	1751-729	B42
11-193	B43	700-804	A22	1820-009	B34
11-195	B43	700-886	A22	1820-019	B34
11-293	B43	700-887	A22	1830-001	B34
35-605606-111	B29	705-205	B9	1830-113	B34
35-605606-223	B29	705-401	B9	1830-210	B34
35-630501-001	B27	705-402	B9	1830-489	B34
35-655800-003	B28	705-404	B9	1830-490	B34
35-655801-013	B28	705-451	B9	1830-491	B34
35-704600-005	B29	705-452	B9	1830-702	B34
35-725206-117	B29	705-461	B9	1950-001	B38
41-204	A28	705-462	B9	1950-532	B38
41-205	A28	710-203	B11	1951-001	B38
41-206	A28	710-205	B11	1951-536	B38
41-209	A28	710-296	B18	1960-027	B36
41-224	A28	710-402	B11	1970-018	B36
41-401	B30	710-501	B11	1970-024	B36
41-402	B30	710-502	B11	1970-036	B36
41-403	B30	710-503	B11	1980-018	B36
41-404	B30	710-511	B11	1980-024	B36
41-405	B30	712-017	B18	1980-030	B36
41-406	B30	720-070	B13	1980-036	B36
41-407	B30	720-079	B13	1980-048	B36
41-408	B30	720-400	B12	2200	C28
41-409	B30	720-402	B12	2200/S	C28
41-410	B30	720-406	B12	2201	C28
41-411	B30	720-472	B12	2201/S	C28
41-412	B30	720-474	B12	2202	C28
41-414	B30	722-051	B14	2202/S	C28
41-418	B30	722-079	B14	2203	C28
41-419	B30	780-001	B20	2203/S	C28
41-521	A29	780-002	B20	2204	C28
41-604	B32	780-502	B24	2204/S	C28
41-605	B32	780-511	B24	2205	C28
41-802N	B33	780-715	B21	2205/S	C28
41-803	B33	780-735	B21	2206	C28
110-202	B15	780-783	B23	2206/S	C28
110-262	B15	780-785	B23	2210/4	C27
110-265	B15	780-790	B23	2210/4E	C27
110-326	B15	780-845	B21	2210/4S	C27
220X	C28	780-910	B22	2210/4SE	C27
220X/S	C28	785-001	B25	2220/4	C27
695-101	B26	1020UL/2S	C25	2220/4E	C27
700-048	B2	1020UL/3S	C25	2220/4S	C27
700-049	B2	1028UL/2S	C25	2220/4SE	C27
700-056	B2	1028UL/3S	C25	2230/4	C27
700-057	B2	1064UL/3S	C25	2230/4E	C27
700-059	B2	1064UL/4S	C25	2230/4S	C27
700-064	B7	1068UL/3S	C25	2230/4SE	C27
700-205	B8	1068UL/4S	C25	2271/2S	C28
700-400	B4	1070UL/4S	C25	2271/3S	C28
700-402	B4	1070UL/5S	C25	2374-495	B41
700-406	B4	1078UL/5S	C25	2374-498	B41
700-409	B4	1099UL/9S	C25	2374-510	B40
700-422	B6	1101	D15	3310/4S	C31
700-426	B4	1102	D15	3310/5S	C31
700-442	B4	1103	D15	3310/7S	C31
700-452	B5	1104	D15	3320/4S	C31
700-454	B5	1720-004	A26	3320/5S	C31
700-501	B3	1720-005	A26	3320/7S	C31

3330/4S	C31	5300-671	A7	C	
3330/5S	C31	5300-711	A7	C12-2001	C11
3330/7S	C31	5300-735	A7	C12-5010	C10
3910/33	C33	5300-766	A7	C17-100	C10
3940/2	C33	5500-134	A4	CB-102	F20
3940/3	C33	5500-135	A4	CB-104	F8
3940/5	C33	5500-200	A4	CB-116	F20
3940/7	C33	5500-200M	A2	CB-826	F12
3950/22	C33	5500-202	A4, G7	CB-880	F20
3950/33	C33	5500-212	A4	CW-001	F2, F3
4075-029	A24	5500-234	A4	CW-164	F2, F3
4075-200	A24	5500-235	A4	CW-300	F6
4200-005	A20	5500-287	A4	CW-333	F2, F3
4200-007	A20	6590/3	C36	CW-346	F2, F3
4200-011	A20	6590/4	C36	CW-347	F2, F3
4200-025	A20	6590/5	C36	CW-349	F2, F3
4200-026	A20	6590/6	C36	CW-400	F2, F3
4200-503	A20	6590/7	C36	CW-402	F2, F3
4200-505	A20	6590/9	C36	CW-468	F2, F3
4200-508	A20	6590/11	C36	CW-471	F2, F3
4290-006	A18	8041-00	D9	CW-531	F6
4290-008	A18	8045-00	D9	CW-551	F2, F3
4290-020	A18	8045-20	D9	CW-600	F2, F3
4303/2	C35	8141-00	D9	CW-673	F2, F3
4303/2S	C35	8141-20	D9	CW-751	F2, F3
4303/3	C35	8145-00	D9	CW-932	F2, F3
4303/3S	C35	8145-20	D9	CW-1300	F6
4305/2	C35	8145-20B	D9	CW-E2	F2, F3
4305/2S	C35	8145-AV	D2	D	
4308/2	C35	8145-AV-M	D2	D81-8145-00EX	D9
4308/3	C35	8245-20	D9	D81-8145-20EX	D9
4308/3S	C35	9045-00	D12	D81-8145-21EX	D9
4316/3	C35	9045-00M	D12	DW-003	F12
4316/4	C35	9105/RA4	C25	DW-101	F12
4316/5	C35	9105/RA6	C25	DW-249	F12
4316/5S	C35	9145-00	D12	DW-345	F12
4341/7S	C35	9145-00M	D12	DW-534	F12
4350-015	A16	9530N814	C7	DW-721	F10
4350-027	A16	9531N195	C6	DW-952	F22
4350-028	A16	9531N320	C6	E	
4350-029	A16	9531N395	C6	E15-2601	C11
4350-040	A16	1290132-A24	C21	E101B	D18
4350-127	A16	1290132-A36	C21	ERC2-212111-370	C2
4350-128	A16	1309007-044	C4	ETC-111000-000	C4
4590-065	B45	A		ETC-112000-000	C4
4590-067	B45	A12-700	C6	ETC-141000-000	C4
4590-069	B45	A12-701	C6	ETC-211000-000	C4
4590-071	B45	A12-1506	C6	ETC-212000-000	C4
4590-170	B45	A12-1560	C6	F	
4590-816	B45	A22-391	C7	F3	F26
5000-811	A14	A22-1112	C7	F25-107	C12
5000-851	A14	A22-1129	C7	G	
5210-125	A12	A30-180	C7	G1401-00	D19
5225-009	A9	A30-260	C7	G1401-20	D19
5225-010	A9	A30-261	C7	G1401-21	D19
5225-047	A9	A30-262	C7	I	
5225-054	A9	A30-263	C7	IMV-001	F22
5225-112	A9	A30-301	C7	IMV-003	F10
5300-146	A6	A30-2209	C7	IMV-114	F14, F15
5300-175	A6	A30-2210	C7	IMV-124	F14, F15
5300-219	A6	A1401-00	D19	IMV-201	F14, F15
5300-401	A6	A1401-20	D19	IMV-202	F10
5300-406	A7	A1401-21	D19	IMV-322	F14, F15
5300-502	A7	B		IMV-373	F10
5300-612	A7	B1401-00	D19	IMV-399	F10
5300-614	A7	B1401-20	D19	IMV-0400	F10
5300-618	A7	B1401-21	D19		
5300-641	A7				
5300-651	A7				

