Robertshaw®

GLOBAL COMMERCIAL CATALOG

HVAC

Transportation

EXPERIENCE

THE POWER OF RAPID ROI

EXPERIENCE the ROBERTSHAW Partnership Advantage

Expertise like ours is unique. When you partner with Robertshaw®, you benefit from a global design, engineering and manufacturing company who invests in world-class equipment, efficient business processes, and 600+ engineering resources. Our investments help speed your new solutions to market, and help deliver greater return on your investment faster.

WHEN YOU PARTNER WITH ROBERTSHAW, YOU GET ACCESS TO:

The industry's best engineering team.

Other solution providers may have the ability to run efficient businesses, but none can replicate what our people provide. Our engineers are more than electromechanical and electronics experts. They are commercial equipment innovators who understand how our controls compliment your equipment.

World class resources.

Robertshaw works closely with your teams so you have access to our network of facilities and testing capabilities. An open and collaborative relationship with our OEM partners provides greater opportunities for shared growth.

Three-tiered partnership model.

Our partnership model delivers unmatched capabilities and results. Whether you need an off-the-shelf, custom tailored or fully customized control, we are ready to meet and exceed your expectations and help your business grow.

The **Robertshaw Commercial Catalog** is a glimpse into the extensive product portfolio and engineering capabilities available to you. With over 100 years of experience, we have established a market presence renowned for delivering greater ROI for our customers.

Ready to accelerate your growth? Call us.

Experience the Robertshaw Partnership Advantage today.

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COOKING

Robertshaw® COOKING

M SERIES INFINITE SWITCH

The Robertshaw® M 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.

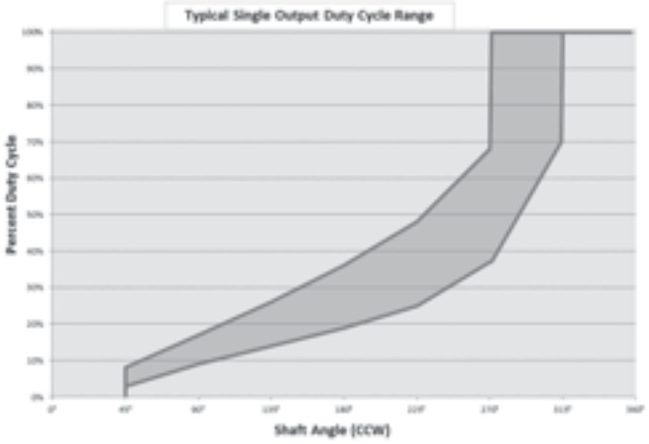
Features and Benefits

- Small compact design
- Single, dual or triple outputs
- New and improved mounting
- A Bushing mount design is also available on some models
- Double line break
- Clockwise (CW) or counterclockwise (CCW) rotation
- Variety of shaft lengths and configurations
- Push-To-Turn (PTT) or Non-Push-To-Turn (Non-PTT)

Specifications

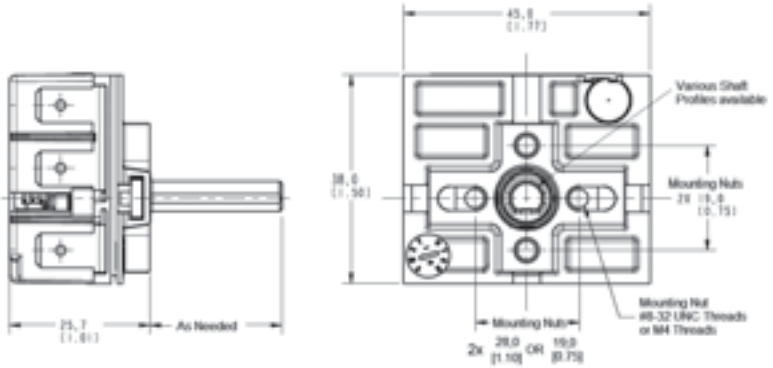
- Ambient temperature rated for intermittent or continuous duty 257°F (125°C) with 15 Amp load
- 100 Watts to 3600 Watts at 240V AC
- Configurations: Single, Dual or Triple Load operations with 3600 Watt maximum
- Pilot Light switching available for an isolated version or a version with one phase combined internally
  - 0.5 Amps maximum pilot switch current
- Standard Calibration for Low (Simmer), Duty Cycle of 2% to 9% at 45° arc rotation from Off
- Optional “B” Calibration for Low (Simmer), Duty Cycle of 15% to 30% at 45° arc rotation from Off
- Operation styles available:
  - Push-To-Turn
  - Non-Push-To-Turn
  - CW direction from Low to High Duty Cycle
  - CCW direction from Low to High Duty Cycle
- Double Line Break versions are standard; Single Phase switching available
- Full 360° dial rotation is standard
- Voltage Ratings: 120V AC, 208V AC, 240V AC
- Agency Certifications:
  - UL File E112536
  - ENEC 2183653.01
  - CE

DUTY CYCLE OUTPUT CURVES



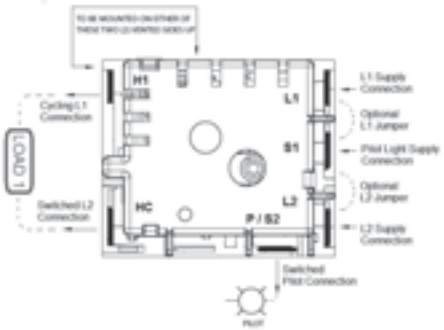
PRODUCT DRAWINGS

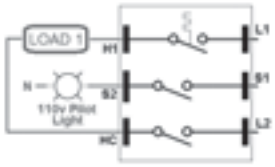
Nut Mounting Style - Single and Dual



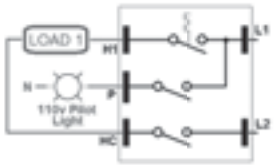
ELECTRICAL SCHEMATICS

Single Load

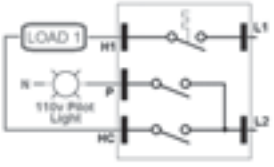




Isolated Pilot

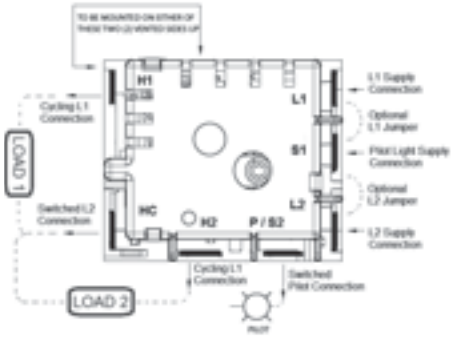


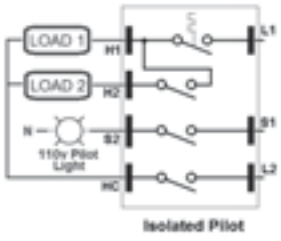
L1 Jumpered Pilot



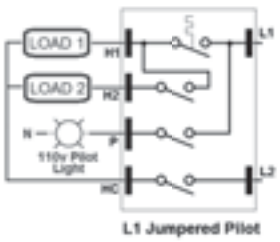
L2 Jumpered Pilot

Dual Load

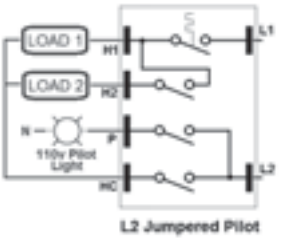




Isolated Pilot



L1 Jumpered Pilot



L2 Jumpered Pilot

Robertshaw® COOKING

KSI SERIES INFINITE SWITCH

The Robertshaw® KSI Series Infinite Switch is a current sensitive rotary switch. A current sensitive switch must be matched to the specific wattage of the heating element. A KSI switch 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
- Single output
- New and improved mounting
- Double line break
- Variety of shaft lengths and configurations
- Four operational styles available including Push-To-Turn (PTT)

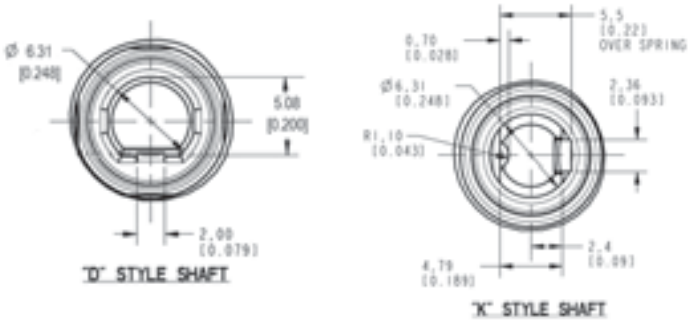
Specifications

- Voltage temperature ratings: 120V AC (1800 Watt maximum rating), or 240V AC (3600 Watt rating)
- Ambient temperature rated for intermittent or continuous duty 257°F (125°C) with 13 Amp load or 210°F (100°C) with 15 Amp load
- 100 Watts to 3600 Watts at 240V AC
- Available in Single Load output with 3600 Watt maximum
- Pilot Light switching available for an isolated version or a version with one phase combined internally
  - 0.5 Amps maximum pilot switch current
- Standard Calibration for Low (Simmer), Duty Cycle of 2% to 9% at 45° arc rotation from Off
- Simmer options of 1% to 5% available
- Operation styles available:
  - Push-To-Turn
  - Non-Push-To-Turn
  - Clockwise (CW) direction from Low to High Duty Cycle
  - Counterclockwise (CCW) direction from Low to High Duty Cycle
- Double Line Break versions are standard, with Single Phase switching also available
- Full 360° degree dial rotation is standard
- Agency Certifications:
  - UL File E29143
  - CSA LR 36461

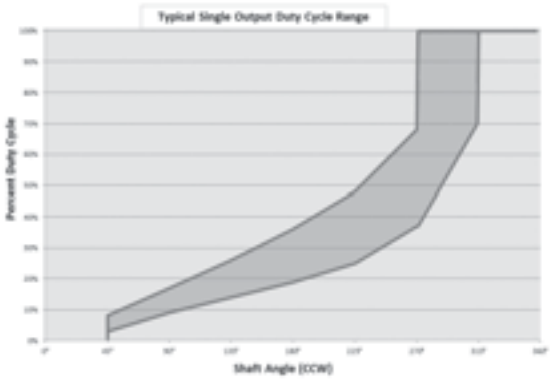
KSI SERIES INFINITE SWITCH

PRODUCT DRAWINGS

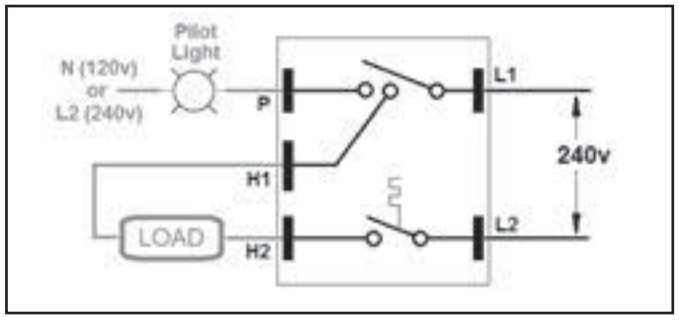
Knob Shaft Styles



DUTY CYCLE OUTPUT CURVES



ELECTRICAL SCHEMATICS



(Back of Switch is shown)

Robertshaw® COOKING

UNIVERSAL ELECTRONIC THERMOSTAT SERIES

The Robertshaw® Universal Electronic Thermostat Series is designed with OEM programable settings for use in cooking and heating applications with a need for high accuracy.

Features and Benefits

- Flash microcontroller based design
- Programmable temperature range with ± 5°F (± 2.5°C) accuracy throughout the entire range
- Programmable offset and hysteresis parameters
- Adjustable dead zone from OFF position to first set point and adapts with existing knobs, temperature scales and graphics
- Diagnostics include "open sensor circuit" or "no heat" fault conditions
- On board diagnostics with flashing LED output
- Compatible with J, K thermocouples or RTD sensors
- Optional pilot LED
- Robust mechanical shaft assembly
- Backwards compatible with electromechanical thermostat
- Includes PC based configuration tool to custom configure the Universal Electronic Thermostat settings for unique appliances

Specifications

- Ambient temperature range: -4°F to 221°F (-20°C to 105°C)
- Temperature range: 90°F to 750°F (32°C to 399°C)
- Universal AC power: 90 to 265V AC, 50/60 Hz
- One relay output: 13.5 Amps @ 120V AC or 240V AC
- Sensor Inputs
  - Thermocouple J or K
  - RTD (Resistance Temperature Device)
- Mechanical
  - Footprint: 3.6” x 2.9” x 1.6” (91mm x 74mm x 41mm)
  - Mounting: Backward compatible with other electromechanical thermostats
  - Mechanical stops
- Communications
  - TTL RS232 interface
- Agency Certifications:
  - CE
  - IEC Standard 60730
  - UL File E110428

Applications

Range

Convection Oven

Griddle

Fryer

Pizza Oven

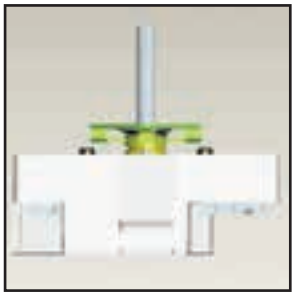
Coffee Brewer

UNIVERSAL ELECTRONIC THERMOSTAT SERIES

STANDARD MOUNTING CONFIGURATION

Back View


Front View


Side View

PROGRAMMING TOOL

Product includes a PC based configuration tool with user friendly interface.

- Windows compatible
- Configurable temperature profiling from PC
- Programmable for C° or F°
- Adjustable hysteresis down to 1°F increments
- Adjustable sensing device offset
- Displays set temperature, sensing device temperature and oven temperature
- Data logging function
- User selectable input for J, K thermocouples or RTD sensors
- Temperature settings from 90°F to 750°F (32°C to 399°C)

REQUIRED HARDWARE

- Power - an AC connector using a Molex 39-01-3022 connector shell and Molex 3-00-0046
- Relay output terminals - 1/4" female terminal
- A Temperature sensing device
  - Type J or K thermocouple and 1/4" female terminal
  - 1,000 ohm platinum RTD Molex 50-57-9402 housing and Molex 16-02-0102
- An optional LED - JST connector housing PAP-02V-S and crimp sockets - SPHD-002T-PO.5
- Two #6-32 machine screws for mounting

Robertshaw® COOKING

K AND S SERIES THERMOSTAT

The Robertshaw® K and S Series Thermostat is a snap-acting, single pole single throw (SPST) type thermostat. The K models have a 25 Amp rating and the S models have a 30 Amp rating. The S and K each use silver contacts and have heavy-duty terminals for durability and sustained accuracy. The snap-action mechanism is precise and reliable. Thermostat applications include commercial appliances and industrial equipment.

Features and Benefits

- Temperature ranges up to 600°F (316°C)
- K Series with NAK filled diastats, temperature ranges 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
- Plastic coating available for protection against moisture, dust, etc.
- Heat resistant plastic dials available

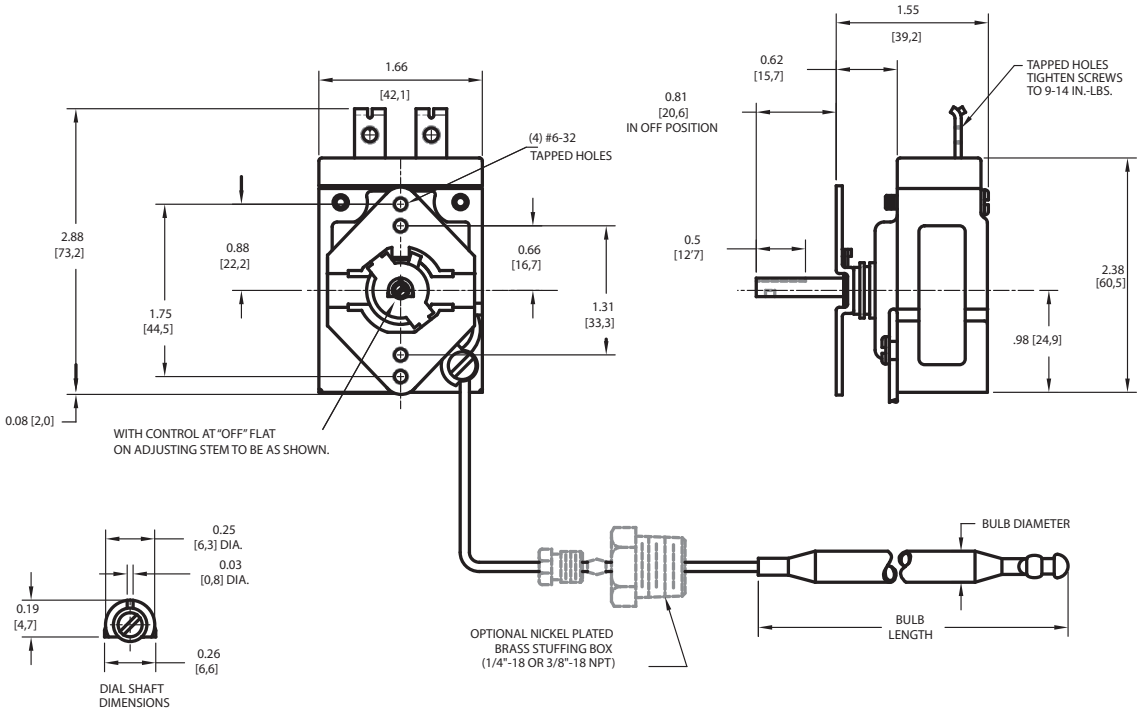
Specifications

- Ambient temperature range: 32°F to 200°F (0°C to 93°C)
- Single pole single throw (SPST) type switch
  - See chart on page 13 for options
- Various voltages
- Agency Certifications:
  - CSA 164327-1195960
  - UL E12103
  - CE US18299BIUL

AVAILABLE BULB DIAMETERS				
inches	0.187	0.250	0.312	0.375
[millimeters]	4,8	6,4	7,9	9,5

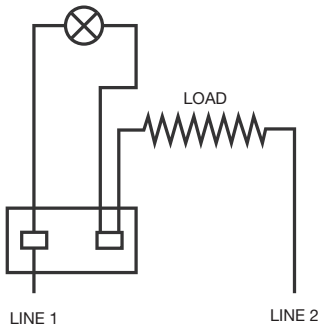
K AND S SERIES THERMOSTAT

PRODUCT DIMENSIONS

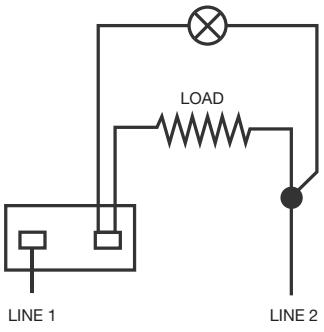


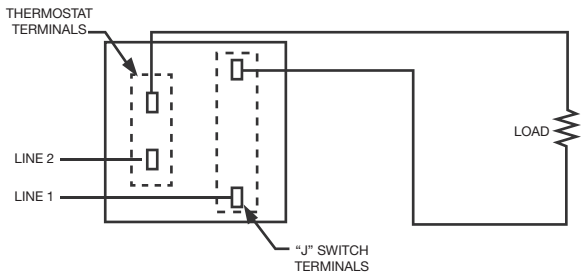
WIRING DIAGRAMS

PILOT LIGHT (OPTIONAL) IS ON WHEN THERMOSTAT SWITCH IS OFF



PILOT LIGHT (OPTIONAL) IS OFF WHEN THERMOSTAT SWITCH IS OFF





MODEL S SERIES AND MODEL K SERIES

Model[1]	Description
K/S	SPST – Break on Temperature Rise
K/S A	SPST – Break on Temperature Rise with SPST Aux. Switch Break in "OFF" Position
K/S B	SPST – Break on Temperature Rise with SPDT Aux. Switch, Break in "OFF" Position
K/S K	SPST – Break on Temperature Rise with Push-To-Turn
K/S J	Break on Temperature Rise With SPST Aux. Switch Break in "OFF" Position. "J" Switch has no Ambient Rating
K/S N	SPST – Break on Temperature Rise with NAK Filled Bulb
K/S P	SPST – Break on Temperature Rise Except with Positive "OFF" Dial
K/S R	SPST – Make on Temperature Rise
K/S X	SPST – Break on Temperature Rise for Use on Low Current Pilot Duty Applications
K/S XA	Similar to KX with Same Aux. Switch As Model KA
K/S XN	Similar to KX with NAK Filled Bulb
K/S XR	SPST – Make on Temperature Rise for Used on Low Current Pilot Duty Circuits

[1]Model K/S L for temperature limiting applications

Robertshaw® COOKING

RX SERIES MILLIVOLT THERMOSTAT

The Robertshaw® RX Series Millivolt Thermostat is a single pole single throw (SPST) thermostat designed for today's demanding Millivolt/Milliamp direct current applications. The RX thermostat features a hermetically sealed reed switch to provide durability and accuracy in the harshest environments.

Features and Benefits

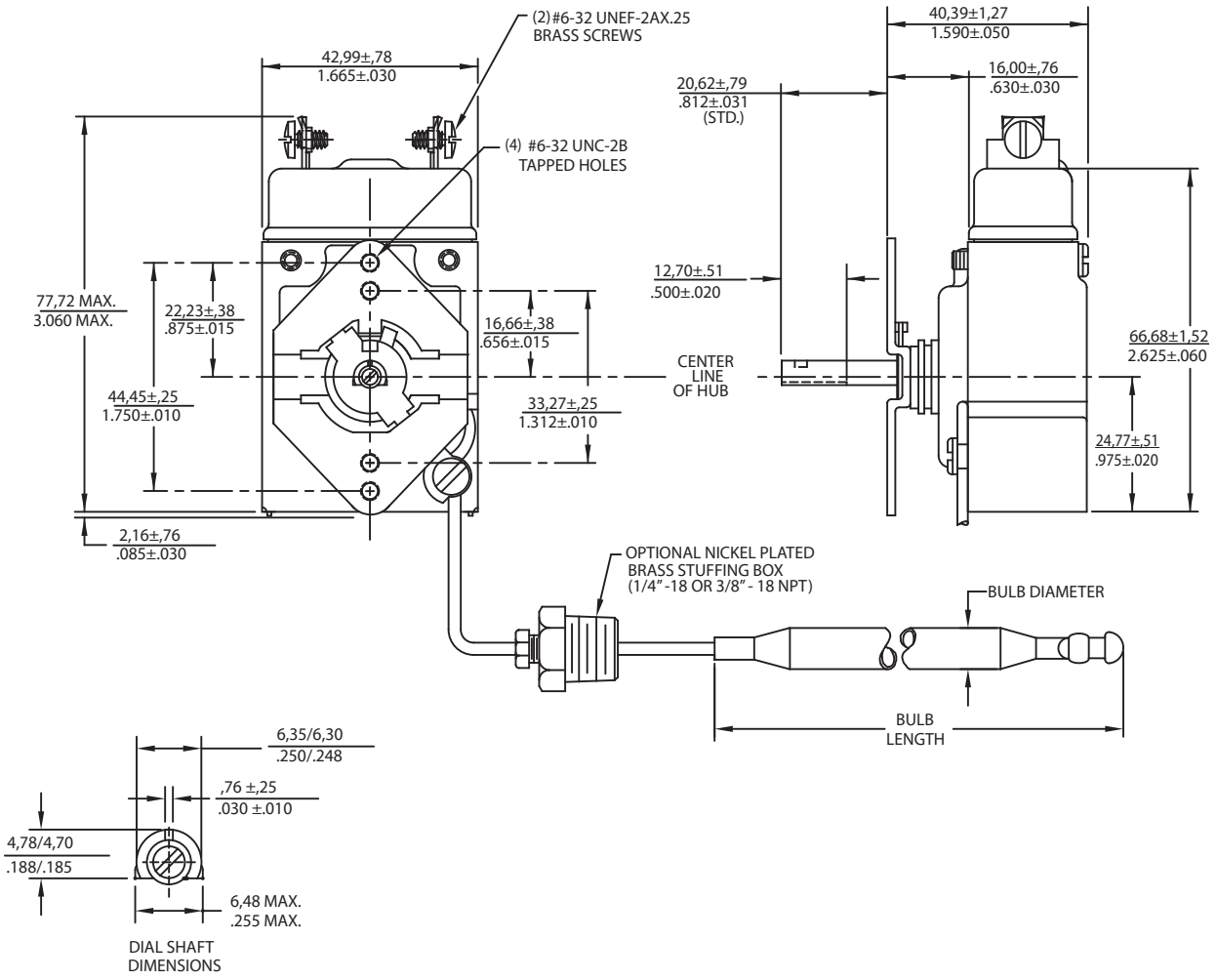
- Millivolt/Milliamp control for reliable low current/low voltage performance
- Sealed contacts provide survival in the harshest environments
- Robust design for increased reliability, durability, and reduced down time
- Precise and proven snap-action mechanism
- Screw type terminals ensure electrical integrity
- Rugged steel case design
- Bulb and capillary assemblies supplied in copper, nickel plated copper or stainless steel

Specifications

- Rated for 0.67 Amps at 5V DC
- Ambient temperature rated 230°F (110°C)
- SPST - Break on temperature rise
- Nickel plated brass stuffing boxes available (.250" or .375" NPT and BSP)
- Flat of shaft is down in the OFF position unless other wise specified
- Dials available in common temperature ranges
- RXN models available up to 900°F (482°C) maximum
- Agency Certifications:
  - UL E12103
  - CSA LR36461
  - CE 665984

RX SERIES MILLIVOLT THERMOSTAT

PRODUCT DIMENSIONS



AVAILABLE BULB DIAMETERS

inches	4.75	6.35	7.92	9.53
[millimeters]	120	161	201	242

NOTE: Use of this control on alternating current (AC) will damage the switch. Custom bulb lengths available.