IMV-0402.....	F10	O16-528.....	C16	T	
IMV-494.....	F14, F15	O16-530.....	C17	TU40.....	D17
IMV-529.....	F8	O16-531.....	C17	U	
IMV-542.....	F14, F15	O16-624.....	C16	UNI-KIT360.....	B19
IMV-576.....	F14, F15	O16-636.....	C15	V	
IMV-604.....	F8	O16-637.....	C15	V2-4100F0-370.....	C22
IMV-605.....	F8	O16-638.....	C16	V2-408060-170.....	C22
IMV-696.....	F14, F15	O16-639.....	C15	V2-408060-270.....	C22
IMV-701.....	F14, F15	O16-640.....	C15	V2-410060-470.....	C22
IMV-708.....	F14, F15	O16-641.....	C15	V3-410080-770.....	C22
IMV-716.....	F14, F15	O16-642.....	C15	V3-412080-870.....	C22
IMV-782.....	F14, F15	O16-643.....	C15	V6-412080-170.....	C22
IMV-865.....	F8	O16-6930.....	C15	V6-414080-170.....	C22
IMV-990.....	F14, F15	O16-6950.....	C15	V10-414080-170.....	C22
IMV-1304.....	F8	O16-6951.....	C15	V10-418140-170.....	C22
IMV-1401.....	F18	O16-6954.....	C15	V12-4220T0-270.....	C22
IMV-1402.....	F18	O16-6980.....	C15	V180.....	F24
IMV-2201.....	F10	O16-6981.....	C15	V190.....	F24
IMV-2401.....	F14, F15	O16-8705.....	C16	V280.....	F24
IMV-3404.....	F8	O16-8706.....	C16	V290.....	F24
IMV-8100.....	F14, F15	O16-8713.....	C16	VA-2.....	C9
K		O16-8750.....	C17	VB7.....	C9
K12L-1529-002.....	C8	O16-8751.....	C17	VC1.....	C9
K50P-1125-001.....	C8	O16-8900.....	C15	VF3.....	C9
K50P-1126-001.....	C8	O17-8701.....	C19	VL1.....	C9
K50P-1127-001.....	C8	O17-8703.....	C19	VL2.....	C9
K50P-6063-001.....	C8	O17-8705.....	C19	VL3.....	C9
K50Q-1125-001.....	C8	O17-8711.....	C19	VL4.....	C9
K50Q-1126-001.....	C8	O18-100.....	C20	VL5.....	C9
K50Q-1127-001.....	C8	O20-7006.....	C17	VL6.....	C9
K-3001.....	C12	O60-100.....	C15	VL7.....	C9
L		P		VL9.....	C9
LDK-110000-070.....	C24	P30-3601.....	C13	VP4.....	C9
LDK-310000-070.....	C24	P30-3701.....	C13	VR-6.....	C9
LDK-410000-070.....	C24	P30-3702.....	C13	VS-5.....	C9
LED145-11.....	A30	P30-3801.....	C13	VT9.....	C9
LED193-009.....	A30	P30-5826.....	C13	VT93.....	C9
M		P30-5839.....	C13	VX0.....	C9
M01.....	A2	P30-5848.....	C13	W	
M601.....	A2	P47.....	D15	W220.....	D16
M602.....	A2	PL-849.....	F22		
M32314K.....	A2	PS984-1R.....	E21		
M55314K.....	A2	PS986-1R.....	E21		
M58314K.....	A2	PS988-1R.....	E21		
M82314K.....	A2	PS2110.....	E13		
MP101K.....	A2	PS2210.....	E13		
O		PS3110.....	E15		
O10-1402.....	C16	PS3210.....	E15		
O10-1408.....	C15	PS4000.....	E17, E19		
O10-1409.....	C15	S			
O10-1410.....	C15	SMART 1000.....	E3		
O10-1416.....	C15	SMART 2000.....	E5		
O10-1418.....	C15	SMART 3000.....	E7		
O10-1483.....	C16	SMART 4000.....	E9		
O10-2054.....	C17	SMART-M-04.....	E11		
O12-1502.....	C19	SMART-R-01H.....	E11		
O12-1506.....	C19	SMART-R-01V.....	E11		
O12-1549.....	C19	SMART-R-02.....	E11		
O12-4154.....	C19	SMART-R-03.....	E11		
O12-4833.....	C19	SMART-R-05.....	E11		
O12-4834.....	C19	SMART-R-06.....	E11		
O12-4860.....	C19	ST10-80K.....	B16		
O12-4900.....	C19	ST10-90K.....	B16		
O12-4902.....	C19	ST12-70K.....	B16		
O16-108.....	C17	ST12-80K.....	B16		
O16-200.....	C17	ST13-70K.....	B16		
O16-527.....	C16	ST22-60K.....	B16		
		ST22-80K.....	B16		

TIPS ON SELECTING A REPLACEMENT GAS VALVE

Safety Warning: Any work on gas valves or equipment should be performed by a qualified service technician only. Please do not attempt any repairs or replacement if you are not qualified. Serious injury can occur from improper installation or usage.

Disclaimer: The cross references provided in this catalog are intended to be functional equivalents and not exact matches of products listed. Robertshaw assumes no liability in connection with the information contained herein and makes no representations regarding the accuracy of any such information. Final selection of a replacement product is the sole responsibility of the buyer.

GAS VALVE SELECTION CHECKLIST GUIDELINES

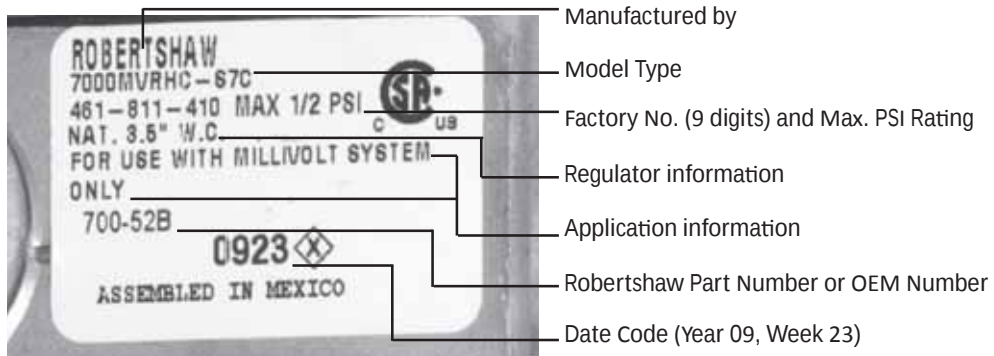
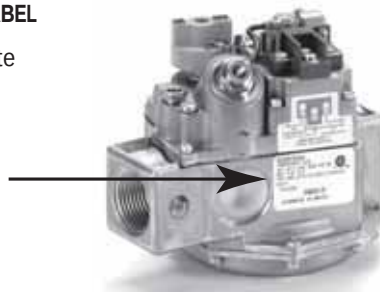
Always check the following with any gas valve retrofit application:

1. Check capacity
2. Check inlet and outlet sizes
3. Determine if the valve is non-regulated
 - a. Check if the pressure regulator requires adjusting
4. Determine if the replacement requires straight-thru
5. Determine if the application is LP or Natural Gas
 - a. For LP gas, a separate pressure regulator may be required
6. Determine if the pilot needs to be plugged
7. Determine if the valve is slow opening
8. Determine if a transformer is required
9. Determine if the replacement shaft and hub will require assembly
10. Check OEM and replacement manuals for proper installation instructions

HOW TO READ AND INTERPRET A GAS VALVE LABEL

To identify your valve type, locate the red or white factory label on the valve body.

Note: It is essential to write down the nine digit factory number correctly.



An OEM valve may have an OEM part number instead of the Robertshaw part number. The cross reference on the following pages will cross most nine digit factory numbers or OEM part numbers to the Robertshaw numbers.

Gas valves with white labels are usually manufactured to be used on natural gas applications. Red labels indicate the valves are usually manufactured to be used on LP gas applications.

Any additional characters after the nine digit factory number are used for shipping purposes and should be ignored when cross referencing.

FACTORY MODEL CODE IDENTIFICATION

Factory Model Number			DESCRIPTION
7000	2000	7200	
•			A Unitrol 7000 Body with small diameter valve seat. 100,000 BTU
•			B Unitrol 7000 Body with large diameter valve seat. 240,000 or 300,000 BTU
•			BB Unitrol 7000 Body with medium diameter valve seat - Intrinsicly "non-hunting"
•			7010 Unitrol 7000 Body without a gas cock
•			CSTR Convertible Hydraulic Actuator - From natural to LP gas
•	•	•	D Solenoid Valve - Pilot Gas - Single coil operated on AC
•	•	•	E Electric Actuator - 24V AC
•			E12 Electric Actuator - 12V AC
•	•	•	E120 Electric Actuator - 120V AC
•		•	E240 Electric Actuator - 240V AC
•			EH Electric Heat Motor Actuator (obsolete)
•			EM Electric Actuator with manual override (obsolete)
•			ESTR-SS Electric Solid-State Actuator (obsolete)
•			F Factory Fixed (not adjustable regulator setting) (3.5° to 5.0° WC)
•			GO Bleed Gas Operated Actuator
•			GS Gas Cock Safety - with gas cock and safety valve - no main valve
•			GV Gas Valve without a safety valve - No Safety Magnet
•			-1H Remote dual hydraulic type - dual bellows
•	•		HC High Capacity Body
•			HHC High Capacity Body AGA rated for side ways or vertical mounting. Can be replaced by HC model
•	•	•	IPER Intermittent Pilot Ignition Gas Valve - regulated
•			L Relight Interlock type. A European requirement
•	•		LC Low Capacity Body - 710 Series
•	•	•	LP For Liquefied Petroleum Gases
•			M Manual Actuator
•			MS Millivolt Safety Magnet - uses thermopile type safety
•			MV Millivolt Actuator
•		•	P Pulse Combustion
•	•	•	R Regulator Type
•		•	RS Adjustable (High - Low) pressure regulator adjusts percentage of output. -3 = 50% of full flow -4 = 60% of full flow -5 = 70% of full flow -6 = 80% of full flow

Factory Model Number			DESCRIPTION
7000	2000	7200	
•			RB High/Low
•	•	•	RC Convertible regulator from natural gas to LP and back
		•	RN Negative Pressure Regulator
•			R1 Class I and II Natural Gas Pressure Regulator
•	•	•	R2 Two-Stage pressure regulator valve opens to percentage of full flow as indicated by the number -1 = 30% of full flow -2 = 40% of full flow -3 = 50% of full flow -4 = 60% of full flow -5 = 70% of full flow -6 = 80% of full flow
•			S Hydraulic Snap-Acting Actuator - non regulated
		•	SO Step-opening regulated with factory fixed setting 30 seconds max. To full flow: -1 = 30% of full flow -2 = 40% of full flow -3 = 50% of full flow -4 = 60% of full flow -5 = 70% of full flow
•			SR Hydraulic Regulated Snap-Acting Actuator
•			ST Hydraulic Snap - Throttle Actuator, but set-up for use on a specific gas; natural gas only or LP gas only. Non-regulated number indicates percentage of By-Pass flow. -1 = 30% of full flow -2 = 40% of full flow -3 = 50% of full flow -4 = 60% of full flow -5 = 70% of full flow
•			STR Hydraulic Snap-Throttle Actuator, regulator number indicates percentage of By-Pass flow. -2 = 40% of full flow -3 = 50% of full flow -4 = 60% of full flow -5 = 70% of full flow
•	•	•	S7 Slow Opening devices with either a plastic body or a metal body Orifice Valve Assembly A = 0 to 5 seconds to full flow B = 5 to 10 seconds to full flow C = 10 to 30 seconds to full flow
•			S13 Slow Opening Control with .0135 orifice in body, but no other "Slow Opening" device. 0 to 5 seconds to full flow.
•			S36 Slow Opening Control with two .018" orifices - one in Body and one in Cover, but no other Slow Opening device. 5 to 10 seconds to full flow.

GAS VALVE CROSS REFERENCE FOR UNI-LINE® PARTS

Factory Number	Uni-Line Number	Factory Number	Uni-Line Number	Factory Number	Uni-Line Number
110ER	120-402	7000BDER-S7A	700-056	7000BMSM	700-185
110ERCHC	120-407	7000BE	700-405	7000BMV	700-503
110ERCHC20-2E	120-472	7000BE	700-401	7000BMV	700-505
110ERCHCS0-2C	120-474	7000BE-120	700-451	7000BMVR	700-510
110ERCHCS0-2D	120-473	7000BE-120	700-453	7000BMVR	700-504
110S	120-204	7000BE-240	700-461	7000BMVR	700-508
110S	120-201	7000BE-240	700-463	7000BMVR	700-506
110S	120-200	7000BER	700-402	7000BMVR-LP	700-515
110SR	120-202	7000BER	700-400	7000BMVR-S7C	700-511
110SS	120-203	7000BER	700-404	7000BMVR-S7C	700-512
220RLPTS8P	110-286	7000BER	700-406	7000BMVR-S7C	700-507
220RLPTS8P	110-285	7000BER-120	700-454	7000DEHC-S7C	700-058
220RLPTS8P	110-280	7000BER-120	700-452	7000DER2-HC-3-LP-S7C	700-063
220RLPTSP	110-262	7000BER2-3-LP-S7C	700-445	7000DER2-HC-4-S7C	700-064
220RLPTSP	110-270	7000BER2-4	700-446	7000DERHC	700-057
220RLPTSP	110-267	7000BER-240	700-462	7000DERHC-S7C	700-059
220RLPTSP	110-266	7000BER-240	700-464	7000EHC-120-S7C	700-455
220RLPTSP	110-265	7000BER2-HC-3-LP-S7C	700-447	7000EHC-240-S7C	700-465
220RTSP	110-202	7000BER2-HC-4	700-448	7000EHC-S7C	700-441
7000AE	700-407	7000BERC	700-412	7000ELC	710-401
7000AER	700-408	7000BER-LP	700-411	7000ERHC	700-438
7000AERB-3-LP-S7C	700-435	7000BER-LP-S7C	700-429	7000ERHC-120	700-468
7000AERB-5-S7C	700-434	7000BER-S7A	700-426	7000ERHC-120-S7C	700-456
7000AERC	700-419	7000BER-S7C	700-428	7000ERHC-240-S7C	700-466
7000AGO	700-811	7000BGOR-S7B	700-804	7000ERHC-S7C	700-442
7000AGOR	700-812	7000BGO-S7B	700-803	7000ERLC	710-402
7000AM	700-101	7000BGVE	700-423	7000ERLC	710-404
7000AMR	700-102	7000BGVE	700-417	7000GOHC-S7B	700-823
7000AMSGO	700-881	7000BGVE	700-421	7000GORHC-S7B	700-824
7000AMSGOR	700-882	7000BGVE-120	700-457	7000GVEHC-120-S7C	700-459
7000AMSGOR-LP	700-888	7000BGVER	700-422	7000GVEHC-S7C	700-431
7000AMV	700-509	7000BGVER	700-424	7000GVERHC-120-S7C	700-458
7000AMV	700-501	7000BGVER	700-420	7000GVERHC-S7C	700-432
7000AMVR	700-502	7000BGVER-120	700-450	7000GVER-S7A	700-430
7000AS	700-215	7000BGVER2-3-LP-S7C	700-440	7000GVMVLC	710-513
7000AS	700-201	7000BGVER2-4	700-413	7000MHC-S7C	700-113
7000AS-1H	700-209	7000BGVER-S36	700-416	7000MLC	710-101
7000ASR	700-202	7000BGVMV	700-523	7000MRHC-S7C	700-114
7000ASR-1H	700-210	7000BGVMVR	700-524	7000MRLC	710-108
7000ASR-LP	700-216	7000BKER-S7A	700-062	7000MRLC	710-102
7000AST-3	700-203	7000BKER-S7A	700-066	7000MRLC	710-107
7000AST-3-1H	700-206	7000BKER-S7C	700-061	7000MVHC-S7C	700-521
7000AST-LP-3	700-204	7000BM	700-105	7000MVLC	710-501
7000AST-LP-3-1H	700-207	7000BMR	700-106	7000MVRB-5-LC	710-503
7000ASTR-3	700-205	7000BMSE-120-S7C	700-471	7000MVRB-5-LC	710-511
7000ASTR-3-1H	700-208	7000BMSE	700-409	7000MVRHC-S7C	700-522
7000ASTR-4	700-213	7000BMSE-120	700-472	7000MVRLC	710-508
7000ASTR-LP-4	700-212	7000BMSE-120	700-470	7000MVRLC	710-502
7000BDER2-3-LP-S7C	700-051	7000BMSE-LP-120	700-469	7000SLC	710-201
7000BDER2-4-S7A	700-053	7000BMSGO	700-885	7000SLC	710-218
7000BDER-LP-S7A	700-055	7000BMSGOR	700-886	7000SLC	710-203
7000BDER-S7A	700-052	7000BMSGOR	700-887	7000SRLC	710-205

Factory Number	Uni-Line Number	Factory Number	Uni-Line Number	Factory Number	Uni-Line Number
7000SRLC	710-204	7200DER-SO-3	720-054	7222DERC	722-053
7010BGVER	700-418	7200DER-SO-4-120	720-083	7222DER-S7A	722-052
7010BGVMV	700-517	7200E	720-401	7222IPER	722-079
7010BGVMV	700-514	7200ER	720-402	R103RCTSLP	110-506
7010BGVMV	700-513	7200ER	720-400	R103RCTSLPPA	110-503
7010BGVMV	700-513	7200ER	720-406	R103RVTSLP	110-507
7100DER	700-077	7200ER	720-404	R103RVTSLP	110-509
7100DERB-5-S02	700-078	7200ERC	720-007	R103RVTSLPP	110-502
7100DER-LP-S7C	700-073	7200ERCS-2	720-472	R103RVTSLPPA	110-505
7100DER-LP-S7C	700-071	7200ERCS-2	720-474	R103RVTSLPPA	110-501
7100DERN	700-074	7200ER-S7C	720-403	R103RVTSLPPA	110-504
7100DERP	700-076	7200IPER	720-079	R103RVTSLPPA	110-508
7100DER-S7C	700-070	7200IPER2-4	720-082	R110RCTS-PC	110-203
7100DER-S7C	700-072	7200IPER-LP	720-080	R110RCTS-PC	110-204
7200DER	720-051	7200IPER-LP-S7C	720-073	R110RTS	110-326
7200DERB-5-SO-2	720-078	7200IPER-LP-S7C	720-071	R110RTS8P	110-353
7200DERCS-1	720-055	7200IPER-S7C	720-072	R110RTSP	110-206
7200DERN	720-074	7200IPER-S7C	720-070	R65RRTSP	110-268
7200DER-S7C	720-050	7200IPER-SO-4	720-081		
7200DER-S7C	720-052	7222DER	722-051		

COMMERCIAL COOKING CROSS REFERENCE FOR UNI-LINE® PARTS

Factory Number	Uni-Line Number	Factory Number	Uni-Line Number	Factory Number	Uni-Line Number
401XM	41-224	GS-C8-060-00-00	4290-008	S-234-36	5300-175
501A	41-204	GS-J1-036-00-00	4290-020	S-23-48	5300-041
501A	41-205	INF-120-1152	5500-134	S-384-36	5300-114
501A	41-209	INF-120-1152	5500-135	SA-245	5300-017
7000BGOR-S7B	700-804	INF-240-1153	5500-234	SA-382-36	5300-017
7000BMSGOR	700-886	INF-240-1153	5500-235	SJ-157-36	5300-146
7000BMSGOR	700-887	INF-240-597	5500-202	SJ-328-36	5300-146
BJWA25PB-02-48	4350-015	INF-240P-1047	5500-287	SM2	41-521
BJWA25PC-09-36	4350-028	INF-240P-1148	5500-212	SP-184-60	5300-612
BJWA25PD-10-48	4350-040	INF-240PX-803	5500-200	SP-186-60	5300-614
BJWA25PM-02-48	4350-127	KA-601-36	5300-015	SP-191-60	5300-618
BJWA25PM-03-48	4350-128	KA-601-72	5300-088	SP-192-36	5300-641
BJWA25PM-11-48	4350-027	KA-604-48	5300-027	SP-197-60	5300-651
BJWA44TC-12-36	4350-029	KNP-6-36	5300-502	SP-200-60	5300-671
D1-32-060-59-00	5000-851	KX-161-24	5300-766	SP-390-36	5300-219
D1-C5-060-59-00	5000-811	KX-299	5300-401	TS11J-1211-1-0	1720-008
EA3-44-36	5300-100	KX-396	5300-402	TS11J-1311-1-0	1720-005
FDH-1-06-48	4200-508	KX-87-36	5300-711	TS11J-3211-1-0	1720-004
FDO-1-04-48	4200-007	KXP-149-60	5300-735	TS11J-4211-1-0	1720-007
FDO-1-07-48	4200-005	LCC-36-060-00-00	5225-010	Z871470042	5210-125
FDO-3-05-54	4200-025	LCH-37-030-00-00	5225-009	Z950641100	1720-801
FDTH-1-05-48	4200-505	LCH-68-024-00-00	5225-047	Z950644100	1720-802
FDTH-1-06-48	4200-503	LCH-J6-024-00-00	5225-054		
FDTH-3-06-54	4200-026	LCHM-05-030-00-00	5225-112		
FDTO-1-05-48	4200-011	BJWA25PC-01-48	4350-027		
FJT-102-1040	4075-029	RX-1-36	5300-401		
FJTDO-13	4075-200	RX-2-24	5300-402		
GS-A6-030-18-00	4290-006	RX-6-36	5300-406		

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EFFECTIVE NOVEMBER 3, 2014

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Distributor will ensure by its contract with the end user or ultimate owner or its buyer that Company is given the benefit of these Terms and Conditions of Sale, including the exclusions and limitations of liability set forth herein, or as hereafter modified by Company, by all such users, owners and buyers and Distributor will indemnify Company, its officers, directors, shareholders, employees, agents and representatives against any actions, claims, demands, liabilities, damages, losses, costs and expenses including, but not limited to, attorneys and expert witness fees, to the extent that Company would not be liable to Distributor under these Terms and Conditions of Sale if the claim had been made by Distributor. Distributor will ensure that these Terms and Conditions of Sale for the Products are transmitted to its end customer(s) upon resale or transfer of the Product. Accordingly, except as to those terms in Sections I, Distributor Recognition; II, Ordering Information; III, Pricing; IV, Payment Terms; V, Freight and Delivery Terms; VI, Inspection and Acceptance; and VIII, Return Material Authorization, which are exclusive to Distributor, any reference to "Distributor" in these Terms and Conditions shall also include Distributor's customers, transferees, assigns, affiliates, or whoever else takes control or possession of the Product.