AVAILABLE CAPILLARY LENGTHS

24" to 120" in 12" increments

610mm to 3048mm in 305mm increments

Robertshaw® COOKING

D1 SERIES THERMOSTAT

The Robertshaw® D1 Series Thermostat is a heavy-duty control designed for use in harsh applications where precise temperature control is required. The thermostat uses a double pole single throw (DPST) snap-action mechanism that is instantaneous, positive and non-fatiguing. The D1 Series is recommended for applications that require double pole operation and accurate temperature control.

Features and Benefits

- Temperature ranges to 650°F (343°C)
- DPST with positive OFF
- Reacts to minute movements of the diaphragms for very close temperature differential
- Diaphragm assembly features two stainless steel diaphragms electrically welded together for maximum sensitivity without overstressing the metal
- Supplied with 4 terminals
- Bulb and capillary available in copper, nickel plated copper, or stainless steel
- Plastic coating available to protect against moisture, dust, etc.
- Optional pilot light

Specifications

- Ambient temperature range:
  0°F to 150°F (-18°C to 66°C)
- Double pole single throw contacts (DPST)
- Positive OFF - Contacts are mechanically open in OFF position
- Electrical rating:
  - 120, 277V AC, 30 Amps
  - 480V AC, 10 Amps
  - 277V AC, 250VA
  - 125V AC, 125VA
- Agency Certifications:
  - UL and CSA File No. E12103

Additional Options

Dial

- Multiple temperature ranges available

Bezel

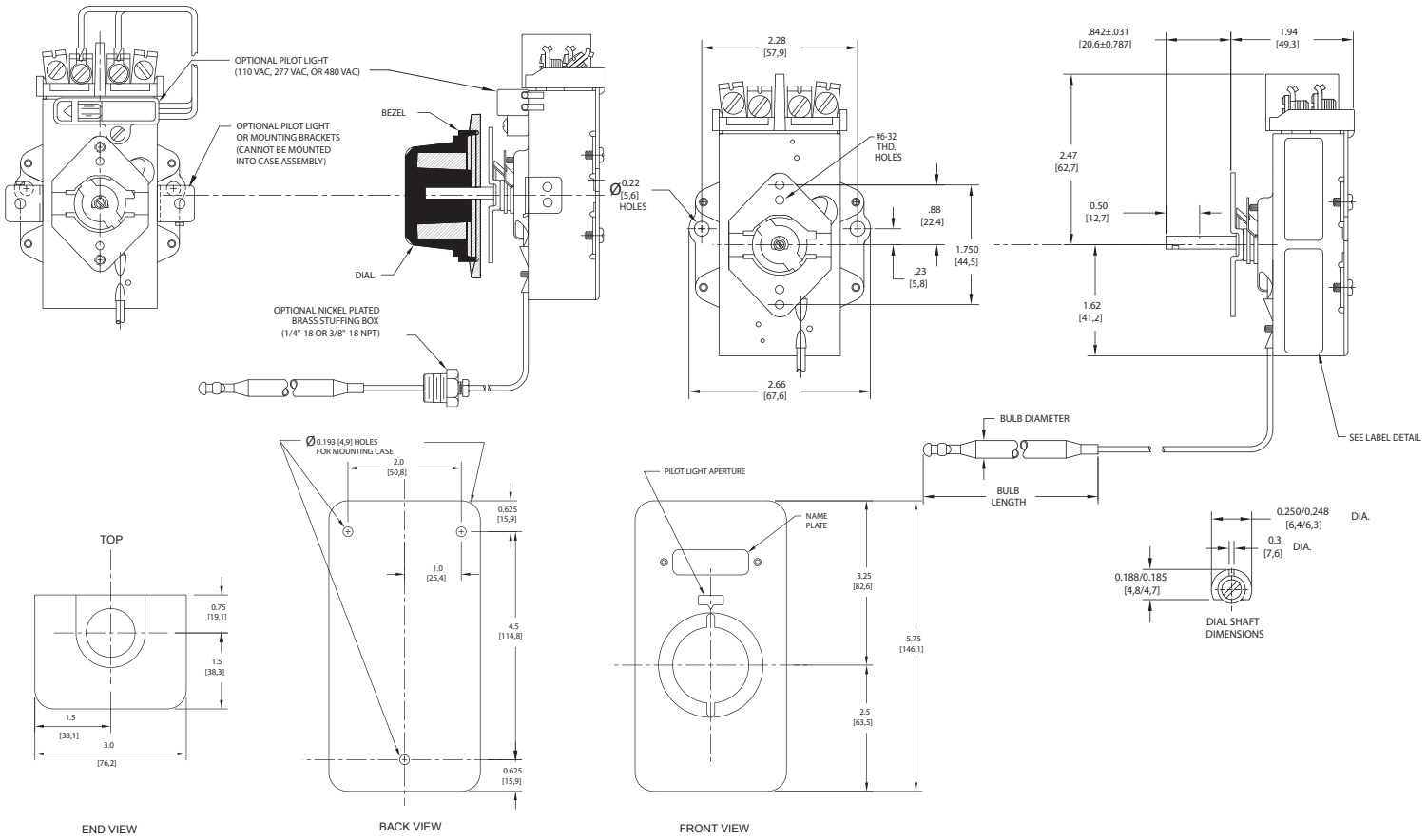
- Chrome plated brass bezel available

Protective Case Assembly

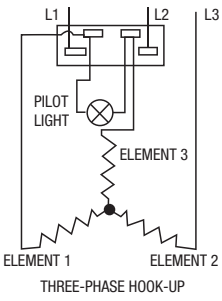
- Plated steel case
- Brass protective sleeve (optional)

D1 SERIES THERMOSTAT

PRODUCT DIMENSIONS

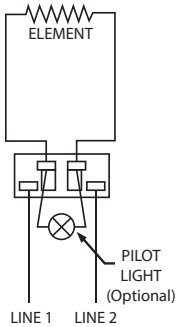


WIRING DIAGRAMS

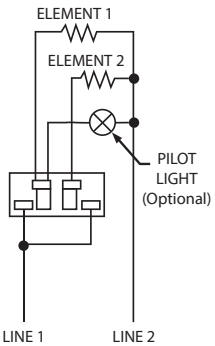


THREE-PHASE HOOK-UP

SINGLE ELEMENT
DOUBLE POLE
SINGLE PHASE



TWO ELEMENTS
SINGLE POLE
SINGLE PHASE



AVAILABLE BULB DIAMETERS

inches	0.178	0.250	0.312	0.375
[millimeters]	4,8	6,4	7,9	9,5

AVAILABLE CAPILLARY LENGTHS

12” to 120” in 6” increments

610mm to 3048mm in 305mm increments

Custom bulb and capillary lengths available.

Robertshaw® COOKING

BJWA SERIES THERMOSTAT

The Robertshaw® BJWA Series Thermostat is a combination gas cock and by-pass type thermostat. It is available with both by-pass and pilot adjustments. With BJWA thermostats, the gas is turned on and the temperature setting made with a single turn of the dial.

The BJWA is available for a wide variety of applications, especially ranges and griddles.

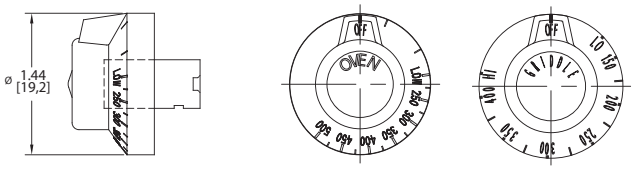
Features and Benefits

- Highly adaptable with multiple orientations and 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
- Dials and bezels available separately
- Flange nipple adaptors available

Specifications

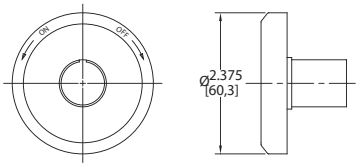
- Ambient temperature range: 32°F to 350°F (0°C to 177°C)
- Maximum inlet pressure: 0.5 PSI
- Rated capacity (Natural Gas) to 70,000 BTU/hour
- Agency Certifications:
  - CSA Certificate 164327-1177534
  - CE 665991
  - CE Certification applies only to BJWE models

DIAL SUBASSEMBLIES



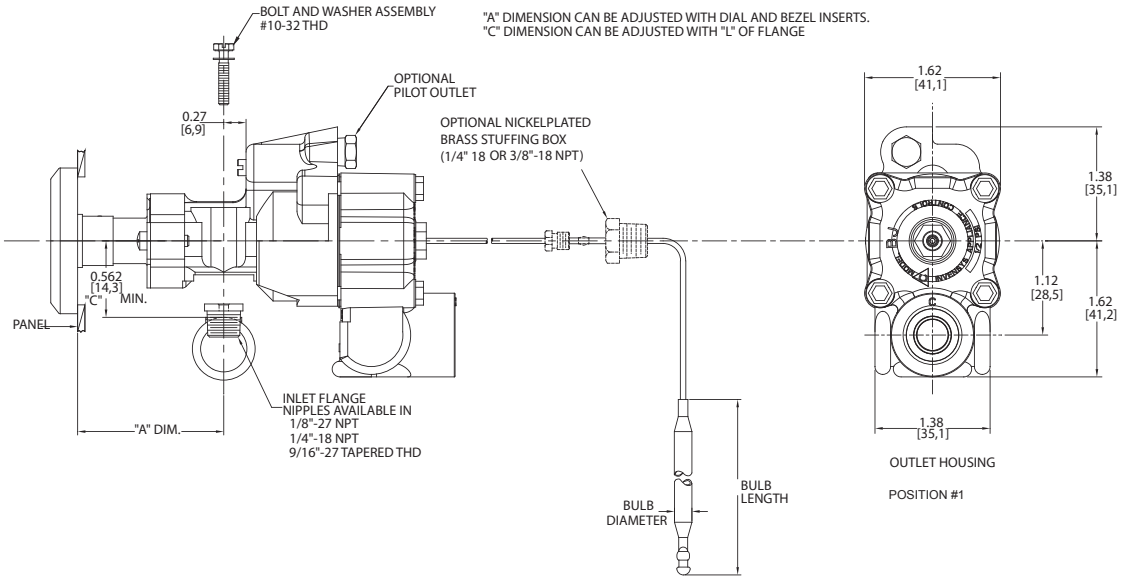
OTHER DIAL LAYOUTS AVAILABLE

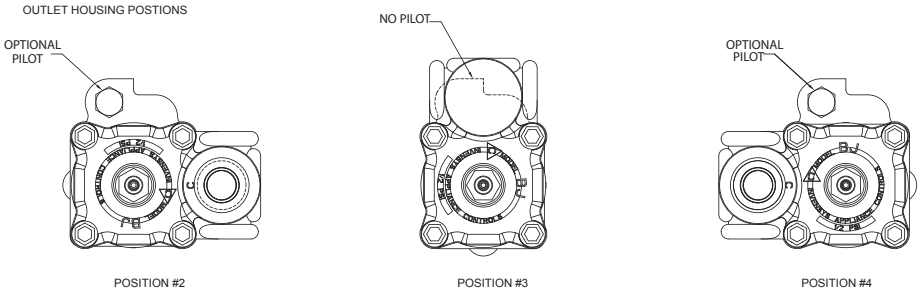
BEZEL SUBASSEMBLIES

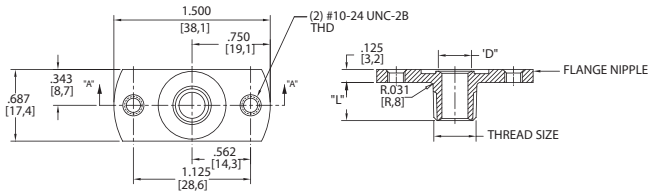


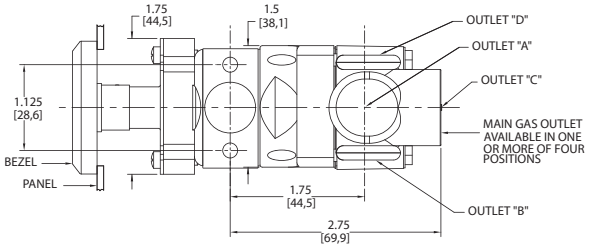
BJWA SERIES THERMOSTAT

PRODUCT DIMENSIONS









AVAILABLE BULB DIAMETERS

inches	0.178	0.250	0.312	0.375
[millimeters]	4,8	6,4	7,9	9,5

Custom bulb and capillary lengths available.

AVAILABLE CAPILLARY LENGTHS

12” to 120” in 6” increments

610mm to 3048mm in 305mm increments

Robertshaw® COOKING

FD SERIES THERMOSTAT

The Robertshaw® FD Series Thermostat is designed as 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 available. Applications include a variety of applications such as deck ovens, convection ovens, baking ovens, and ranges.

Features and Benefits

- Available in various temperature ranges with temperature control up to 650°F (343°C)
- Heat resistant materials and rugged design
- Pilot and bypass keys accessible and slotted for easy adjustment from the front of the control
- 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
- Heat resistant plastic dials available in black with white characters

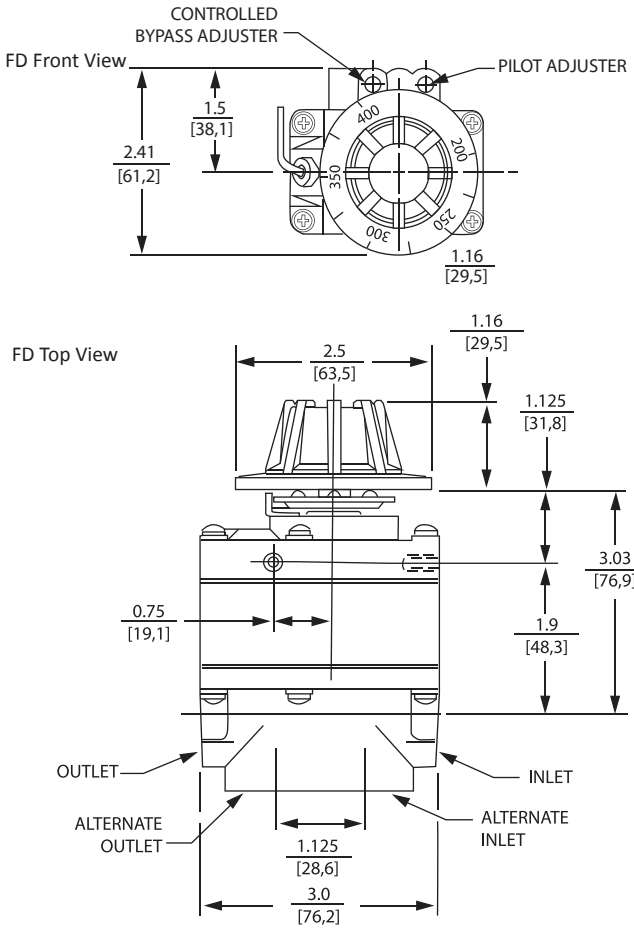
Specifications

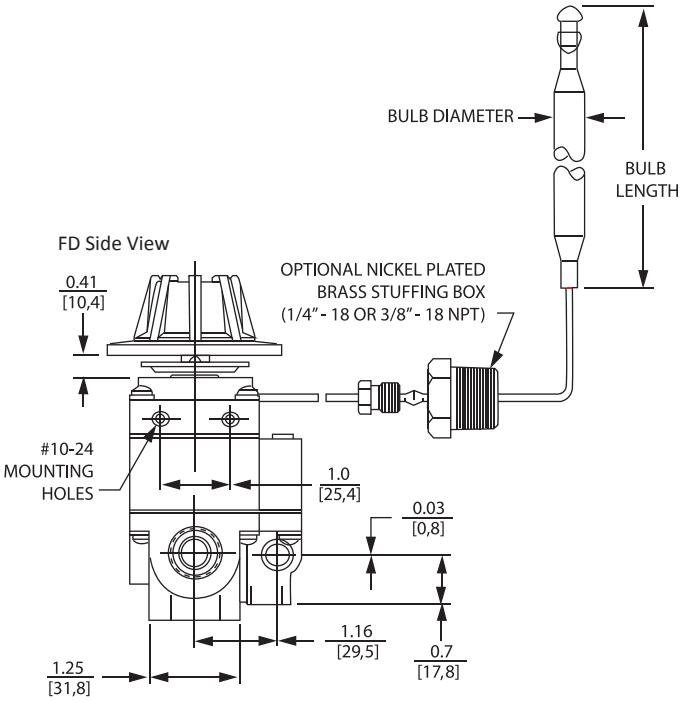
- Ambient temperature range: 32°F to 350°F (0°C to 177°C)
- Maximum inlet pressure: 0.5 PSI
- Rated capacity (Natural Gas):
  - 3/8” pipe in and out 100,000 BTU/hour
  - 1/2” pipe in and out 100,000 BTU/hour
  - 7/16” tubing in and out 100,000 BTU/hour
- Agency Certifications:
  - CSA 164327-1195899
  - CE 665989
  - CE Certification applies only to FDTOE, FDTHE and FDTSE models
  - RoHS Compliant

RoHS

FD SERIES THERMOSTAT

PRODUCT DIMENSIONS





AVAILABLE BULB DIAMETERS				
inches	0.178	0.250	0.312	0.375
[millimeters]	4,8	6,4	7,9	9,5

Custom bulb and capillary lengths available.

AVAILABLE CAPILLARY LENGTHS
12" to 120" in 6" increments
610mm to 3048mm in 305mm increments

Robertshaw® COOKING

GS SERIES THERMOSTAT

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

Features and Benefits

- Available in various temperature ranges with temperature control up to 600°F (316°C)
- Snap-acting from OFF position to full gas flow
- Adequate capacity and small size for counter top appliances
- Applicable to use with high capacity gas operated diaphragm valves
- Adapts to limited mounting space
- Bulb and capillary assemblies supplied in copper, nickel plated copper or stainless steel
- Dials in heat resistant plastic are available
- Available with main burner bypass or pilot outlet

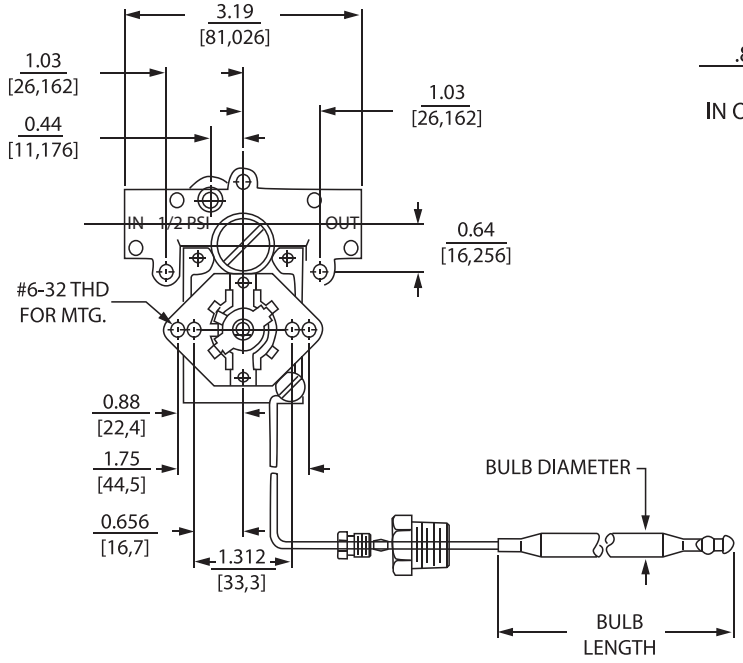
Specifications

- Ambient temperature range: 32°F to 300°F (0°C to 93°C)
- Maximum inlet pressure: 0.5 PSI
- Rated capacity (Natural Gas):
  - 3/8" pipe in and out 30,000 BTU/hour
  - 7/16" tubing in and out 30,000 BTU/hour
  - 1/4" tubing in and out 9,000 BTU/hour
- Agency Certifications:
  - CSA 164327-1195957
  - CE Certification applies only to GSE models
  - CE 665992

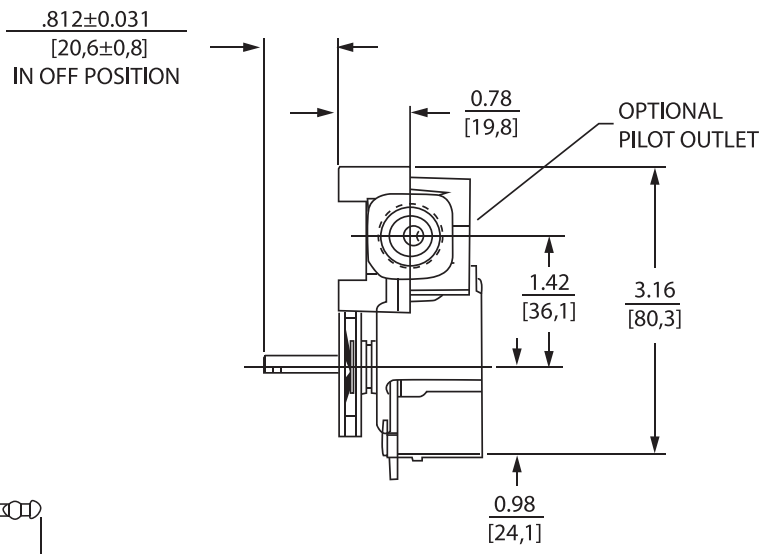
GS SERIES THERMOSTAT

PRODUCT DIMENSIONS

GS Front View



GS Right View



AVAILABLE BULB DIAMETERS				
inches	0.178	0.250	0.312	0.375
[millimeters]	4,8	6,4	7,9	9,5

Custom bulb and capillary lengths available.