I. DISTRIBUTOR RECOGNITION

- A. Recognition as a non-exclusive Company distributor is based upon market coverage, product knowledge, and general effectiveness in representing specific Products supplied by Company. Distributor acknowledges that Company may sell directly or to any third party that Company selects as and when Company so desires in its sole and absolute discretion. Distributor represents to Company that Distributor is engaged in business solely as a stocking distributor and its primary customers for Company's Products are HVACR contractors and others who directly engage in the installation and servicing of environmental controls, heating, ventilation and air conditioning controls and equipment. Distributor acknowledges that Company's Products are designed for specific applications and Distributor agrees it shall not market, resell, distribute, or recommend the use of any of Company's Products in any application where the use of the Product is not as intended or designed by Company or does not conform to Company's specifications for use, and shall indemnify Company, its officers, directors, shareholders, employees, agents and representatives for all such unauthorized use. Company shall have no responsibility, and/or liability and the Product Warranty set forth herein shall be void, if Distributor uses or recommends the use of any Product for any application for which it is not intended or designed.
- B. Distributor agrees that Company's arrangement with Distributor can be terminated by Company with or without cause, upon fourteen (14) days notice unless otherwise agreed in writing by Company and Distributor. In the event of termination, all of the goodwill and other proprietary and intellectual rights in and to Company's Products shall remain the sole property of Company. Distributor will not be entitled to any compensation or payments including, but not limited to, expenses, lost profits, sales or revenue, loss of goodwill or otherwise, as a result of Company's termination.
- C. Distributor agrees to provide a credit application and Tax Resale Certificate, if applicable, to Company's Credit Department to obtain credit approval in order to set up Distributor's account. Distributor also agrees to periodically furnish Company, at Company's request, updated financial information. Recognized distributors must maintain minimum annual net purchases of \$5,000 USD or CND, respectively.

II. ORDERING INFORMATION

- A. Company will only accept orders from its recognized Distributors, or the Distributor's recognized branches. Possession of Company's product catalog or Price Schedule does not constitute authority or right to purchase items directly from Company.
- B. To submit orders, please fax order to:

USA and Canada	800.426.0804
International	951.737.8261
- C. Orders must state Distributor's account number, ship to address, catalog part number, item description, quantity ordered and unit price. Orders will not be processed without this information confirmed in writing by Distributor.
- D. Order changes by Distributor must be made in writing, or verified in writing, before Company can complete processing of the order, and shall be subject to the terms of Section V below.
- E. All Products may be combined in a single order for best pricing and freight terms.
- F. Products carrying the footnote "@" are only available in the multiples shown. Some items are also noted with a required minimum purchase quantity that must be followed. Company reserves the right to increase the order quantity in compliance to item minimums and multiples without authorization by Distributor or to refuse to accept the order.
- G. A minimum net billing of \$100 USD or CND, respectively, per order, per branch drop shipment applies (excluding freight and/or applicable taxes).
- H. Orders will only be accepted for shipment to one destination. Portions of orders for shipment to other addresses will be considered separately for pricing, freight, and item minimum and multiple requirements.
- I. Drop shipments to destinations other than a recognized Distributor's address, or its recognized branch address, will require approval based solely at the discretion of Company. If approved, additional charges may apply. Standard order terms and requirements will apply.
- J. Nothing in these Terms and Conditions of Sale requires or is intended to require Company to accept any purchase order from Distributor, and Company shall have no liability to Distributor or to any third party in the event Company decides not to accept any order.
- K. All orders are final once shipped to Distributor.

TERMS AND CONDITIONS OF SALE - NA, SA, ANZ

III. PRICING

- A. PRICES ON ALL ORDERS ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE AT ANY TIME. Written notification of pending price increases will be made in advance of the effective date of the price change, whenever practicable. Except where prices are specifically designated in Company's quotation as "Firm" for a specified period of time, all Products shipped on or after the effective date of a price change will be invoiced at the new price level. Company reserves the right to make price changes during the term of an existing Agreement (unless expressly agreed otherwise in such Agreement) or any blanket orders. Company's US HVACR and Appliance Wholesaler Policy and Distributor Price Schedule 157, literature number 150-2476, HVACR and Appliance Canadian Distributor Price Schedule C153, literature number 150-2477, and Canada HVACR and Appliance Distributor Price Schedule C153-BMS, literature number 150-2478 may be ordered online or electronically downloaded in their current versions through Company's online literature service at www.Robertshaw.com. International Distributors should contact their customer service representative for current Price Schedules.
- B. Prices do not include any applicable taxes, excises, duties, quotation fees or other government charges or surcharges that Company may be required to pay or collect under any existing or future law. Distributor agrees to pay or reimburse Company for any applicable taxes, charges or surcharges that Company or Company's agents or suppliers are required to pay. Prices may also be adjusted at any time, with or without notice, for changes in exchange rates.
- C. In the event any order submitted by Distributor to Company contains pricing not in accordance with the then-current Price Schedule, or its special quoted pricing, Company will notify Distributor of the discrepancy in price and Distributor shall correct the pricing in writing by either acknowledging the correction on a revised order confirmation, a pricing approval form, or by submitting a new order to Company. All orders shall be placed on hold until Distributor provides written acknowledgment of correct pricing.

IV. PAYMENT TERMS

- A. Subject to Company's Credit Department approval, standard invoice payment terms are Net 30 days from date of shipment.
- B. Payments can be made either via check, certified check, money order, wire transfer, or irrevocable and confirmed letter of credit, paid to the order of the remittance name specified on the respective invoice. All billings and payments shall be in United States Dollars (USD) or CND, respectively. International Distributor's billings and payments shall be in the agreed currency. Company may require check in advance, cash in advance, or a Letter of Credit (LOC) on international accounts, which Distributor shall furnish upon request.
- C. If Distributor's order requires check in advance, supplies and raw materials may not be purchased and Product may not be produced or shipped until payment is received and funds are cleared from the bank upon which they are drawn. In the event standard or non-standard Product is produced and funds do not clear Distributor's bank, Distributor is liable to Company for all associated costs and damages thereof including, but not limited to, price of Products already shipped (plus freight charges); finished goods; costs of work-in-progress, vendor items, raw materials and parts Company cannot return, vendor cancellation charges, if any and other costs related to the order or incurred therewith. Applicable Product lead-times will begin once funds clear.
- D. Invoices are due and payable in one installment and any portion of the price which is not paid on time shall be subject to a service charge at the lesser of one and one half percent (1-1/2%) per month (18% per annum), or the maximum rate permitted by law, from the due date until the amount is paid in full. Company shall be entitled to recover from Distributor all costs for collection, including reasonable attorneys fees and court costs, incurred by Company in connection with any amount due Company from Distributor. Company reserves the right to withhold shipments or require Distributor to provide prepayment or a check in advance if, in Company's judgment, Distributor presents a credit risk.
- E. Deductions are not allowed without prior written authorization from Company. Any invoice corrections or money owed Distributor will be issued in the form of a credit from Company to Distributor's account.

V. FREIGHT AND DELIVERY TERMS

- A. Unless otherwise agreed by Company in writing, the delivery terms for all orders are Ex works (Company's shipping point) (EXW, Incoterms 2010).
- B. For US and Canada Distributors, regular ground freight will be prepaid by Company via carrier of Company's choice on individual orders with a minimum net value of \$2,500.00 USD or CND, respectively, before applicable taxes, and shipping at one time to any recognized Distributor or its branch. Orders less than \$2,500.00 USD or CND, respectively, will be prepaid by Company but will be at Distributor's expense and freight charges will be added to Distributor's invoice.
- C. Unless otherwise agreed by Company in writing, international Distributor's freight will be prepaid by Company via carrier of Company's choice and freight charges will be added to Distributor's invoice.
- D. If Distributor requests and Company agrees, in its sole discretion, to arrange for shipment of Products as an accommodation to Distributor, Distributor must furnish Company with Distributor's carrier account number and carrier information. All freight, storage, insurance or other costs of shipment shall be paid by Distributor and, if advanced by Company, shall be added to Distributor's invoice.
- E. Distributor may request to pick up Product at Company's distribution facility site and Company may honor such request, in its sole discretion, provided Distributor notifies Company's Customer Service Department at least forty-eight (48) hours in advance of the pick-up date and Company confirms such request in writing within twenty-four (24) hours of Distributor's notice. In no event may Distributor pick up Product unless Distributor has received written confirmation from Company allowing such pick up.
- F. Company agrees to use commercially-reasonable efforts to meet delivery schedules requested by Distributor, but shall have no liability for failure to do so for any reason.
- G. Company reserves the right to select the manner in which the Product is packaged. Quoted prices include regular packing. Special requirements for packing will be subject to extra charges, unless otherwise agreed by Company in writing.
- H. Orders acknowledged by Company may not be canceled or amended, or deliveries deferred by Distributor, except with Company's prior written consent, and then only upon such terms as shall be acceptable to Company. In the event of order cancellation, in whole or in part, Distributor shall be liable to Company for all costs and damages arising from or related to such cancellation including, but not limited to, price of Products already shipped (plus freight charges finished goods; costs of work-in-progress, including vendor items, raw materials and parts Company cannot return, vendor cancellation charges, if any and other documented costs related to the order.
- I. Title and risk of loss to all Products shall pass to Distributor upon delivery by Company to a carrier at Company's shipping point.
- J. Export/Import and Code of Conduct Compliance. If Distributor distributes Company's Product outside the United States, Distributor shall be responsible for compliance with all applicable export, re-export and import control laws and regulations imposed on the Product; any related technical information by the United States government or by any foreign country; trade sanctions and embargo laws, regulations, rules, licenses, orders and requirements including, but not limited to, the U.S. Export Administration Regulations, rules and regulations administered by the U.S. Treasury Department's Office of Foreign Assets Control, EU Regulation No. 428/2009, any regulations in force within any relevant territory, and any orders issued under the foregoing in force from time to

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time. Distributor shall obtain all validated governmental authorizations or licenses, as required. Upon Company's request, Distributor shall furnish statements certifying such compliance either annually or on a per-order basis and shall cooperate in any audit or inspection related to applicable export or import control laws or regulations. Distributor shall comply with the Robertshaw Supplier Code of Conduct and the Robertshaw Code of Conduct, including their Anti-Bribery provisions, copies of both of which are available upon request to Company. Distributor and shall indemnify and hold Company and its directors, officers, shareholders, employees, agents and representatives harmless for any and all liability including, but not limited to, any and all fines, penalties, losses, costs, damages or expenses (including attorneys', expert and witness fees) incurred by Company as a result of, or relating to, Distributor's noncompliance with the terms herein.

- K. Harmonized Tariff Schedule (HTS) and export classification numbers such as Schedule B, ECCN, and the like, if provided by Company, represent solely an opinion of Company. Under no circumstances shall Company be liable whatsoever for the validity or any inaccuracies therein. Distributor shall be solely responsible for ensuring the proper classifications are declared on the shipment documents and to the relevant authorities. Company urges Distributor to consult with a subject matter expert, such as an attorney or a licensed Freight Forwarder, to review and determine the correct classification for the imported/exported Products.

VI. INSPECTION AND ACCEPTANCE

- A. Distributor shall inspect all deliveries within two (2) business days of receipt. In the event there is damage to Product or shortage of Product, Distributor shall notify the carrier and Company within the two (2) business-day period and provide a copy of the signed packing list noting the damage or shortage thereon. All other Products shall be deemed to have been finally inspected and accepted by Distributor within ten (10) days after date of invoice, unless a written notice of claim is given by Distributor to Company within the 10-day period. This ten (10) day period applies to all other discrepancies, including discrepancies in invoicing, shortage or damage, and excludes shortage in shipment caused by carrier or damaged shipment caused by carrier, as provided above, which requires two (2) business days notice. No Product subject to a claim may be returned without the prior authorization of Company. Authorized return shipments must be sent to Company accompanied by a packing slip, and include Company's Return Materials Authorization (RMA) Number, purchase order number, Company's invoice number, the number of cartons and items received, condition of cartons and any other relevant facts that would be helpful in tracing the cause of the discrepancy, and must have transportation charges prepaid.
- B. Company will verify all reports of shipping discrepancies and, where applicable, will issue a credit invoice. No prior debits will be accepted.

VII. WARRANTY

A. Warranty

- Company warrants its standard Products listed in the then-current Distributor Price Schedule to be free from defects in workmanship and material under normal use and service and to perform substantially in accordance with published Company specifications (subject to reasonable tolerances) in effect at the time of acceptance of Distributor's order, for a period of twelve (12) months from the date the Product is placed in use (proof of installation is required), or eighteen (18) months from the date of manufacture, whichever occurs first (the "Warranty Period").
- Exceptions from the Warranty stated above:
Some Products may contain extended warranties. Please refer to the Product's documentation for specific warranty coverage, if applicable.
 - Plastic items are not warranted for failure after installation in a machine or assembly.
 - Product subjected to abuse or damage is not warranted. Abuse or damage may be indicated by, but not limited to, one or more of the following:

Burned contacts	Abuse or tampering
Stripped threads	Missing parts
Water or fire damage	Improper installation or application
Split castings	
- Products that fail during the Warranty Period and otherwise qualify under the terms of Company's Warranty will, in Company's sole discretion, be (i) credited to Distributor's account at Distributor's lowest net invoice amount, (ii) repaired, or (iii) replaced provided that the Products are returned to Distributor pursuant to Section VIII(B) below. Payment deductions for warranty returns are not allowed. In no event shall the warranty claim exceed the Product price allocated to the Distributor's lowest net invoice price over either the previous twelve (12) months, or since inception of an Agreement between Company and Distributor, if any, whichever is less. If a returned Product is determined by the Company, in its sole discretion, to fall under the Warranty above, and if Distributor has requested on the packing list that a replacement Product be sent to Distributor, then Company will issue a replacement Product in lieu of issuing a credit to Distributor. Company reserves the right to supply suitable substitutes for Warranty Products that are not currently in production or otherwise available. Costs of Product removal or reinstallation, including labor, are not the responsibility of Company and not included in the Warranty.
- THIS EXPRESS WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER EXPRESS OR IMPLIED WARRANTIES, GUARANTEES, OR REPRESENTATIONS, BY OPERATION OF LAW OR OTHERWISE INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, TITLE, AND FITNESS FOR A PARTICULAR PURPOSE. COMPANY SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, INDIRECT OR PUNITIVE DAMAGES OF ANY NATURE WHATSOEVER INCLUDING, BUT NOT LIMITED TO, LOST SALES, LOST REVENUES OR PROFITS, LOSS OF USE, OR GOODWILL ARISING OUT OF OR RESULTING FROM THE USE OR INABILITY TO USE COMPANY'S PRODUCTS. ANY STATEMENTS OR REPRESENTATIONS MADE BY OTHER PERSONS, ENTITIES, OR ANY THIRD PARTIES ARE SPECIFICALLY DISCLAIMED AND SHALL BE NULL AND VOID.
- THE FOREGOING REMEDY SHALL BE THE DISTRIBUTOR'S SOLE AND EXCLUSIVE REMEDY AND COMPANY'S SOLE OBLIGATION FOR FAILURE OF PRODUCT TO CONFORM TO THE WARRANTY.

B. Return for Warranty Consideration

- All Products to be considered for warranty must be returned to Company with freight and transportation charges prepaid.
- Product returned to Company must be packaged in such a manner that will prevent any further damage to the Product during transit. The Warranty terms above shall not apply to any items damaged in transit.
- An itemized packing slip, including Distributor's name and address, is required for each shipment to Company of Product(s) to be considered for warranty. The packing slip must contain a reference number, items and their quantities being returned, reason for warranty return, date of installation, date of failure, and a contact name at the Distributor in case further information is required.
- For Distributors within North America (USA and Canada), all cartons must be clearly identified as WARRANTY PRODUCT and returned to:

USA Distributors:
Warranty Department
Robertshaw
1921 Anei Circle
Brownsville, TX 78521

Canada Distributors:
Warranty Department
Robertshaw
4060 Ridgeway Drive, Unit 14
Mississauga, ON L5L5X9

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For International Distributors, please contact your customer service representative for return authorization and procedures.

C. Inspection of Product

1. Company will inspect each item to confirm that the returned Product qualifies for the Warranty in Section VII. If the inspection by Company does not disclose any defect covered by the Warranty, then Company shall notify Distributor accordingly and the Distributor has the option to request Company to scrap the Product or return it at Distributor's expense. AT COMPANY'S OPTION, COMPANY MAY SCRAP THE PRODUCT WITH NO FURTHER LIABILITY TO DISTRIBUTOR, UNLESS DISTRIBUTOR NOTIFIES COMPANY OTHERWISE WITHIN ONE (1) WEEK OF COMPANY'S NOTIFICATION.
2. In the event Distributor sends Company goods that were not manufactured and/or distributed by Company, Company will notify Distributor. Distributor has the option to request Company to scrap the product or return it at Distributor's expense. AT COMPANY'S OPTION, COMPANY MAY SCRAP THE PRODUCT WITH NO FURTHER LIABILITY TO DISTRIBUTOR, UNLESS DISTRIBUTOR NOTIFIES COMPANY OTHERWISE WITHIN ONE (1) WEEK OF COMPANY'S NOTIFICATION.

- D. Final disposition of any warranty claim shall be determined solely by Company and shall be final and binding.

VIII. RETURN MATERIAL AUTHORIZATION (FOR NEW AND UNUSED PRODUCT RETURNS)

- A. Returns will not be accepted, nor credits given, without a factory authorized Return Materials Authorization (hereinafter "RMA"). RMAs are only issued to the original point of purchase location for current manufactured and/or distributed items that fall within the Warranty terms and have been purchased within the previous twelve months. Returns will not be accepted for special order or non-stock items (as indicated in the Price Schedule).
- B. In order to request an RMA number, Distributors must provide the invoice number, sales order number (or customer's purchase order number), the item numbers and quantities of Products they wish to return, and the reason for return to their Sales or Customer Service Representative.
- C. RMA Processing
 1. The RMA number is valid only if the Product it refers to is received at the address specified on the RMA form, freight and transportation charges prepaid, within fourteen (14) days from the date of Company's-issued authorization. Company may reject the request if Product is received after fourteen (14) days from the date of Company's-issued authorization.
 2. The Product must be received in its original saleable condition (including all accessories and inserts), in its original packaging, and undamaged. Damaged Product will not be accepted for return or replacement, even if a RMA number has been issued.
 3. Credit for the return will be based on the lowest net invoice amount for the Distributor over the last 12 months, or per the Agreement between Company and Distributor, if any, unless proof of purchase for the actual shipped Product is provided.
 4. All returns are subject to a minimum fifteen percent (15%) restock charge or \$15.00 USD, whichever is greater. Company will not accept returns that do not have a proper RMA or are sent to Company in error.