AVAILABLE CAPILLARY LENGTHS
12” to 120” in 6” increments
610mm to 3048mm in 305mm increments

Robertshaw® COOKING

B10 SERIES THERMOSTAT

The Robertshaw® B10 Series 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, nickel plated copper or stainless steel
- Plastic coating available to protect against moisture, dust, etc.

Specifications

- Ambient temperature range: 32°F to 150°F (0°C to 66°C)
- Electrical rating:
  - 20 Amps @ 125V AC
  - 15 Amps @ 250V AC
  - 125VA PD @ 125V AC
- Agency Certifications:
  - UL E12103
  - CSA LR36461

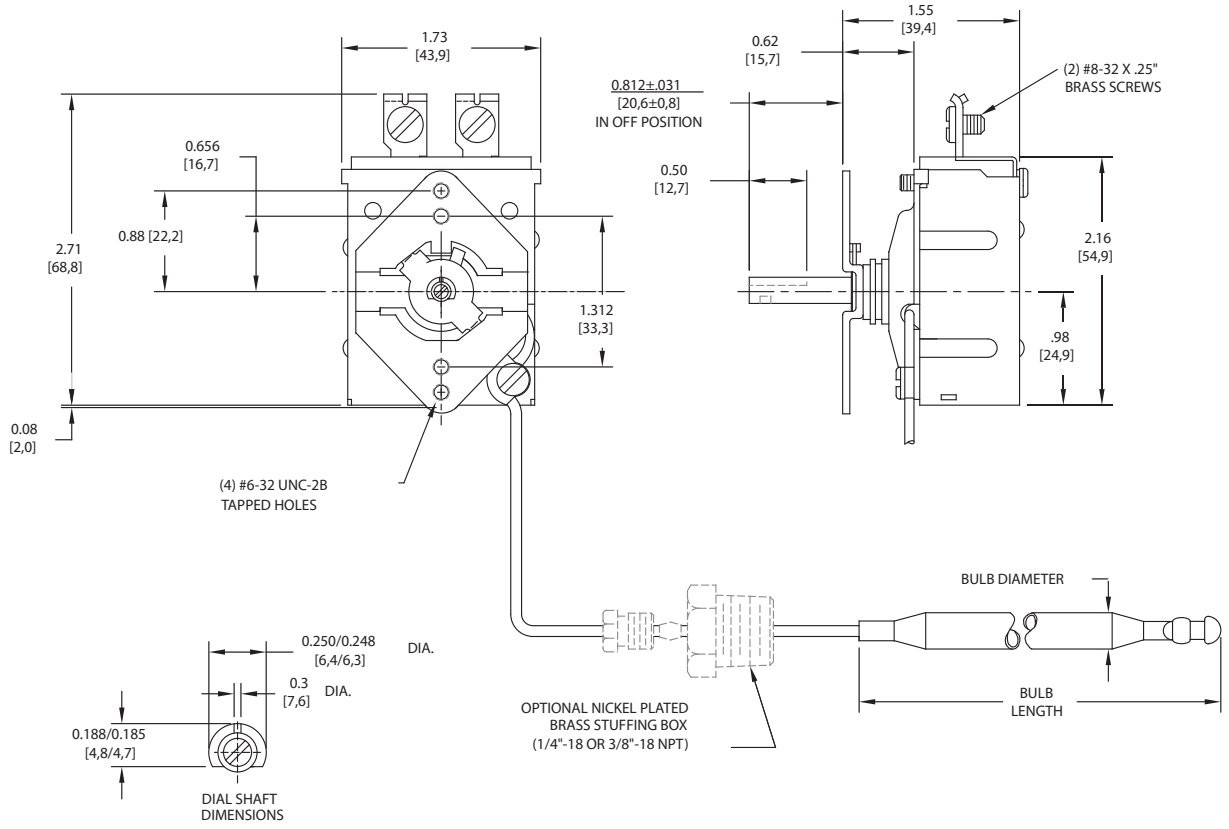
AVAILABLE BULB DIAMETERS				
inches	0.187	0.250	0.312	0.375
[millimeters]	4,8	6,4	7,9	9,5

AVAILABLE CAPILLARY LENGTHS
12” to 120” in 6” increments
610mm to 3048mm in 305mm increments

Custom bulb and capillary lengths available.

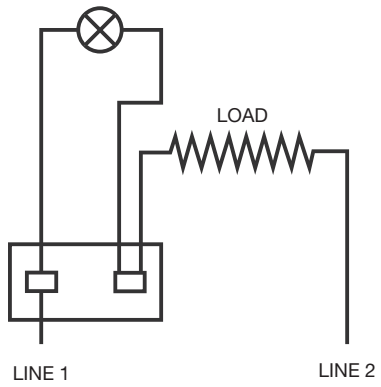
B10 SERIES THERMOSTAT

PRODUCT DIMENSIONS

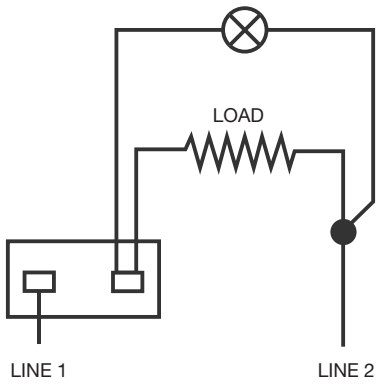


WIRING DIAGRAMS

PILOT LIGHT (OPTIONAL) IS ON WHEN
THERMOSTAT SWITCH IS OFF



PILOT LIGHT (OPTIONAL) IS OFF WHEN
THERMOSTAT SWITCH IS OFF



Robertshaw® COOKING

C1 SERIES THERMOSTAT AND HIGH LIMIT CONTROL

The Robertshaw® C1 Series Thermostats and High Limit Controls are standard hydraulic sensing thermostats and manual reset high limit controls for applications that require precise temperature control. The C1 Series is designed for applications such as pool and spa heaters, coffee brewers, hot water boosters, bain marie's, pasta cookers, re-thermalizers, space heaters, and heated display units.

Features and Benefits

- C1 Series use a single pole or double pole, snap-acting switch for switching heavy resistive or inductive loads
- Optional gold flash contact switch is offered to switch millivolt or pilot duty applications
- Ambient temperature compensated to maintain accurate temperature control over a wide range of environmental conditions
- C1-RX limit control features a manual reset M1 type switch or an automatic reset switch

Specifications

- See chart on page 27 for specifications unique to three models
- Agency Certifications:
  - UL E16835
  - CSA LR10499

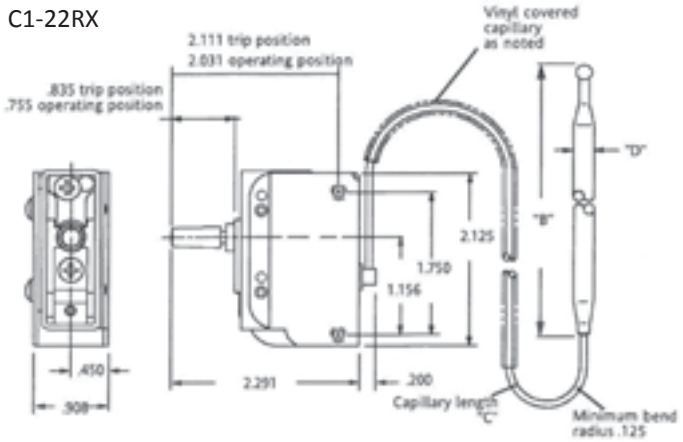
C1 SERIES THERMOSTAT AND HIGH LIMIT CONTROL

Specifications

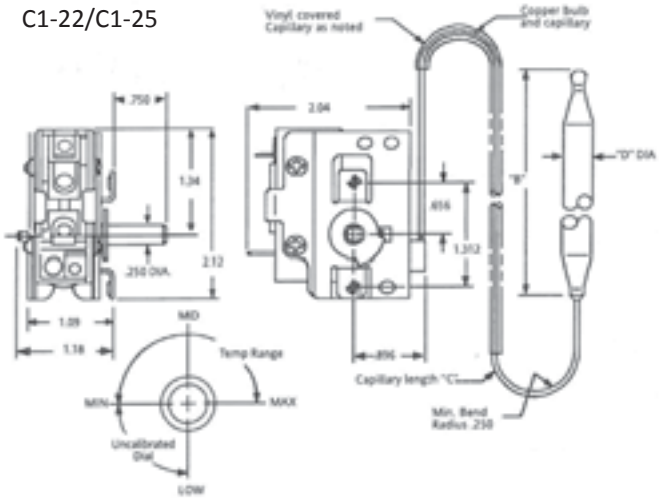
Model	Thermostat shaft size	Termination	Max Ambient Temperature	Temperature Range	Electrical Ratings
Model 22	.25" diameter x .156", .187" or .199" flat. Multiple shaft lengths and configurations available up to 1.5"	.25" male copper quick-connect per NEMA DC-2 specifications. Optional No. 12 AWG, 105°C wire leads or 8-32UNC threaded terminals available	180°F (82°C)	Minimum 30°F Maximum 250°F (higher temperature ranges available)	22A @125/250V AC Resistive ¼ HP @125V AC, ½ HP @250V AC Pilot Duty: 125VA Pilot Duty
Model 22RX	None	25" male copper quick-connect per NEMA DC-2 specifications. Optional No. 12 AWG, 105°C wire leads or 8-32UNC threaded terminals available	180°F (82°C)	Minimum 30°F Maximum 250°F (higher temperature ranges available)	22A @125/250V AC Resistive 1 HP@125V AC, 2 HP @ 250V AC Pilot Duty: 125VA Pilot Duty
Model 25	.25" diameter x .156", .187" or .199" flat. Multiple shaft lengths and configurations available up to 1.5"	25" male copper quick-connect per NEMA DC-2 specifications. Optional No. 12 AWG, 105°C wire leads or 8-32UNC threaded terminals available	180°F (82°C)	Maximum 600°F	30A @125/250V AC Resistive 20A, 277/480V AC 50/60Hz ¾ HP, 125V AC, 1 ½ HP, 250V AC Pilot Duty: 125 VA pilot duty - 24/120/480V, 360 VA pilot duty - 240V

PRODUCT DIMENSIONS

C1-22RX



C1-22/C1-25



Robertshaw® COOKING

TS SERIES THERMOMAGNETIC SAFETY VALVE

The Robertshaw® TS 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 manually operated then held open by the voltage generated by a thermocouple when it is heated by the pilot flame. When this flame is extinguished, the thermocouple voltage decreases until the valve 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

- Ambient temperature rated 300°F (149°C); 350°F (177°C) versions available
- TS11J - separate pilot inlet/outlet connections
- TS11K - main inlet supplies pilot gas
- Compatible with other Robertshaw models such as the BJ, FD, and GS series thermostats
- Agency Certifications:
  - CSA Certification 164327-1910372
  - RoHS compliant

Specifications

PILOT CONNECTIONS		
Model	Inlet	Outlet
J	1/8” Pipe	1/8” Pipe
J	1/4” Tubing	1/4” Tubing
J	3/16” Tubing	3/16” Tubing
K	NA	1/8” Pipe
K	NA	1/4” Tubing
K	NA	3/16” Tubing

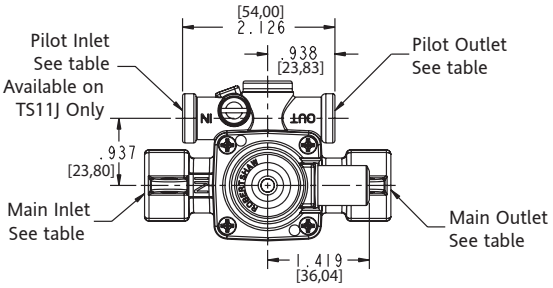
MAIN SIZE		CAPACITIES BTU/HR @ 1” WC PD	
Inlet	Outlet	Natural Gas	LP Gas
1/4” Pipe	1/4” Pipe	97,000	157,000
1/2” Pipe	1/2” Pipe	210,000	340,355
7/16” Tubing	7/16” Tubing	99,000	160,599
3/8” Pipe	7/16” Tubing	99,000	160,599
3/8” Pipe	3/8” Pipe	135,000	218,999

RoHS

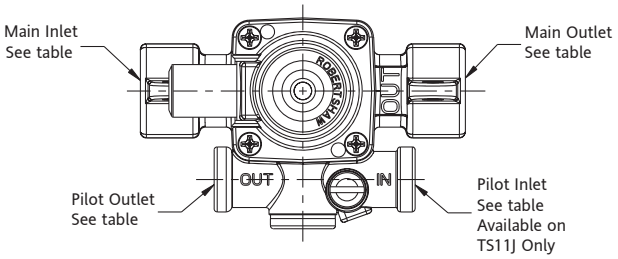
TS SERIES THERMOMAGNETIC SAFETY VALVE

PRODUCT DIMENSIONS

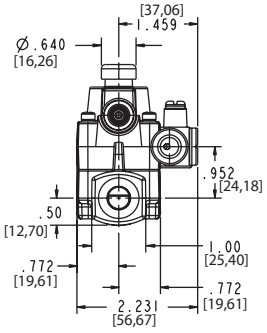
TS11J Top



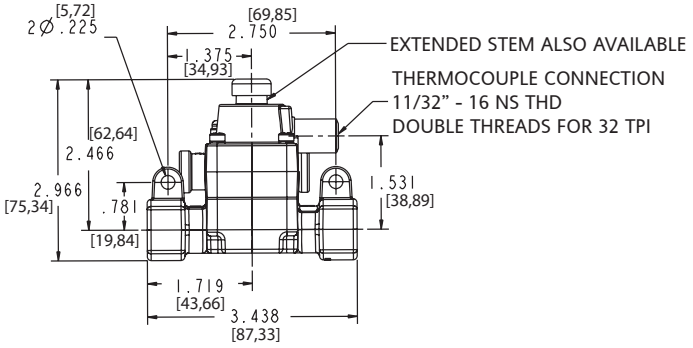
TS11J Top (rotated 180°)



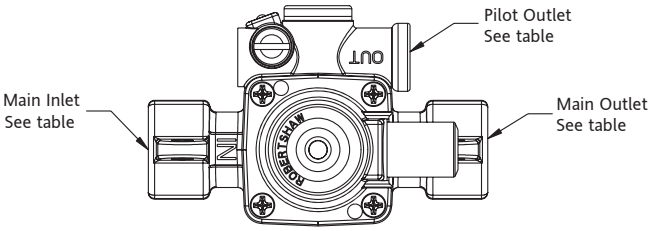
TS11J Side



TS11J Front



TS11K Top with no Pilot Inlet



Robertshaw® COOKING

GPR SERIES GAS PRESSURE REGULATOR

The Robertshaw® GPR Series Gas Pressure Regulator (GPR) is designed for use in any appliance to regulate the gas flow. This standard regulator can be set for 4”, 5” or 6” Water Column (W.C.) Natural Gas or for 10” W.C. Liquid Propane (LP) gas outlet pressures.

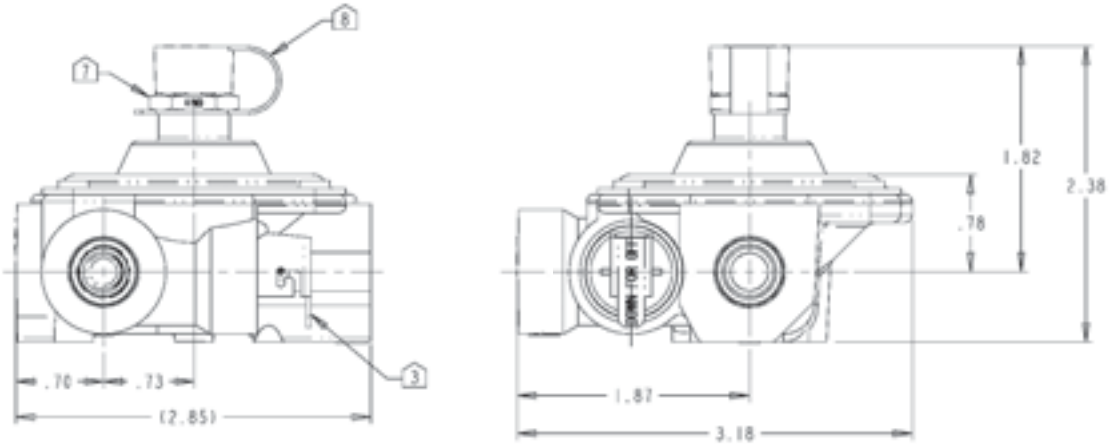
Features and Benefits

- Integral manual valve for oven supply
- Convertible for Natural or LP gas
- Can be mounted in multiple positions
- Various inlet and outlet options available

Specifications

- Ambient temperature rating up to 300°F (148°C)
- Up to 100,000 BTUs
- 1/2" PSIG rating
- 1/2" NPT inlet
- Main outlet available in 3/8” loxit, 3/8” NPT, or 1/4” NPT
- Valve outlet available in 3/8” loxit, 1/4” NPT
- Die cast aluminum housing
- Mounting brackets available
- Agency Certifications:
  - CSA 164327-1026921

PRODUCT DIMENSIONS



Robertshaw® COOKING

GPR HIGH CAPACITY SERIES GAS PRESSURE REGULATOR

The versatile Robertshaw® GPR High Capacity Series Gas Pressure Regulator has ratings up to 200,000 BTU. This versatile regulator can be used in any gas appliance to regulate the gas flow.

Features and Benefits

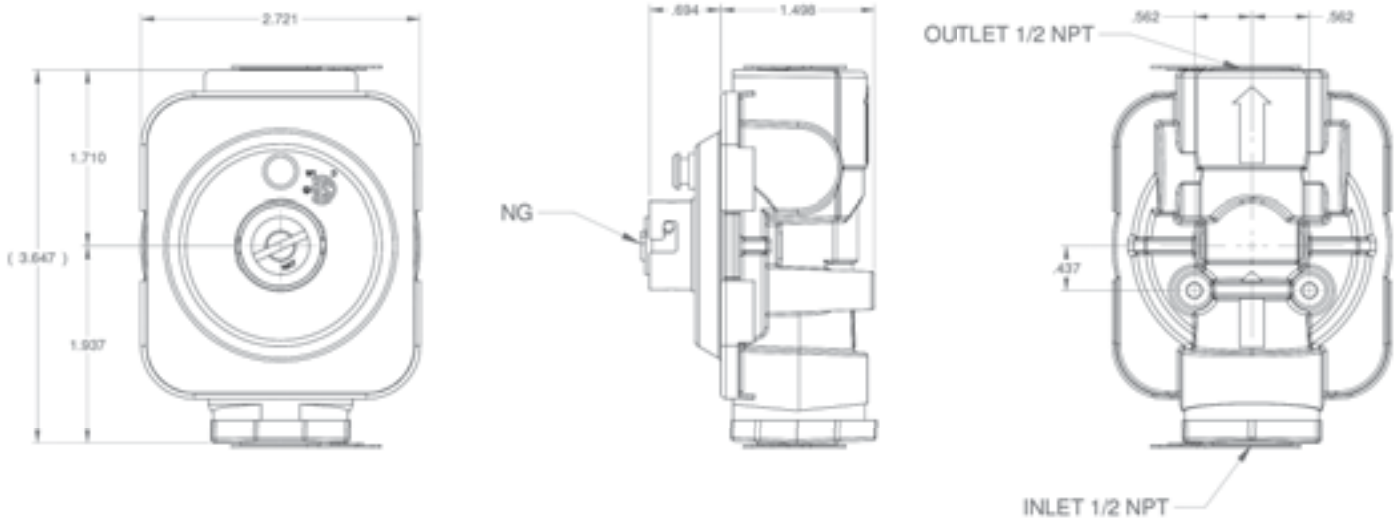
- Available with or without integral shut off valve
- Convertible or fixed for Natural or LP gas
- Standard 225°F (107°C) or high temperature 300°F (148°C) ambient ratings
- Choice of inlet/outlets
- Choice of outlet pressure settings
- Optional 1/8” NPT side outlet tap
- Can be mounted in multiple positions

Specifications

- Regulation range of 150 BTU up to 200,000 BTU/HR
- Rated capacity: 155,000 BTU at 1” pressure drop (3/8” x 1/2” inlet/outlet)
- Rated outlet pressures: 4”, 5” or 6” W.C. Natural Gas 10” and 11” W.C. LP gas
- Straight-thru design
- Die-cast aluminum housing
- Rated inlet pressure 0.5 PSI
- Inlet and outlet options up to 3/4” NPT
- Agency Certifications:
  - CSA 164114-1763594 (4670)
  - CSA 164114-1763603 (4680)

GPR HIGH CAPACITY SERIES GAS PRESSURE REGULATOR

PRODUCT DIMENSIONS



Robertshaw® COOKING

7000 SERIES GAS VALVE

The Robertshaw® 7000 Series Gas Valve is a combination gas valve that typically includes pilot safety valve, main gas regulation and main gas control. It is available in thousands of variations making it the right choice for nearly any application. Multiple inlet and outlet sizes and orientations, multiple BTU capacity options, types of actuators, available inlet/outlet pressure taps and along with pilot outlet make this the most versatile valve platform available. Examples of applications that use the 7000 series are: furnaces, industrial heaters, pool heaters, commercial fryers, commercial ovens, gas log fireplaces, space heaters, and recreational vehicle heaters.