IX. DISCONTINUED PRODUCTS

- A. Company reserves the right to discontinue distribution of any Product without notice, or substitute material or complete devices, when items ordered are not currently in production or otherwise available.

X. PERMISSIBLE VARIATIONS

- A. Company may, prior to the delivery of Product to Distributor, make changes in the Product including, but not limited to, changes to the model, design, component parts or dimensions. In addition, Company may make any change or variation in the Product that is within industry, government or professional organization standards or specifications applicable at the time of manufacture, without notice to Distributor. Distributor hereby agrees to accept any Product that may incorporate any such changes or variations, and any increase in price resulting from such changes or variations will be for the account of Distributor.

XI. FORCE MAJEURE

- A. Company shall not be liable for any delay or failure in performance, or for any damages suffered by the Distributor by reason of such delay, if caused or arising directly or indirectly from any act beyond Company's reasonable control including, but not limited to, acts of God; vandalism; sabotage; accidents; fires; floods; strikes or other labor disputes; mechanical breakdowns; shortages or delays in obtaining suitable parts, equipment, material, labor, power or transportation; acts of suppliers; interruption of utility services; acts of terrorism, or acts of any unit or agency of government. Any delays so occasioned shall affect a corresponding extension of Company's performance dates that are, in any event, understood to be approximate.

XII. LIMITATION OF LIABILITY

Notwithstanding any other provision in these Terms and Conditions, Company's liability shall be limited as follows:

- A. IN NO EVENT SHALL COMPANY BE LIABLE FOR ANY CONSEQUENTIAL, INDIRECT, INCIDENTAL, SPECIAL OR PUNITIVE DAMAGES INCLUDING, BUT NOT LIMITED TO, LOSS OF SALES, PROFITS OR REVENUE, LOSS OF USE, LOSS OF GOODWILL OR INCREASE IN OPERATING COSTS.
- B. IN NO EVENT SHALL COMPANY'S LIABILITY EXCEED THE AMOUNT PAID TO COMPANY FOR THE PRODUCT FOR THE QUANTITIES OF COMPANY'S PRODUCTS GIVING RISE TO ANY SUCH LIABILITY, EXCEPT WITH RESPECT TO THIRD-PARTY CLAIMS FOR PERSONAL INJURY, WHICH SHALL BE LIMITED TO COMPENSATION FOR SUCH PERSONAL INJURY.
- C. COMPANY SHALL NOT BE LIABLE TO DISTRIBUTOR FOR ANY CLAIMS, DAMAGES, EXPENSES, FEES, COSTS, LOSSES, CAUSES OF ACTION, OR SUITS WHICH ARISE OUT OF OR RELATE TO THE SALE OF PRODUCT DUE TO THE DIRECTION, NEGLIGENCE, ACT, OMISSION, OR USE OF THE PRODUCT IN A MANNER NOT SPECIFICALLY AUTHORIZED, INTENDED OR DESIGNED BY COMPANY, WILLFUL MISCONDUCT, OR OTHER FAULT OF ANY NATURE WHATSOEVER OF DISTRIBUTOR, ITS EMPLOYEES, AGENTS, SERVANTS, CUSTOMERS, OR END USERS.
- D. THE ABOVE LIMITATIONS OF LIABILITY SHALL APPLY EVEN IF COMPANY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, AND REGARDLESS WHETHER THE CLAIM FOR RECOVERY IS BASED ON BREACH OF WARRANTY OR CONTRACT, NEGLIGENCE, INFRINGEMENT, STRICT LIABILITY OR OTHER TORT.
- E. THE RIGHT TO RECOVER DAMAGES WITHIN THE LIMITATIONS SPECIFIED ABOVE IS THE DISTRIBUTOR'S EXCLUSIVE ALTERNATIVE REMEDY IN THE EVENT THAT ANY OTHER CONTRACTUAL REMEDY FAILS OF ITS ESSENTIAL PURPOSE.

XIII. CONFIDENTIALITY

- A. Company's Price Schedules, quotes and any discounts contained herein are considered confidential and/or proprietary information of Company and Distributor shall in no instance share any Price Schedules or discounts, business discussions, financial information, or other confidential and/or proprietary information of Company with any other person, group, entity, or third party.

TERMS AND CONDITIONS OF SALE - NA, SA, ANZ

XIV. GENERAL

- A. This document shall be governed by and interpreted in accordance with the laws of the State of Illinois, USA, regardless of the laws that might otherwise govern under Illinois principles of conflicts of laws and without regard to the United Nations Convention on Contracts for the International Sale of Goods. Venue for any dispute shall be exclusively in the Circuit Court of DuPage County, the Circuit Court of Cook County, or the US District Court for the Northern District of Illinois, Eastern Division.
- B. Company and Distributor expressly agree that all terms and conditions, quotations, purchase orders and any related documents and correspondence be drafted and interpreted in the English language.
- C. In the event that any of the provisions hereof shall be held invalid, illegal, void or unenforceable, the remaining provisions shall remain in full force and effect as written.
- D. As used herein, the terms Distributor and Company include their respective heirs, executors, personal representatives, successors and assigns, including their corporate successors by purchase, merger and acquisition.
- E. Distributor may not assign its rights or obligations, or any portion thereof, without the advance written consent of Company.
- F. Paragraph headings are inserted for convenience of reference only and shall not be used in the construction or interpretation hereof.
- G. Company's failure to assert any of its rights under these Terms and Conditions of Sale shall not be deemed a waiver of such rights and shall not extend to or affect any other right Company may possess or to any subsequent or dissimilar event.
- H. These Terms and Conditions of Sale supersede any and all previously published versions issued by Company. Except where there exists a fully executed agreement between Distributor and Company, these Terms and Conditions of Sale constitute the entire agreement between Distributor and Company and supersede all previous and/or contemporaneous understandings and agreements, whether verbal or written, express or implied, relating to the subject matter herein. Any changes to these Terms and Conditions of Sale must be in writing and signed by an authorized representative of Company.

TERMS AND CONDITIONS OF SALE - EUROPE

EFFECTIVE JANUARY 1, 2015

The following are the Terms and Conditions of Sale of Robertshaw s.r.o., a Czech Republic company (the "Company"), for those of its products it may agree to sell for distribution ("Products").

THESE TERMS AND CONDITIONS ARE COMPANY'S EXCLUSIVE TERMS AND CONDITIONS OF SALE BETWEEN COMPANY AND DISTRIBUTOR, AND SHALL APPLY TO ALL PRODUCTS ILLUSTRATED HEREIN AND SUPERSEDE ANY INCONSISTENT, ADDITIONAL, PREPRINTED OR OTHER TERMS AND CONDITIONS CONTAINED IN DISTRIBUTOR'S PURCHASE ORDER OR ANY OTHER DISTRIBUTOR DOCUMENT OR ANY DOCUMENTS DERIVED FROM THE DISTRIBUTOR'S CUSTOMERS AND COMPANY DOES NOT AGREE TO ANY ADDITION, MODIFICATION OR DELETION OF THESE TERMS AND CONDITIONS. ANY OTHER TERMS AND CONDITIONS ARE HEREBY REJECTED AND CONSIDERED NULL AND VOID. THESE TERMS AND CONDITIONS CAN BE VARIED ONLY BY A WRITTEN DOCUMENT SIGNED BY COMPANY. COMPANY RESERVES THE RIGHT TO MODIFY THESE TERMS AND CONDITIONS OF SALE AT ANY TIME WITHOUT PRIOR NOTICE TO DISTRIBUTOR. ANY REVISED TERMS AND CONDITIONS, HOWEVER, WILL ONLY AFFECT THOSE ORDERS RECEIVED BY COMPANY AFTER THE EFFECTIVE DATE OF THE REVISION.

Distributor will ensure by its contract with the end user or ultimate owner or its buyer of the Products, that Company is given the benefit of these Terms and Conditions of Sale, including the exclusions and limitations of liability set forth herein, or as hereafter modified by Company, by all such users, owners and buyers and Distributor will indemnify Company, its officers, directors, shareholders, employees, agents and representatives against any actions, claims, demands, liabilities, damages, losses, costs and expenses including, but not limited to, legal and expert witness fees, to the extent that Company would not be liable to Distributor under these Terms and Conditions of Sale if the claim had been made by Distributor. Accordingly, except as to those terms in Sections I, Distributor Recognition; II, Ordering Information; III, Pricing; IV, Payment Terms; V, Freight and Delivery Terms; VI, Inspection and Acceptance; and VIII, Return Material Authorization, which are exclusive to Distributor, any reference to "Distributor" in these Terms and Conditions shall also include Distributor's customers, transferee's, assigns, affiliates, or whoever else takes control or possession of the Product.

I. DISTRIBUTOR RECOGNITION

- A. Recognition as a non-exclusive Company distributor is based upon market coverage, product knowledge, and general effectiveness in representing specific products supplied by Company. Distributor acknowledges that Company may sell directly or to any third party that Company selects as and when Company so desires, at Company's sole and absolute discretion. Distributor represents to Company that Distributor is engaged in business solely as a stocking distributor and its primary customers for Company's Products are "HVACR" contractors and others who directly engage in the installation and servicing of environmental controls, heating, ventilation and air conditioning controls and equipment. Distributor acknowledges that Company's Products are designed for specific applications and Distributor agrees it shall not market, resell, distribute, or recommend the use of any of Company's Products in any application where the use of the Product is not as intended or designed by Company or does not conform to Company's specifications for use, and shall indemnify Company, its officers, directors, shareholders, employees, agents and representatives for all such unauthorized use.
Company shall have no responsibility and/or liability and the Product Warranty set forth herein shall be void, if Distributor uses or recommends the use of any Product for any application for which it is not intended or designed.
- B. Distributor agrees that Company's arrangement with Distributor can be terminated by Company with or without cause, upon fourteen (14) days' notice unless otherwise agreed in writing by Company and Distributor. In the event of termination, all of the goodwill and other proprietary and intellectual rights in and to Company's Products shall remain the sole property of Company. Distributor will not be entitled to any compensation or payments including, but not limited to, expenses, lost profits, sales or revenue, loss of (or Company's gain of) goodwill or otherwise, as a result of Company's termination.
- C. Distributor agrees to provide a credit application to Company's Credit Department to obtain credit approval in order to set up Distributor's account. Distributor also agrees to periodically furnish Company, at Company's request, updated financial information. Recognized distributors must maintain minimum annual net purchases of €5,000.

II. ORDERING INFORMATION

- A. Company will only accept orders from its recognized Distributors, or the Distributor's recognized branches. Possession of Company's product catalog or Price Schedule does not constitute authority or right to purchase items directly from Company.
- B. To submit orders, please fax order to: +420 587 805 241
- C. Orders must state Distributor's account number, ship to address, catalogue part number, item description, quantity ordered and unit price. Orders will not be processed without this information confirmed in writing by Distributor.
- D. Order changes by Distributor must be made in writing, or verified in writing, before Company can complete processing of the order, and shall be subject to the terms of Section V below.
- E. All Products may be combined in a single order for best pricing and freight terms.
- F. Products carrying the footnote "@" are only available in the multiples shown. Some items are also noted with a required minimum purchase quantity that must be followed. Company reserves the right to increase the order quantity in compliance to item minimums and multiples without authorization by Distributor, or to refuse to accept the order.
- G. A minimum net billing of €100 per order, per branch drop shipment applies (excluding freight and/or applicable taxes).
- H. Orders will only be accepted for shipment to one destination. Portions of orders for shipment to other addresses will be considered separately for pricing, freight, and item minimum and multiple requirements.
- I. Drop shipments to destinations other than a recognized Distributor's address, or its recognized branch address, will require approval based solely at the discretion of Company. If approved, additional charges may apply. Standard order terms and requirements will apply.
- J. Nothing in these Terms and Conditions of Sale requires or is intended to require or shall be construed by Distributor as requiring Company to accept any purchase order from Distributor, and Company shall have no liability to Distributor or to any third party in the event Company decides not to accept any order.
- K. All orders are final once shipped to Distributor.

TERMS AND CONDITIONS OF SALE - EUROPE

III. PRICING

- A. PRODUCT PRICES ON ALL ORDERS ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE AT ANY TIME. Company reserves the right to make price changes during the term of any blanket orders unless prices are specifically designated in Company's quotation as "firm" for a specified period of time. Company's Europe HVACR and Appliance Wholesaler Policy and Distributor Price Schedule 001, literature number 150-2527, US HVACR and Appliance Wholesaler Policy and Distributor Price Schedule 157, literature number 150-2476, HVACR and Appliance Canadian Distributor Price Schedule C153, literature number 150-2477, and Canada HVACR and Appliance Distributor Price Schedule C153-BMS, literature number 150-2478 may be ordered online or electronically downloaded in their current versions through Company's online literature service at www.Robertshaw.com.
- B. Prices do not include any applicable taxes, excises, duties, quotation fees or other government charges or surcharges that Company may be required to pay or collect under any existing or future law. Distributor agrees to pay or reimburse Company for any applicable taxes, charges or surcharges that Company or Company's agents or suppliers are required to pay.
- C. In the event any order submitted by Distributor to Company contains pricing not in accordance with Company's then-current Price Schedule, or its special quoted pricing, Company will notify Distributor of the discrepancy in price and Distributor shall correct the pricing in writing by either acknowledging the correction on a revised order confirmation, a pricing approval form, or by submitting a new order to Company. All orders shall be placed on hold until Distributor provides written acknowledgment of correct pricing.

IV. PAYMENT TERMS

- A. Subject to Company's Credit Department approval, standard invoice payment terms are Net 30 days from date of shipment.
- B. Payments can be made either via money order, wire transfer, or irrevocable and confirmed letter of credit, paid to the order of the remittance name specified on the respective invoice. All billings and payments shall be in Euros (EUR) or such other currency as Company's Sales Order Acknowledgment may provide for. Company may require cash in advance or an irrevocable letter of credit, which Distributor shall furnish upon request.
- C. Distributor's order requires payment in advance, supplies and raw materials may not be purchased and Product may not be produced or shipped until payment is received and funds are cleared from the bank upon which they are drawn. In the event standard or non-standard Product is produced and funds do not clear Distributor's bank, Distributor is liable to Company for all associated costs and damages thereof including, but not limited to: price of Products already shipped (plus freight charges); finished goods; costs of work-in-progress, vendor items, raw materials and parts Company cannot return, vendor cancellation charges (if any) and other costs related to the order or incurred therewith. Applicable Product lead-times will begin once funds clear.
- D. Invoices are due and payable in one installment and any portion of the price which is not paid on time shall be subject to a service charge equal to 2% above the EURIBOR rate from time to time in force, from the due date until the amount is paid in full (before and after judgment). Company shall be entitled to recover from Distributor all costs for collection, including reasonable legal fees and court costs incurred by Company in connection with any amount due to the Company from Distributor. Company reserves the right to withhold shipments or require Distributor to provide payment in advance if, in Company's judgment, Distributor presents a credit risk.
- E. Deductions are not allowed without prior written authorization from Company. Any invoice corrections or money owed Distributor will be issued in the form of a credit from Company to Distributor's account.

V. FREIGHT AND DELIVERY TERMS

- A. Unless otherwise agreed by Company in writing, the shipment terms for all orders are Ex works (Company's premises) (EXW, Incoterms 2010).
- B. All freight, storage, insurance or other costs of shipment arising outside of an EXW arrangement shall be paid by Distributor and, if advanced by Company, shall be added to Distributor's invoice.
- C. Company agrees to use commercially-reasonable efforts to meet delivery schedules requested by Distributor and agreed to in Company's Sales Order Acknowledgment, but shall have no liability for failure to do so for any reason and time for delivery shall not be of the essence.
- D. Company reserves the right to select the manner in which the Product is packaged. Quoted prices include regular packing. Special requirements for packing will be subject to extra charges, unless otherwise agreed by Company in writing.
- E. Orders acknowledged by Company may not be canceled or amended, or deliveries deferred by Distributor, except with Company's prior written consent, and then only upon such terms as shall be acceptable to Company. In the event of order cancellation, in whole or in part, Distributor shall be liable to Company for all costs and damages arising from or related to such cancellation including, but not limited to: price of Products already shipped (plus freight charges for finished goods); costs of work-in-progress, including vendor items, raw materials and parts Company cannot return; vendor cancellation charges (if any) and other documented costs related to the order.
- F. Title and risk of loss to all Products shall pass to Distributor upon delivery.
- G. Code of Conduct Compliance. Distributor shall comply with the Robertshaw Supplier Code of Conduct and the Robertshaw Code of Conduct, including their Anti-Bribery provisions, copies of both of which are available upon request to Company. Distributor shall indemnify and hold Company and its directors, officers, shareholders, employees, agents and representatives harmless for any and all liability including, but not limited to, any and all fines, penalties, losses, costs, damages or expenses (including legal, expert and witness fees) incurred by Company as a result of, or relating to, Distributor's non-compliance with the terms therein.
- H. Harmonized Commodity Descriptions and Codes and export classification numbers if provided by Company, represent solely an opinion of Company. Under no circumstances shall Company be liable whatsoever for the validity or any inaccuracies therein. Distributor shall be solely responsible for ensuring the proper classifications are declared on the shipment documents and to the relevant authorities. It is incumbent on Distributor to consult with a trade compliance expert to review and determine the correct classification for the imported/exported Products.

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VI. INSPECTION AND ACCEPTANCE

- A. Distributor shall inspect all deliveries within two (2) business days of receipt. In the event there is damage to Product or shortage of Product, Distributor shall notify any carrier and Company within the two (2) business-day period and provide a copy of the signed packing list noting the damage or shortage thereon. Products shall be deemed to have been finally inspected and accepted by Distributor within ten (10) days after date of invoice, unless a written notice of claim is given by Distributor to Company within the 10-day period. This ten (10) day period applies to all other discrepancies, including discrepancies in invoicing, shortage or damage, and excludes shortage in shipment caused by carrier or damaged shipment caused by carrier, as provided above, which requires two (2) business days' notice. No Product subject to a claim may be returned without the prior authorization of Company. Authorized return shipments must be sent to Company accompanied by a packing slip, and include Company's Return Materials Authorization (RMA) Number, purchase order number, Company's invoice number, the number of cartons and items received, condition of cartons and any other relevant facts that would be helpful in tracing the cause of the discrepancy, and must have transportation charges prepaid.
- B. Company will verify all reports of shipping discrepancies and, where applicable, will issue a credit invoice. No prior debits will be accepted.