Features and Benefits

- Compact versions available for applications where space is premium
- 1" W.C. PD regulation capacities available from 5,000 BTU to 600,000 BTU Natural Gas
- Various types of gas: Natural, manufactured, mixed, LP and LP/air mixtures
- Outlet screen
- Inlet/outlet pressure taps
- 1/4" and 3/16" spade connectors to prevent mis-wiring
- May be mounted at any angle between 0° and 90° from upright
- Pilot gas filter
- Natural Gas to LP field convertible models available
- Soft ignition available
- Works with hot surface, direct spark, intermittent pilot or standing pilot ignition
- Negative pressure regulation available
- Pilot capacity 2CFH
- High/low models available
- Gas operated, mV, 12V DC, 24V AC, 120V AC and 240V AC versions available

Specifications

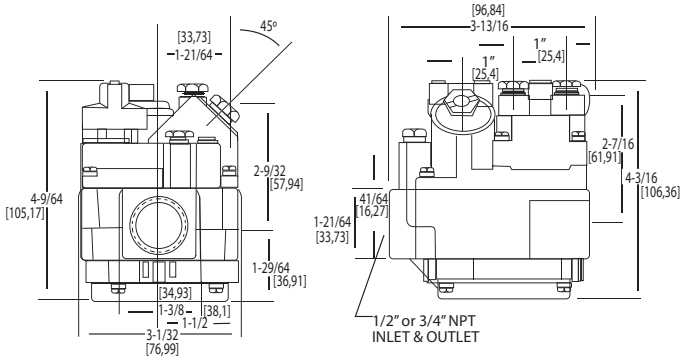
- Range of regulation adjustment: 3.0" to 5.0" W.C. Natural Gas; 8.0" to 12.0" W.C. LP
- Straight line regulation
- Maximum operating pressure is .5 PSI
- Available inlet/outlet sizes available are 3/8", 1/2", 3/4" and 1" in the NPT or BSP (some exceptions)
- Ambient temperature range: -40°F to 175°F (-40°C to 80°C)
- Agency Certifications:
  - ROHS compliant
  - CSA 153207-1019511
  - CE 665994

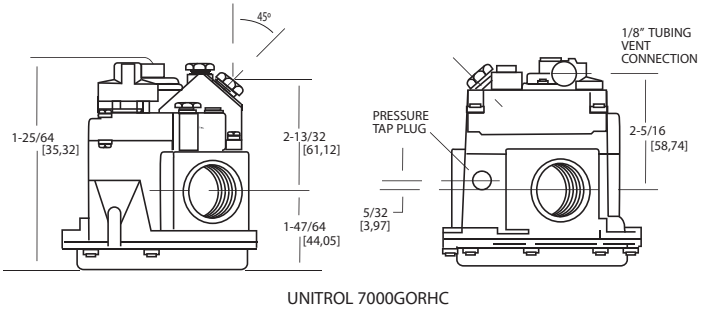
RoHS

7000 SERIES GAS VALVE

PRODUCT DIMENSIONS

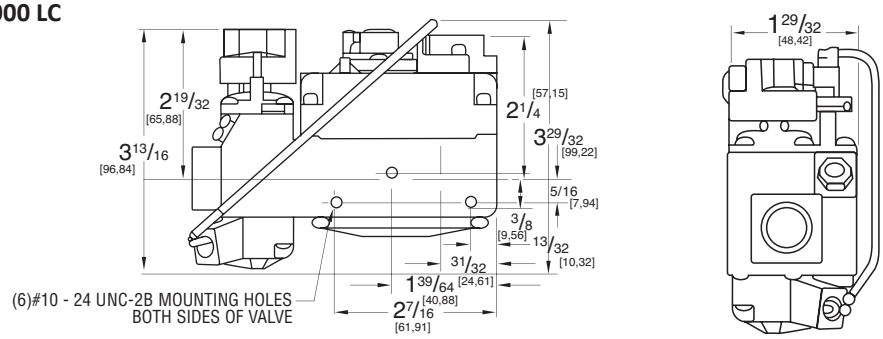
7000 STD





UNITROL 7000GORHC

7000 LC



REGULATION CAPACITIES

Factory Model	Inlet x Outlet"	Natural Gas BTU @ 1" W.C. PD	Natural Gas Min - Max BTU Capacity	LP BTU @ 1" W.C. PD	LP Min - Max BTU Capacity
7000	3/4 x 3/4	300,000	34,500 - 370,000	485,000	34,500 - 560,000
7000 HC	1 x 1	600,000	200,000 - 800,000	972,000	300,000 - 1,150,000
7000 LC	1/2 x 1/2	40,000	5,000 - 70,000	65,000	5,000 - 110,000

Robertshaw® COOKING

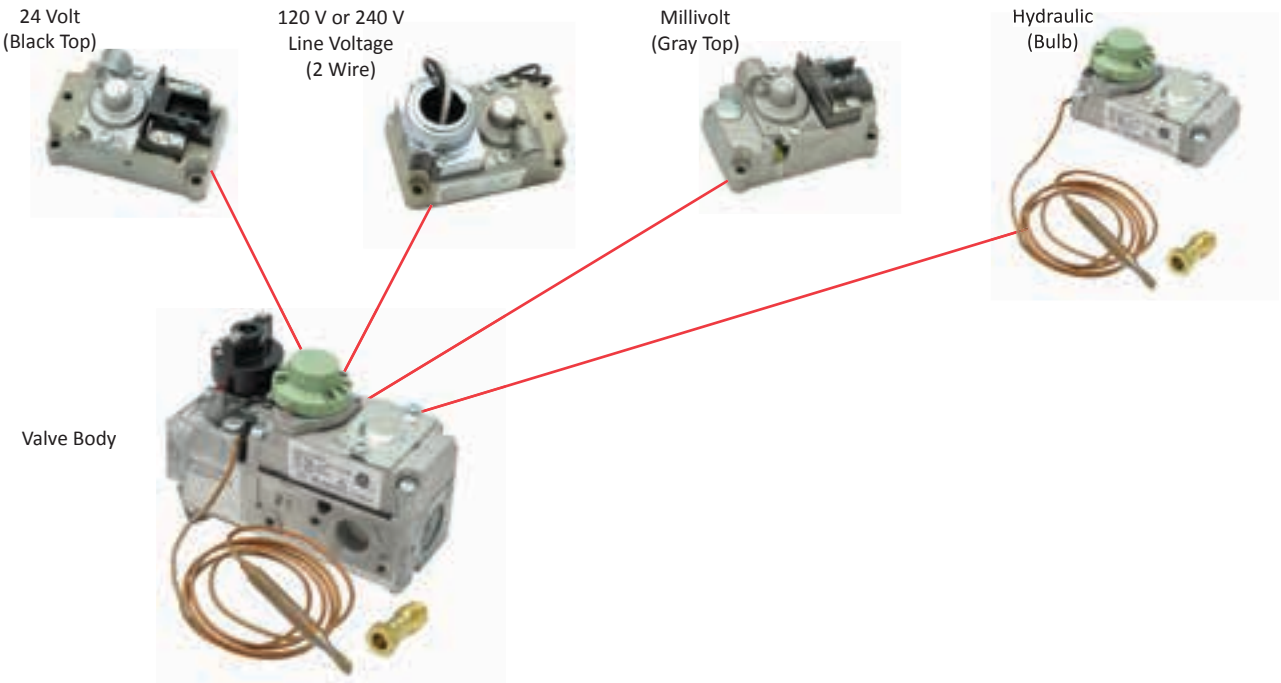
7000 SERIES GAS VALVE

FACTORY MODEL CODE IDENTIFICATION

Factory Model Number			DESCRIPTION	
7000	7000LC	7000HC		
•			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 - Intrinsically “non-hunting”
•	•	•	7010	Unitrol 7000 Body without a gas cock
•		•	D	Solenoid Valve - Pilot Gas - Single coil operated on AC
•	•	•	E	Electric Actuator - 24V AC
•	•	•	E12	Electric Actuator - 12V DC
•	•	•	E120	Electric Actuator - 120V AC
•	•	•	E240	Electric Actuator - 240V AC
•	•	•	F	Factory Fixed (not adjustable regulator setting 3.0" to 7.0" W.C.)
•		•	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
		•	HHC	High Capacity Body CSA rated for limited horizontal or vertical mounting. Can be replaced by HC model
•		•	IPER	Intermittent Pilot Ignition Gas Valve - regulated
•		•	L	Relight Interlock type. A European requirement
•	•	•	LP	For Liquefied Petroleum Gases
•	•	•	M	Manual Actuator
•		•	MS	Millivolt Safety Magnet - uses thermopile type safety
•	•	•	MV	Millivolt Actuator
•		•	P	Regulator Pressure Range (1.4" to 3.6" W.C.)
•	•	•	R	Regulator Type
•		•	RB	Adjustable (High - Low) pressure regulator adjusts percentage of output. -4 = 60% of full flow -5 = 70% of full flow -6 = 80% of full flow

Factory Model Number			DESCRIPTION	
7000	7000LC	7000HC		
•	•	•	RC	Convertible regulator from Natural Gas to LP and back
•	•	•	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
•			SR	Hydraulic Snap-Acting Actuator - Regulated
•		•	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. -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
•		•	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

Actuator options



Low Capacity valve body shown along with Hydraulic bulb actuator

Robertshaw® COOKING

FJT AND FJTDO SERIES SOLENOID GAS VALVES

The Robertshaw® FJT and FJTDO Series Solenoid Gas Valves are 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. Auxiliary outlets can be supplied for pressure taps or pilots if required. Mounting options include multiple positions, rigid mounting, and standard brackets.

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 screens available
- Gas types: Natural and LP
- Mounting brackets available
- 1/2 wave rectified
- Pilot outlet available on both single and dual models

Specifications

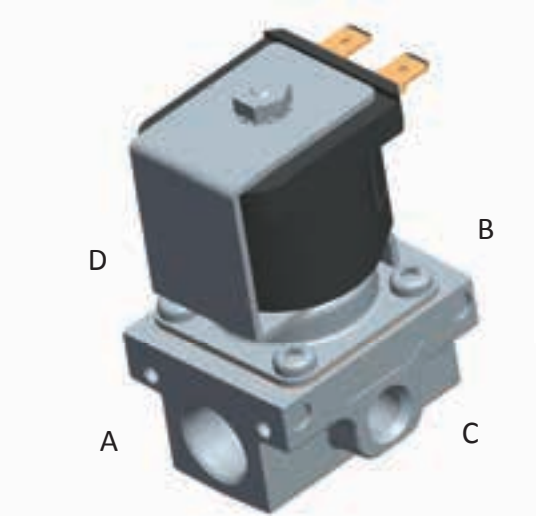
- Ambient temperature range: -40°F to 275°F (-40°C to 135°C)
- Rated capacity up to 119,000 BTU/hour at 1" W.C. pressure drop
- 24, 120 or 240V AC at 50/60 Hz
- Maximum pressure: 0.5 PSI
- Agency Certifications:
  - CSA Certification 164327-1177530
  - CE 665987
  - RoHS Compliant

RoHS

FJT AND FJTDO SERIES SOLENOID GAS VALVES

BODY STYLE CODES

	Inlet		Outlet	
Code	Main A	Main B	Main C	Main D
01	⅜ Pipe	⅜ Pipe	None	None
02	⅜ Pipe	⅜ Pipe	⅛ Pipe*	⅛ Pipe*
03	⅜ Pipe	⅜ Pipe	⅛ Pipe*	None
04	⅜ Pipe	⅜ Pipe	None	⅛ Pipe*
05	⅜ Pipe	⅜ Pipe	⅛ Pipe**	⅛ Pipe**
06	⅜ Pipe	⅜ Pipe	⅛ Pipe**	None
07	⅜ Pipe	⅜ Pipe	None	⅛ Pipe**
08	⅜ Pipe	⅜ Pipe	⅛ Pipe*	⅛ Pipe**
09	⅜ Pipe	⅜ Pipe	⅛ Pipe**	⅛ Pipe*
10	⅜ Tube	⅜ Tube	None	None
11	⅜ Tube	⅜ Tube	⅛ Pipe*	⅛ Pipe*
12	⅜ Tube	⅜ Tube	⅛ Pipe*	None
13	⅜ Tube	⅜ Tube	None	⅛ Pipe*
14	⅜ Tube	⅜ Tube	⅛ Pipe**	⅛ Pipe**
15	⅜ Tube	⅜ Tube	⅛ Pipe**	None
16	⅜ Tube	⅜ Tube	None	⅛ Pipe**
17	⅜ Tube	⅜ Tube	⅛ Pipe*	⅛ Pipe**
18	⅜ Tube	⅜ Tube	⅛ Pipe**	⅛ Pipe*



* Outlet is drilled so gas flows when solenoid is closed.
** Outlet is drilled so gas flows only when solenoid is open.

Robertshaw® COOKING

SGV SERIES SOLENOID GAS VALVES

The Robertshaw® SGV Series Solenoid Gas Valves valve has a rugged design to control the flow of gas in an appliance application. Die cast aluminum bodies with multi-position, rigid mounting and standard brackets are available. This gas solenoid valve can be used for a wide variety of applications, especially in ovens and griddles.

Features and Benefits

- Normally closed solenoid
- Compact size with high flow rates
- Standard NEMA terminals
- Inlet screens available
- Various gas types: Natural and LP
- Multiple terminal and mounting brackets and bracket configurations available

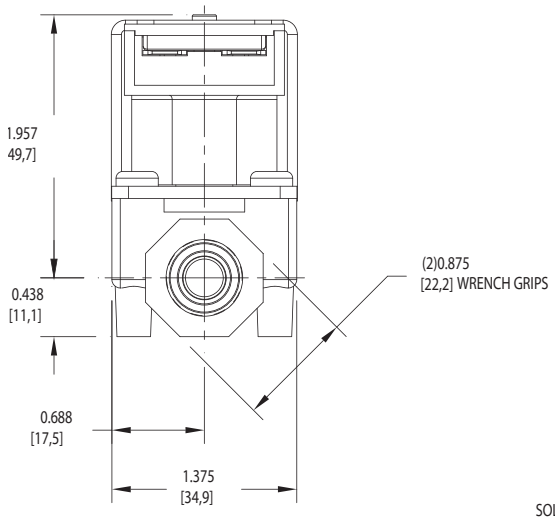
Specifications

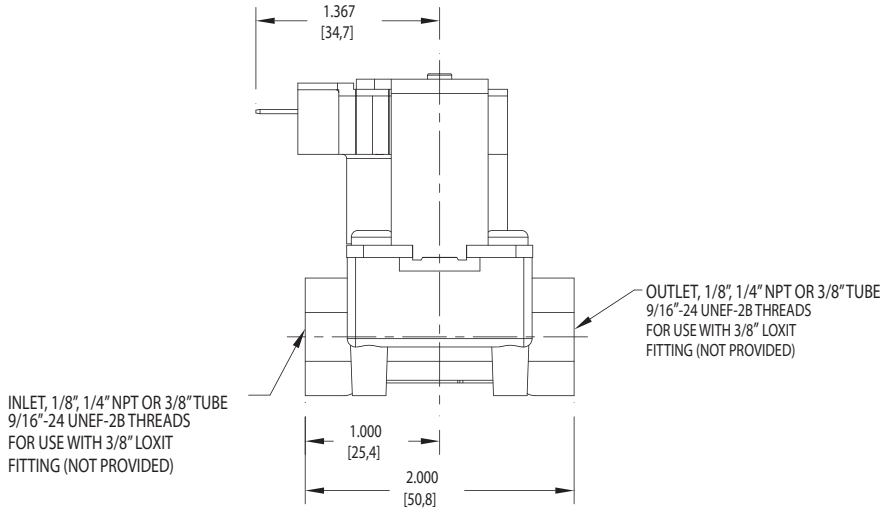
- Ambient temperature range: 32°F to 300°F (0°C to 149°C) maximum
- Capacity up to 30,000 BTU at 1" W.C. PD
- 24V AC, 50/60 Hz, 0.56 Amp
- 120V AC, 50/60 Hz, 0.13 Amp
- Maximum pressure: 0.5 PSI
- Agency Certifications:
  - CSA 164327-1177530
  - CE 665986
  - RoHS compliant

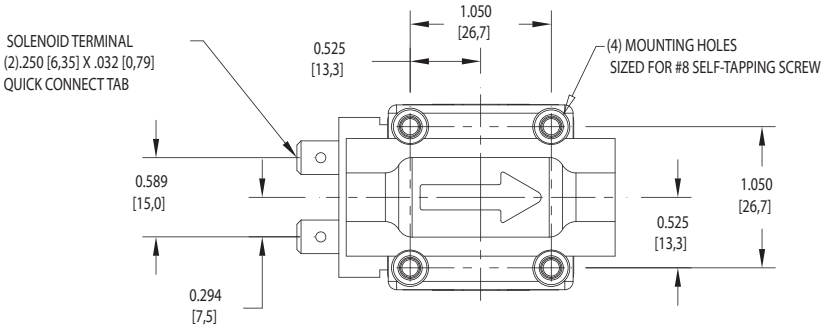
RoHS

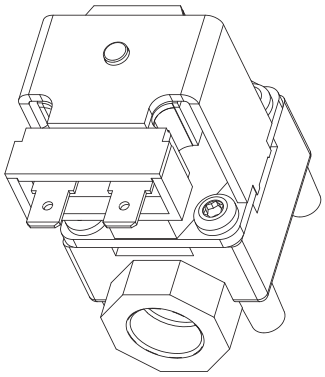
SGV SERIES SOLENOID GAS VALVES

PRODUCT DIMENSIONS





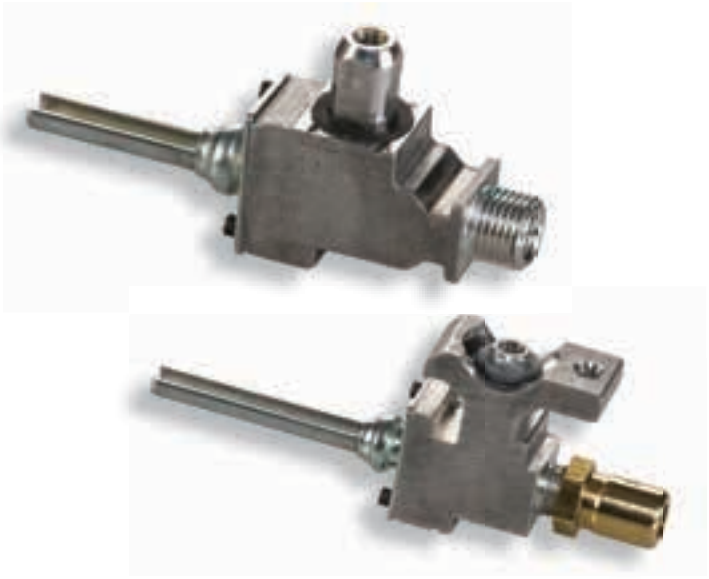




Robertshaw® COOKING

TOP BURNER VALVE SERIES

The Robertshaw® Top Burner Valve Series are a standard feature in many cooking appliances. The saddle-mount version connects to .625 OD (approx. 16mm) manifold tubing. The bolt-through mount version connects to square or double-D profile manifold tubing. Many design options are available including various outlet connections, stem lengths, and custom low-flow settings. Valves can include a hooded orifice for connection directly to the burner venturi tube. Field conversions are achieved by adjusting the low-flow setting through the stem.



Features and Benefits

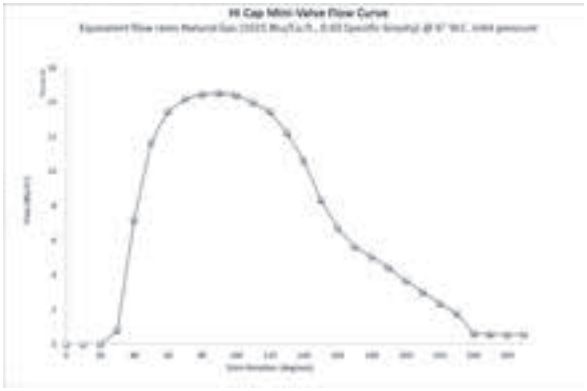
- Locking (Push-To-Turn) construction
- Counterclockwise turn to On
- Minimum size for space and weight savings
- Proportional flow for excellent flame control and true low settings
- Designed for manufacturing and high volume production
- Bolt-through, saddle mount and 1/8" NPT inlet options
- Available with either 1/4” cc or hood/pin outlet
- Conventional right-angle body design
- Stem length available in variety of lengths
- Adjustable low setting
- Minimum pressure drop in low turn down range

Specifications

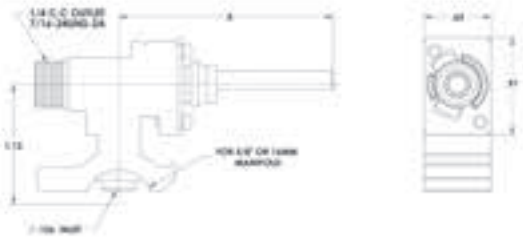
- For use on Natural, LP, Manufactured or Mixed gas
- Operating temperature range: -20°F to 300°F (-28.89°C to 148.89°C)
- Maximum rated inlet pressure: 1/2 PSIG
- Rated capacity: 8,000 BTU/hour on gas with a heating value of 1,000 BTU/cubic foot and specific gravity of 0.64 at a pressure drop of .3” W.C.
- Agency Certifications:
  - CSA 164114-1763520

PRODUCT DIMENSIONS

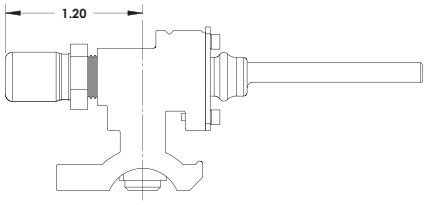
Hi Cap Mini-Valve Flow Curve at 6" W.C.



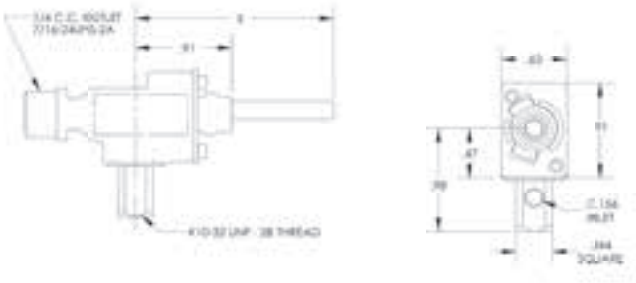
SRV with 1/4” C.C. Outlet



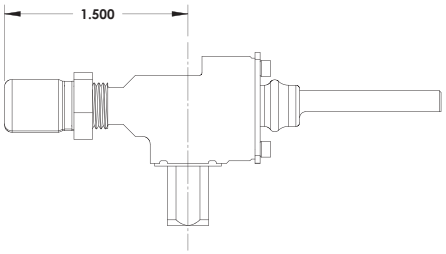
SVR with Hood Outlet



BTM with 1/4” C.C. Outlet



BTM with Hood Outlet



Robertshaw® COOKING

RAM 4 SERIES INTERMITTENT PILOT IGNITION CONTROL

The RAM 4 Series Intermittent Pilot Ignition Control is designed to initiate sparking and open the pilot valve portion of the gas valve when the thermostat calls for heat. Pilot flame recognition stops ignition sparking and opens the main valve portion of the gas valve. The pilot burner flame is monitored continuously at a synchronous frequency for the duration of the heating cycle. Should the pilot flame fall during the heating cycle, RAM's IID Control simultaneously will shut off the main valve until the pilot is established.

Features and Benefits

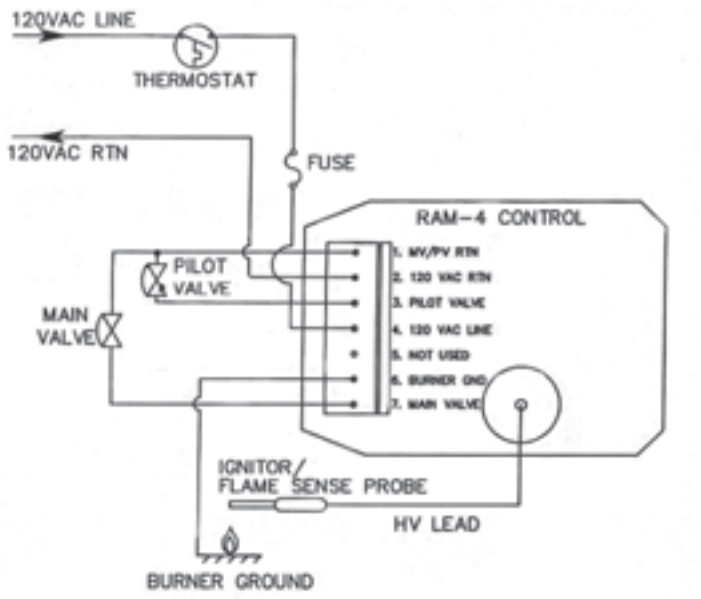
- Open and close valve for safe operation

Specifications

- Electrical rating (input): 120V AC 50/60 Hz
- Flame sensor current: 0.7mA
- Gas valve relay ratings: 5 Amps
- Temperature range: -40°F to 175°F (-40°C to 79°C)
- Agency Certifications:
  - CSA 153104-1249491

RAM 4 SERIES INTERMITTENT PILOT IGNITION CONTROL

PRODUCT DIMENSIONS



Robertshaw® COOKING

RE-IGNITION SPARK MODULE SERIES

The Robertshaw® Re-ignition Spark Module Series is designed to provide spark ignition at multiple top burners for ranges or cooktops. These solid state electronic modules offer distinctly improved performance over other spark ignition modules.

Spark energy available at each burner is typically greater than 15 millijoules. With the large variation in burner spark gap distances experienced by range manufacturers today, this module's higher energy level guarantees that spark miss will not occur. The modules higher energy ignition combined with new types of electrode wiring helps OEMs maintain or improve upon current spark system performance.

Features and Benefits

- Low RFI noise for increased compatibility with other "on range" electronic products
- Re-ignition optimized on time delays and spark rates to minimize nuisance sparking
- Flame rectification for flame sense
- Two to six high-voltage outputs available when two sizes of housing used

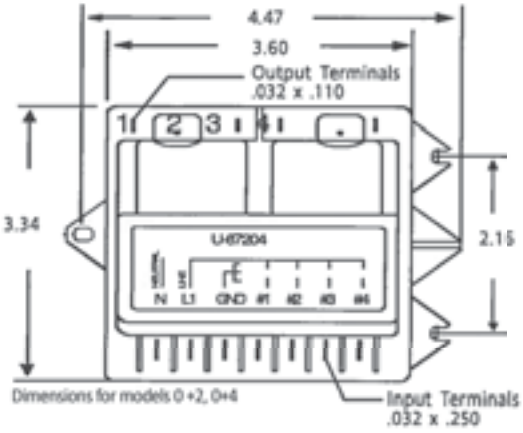
Specifications

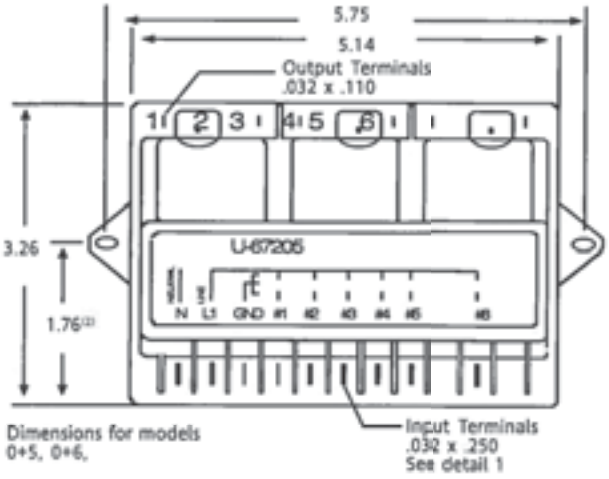
- Burner electrode gap distances increase up to 0.160" (0.4cm) each
- Spark energy available at each burner typically greater than 15 millijoules
- Operating temperature: CSA continuous rating of 248°F (120°C)
- Full potted to meet UL 94:VO ratings
- Available in 120V AC and 230V AC, 50/60 Hz
- Agency Certifications:
  - CSA 164327-2675162
  - UL 94:VO rates

Module Function

Model	Module Function (Number of electrodes)	Operation Capability
U-67204	0+4	4 flame sensed top burners
U-67205	0+5, 0+6	5 or 6 flame sensed burners (any combination of top)

PRODUCT DIMENSIONS





Robertshaw® COOKING

C AND S SERIES PILOTS AND IGNITORS

The Robertshaw® C and S Series Pilots and Ignitors are available in multiple flame, ignitor and sensor configurations.

Features and Benefits

- Many flame patterns available
- Options for mounting thermocouple and/or thermopile
- Spark electrode and flame sensor options available
- Horizontal or vertical gas inlet
- Several mounting bracket types available
- Pilot tubing diameter is typically 1/4”
- Natural Gas or Liquid Propane orifices installed
- Easy conversion from Natural Gas to Liquid Propane
- Various flame patterns available with three possible orientations for each

Specifications

- Aerated pilots with non-linting characteristics
- Incinerator type pilots
- Custom lead lengths available
- Hood Material: 430 stainless steel
- Bracket material: Zinc plated cold rolled steel

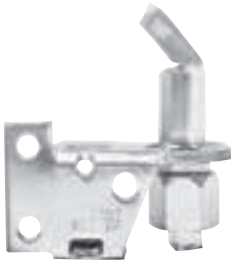
2CH

6CH24-6

6S14-2ER

C AND S SERIES PILOTS AND IGNITORS

PILOT MODEL TYPE IDENTIFICATION



HOOD TYPE
(6 Types)

PILOT TYPE

C	Thermocouple Type
CH	Thermopile Type
S	Spark Electrode
SH	Spark with Thermopile

2 CH AL 24-6

ELECTRODE LOCATION
"E" = End
"F" = Front

BRACKET TYPE
(7 Types)

HOOD WIDTH
(Type 6 Only)
First digit is for increments of one inch [25,4mm]
Second digit is for number of increments in 1/8" [3,18mm]

DRAFT SHIELD
(Optional)

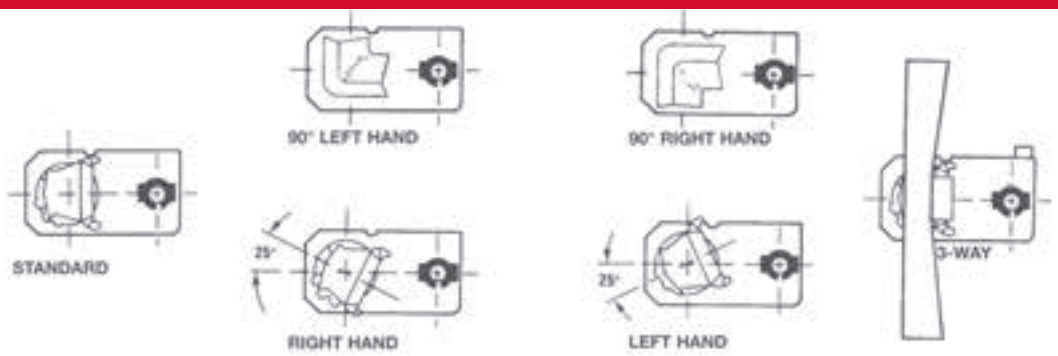
FLAME PATTERN
"L" for Left Hand
"R" for Right Hand

HOOD TYPE

MOUNTING BRACKET TYPE

Note: Additional mounting bracket types available

FLAME PATTERN TYPE

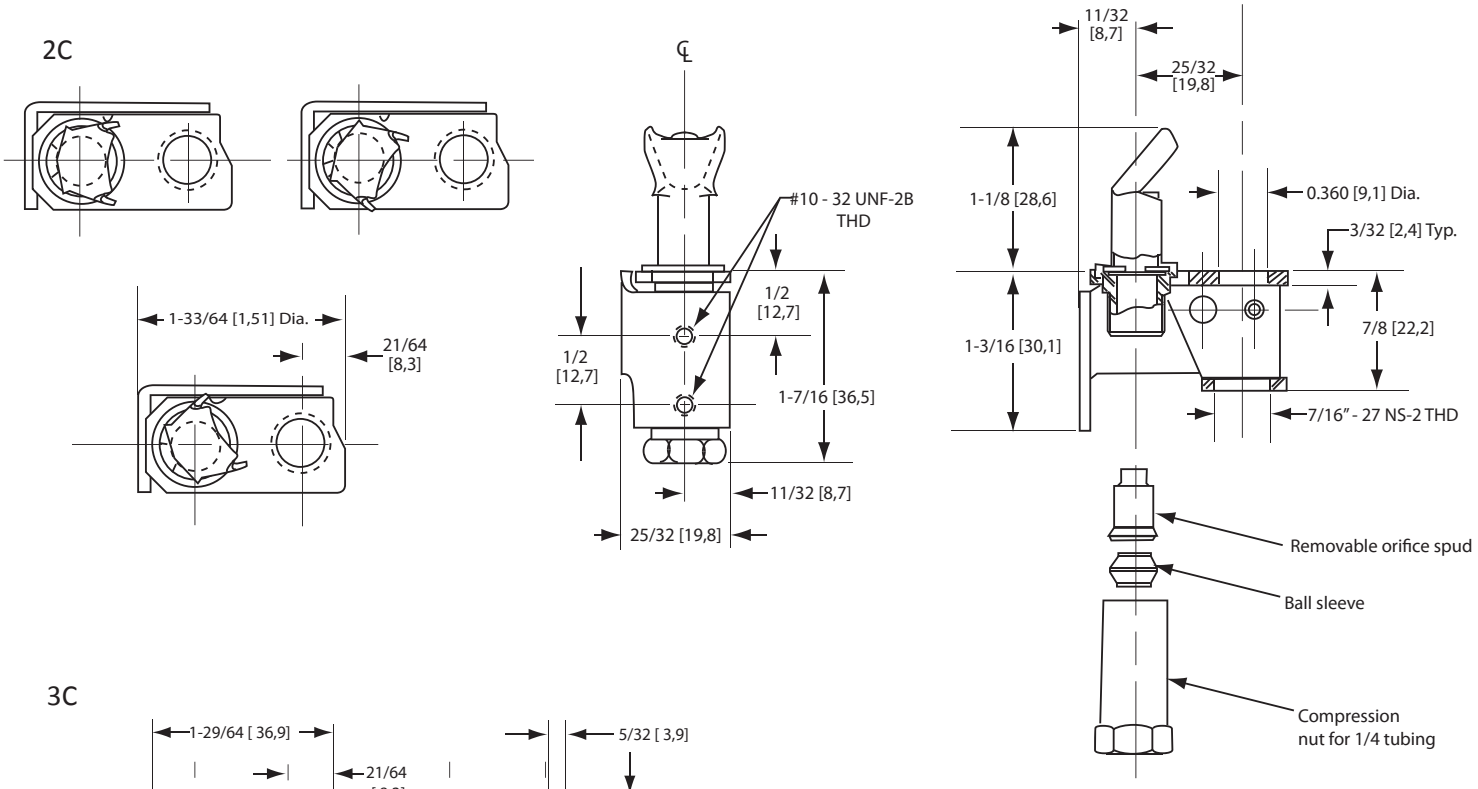


Robertshaw® COOKING

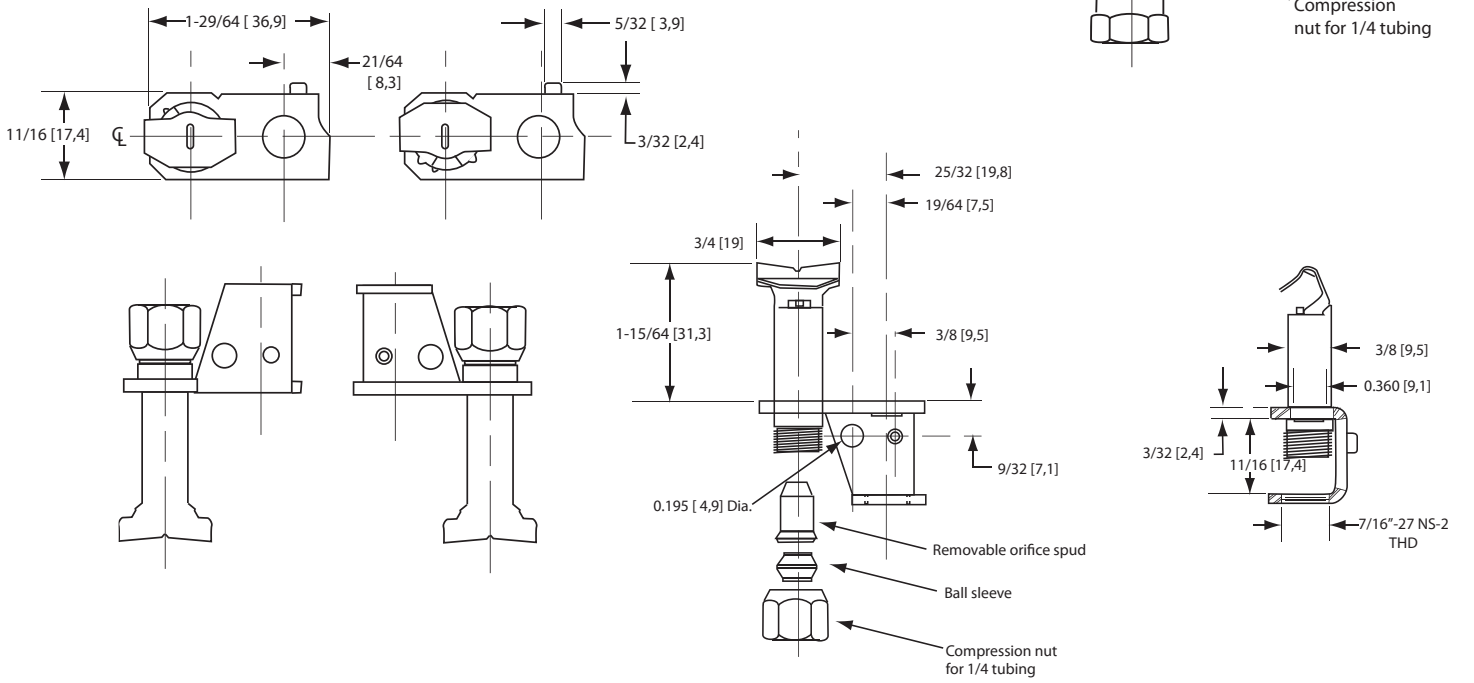
C AND S SERIES PILOTS AND IGNITORS

PRODUCT DIMENSIONS

2C

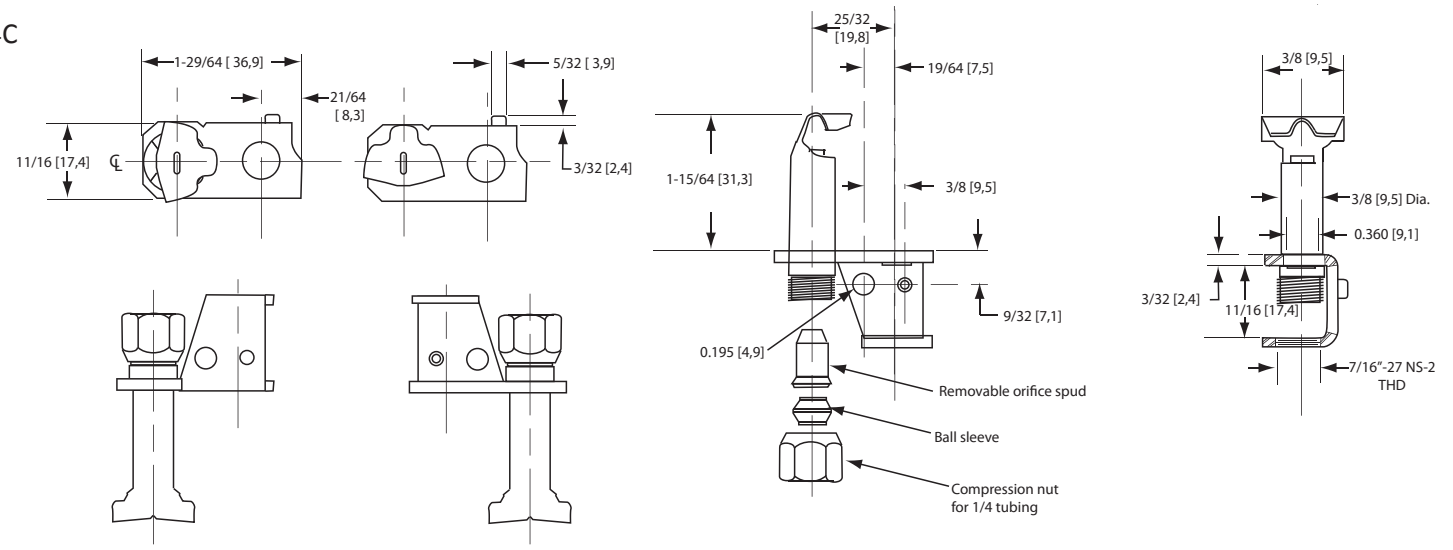


3C

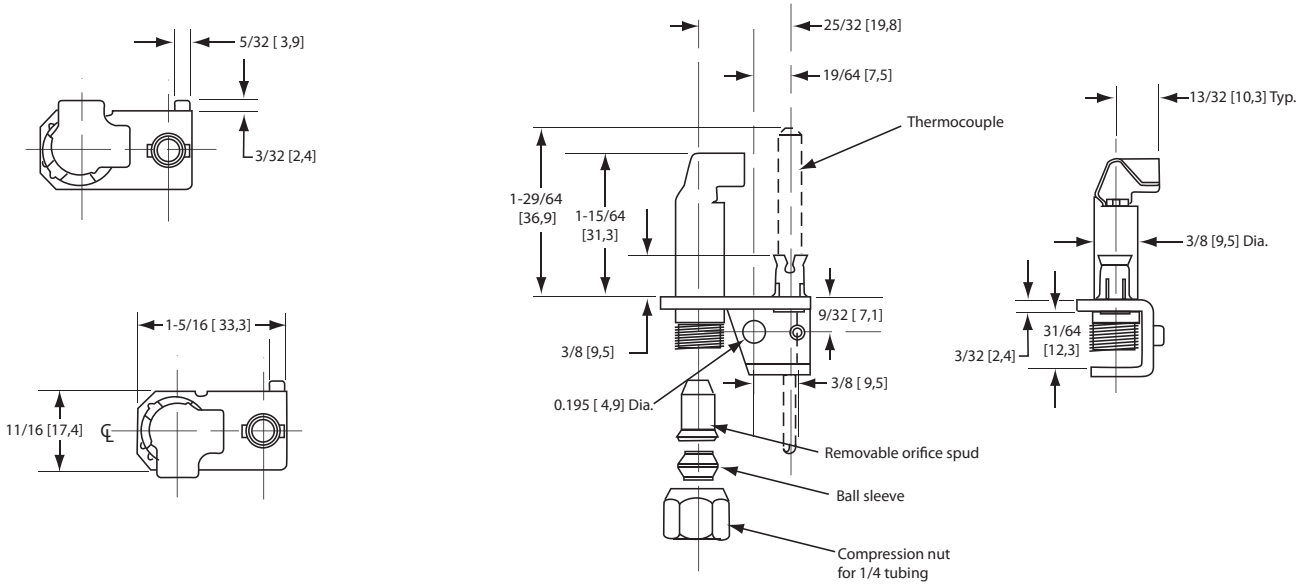


PRODUCT DIMENSIONS

4C



5C



Robertshaw® COOKING

T46 AND 2C SERIES THERMOCOUPLES

The Robertshaw® T46 and 2C Series Thermocouples are the industry leader for gas heating and appliances. Their primary function is to monitor the pilot flame.

The Robertshaw thermocouples are made of two different metals with various lengths. The T46 thermocouples have threaded mounting. The 2C thermocouples offer easy snap-in installation into the majority of pilot burners.

Features and Benefits

- Easy 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
- Various lengths available for multiple applications

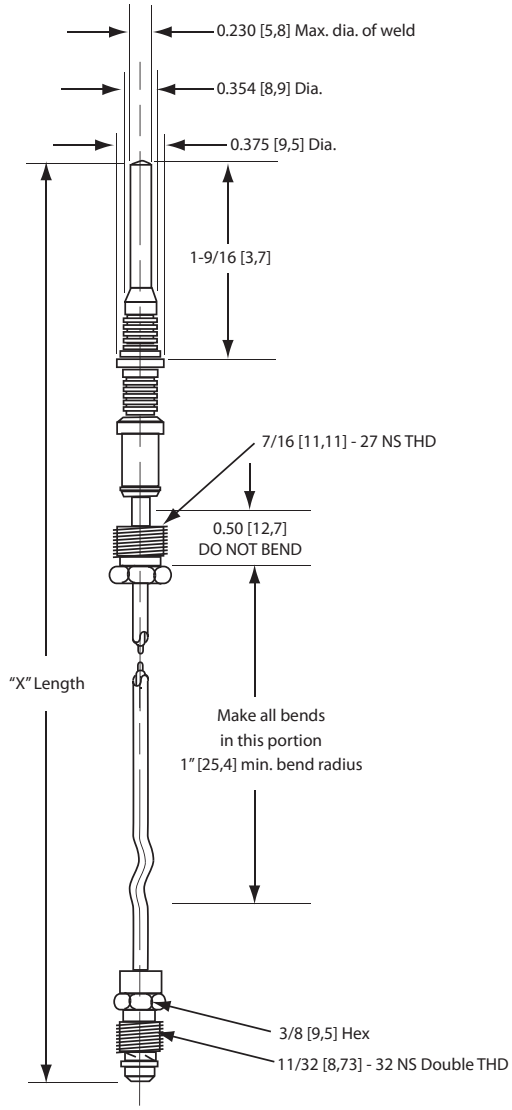
Specifications

- Lead lengths range from 12" to 72” [305mm to 1830 mm]
- Open circuit output: 25 and 30 millivolts
- Connection type: Male connector nut
- Agency Certifications:
  - CSA 153207-1097670

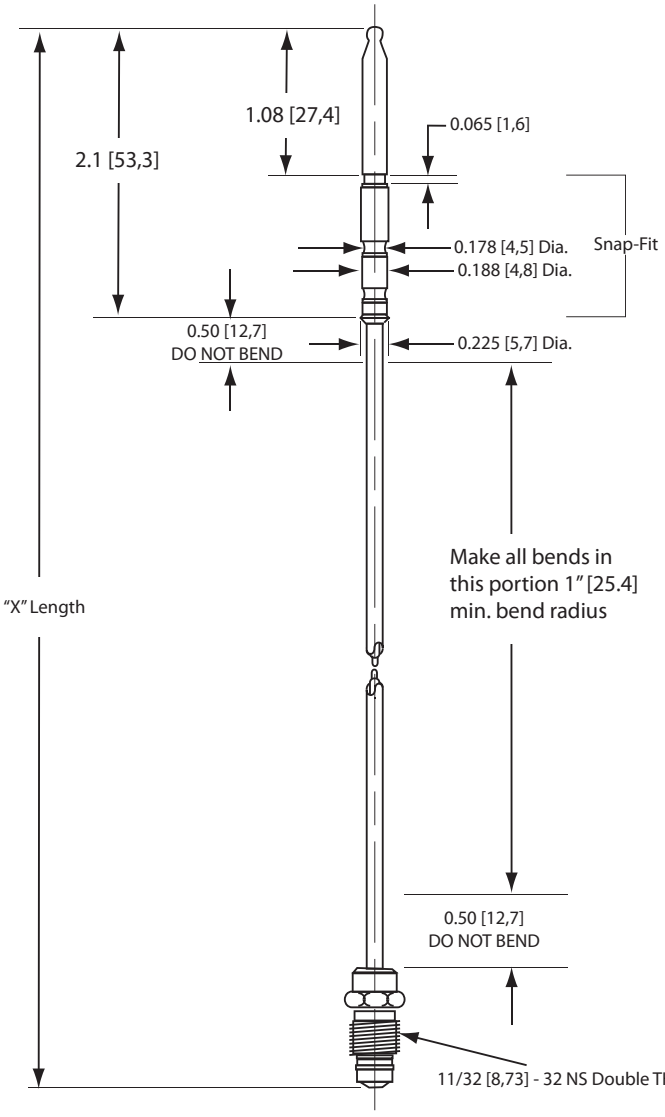
T46 AND 2C SERIES THERMOCOUPLES

PRODUCT DIMENSIONS

T46 Series



2C Series



Available in the following lengths:

Overall "X" Length
12" [304,8]
15" [381,0]
18" [457,2]
19" [482,6]
20" [508,0]
21" [533,4]
24" [609,6]
26" [660,4]
30" [762,0]
36" [914,4]
40" [1016,0]
42" [1066,8]
48" [1219,2]
54" [1371,6]
60" [1524,0]
72" [1828,8]

Robertshaw® COOKING

TP-75 AND CP-2 SERIES THERMOPILES

Robertshaw® TP-75 and CP-2 Series Thermopiles are the industry leader for gas appliance applications. They monitor pilot flame and generate power for use with self-powered gas control systems.