VII. WARRANTY

A. Warranty

1. Company warrants its standard Products listed in the then-current Distributor Price Schedule to be free from defects in workmanship and material under normal use and service and to perform substantially in accordance with published Company specifications (subject to reasonable tolerances) in effect at the time of acceptance of Distributor's order, for a period of twenty-four (24) months from the date the Product is manufactured (the "Warranty Period").
2. Exceptions from the warranty stated above: Some Products may contain extended warranties. Please refer to the Product's documentation for specific warranty coverage, if applicable.
 - Plastic items are not warranted for failure after installation in a machine or assembly.
 - Product subjected to abuse or damage is not warranted. Abuse or damage may be indicated by, but not limited to, one or more of the following:

Burned contacts	Abuse or tampering
Stripped threads	Missing parts
Water or fire damage	Improper installation or application
Split castings	
3. Products that fail during the Warranty Period and otherwise qualify under the terms of Company's Warranty will, in Company's sole discretion, be (i) credited to Distributor's account at Distributor's lowest net invoice amount, (ii) repaired, or (iii) replaced provided that the Products are returned to Distributor pursuant to Section VIII (B) below. Payment deductions for warranty returns are not allowed. In no event shall the warranty claim exceed the Product price allocated to the Distributor's lowest net invoice price over either the previous twelve (12) months, or since inception of an Agreement between Company and Distributor, if any, whichever is less. If a returned Product is determined by the Company, in its sole discretion, to fall under the Warranty above, and if Distributor has requested on the packing list that a replacement Product be sent to Distributor, then Company will issue a replacement Product in lieu of issuing a credit to Distributor. Company reserves the right to supply suitable substitutes for Warranty Products that are not currently in production or otherwise available. Costs of Product removal or re-installation, including labor, are not the responsibility of Company and not included in the Warranty.
4. THIS EXPRESS WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER EXPRESS OR IMPLIED WARRANTIES, GUARANTEES, OR REPRESENTATIONS, BY OPERATION OF LAW OR OTHERWISE INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, TITLE, AND FITNESS FOR A PARTICULAR PURPOSE. COMPANY SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, INDIRECT OR PUNITIVE DAMAGES OF ANY NATURE WHATSOEVER INCLUDING, BUT NOT LIMITED TO, LOST SALES, LOST REVENUES OR PROFITS, LOSS OF USE, OR GOODWILL ARISING OUT OF OR RESULTING FROM THE USE OR INABILITY TO USE COMPANY'S PRODUCTS. ANY STATEMENTS OR REPRESENTATIONS MADE BY OTHER PERSONS, ENTITIES, OR ANY THIRD PARTIES ARE SPECIFICALLY DISCLAIMED AND SHALL BE NULL AND VOID.
5. THE FOREGOING REMEDY SHALL BE THE DISTRIBUTOR'S SOLE AND EXCLUSIVE REMEDY AND COMPANY'S SOLE OBLIGATION FOR FAILURE OF PRODUCT TO CONFORM TO THE WARRANTY.

B. Return for Warranty Consideration

1. All Products to be considered for warranty must be returned to Company with freight and transportation charges prepaid.
2. Product returned to Company must be packaged in such a manner that will prevent any further damage to the Product during transit. The Warranty terms above shall not apply to any items damaged in transit.
3. An itemized packing slip, including Distributor's name and address, is required for each shipment to Company of Product(s) to be considered for warranty. The packing slip must contain a reference number, items and their quantities being returned, reason for warranty return, date of installation, date of failure, and a contact name at the Distributor in case further information is required.
4. All cartons must be clearly identified as WARRANTY PRODUCT and returned to:
Warranty Department
Robertshaw
Dlouhá 4
785 01 Sternberk, Czech Republic

C. Inspection of Product

1. Company will inspect each item to confirm that the returned Product qualifies for the Warranty in Section VII. If the inspection by Company does not disclose any defect covered by the Warranty, then Company shall notify Distributor accordingly and the Distributor has the option to request Company to scrap the Product or return it at Distributor's expense. AT COMPANY'S OPTION, COMPANY MAY SCRAP THE PRODUCT WITH NO FURTHER LIABILITY TO DISTRIBUTOR, UNLESS DISTRIBUTOR NOTIFIES COMPANY OTHERWISE WITHIN ONE (1) WEEK OF COMPANY'S NOTIFICATION.
2. In the event Distributor sends Company products that were not manufactured and/or distributed by Company, Company will notify Distributor. Distributor has the option to request Company to scrap the product or return it at Distributor's expense. AT COMPANY'S OPTION, COMPANY MAY SCRAP THE PRODUCT WITH NO FURTHER LIABILITY TO DISTRIBUTOR, UNLESS DISTRIBUTOR NOTIFIES COMPANY OTHERWISE WITHIN ONE (1) WEEK OF COMPANY'S NOTIFICATION.

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D. Final disposition of any warranty claim shall be determined solely by Company and shall be final and binding.

VIII. RETURN MATERIAL AUTHORIZATION (FOR NEW AND UNUSED PRODUCT RETURNS)

- A. Returns will not be accepted, nor credits given, without a factory authorized Return Materials Authorization (hereinafter "RMA"). RMAs are only issued to the original point of purchase location for current manufactured and/or distributed Products that fall within the Warranty terms and have been purchased within the previous twelve months. Returns will not be accepted for special order or non-stock items (as indicated in the Price Schedule).
- B. In order to request an RMA number, Distributors must provide the invoice number, sales order number (or customer's purchase order number), the item numbers and quantities of Products they wish to return, and the reason for return to their Sales or Customer Service Representative.
- C. RMA Processing
 1. The RMA number is valid only if the Product it refers to is received at the address specified on the RMA form, freight and transportation charges prepaid, within fourteen (14) days from the date of Company's issued authorization. Company may reject the request if Product is received after fourteen (14) days from the date of Company's issued authorization.
 2. The Product must be received in its original saleable condition (including all accessories and inserts), in its original packaging, and undamaged. Damaged Product will not be accepted for return or replacement, even if a RMA number has been issued.
 3. Credit for the return will be based on the lowest net invoice amount for the Distributor over the last 12 months unless proof of purchase for the actual shipped Product is provided.
 4. All returns are subject to a minimum fifteen percent (15%) restock charge or €15.00, whichever is greater. Company will not accept returns that do not have a proper RMA or are sent to Company in error.

IX. DISCONTINUED PRODUCTS

- A. Company reserves the right to discontinue distribution of any Product without notice, or substitute material or complete devices, when items ordered are not currently in production or otherwise available.

X. PERMISSIBLE VARIATIONS

- A. Company may, prior to the delivery of Product to Distributor, make changes in the Product including, but not limited to, changes to the model, design, component parts or dimensions. In addition, Company may make any change or variation in the Product that is within industry, government or professional organization standards or specifications applicable at the time of manufacture, without notice to Distributor. Distributor hereby agrees to accept any Product that may incorporate any such changes or variations, and any increase in price resulting from such changes or variations will be for the account of Distributor.

XI. FORCE MAJEURE

- A. Company shall not be liable for any delay or failure in performance, or for any damages suffered by the Distributor by reason of such delay or failure, if caused or arising directly or indirectly from any act beyond Company's reasonable control including, but not limited to: acts of God; vandalism; sabotage; accidents; fires; floods; strikes or other labor disputes; mechanical breakdowns; shortages or delays in obtaining suitable parts, equipment, material, labor, power or transportation; acts of suppliers; interruption of utility services; acts of terrorism, or acts of any unit or agency of government. Any delays so occasioned shall affect a corresponding extension of Company's performance dates that are, in any event, understood to be approximate.

XII. LIMITATION OF LIABILITY

- A. Subject to clause XII (C), Company shall not in any circumstances be liable for any loss of use, production, profit, business, contracts, revenues or anticipated savings, any increase in operating costs, any product recall or corrective action costs or any other financial or economic loss or any indirect or consequential loss or damage whatsoever whether suffered by Distributor or by any third party.
- B. The exclusions and limitations of liability contained in these Terms and Conditions shall apply to all claims of any kind whether in contract tort or otherwise on the part of Company, its employees, agents, sub-contractors or suppliers.
- C. No limitation or exclusion contained in these Terms and Conditions shall apply in cases of fraud or fraudulent misrepresentation or in cases of death or personal injury caused by the negligence of Company, or for any other matter for which it would be illegal to exclude or to attempt to exclude Company's liability.
- D. Except as provided under clause XII(C), notwithstanding anything else in these Terms and Conditions or otherwise, the total aggregate liability of Company to Distributor for all claims of any kind for any loss or damage resulting from its performances or lack of performance under this and all other contracts under these Terms and Conditions in any one calendar year will not in any event exceed an amount equal to 50% of the value of the Products delivered to Distributor in that calendar year.

XIII. CONFIDENTIALITY

- A. Company's Price Schedules, quotes and any discounts contained herein are considered confidential and/or proprietary information of Company and Distributor shall in no instance share any Price Schedules or discounts, business discussions, financial information, or other confidential and/or proprietary information of Company with any other person, group, entity, or third party.

XIV. GENERAL

- A. This document shall be governed by and construed in accordance with the laws of the Czech Republic without regard to its conflict of laws provisions. The United Nations 'Convention on Contracts for the International Sale of Goods' signed in Vienna in 1980 shall not apply. Any disputes, controversies or differences arising out of or in any way connected with this document shall be determined and finally settled by binding arbitration in accordance with the Arbitration Rules of the International Chamber of Commerce "Rules", by a single arbitrator appointed in accordance with such Rules. The venue of arbitration shall be in London, England and the arbitration proceedings shall be conducted in the English language. Nothing in this arbitration clause shall prevent a party from applying to any appropriate court in the other party's jurisdiction for any injunction or other like interim remedy to restrain the other party from committing any breach or anticipated breach of these Terms and Conditions.
- B. Company and Distributor expressly agree that all terms and conditions, quotations, purchase orders and any related documents and correspondence

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be drafted and interpreted in the English language.

- C. In the event that any of the provisions hereof shall be held invalid, illegal, void or unenforceable, the remaining provisions shall remain in full force and effect as written.
- D. As used herein, the terms Distributor and Company include their respective heirs, executors, personal representatives, successors and assigns, including their corporate successors by purchase, merger and acquisition.
- E. Distributor may not assign its rights or obligations, or any portion thereof, without the advance written consent of Company.
- F. Paragraph headings are inserted for convenience of reference only and shall not be used in the construction or interpretation hereof.
- G. Company's failure to assert any of its rights under these Terms and Conditions of Sale shall not be deemed a waiver of such rights and shall not extend to or affect any other right Company may possess or to any subsequent or dissimilar event.
- H. These Terms and Conditions of Sale supersede any and all previously published versions issued by Company. Except where there exists a fully executed agreement between Distributor and Company, these Terms and Conditions of Sale constitute the entire agreement between Distributor and Company and supersede all previous and/or contemporaneous understandings and agreements, whether verbal or written, express or implied, relating to the subject matter herein. Any changes to these Terms and Conditions of Sale must be in writing and signed by an authorized representative of Company.

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