The thermopile is the assembly of many thermocouples, increasing the electrical output. Robertshaw offers two types of thermopiles: the TP-75 with a two wire spade connection, and the CP-2 with a coaxial connection.

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
- Various lengths available for multiple applications

Specifications

- Lead lengths range from 18” to 72” (460mm to 1828.8mm)
- Open circuit output: 500-750 millivolts
- Connection type: Male connector nut
- Agency Certifications:
  - CSA 153207-1097660

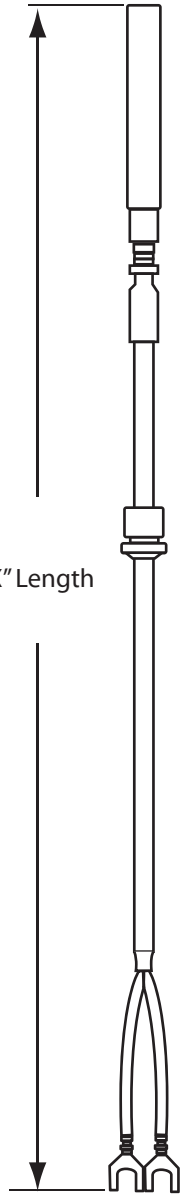
TP-75

CP-2

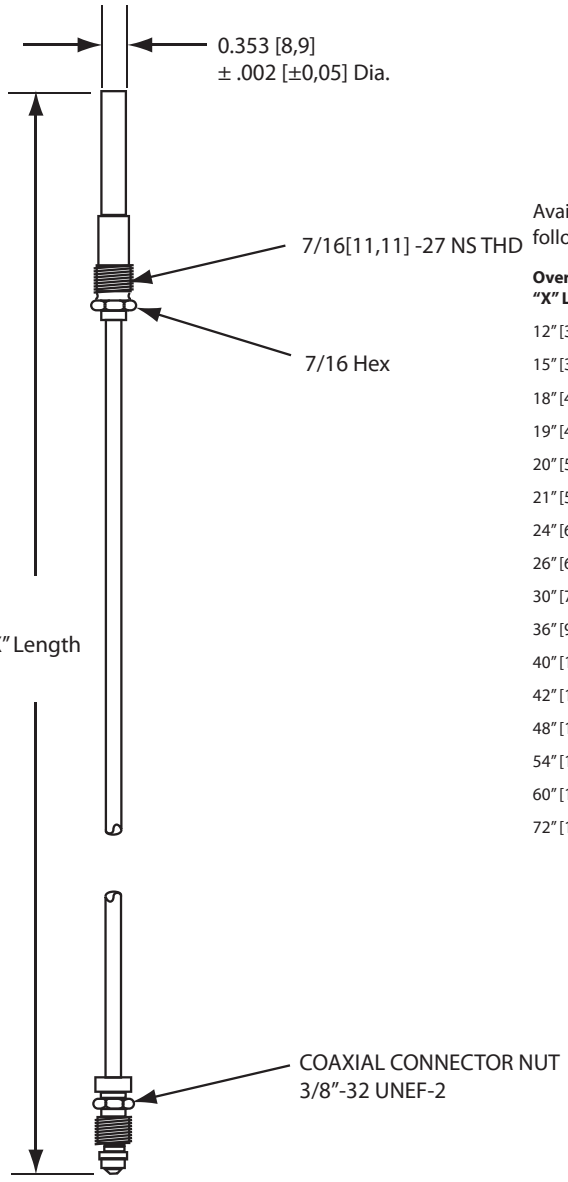
TP-75 AND CP-2 SERIES THERMOPILES

PRODUCT DIMENSIONS

TP-75 Series



CP-2 Series



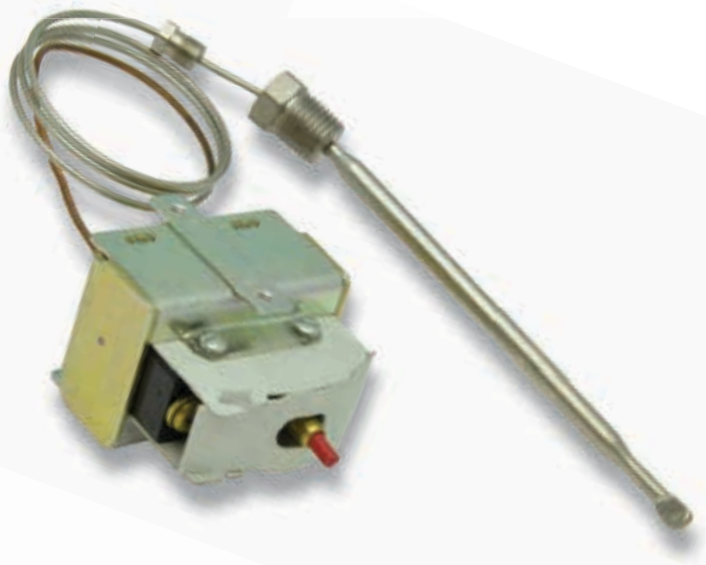
Available in the following lengths:

Overall "X" Length
12" [304,8]
15" [381,0]
18" [457,2]
19" [482,6]
20" [508,0]
21" [533,4]
24" [609,6]
26" [660,4]
30" [762,0]
36" [914,4]
40" [1016,0]
42" [1066,8]
48" [1219,2]
54" [1371,6]
60" [1524,0]
72" [1828,8]

Robertshaw® COOKING

LC SERIES HIGH LIMIT CONTROL

The Robertshaw® LC Series High Limit Control is designed for any appliance where temperature protection is needed. All LC Series controls are factory calibrated and non-adjustable. The LC Series is a proven high limit control for commercial and specialty applications.



Features and Benefits

- Calibrated temperature settings 340°F to 600°F (170°C to 316°C) in 5°F increments
- Bulb and capillary assemblies available in copper, nickel plated copper or stainless steel
- Available in manual reset or automatic operation
- Control function designed to interrupt power in the appliance circuit at the calibrated temperature
- Circuit automatically opens if the pressure integrity of the thermal element is compromised
- Several mounting configurations available
- Agency Certifications:
  - CSA 36461
  - UL 12103
  - CE 665982 and 665983

Specifications

Model	Description	UL Rating[1]
LCH	SPST – Break on Temperature Rise Manual Reset. Type M2*	30 A
LCHM	SPST – Break on Temperature Rise Manual Reset. Type M2* Millivolt Application	400mA @500 mV DC
LCC	SPDT – Make and / or Break on Temperature Rise. Automatic Reset	25 A
LCCM	SPDT – Make and / or Break on Temperature Rise. Automatic Reset. Millivolt Application	400 mA @500 mV DC

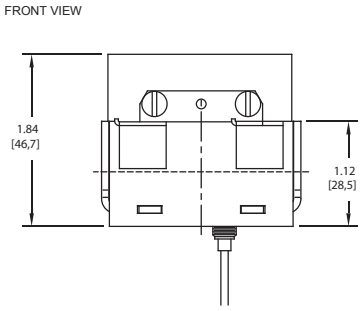
*M2 switch – trip free – will not recycle if reset button is depressed while temperature is above trip point[1]

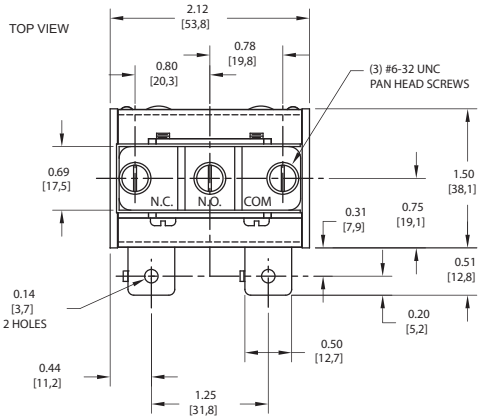
For All Models:
Ambient temperature is 185°F (85°C)
Maximum continuous temperature on bulb is 600°F (316°C)

LC SERIES HIGH LIMIT CONTROL

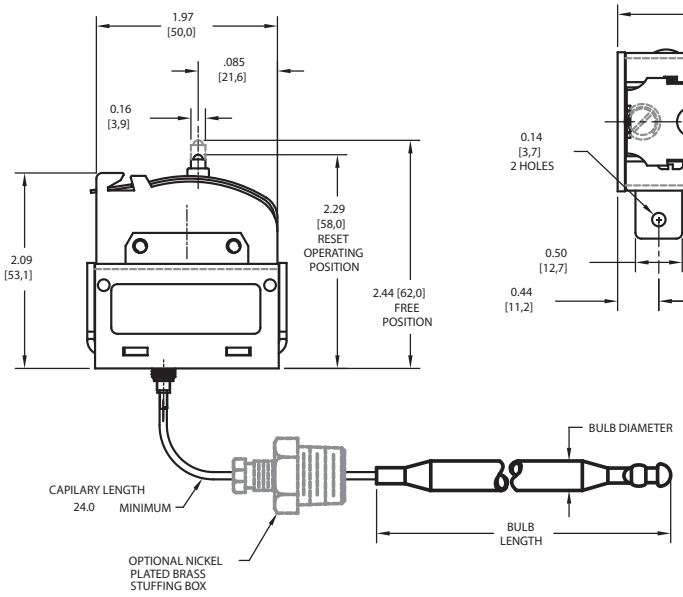
PRODUCT DIMENSIONS

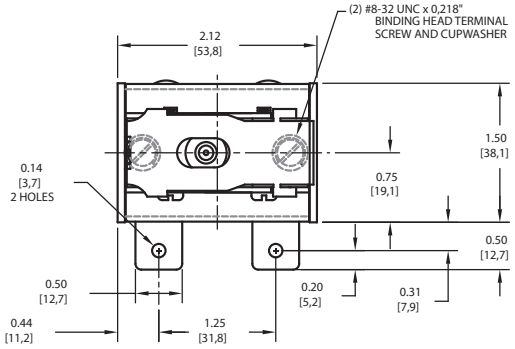
Models LLC and LCCM

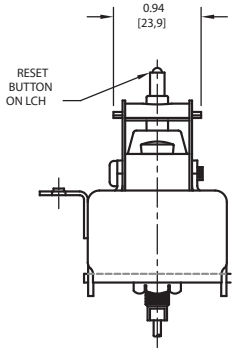




Models LCH and LCHM







AVAILABLE BULB DIAMETERS

inches	0.187	0.250	0.312
[millimeters]	4,8	6,4	7,9

AVAILABLE CAPILLARY LENGTHS

24” to 66” in 6” increments
610mm to 1675mm in 228mm increments

Robertshaw® COOKING

G8 SERIES TOP BURNERS

The Robertshaw® G8 Series Top Burners are designed as a standard burner system with customization options. OEMs can scale the burner system to a wide range of appliance price ranges with minimal changes to the appliance.

Features and Benefits

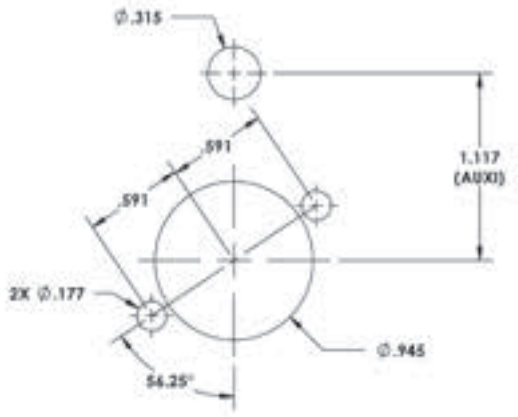
- Sealed burner construction
- Primary air from below the cooktop
- Four physical sizes with burner ratings of:
  - 5,000 BTU
  - 9,500 BTU
  - 12,000 to 15,000 BTU
  - 17,000 to 20,000 BTU
- Removable or attached burner head
- Bottom feed orifice holder with rail mounting legs - electrode mounts to the orifice holder and is accessible from the top of the appliance
- Bottom feed orifice holder includes a staked tube for easy valve connection
- Side feed orifice holder for shallow burner box applications - electrode mounts to the burner head
- Burner can be used as standard ignition or re-ignition without changing any components
- Nominal turndown performance: 10:1
- Burner head material: Die cast aluminum (A380) or Brass

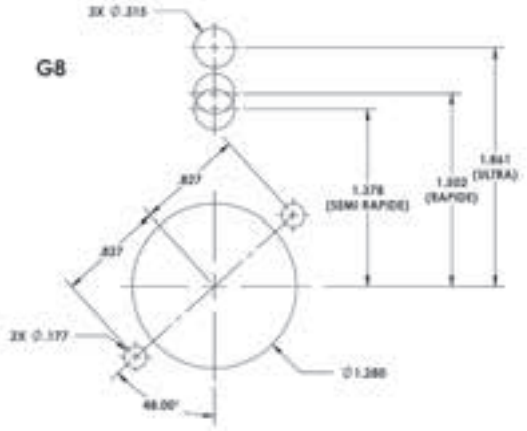
Specifications (Customizable Options)

- Burner skirt
  - Large (tall or short) or Small skirt
  - Polished or standard blast finish
  - Premium blast finish
- Burner cap
  - Sheet metal with enamel finish
  - Powdered metal (PM) with enamel finish
- Ignition: standard or re-ignition (same burner and ignitor for both)

G8 SERIES TOP BURNERS

PRODUCT DIMENSIONS





Robertshaw® COOKING

HALO SERIES TOP BURNERS

The Robertshaw® Halo Series Top Burners is designed to deliver premium performance (time to boil and consumer union simmer testing), easy assembly, and minimal components. The Halo Top Burner also offers custom trim levels.

Features and Benefits

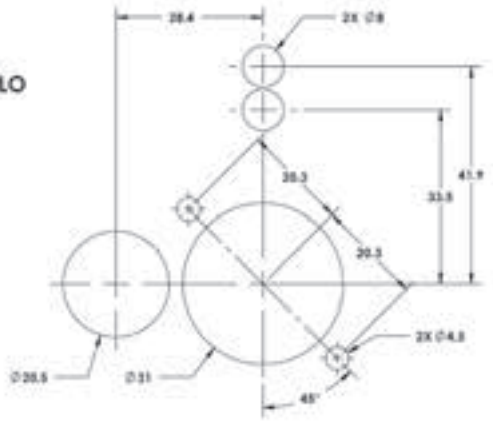
- Sealed burner construction
- Primary air from below the cooktop
- Three physical sizes with approximate burner ratings of:
  - 8,000 to 10,000 BTUs Low Turn Down Simmer flame rating of 800
  - 12,000 to 15,000 BTUs Low Turn Down Simmer flame rating of 1000
  - 17,000 to 20,000 BTUs Low Turn Down Simmer flame rating of 1320
- Non-removable burner head construction
- Side feed orifice holder with rail mounting holes
- Electrode mounts to the orifice holder and is accessible from the top of the appliance
- Standard ignition or re-ignition without changing any components
- Two sheet metal cutouts including orifice holder mounting screw holes (medium and large burners use common cutout)
- Exceptional time to boil
- All burners pass the chocolate test
- Burner base material: Die cast aluminum (A380)

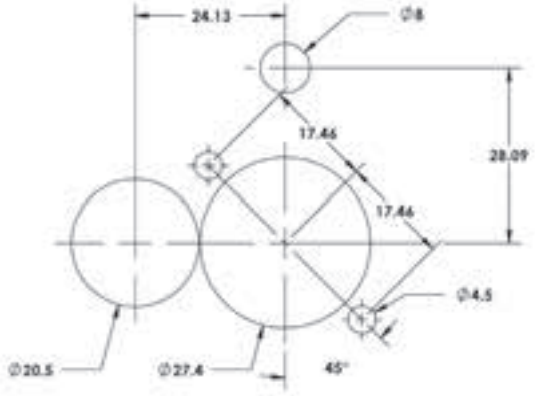
Specifications (Customizable Options):

- Burner base
  - Large or small skirt
  - Standard, premium blast finish or bright machined finish
- Burner ring
  - Aluminum: Slotted ports with polished or blast finish
  - Brass: Drilled ports with polished or blast finish
- Burner cap
  - High quality powdered metal or stamped steel with several enamel color options
  - Brass option available

PRODUCT DIMENSIONS

HALO





Robertshaw® COOKING

MANIFOLD SERIES

The Robertshaw® Manifolds Series are designed to customer specifications for cooking or heating. Manifolds are available in either round or square tubing, aluminized or painted finishes and heavy or light-wall tubing. Multiple design options and capabilities are offered to meet performance and durability requirements. Manifolds manufacturing capabilities include: punching, welding, brazing, stamping, bending, leak-testing and value-added assembling of strategic components.

Features and Benefits

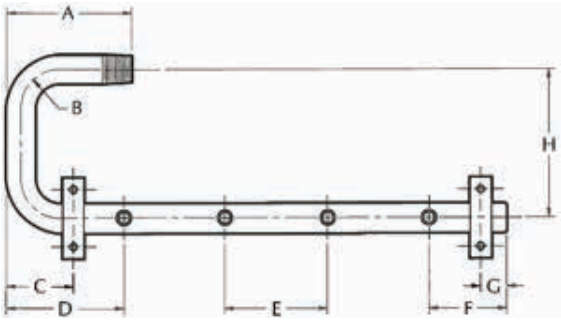
- Highly customizable
- Round and square tubing available
- 100% leak tested
- Machine (CNC) bending capabilities
- Multiple coatings available: powder coat and aluminized
- Induction welded brackets
- Mig welding for custom applications

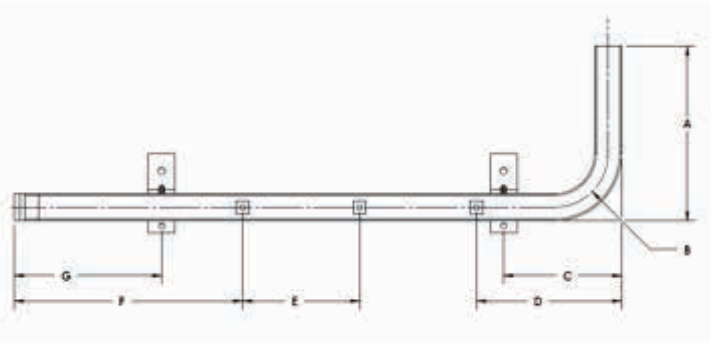
Specifications

SAE 1008 MANIFOLD TUBING [INCH]		
Nominal Size	Basic OD	Wall Thickness (min.)
3/8	0.675	0.083
1/2	0.840	0.096
3/4	1.050	0.096
3/4 Square	NA	0.049

MINIMUM DIMENSIONS [INCH]								
Nominal Pipe Diameter	A	B	C	D	E	F	G	H
3/8	2.42	.88	1.25	1.62	1.38	.75	.25	3.75
1/2	2.96	1.00	1.25	2.00	1.38	.75	.25	4.38
3/4	3.92	1.50	2.00	2.50	1.38	.75	.25	4.75
3/4 Square	3.25	1.38	2.50	3.25	1.25	1.5	.8	3.5

PRODUCT DIMENSIONS





Robertshaw® COOKING

TUBES AND FITTINGS SERIES

The Robertshaw® Tubes and Fittings Series are manufactured for a wide variety of industry standard end forms as well as the patented UTS Double Bead and High Temperature Flare. Tube assemblies and components offer an efficient alternative to standard compression fittings.

Features and Benefits

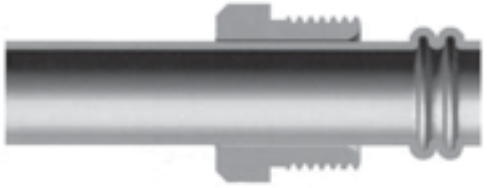
- More efficient, lower cost assembly
- Reduced number of inventoried parts
- Double Bead and High Temperature Flare are a formed part of the tube to assure proper assembly
- Reassemble repeatedly
- No danger of cut tubes due to over-tightening or misalignment of compression sleeves
- Reliable gas-tight connection

Specifications

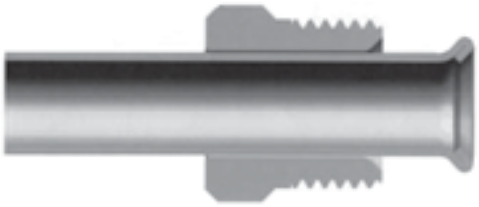
Outside Diameter	Double Bead	Single Flare	Double Flare
3/16”	Yes	No	No
1/4”	Yes	Yes	No
5/16”	Yes	Yes	Yes
3/8”	Yes	Yes	Yes
7/16”	Yes	Yes	No
1/2”	Yes	Yes	No
5/8”	No	Yes	No

PRODUCT DRAWINGS

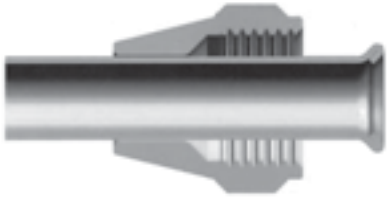
UTS Double Bead (Male Nut)



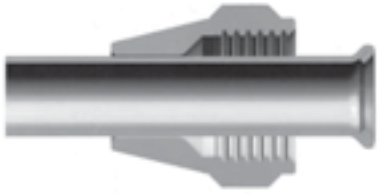
Inverted Flare



SAE 45" Flare

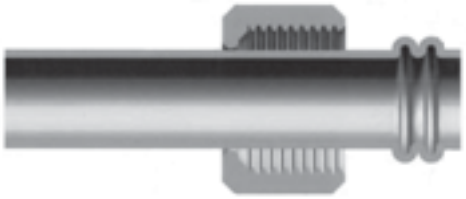


SAE 45" Double Flare



UTS High Temperature Flare

UTS Double Bead (Female Nut)



Robertshaw® COOKING

TUBE BURNERS SERIES

The Robertshaw® Tube Burner Series are atmospheric burners designed for a wide range of cooking, heating and drying applications. Whether it is a burner selected from the extensive existing product line or one custom designed to meet unique needs, Robertshaw burners offer OEM manufacturers the flexibility they need.

All atmospheric gas tube burners are made of aluminized steel tubing and use traditional porting to assure dependable, even heat distribution and long service life.

Features and Benefits

- Numerous types: straight, angle, “U”, and “T” burners
- Reliable ignition
- Clean burning blue flame
- High efficiency
- Mounting simplicity
- Lightweight

Applications

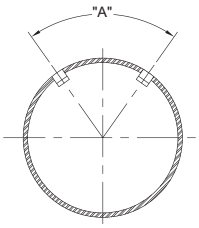
- Cooking Appliances – ranges, fryers, griddles, pizza ovens, bake ovens, convection ovens or hot tops
- Comfort Heating – commercial and residential furnaces, decorative fireplaces, space heaters or mobile homes
- Drying Ovens – curing and baking
- Laundry Equipment – dryers

Specifications

- Available in multiple diameters
- Used with natural, LP, mixed or manufactured gases
- The location of the burner porting is variable and can be supplied in one to seven row configurations of incrementally positioned ports
- Various output options available depending on application and design

TUBE BURNERS SERIES

Porting Alignment Features



"A" DIMENSIONS AVAILABLE									
1" Burners (25,40mm)	47°	92°	112.5°	137°	180°	360°	and	30°	increments
1.25" Burners (31,5mm)	36°	60°	90°	120°	180°	360°	and	23.5°	increments
3/4" Burners (19,05mm)	-	-	-	144°	-	-		-	-
1.5" Burners (38,1mm)	Double Lanced Parts								

Orifice Hood Features

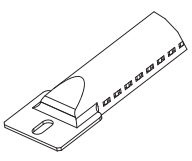
DIAMETERS AVAILABLE							
1" Burners (25,40mm)	0.455" (standard) (11,56mm)	0.250" (6,35mm)	0.375" (9,53mm)	0.406" (9,53mm)	0.500" (12,70mm)	0.580" (14,73mm)	0.609" (15,47mm)
1.25" Burners (31,75mm)	0.578" (standard) (14,68mm)	to	0.325" (maximum) (8,26mm)				
1.5" Burners (38,1mm)	0.578" (standard) (14,68mm)	to	0.325" (maximum) (8,26mm)				
3/4" Burners (19,05mm)	0.578" (standard) (14,68mm)	to	0.325" (maximum) (8,26mm)				

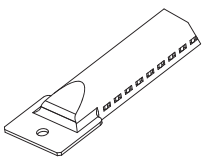
Venturi Lengths

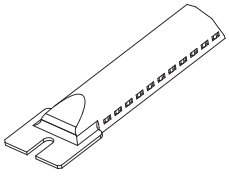
3/4" Burners (19,05mm)	3.40" (86,36mm)
1" Burners (25,40mm)	5.25" (133,35mm), 4.00" (101,60mm), 3.063" (77,8002)
1.25" Burners (31,75mm)	5.50" (139,70mm)
1.5" Burners (38,1mm)	6.00" (152,40mm)

OPTIONS

- Mounting tabs and brackets are available
- Special mounting components available to meet OEM specifications for easy mounting
- Carryover ports available to meet customer's specifications
- End closures available for various custom applications







HEATING

Robertshaw® HEATING

ST SERIES ELECTRIC THERMOSTAT

The Robertshaw® ST Series Electric Water Heating Thermostat is designed to meet the stringent requirements of the OEM in the residential and commercial electric water heating market.

The control incorporates two thermostat functions - a cycling thermostat fitted with a vibration resistant range dial, and a high limit manual reset thermostat.

Features and Benefits

- Quick-fit lugs allow easy installation on the tank via mounting clips
- Protective cover for terminals available
- Bi-metal actuators in direct contact with the tank for faster reaction to temperature changes
- Fast and easy wiring
- High limit function switches both active and neutral lines
- Custom temperature ranges available
- ST12 models features M1 reset style
- ST14 model features M2 reset style

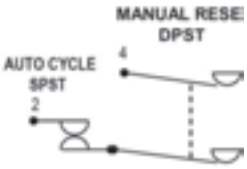
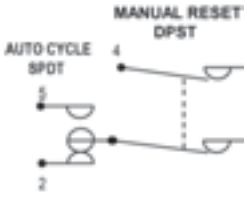
Specifications

- Maximum ambient temperature: 185°F (85°C)
- Differential of 14°F ± 7°F (8°C ± 4°C)
- Cycling temperature ranges available:
  - 110°F - 150°F (43°C - 65°C)
  - 110°F - 170°F (43°C - 76°C)
  - 90°F - 130°F (32°C - 54°C)
  - 90°F - 144°F (32°C - 62°C)
- Rated for 30 Amps at 240V AC
- SPST or SPDT cycling contacts
- Agency Certifications:
  - UL approved E110428

c UL us

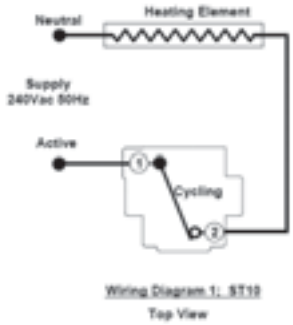
ST SERIES ELECTRIC THERMOSTAT

ELECTRICAL RATING

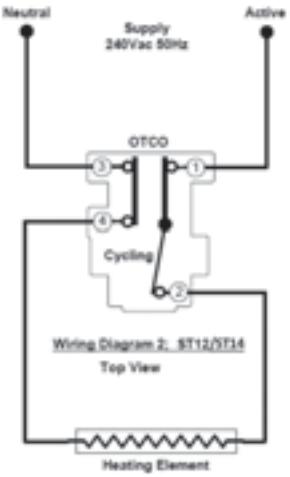
Models	Internal Schematic	Cycling	High Limit Manual Reset (ECO)
ST12/ST14 		Opens on Temperature Rise Single Pole – Single Throw (SPST)	Opens on Temperature Rise Double Pole – Single Throw (DPST)
ST12/ST14 		Opens on Temperature Rise Single Pole – Double Throw (SPDT)	Opens on Temperature Rise Double Pole – Single Throw (DPST)
ST10 		Opens on Temperature Rise Single Pole – Single Throw (SPST)	No High Limit Manual Reset

WIRING DIAGRAM

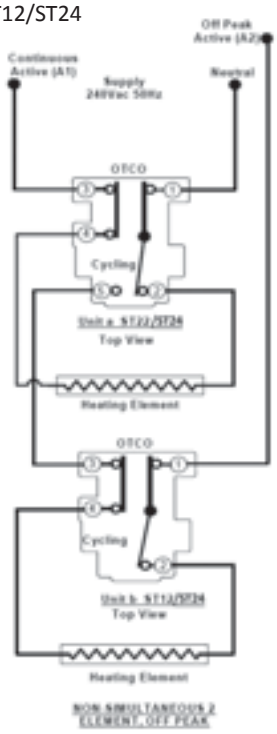
ST10



ST12/ST14



Non-simultaneous 2 Element, Off Peak
ST12/ST24



Robertshaw® HEATING

R220 SERIES GAS VALVE

The Robertshaw® R220 Series Water Heating Combination Gas Valve is designed as an all-in-one control for use on residential gas fired water heaters. The R220 combination control integrates the thermostat, Energy Cut-Off (ECO) safety, main gas pressure regulator, pilot gas regulator, plus a combination main and pilot manual valve, all in one compact unit.

Features and Benefits

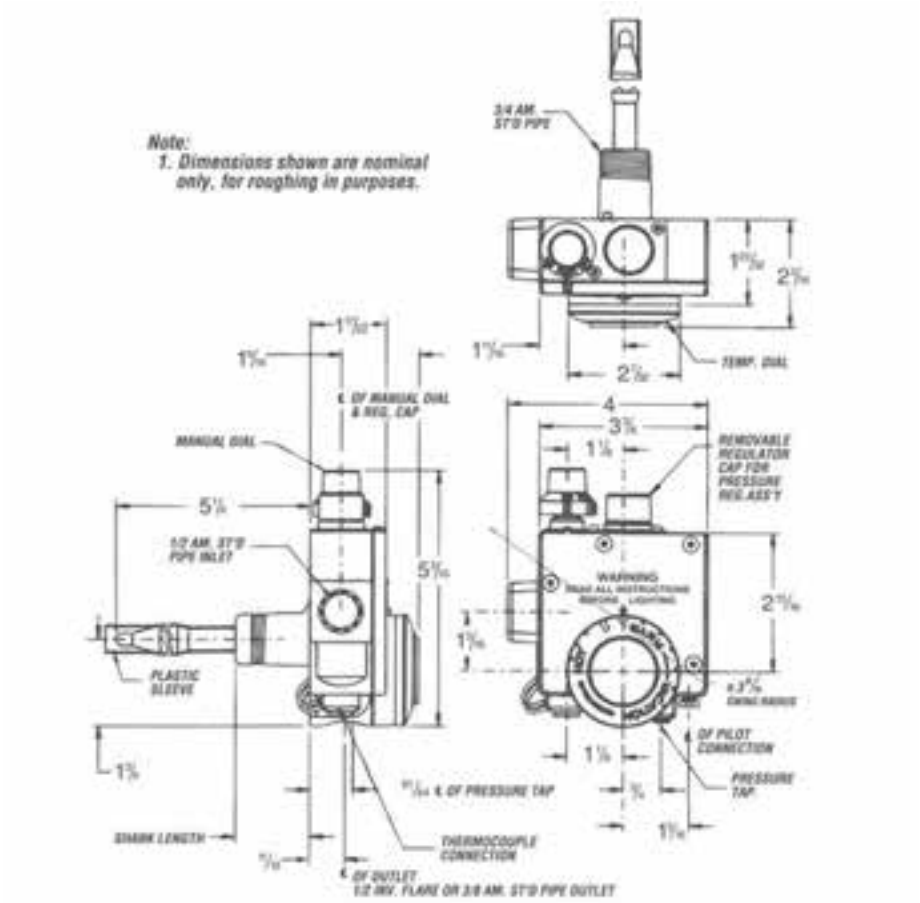
- Direct immersion temperature sensing thermostat
- Single control knob for gas cock and magnet reset
- ECO in tip of drywell for maximum sensitivity
- Identical footprint to R110R
- Interlock switch eliminates an unsafe lighting condition
- LP and Natural Gas versions available

Specifications

- Capacity – 86,000 BTU/hour @1" P.D.; 107,000 BTU/hour Maximum Regulator
- Top Stop Temperature options: 140°F (60°C), 160°F (71°C) or 180°F (82°C)
- 100% automatic safety valve
- Ambient temperature range: 32°F to 175°F (0°C to 79°C)
- Agency Certifications:
  - CSA approved 153207-1035835

R220 SERIES GAS VALVE

PRODUCT DRAWING



R220 MODEL MATRIX

220	220R	220RTS	220RTSP	FEATURES
•	•	•	•	Main and Pilot Manual Valve
•	•	•	•	100% Automatic Pilot Safety
•	•	•	•	Thermostat Valve
	•	•	•	Pressure Regulator
			•	Pilot Regulator
•	•	•	•	Pressure Tap
		•	•	Built-In Energy Cut-Off
•	•	•	•	140°F Maximum Temperature
•	•	•	•	160°F MaximumTemperature
•	•	•	•	180°F Maximum Temperature

Robertshaw® HEATING

HORNET SERIES GAS VALVE CONTROL

The Robertshaw® Hornet Series Gas Valve Control combines the functions of a gas valve, thermostat and thermoelectric flame failure device to control gas storage hot water heaters. The compact yet robust design integrates the pilot button into the dial so the controls face the user.

Features and Benefits

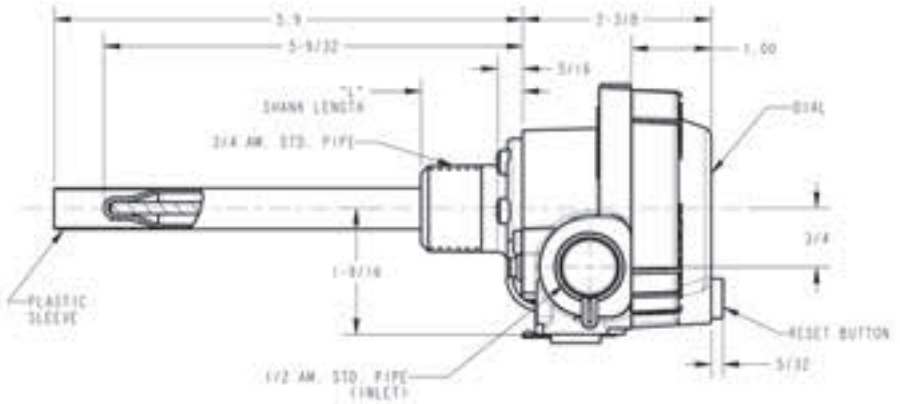
- Various temperature ranges available
- Integrated dial and pilot button
- Tamper resistant design shuts off gas flow if valve is tampered with
- Pilot and thermocouple available

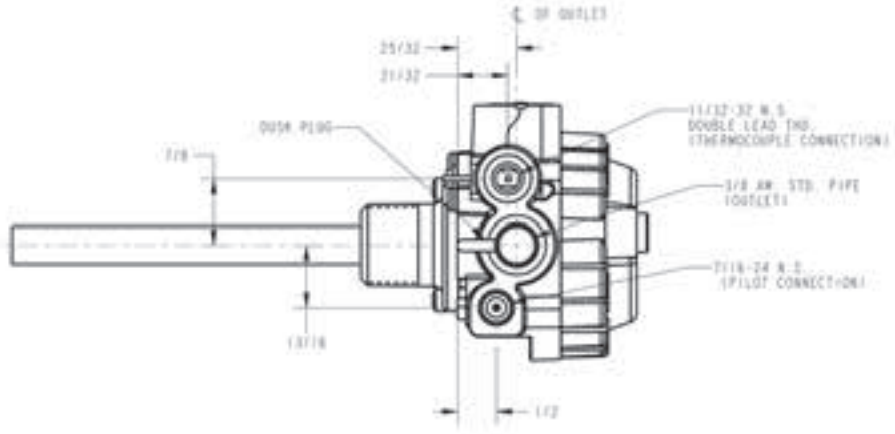
Specifications

- Capacity: 45,000 BTU @ 1” Pressure Drop (P.D.)
- Ambient temperature range: 32°F to 175°F (0°C to 79.4°C)
- Non-regulated
- 3/8” NPT or 3/8” inverted flare inlet and outlet
- Agency Certifications:
  - ANCE 201601C07757

HORNET SERIES GAS VALVE CONTROL

PRODUCT DIMENSIONS





Robertshaw® HEATING

2000 DER/IPER SERIES GAS VALVE HEATING CONTROL

The Robertshaw® 2000 DER/IPER Series Gas Valve Heating Control is designed for residential applications that use intermittent pilot or direct ignition systems such as central heating units, space heaters, wall heaters, boilers, commercial cooking appliances and manufactured home furnaces.

The DER Series is used with direct ignition systems and incorporates a manual valve, dual automatic valves and main gas regulator. The IPER Series is used for intermittent pilot systems and incorporates a manual shut-off valve, separate sequenced pilot and main gas valves, and an adjustable straight-line main gas regulator.

Features and Benefits

- Compact construction
- Spring loaded manual on/push button off selector
- Adjustable main gas regulator
- Inlet/outlet screens and pressure tap
- Multi-Position Mounting: Any angle between 0° and 90° from upright

Specifications

- DER: Quick-connect for convenient wiring
- IPER: Simple 3-pin connector to prevent mis-wiring
- Outlet positions and sizes: Straight out, 90° angle flange out 3/8”, 1/2”, NPT and 1/2” inverted flare
- Inlet positions and sizes: Straight in, side in, 90° angle flange in 3/8”, 1/2” NPT
- Power consumption: 9.6 Watts maximum
- Ambient temperature: -40°F to 175°F (-40°C to 79°C)
- Agency Certifications:
  - CSA 153104-1019522
  - UL #M H7925
  - Commercial cooking seal

2000 DER/IPER SERIES GAS VALVE HEATING CONTROL

CAPACITIES (BTU/HR)

RANGE OF REGULATION

CONTROL	SIZE	TYPE GAS			
		NATURAL		LP	
		MIN. BTU	MAX. BTU	MIN. BTU	MAX. BTU
2000 SERIES	3/8 x 3/8	30,000	125,000	40,000	200,000
	1/2 x 3/8	30,000	125,000	40,000	200,000
	1/2 x 1/2	30,000	160,000	40,000	260,000
	1/2 x 1/2 I.F.	30,000	160,000	40,000	260,000

CAPACITY @ 1" P.D.

CONTROL	SIZE	TYPE GAS		
		NATURAL	MANUFACTURED GAS	LP
2000 SERIES	3/8 x 3/8	100,000 BTU	51,500 BTU	160,000 BTU
	1/2 x 3/8	100,000 BTU	51,500 BTU	160,000 BTU
	1/2 x 1/2	125,000 BTU	79,500 BTU	200,000 BTU
	1/2 x 1/2 I.F.	100,000 BTU	51,500 BTU	160,000 BTU

MODEL SPECIFICATIONS

MODEL NUMBERS	DESCRIPTION	REGULATOR ADJUSTMENT	ELECTRICAL RATING
2000 DE	Non-Regulated	**For All Models** 3" to 6" Natural and 8" to 12" LP Fixed Regulation; 2" W.C. Straight-line Regulation; maximum Operating Pressure 1/2 PSI	**All DE and DER Models** 24V AC, 60 Hz, 0.4 Amps 120V AC, 60 Hz, 0.1 Amps **All IPE and IPER Models** 24V AC, 50 or 60 Hz, 0.5 Amps 120V AC, 50 or 60 Hz, 0.13 Amps
2000 DER	Regulated For Natural Gas		
2000 DERLP	Regulated For LP Gas		
2000 DERC	Convertible Regulator For Manufactured Home Applications		
2000 DER-S7	Slow Opening		
2000 IPE	Non-Regulated		
2000 IPER	Regulated For Natural Gas		
2000 IPERLP	Regulated For LP Gas		
2000 IPERC	Convertible Regulator For Manufactured Home Applications		
2000 IPER-S7	Slow Opening		

Robertshaw® HEATING

7200 SERIES GAS VALVE CONTROLS

The Robertshaw® 7200 Series Gas Controls are designed for residential applications with direct ignition or intermittent pilot ignition systems such as central heating units, space heaters, wall heaters, boilers, mobile home furnaces, and commercial cooking appliances.

The 7200 Series incorporates a manual valve, dual automatic valves (2) and main gas regulator. The valves compact size, with a swing radius of 3-9/16" will fit most OEM and replacement applications. Wiring connections, manual selector, and adjustments are all accessible on top of the control. To prevent unsafe attempts at repair, screws requiring special drivers are used and replacement parts are not available.

Features and Benefits

- Equipped with inlet/outlet screens, and bleed gas filter to reduce the risk of valve contamination
- Compact construction for maximum application flexibility and capacity range
- Ground wire connection
- Pressure taps for checking inlet and outlet gas pressure
- Instantaneous, slow, step, and two-stage opening models
- Multi-positional mounting (any angle between 0° and 90° from upright)
- Quick-connect and screw terminals for convenient wiring

Specifications

- Regulated or non-regulated
- Natural or liquid propane gas
- Manually adjusted regulator, convertible regulator, or negative pressure regulator
- Two-stage operation (factory set: 40% to 70%)
- Step-opening with step time of 8 to 20 seconds (factory set: 40% to 80%)
- Slow-opening: 8 to 20 seconds from energizing to full pressure
- Range of regulation adjustment:
  - 3.0" to 7.0" Natural Gas
  - 8.0" to 12.0" Liquid Propane
  - Fixed regulation
  - Maximum operating pressure: 1/2 PSI
- Outlet positions and sizes:
  - Straight out: 3/8", 1/2", 3/4" NPT
  - Left or right side: 3/8", 1/2" NPT
- Inlet position and sizes:
  - Straight in: 3/8", 1/2", 3/4" NPT
- Electrical rating: 24V AC, 60 Hz, .5 Amp
- Power consumption: 5 Watts
- NEC Class 2
- Ambient Temperature range from -40°F to 175°F (-40°C to 79°C)
- Agency Certifications:
  - CSA 153104-1019522
  - UL MH6474

Models Available

- 7200DE – direct ignition
- 7200IPI – intermittent pilot ignition

7200 SERIES GAS CONTROLS

CAPACITIES

1" P.D. CAPACITY – BTU PER HOUR

CONTROL	SIZE	TYPE GAS		
		NATURAL	MANUFACTURED GAS	L.P.
7200 SERIES	3/8" x 3/8" *	125,000	64,500	200,000
	1/2" x 3/8" *	125,000	64,500	200,000
	1/2" x 1/2" *	150,000	77,400	240,000
	1/2" x 3/4" +	150,000	77,400	240,000
	3/4" x 3/4" +	150,000	77,400	240,000

* Straight through or side outlet
+ Straight through only

REGULATION CAPACITIES (BTUs)

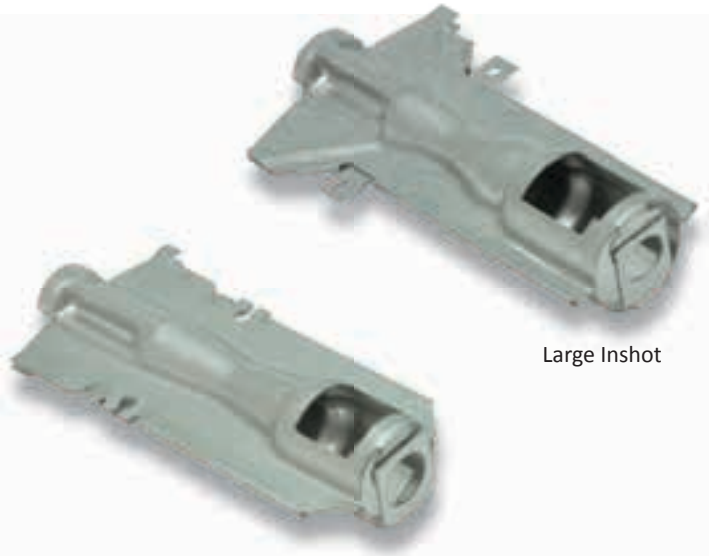
CONTROL	SIZE	TYPE GAS			
		NATURAL		L.P.	
		MIN.	MAX.	MIN.	MAX.
7200 SERIES	3/8" x 3/8"	15,000	175,000	15,000	280,000
	1/2" x 3/8"	175,000	175,000	15,000	280,000
	1/2" x 1/2"	15,000	200,000	15,000	320,000
	1/2" x 3/4"	15,000	200,000	15,000	320,000
	3/4" x 3/4"	15,000	200,000	15,000	320,000

Robertshaw® HEATING

INSHOT BURNER SERIES

The Robertshaw® Inshot Burners Series offer highly efficient, low cost alternatives for many cooking applications. The single port option, combined with versatile mounting tab design and multiple in-line mounting capabilities, offers appliance manufacturers the flexibility needed to meet today's design requirements.

All Robertshaw Inshot Burners are stamped from aluminized steel and incorporate integral carryover flaps to provide dependable performance and long service life.



Large Inshot

Small Inshot

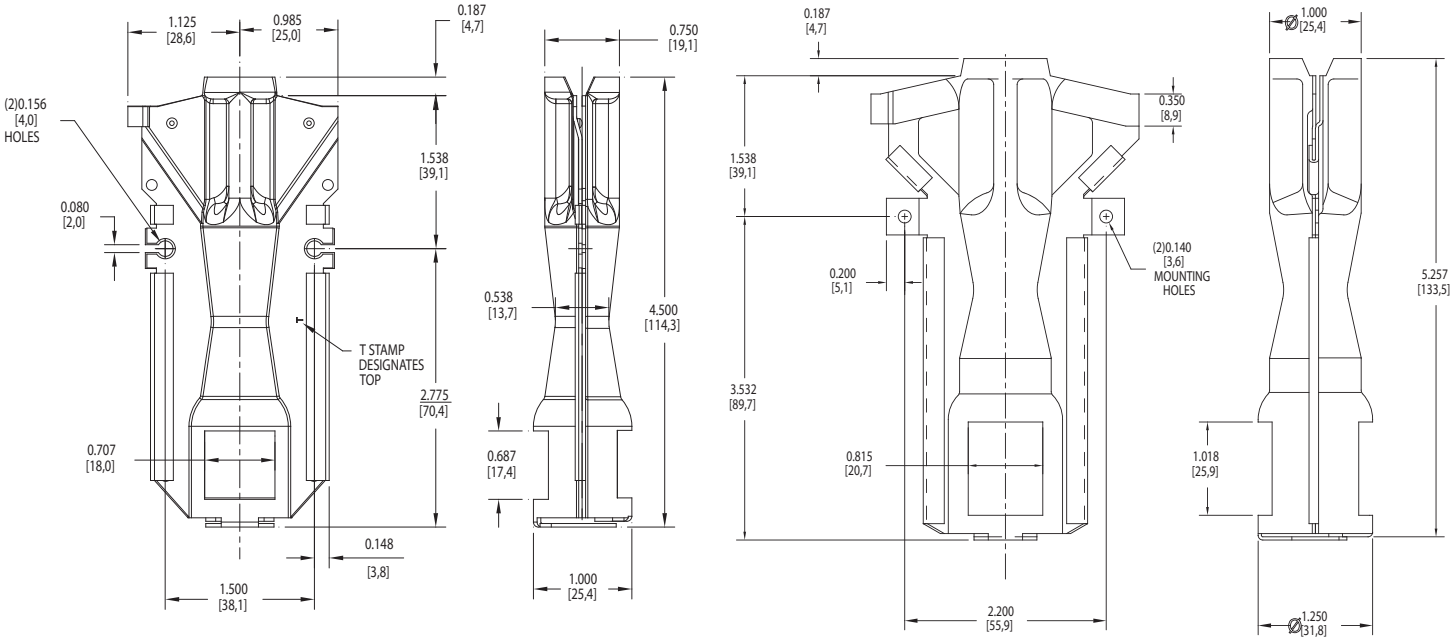
Features and Benefits

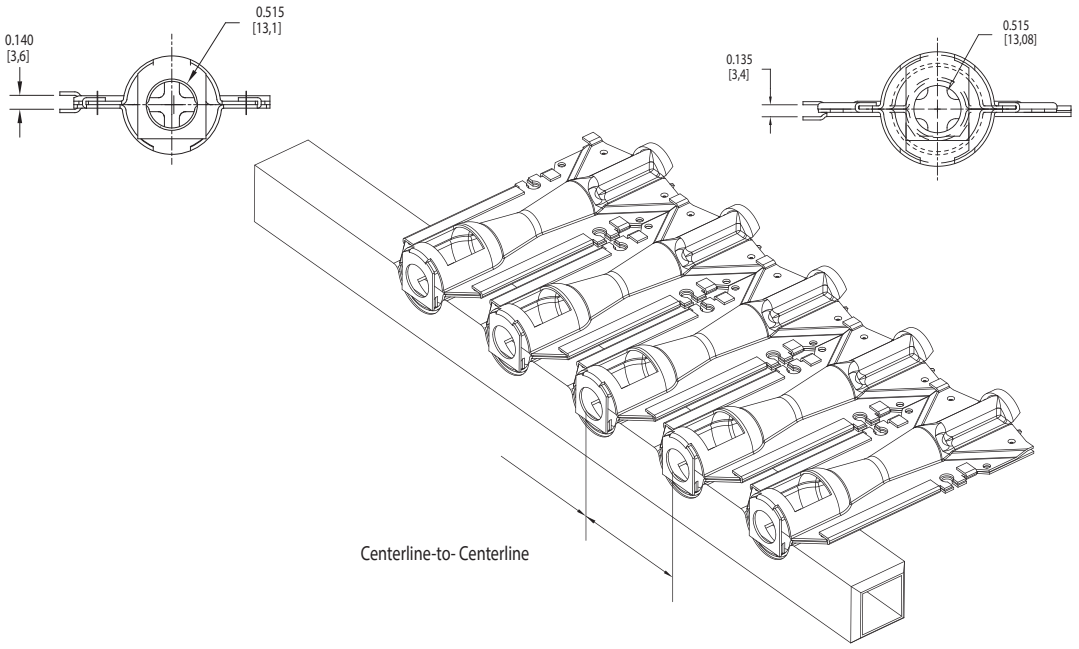
- Rugged, compact design for versatility and long life
- Available in 4.5" and 5.25" overall length
- 0.5" orifice cap
- Consistent ignition
- Clean burning blue flame
- Induces high efficiency draft
- Mounting simplicity
- Lightweight
- Low cost

Specifications

- Used with Natural, LP, mixed or manufactured gas
- 5.25" burners have a 20,000 – 25,000 BTU range
- Higher outputs dependent upon the application
- 4.5" burners maximum output of 15,000 BTU
- Steel grade for both burners is AISI #C1008
- Applications Include:
  - Comfort Heating – Commercial and residential
  - Cooking Appliance – Fryers and steamers
  - Specialized – Space heaters

PRODUCT DIMENSIONS





Robertshaw® HEATING

SR AND PREMIX BURNER SERIES

The Robertshaw® SR and Premix Burner Series are designed for multiple heating applications. The combustion characteristics of each burner are tested to ensure they meet the specified application requirements. Advanced modeling software is used to create burner geometry that fits the physical characteristics of each customer's application.

Features and Benefits

- Standard sizes offered: 40mm, 50mm, 60mm and 50mm x 70mm oval
- Input modulation
- Low flame profile
- Heat resistant stainless steel burner deck
- Reduced CO and NOx emissions

Specifications

- Cylindrical premixed burners with loadings from 1,000 to 10,000 BTU/in^2
- CO and NOx levels less than 25PPM
- Suitable for Natural Gas, LP and manufactured gas applications
- Premixed SR burners can replace traditional atmospheric burners and reduce NOx levels
- Applications include:
  - Boilers
  - Pool heaters
  - Water heaters
  - Space heaters
  - Commercial / Residential dryers
  - Ovens
  - Cooking appliances
  - Outdoor heaters
  - Grills
  - Furnaces

HEATING MANIFOLD SERIES

The Robertshaw® Heating Manifold Series is designed for HVAC, boiler and commercial water heating appliances. Available in a variety of configurations, heating manifolds are manufactured with gas-tight ending/sealing, thread forming, bending, welding, punching, and tapping. All manifolds are finished with a durable, powder-coat paint finish.

A complete manifold assembly is offered with a value-added orifice. Manifolds are tested for leaks and the dimensions of each orifice is independently verified.

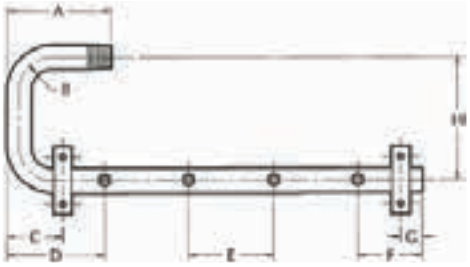
Features and Benefits

- Highly customizable
- 100% leak tested
- CNC bending capabilities
- Powder coat for superior rust protection
- Induction welded brackets
- Mig welded for custom applications

Specifications

SAE 1008 MANIFOLD TUBING [INCH]		
Nominal Size [inch]	Basic OD [inch]	Wall Thickness (min.) [inch]
1/2	0.840	0.096
3/4	1.050	0.096
1	1.315	0.117

PRODUCT DIMENSIONS [INCH]								
Nominal Pipe Diameter	A	B	C	D	E	F	G	H
1/2	2.96	1.00	1.25	2.00	1.38	.75	.25	4.38
3/4	3.92	1.50	2.00	2.50	1.38	.75	.25	4.75
1	5.75	2.00	3.00	3.50	3.00	1.875	.375	7.00



REFRIGERATION

9000 SERIES UNIVERSAL DEFROST TIMERS

The Paragon® 9000 Series 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 end time
- 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

Specifications

- Electrical Rating: 120/208/240V AC (+10, -15%) 50/60 Hz
- Temperature ranges from -40°F to 60°F (-40°C to 16°C)
- Defrost Cycles: 1 to 8 per day or 1 every 48 hours
- Ambient Humidity: 0% to 95% RH (non-condensing)
- Ambient Temperature ranges from -40°F to 122°F (-40°C to 50°C)
- Case Dimensions: 4.40" W x 7.82" H x 3.80" D (11.2cm W x 19.9cm H x 9.7cm D)
- Case Type: NEMA 1
- Display Module Dimensions: 2.75" W x 1.10" H x 1.38" D (7cm W x 2.8cm H x 3.5cm D)
- Temperature Sensor: NTC (Negative Temperature Coefficient) thermistor
- Agency Certifications:
  - UL SA512

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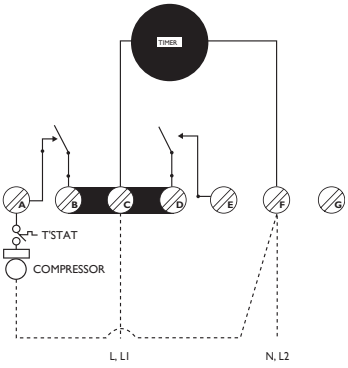
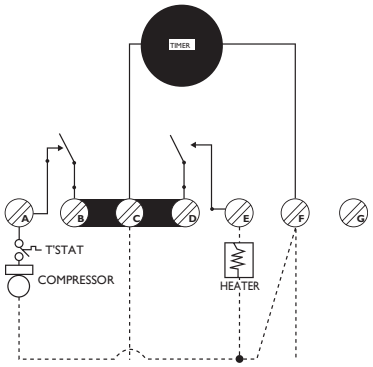
9000 SERIES UNIVERSAL DEFROST TIMERS

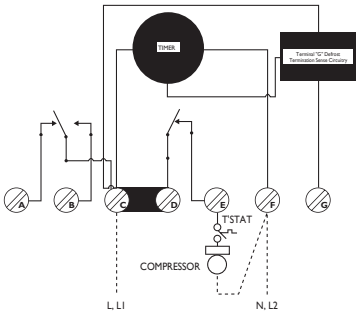
PRODUCT DRAWING



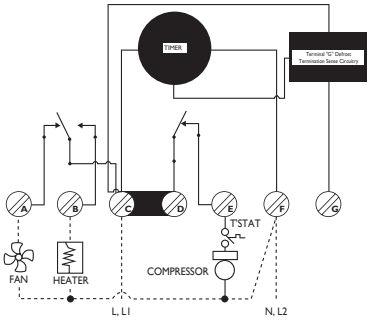
9045 AIR DEFROST - Time Initiated
Time Terminated - Wiring Diagram



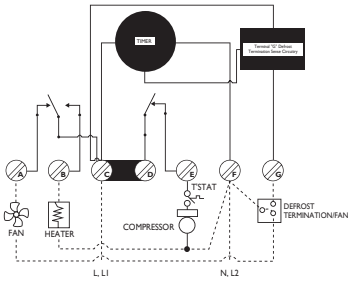
9045 ELECTRIC DEFROST - Time Initiated
Time Terminated - Wiring Diagram



9145 AIR DEFROST - Time Initiated
Time Terminated - Wiring Diagram



9145 ELECTRIC DEFROST - Time Initiated
Time Terminated - Wiring Diagram



9145 ELECTRIC DEFROST - Time Initiated
Temperature Terminated - Wiring Diagram

8000 SERIES COMMERCIAL DEFROST TIMERS

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 contaminates
- 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

Specifications

- Electrical Rating: 120V AC Coil, 60 Hz
- Switch Rating: 40 Amps, 2HP, 690 VA, 120-240V AC
- Initiation/Termination Type: Time/Temperature or Pressure
- Enclosure Material: Heavy-duty Steel
- Agency Certifications:
  - CSA 32079
  - UL SA512

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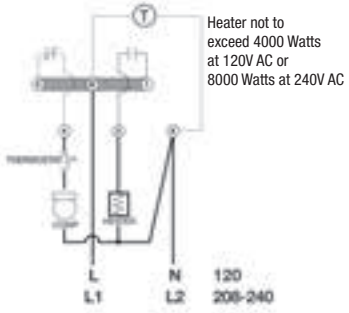
8000 SERIES COMMERCIAL DEFROST TIMERS

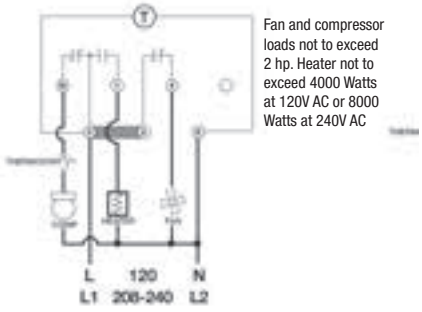
PRODUCT DRAWING

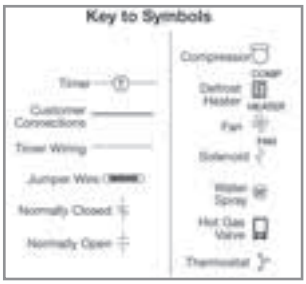
Electric Heat Defrosting

Models 8045-00 and 8045-20 - Wiring Diagram



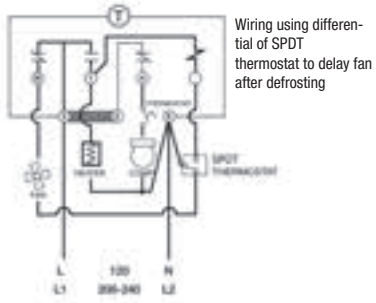
Models 8041-00 and 8041-20 - Wiring Diagram



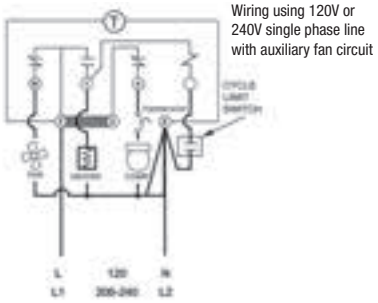


Electric Heat Defrosting

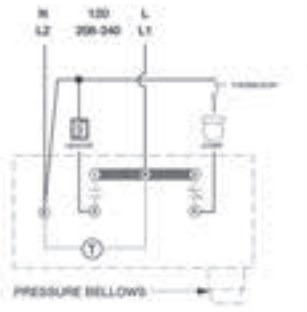
Models 8141-00 and 8141-20 - Wiring Diagram



Models 8141-00, 8141-20 - Wiring Diagram

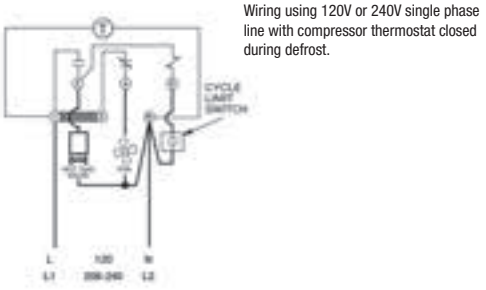


Models 8245-00 and 8245-20 - Wiring Diagram



Hot Gas Defrosting

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



1401 SERIES 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

- 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
- Brass contacts for better corrosion protection
- Approved for use in propane based systems
- Bulk quantities must be ordered in multiples of 12

Specifications

- Cycle Time range: 1 to 24 hours
- Defrost Time range: 2 to 96 minutes
- Terminal Size: 0.25”
- Electrical Rating: 240V AC, 60 Hz, 15 Amps, 1/2 HP; 120V AC, 60 Hz, 15 Amps, 1/2 HP
- Agency Certifications:
  - CSA 42474
  - UL E30359
  - RoHS Compliant

RoHS

RTC SERIES ELECTRONIC TEMPERATURE CONTROLS

The Ranco® RTC Series Electronic Temperature Control is engineered to manage various refrigeration applications. With its wide temperature range, NTC and PTC probe inputs, and ambient storage humidity range, the Ranco RTC Series can be used in commercial refrigeration display cases, coolers and chillers.

This series has intelligent menus and easy browsing for quick and intuitive configurations. Key shortcuts provide direct access to the most common functions to speed up typical operations.

In addition, HACCP and installation status information is stored in memory to help maintain the control settings.

Features and Benefits

- Maximum flexibility, with a large number of electronic, mechanical and appearance combinations
- Built-in universal power supply for installation anywhere in the world
- Configurable PTC/NTC temperature sensor inputs
- Ability to integrate Modbus communications
- Standard panel format with white display (in addition to monochrome green and blue)
- One-relay controller up to 2 HP with 5mm terminals for all inputs and outputs
- Automated processes for the configuration, calibration and verification of the entire controller in approximately 20 minutes

Specifications

- Temperature range from -58°F to 212°F (–50°C to 100°C)
- Electrical Rating: 90-240V AC, 120V AC, 230V AC
- Relay Function: N/A; 1 Relay SPDT 16A; 2 Relay (1) SPDT 16A (1) SPDT 8A; 2 Relay (1) SPDT 16A, (1) SPDT 8A; 3 Relay (1) SPDT 16A, (1) SPDT 8A, (1) SPDT 6A or 4 Relay (1) SPDT 16A, (1) SPDT 8A, (2) SPDT 6A
- Agency Certifications:
  - ETL

ETC SERIES ELECTRONIC TEMPERATURE CONTROLS

The Ranco® ETC Series Electronic Temperature Control is a full-featured electronic replacement for electromechanical temperature controls used in many commercial refrigeration applications. The ETC is designed with application flexibility in mind. Its easy four-step set-up and white backlight display plus extensive settings and voltage options offer OEMs an all-in-one control for a wide range of installations. 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.

Features and Benefits

- 120/208/240V AC and 24V AC models available
- Wide differential adjustment from 1°F to 30°F (-17°C to -1°C)
- Wide temperature range from -30°F to 220°F (-34.4°C to 104.4°C)
- Selectable °F or °C heating/cooling modes
- Sensor rated IP67 for dust and water (<1m) resistance
- “Plug-in” temperature probe connector to allow for field retrofit as needed
- Single and two stage models
- 8' (2.4384m) lead with sensor is extendable up to 400' (121.92m) using 18- or 22-gauge thermostat wire
- Customizable to specific applications
- Heavy-duty relay is 1 HP rated
- High Amp output relay (FLA 16 Amps @ 120V AC and 8 Amps @ 208/240V AC) single stage
- NEMA 1 case and cover
- NEMA 4X models available
- Agency Certifications:
  - CSA
  - UL

ETC SERIES ELECTRONIC TEMPERATURE CONTROLS

Specifications

Part Numbers	Description	Number of Stages	Enclosure Type	Temperature Range	Differential Range	Electrical Rating	0 to 10 Volt Output
ETC-111020-000	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)	120/208/240V AC	No
ETC-111120-000	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	120/208/240V AC	No
ETC-112020-000	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-141020-000	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)	120/208/240V AC	No
ETC-211020-000	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)	120/208/240V AC	No
ETC-212020-000	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
ETC-241020-000	Electronic Temperature Control	Two	NEMA 4X	-30°F to 220°F (-34°C to 104°C)	1°F to 30°F (1°C to 16°C)	120/208/240V AC	No
1309007-044	Thermistor Sensor, 2" long x 1/4" diameter with 8' #22 AWG cable	NA	NA	NA	NA	NA	NA

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

E70 SERIES ELECTRONIC TEMPERATURE CONTROLS

The Ranco® E70 Series Electronic Temperature Control is designed to switch compressor driven refrigerators and freezers in response to sensed temperatures.

Features and Benefits

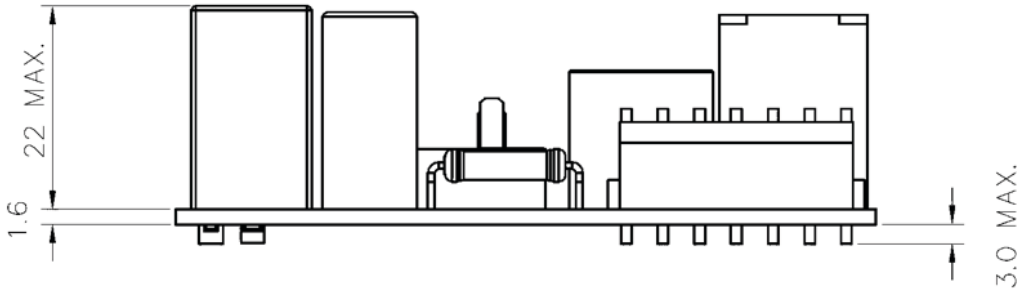
- Compact dimensions make installation easy in most appliances
- Can be used in appliances where the control must not ignite escaped refrigerant gas
- User adjustable temperature dial with plastic cover or fixed setting option with no dial or cover
- Highly flexible custom designs available through programmable settings and optional configurations
- Factory configured optional defrost time
- Choice of adjustment ranges for cut-in and cut-out temperatures
- An optional plastic bracket is available with a standard center-post mounting boss that allows the E70 to replace electromechanical thermostats without requiring tooling changes
- Optional second control output for a defrost heater up to 1 Watt
- Connection type: 4-pin JST connector for power, compressor, and heater
- Capable of controlling 1/4 HP compressor load with option for 1/3 HP load

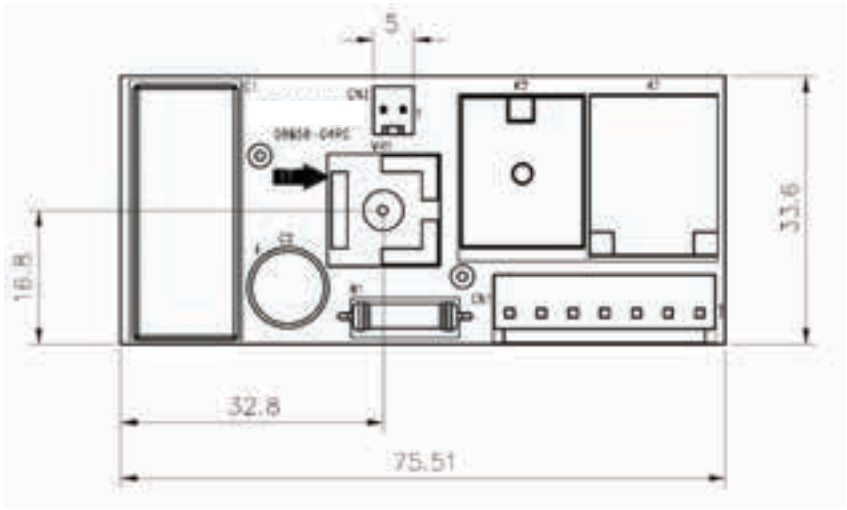
Specifications

- Supply Voltage range: 100V – minimum 142V
- Frequency: 50 Hz or 60 Hz ± 1% sinusoidal
- Control Energy Consumption: 1 Watt ± 10% @110V 60 Hz
- Compressor Load: up to 1/4 HP; optional fitting for 1/3 HP
- Defrost Heating: up to 1,000 Watt heating load
- Ambient Temperature range from 0°C to 45°C (32°F to 113°F)
- Storage/Transport Temperature range from -30°C to 75°C (-22°F to 167°F)
- Humidity: 0 to 93% RH non-condensing
- Agency Certifications:
  - IEC 60335-2-24, IEC 60730-1, 60079-15

E70 SERIES ELECTRONIC TEMPERATURE CONTROLS

PRODUCT DRAWING





9500 SERIES TEMPERATURE CONTROLS

The Ranco® 9500 Series 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 0.25” (0.6cm) quick-connect terminals with optional screw terminals
- Constant cut-in and constant differential versions are available

Specifications

- Temperature range from 5°F to 40°F (-15°C to 4.44°C)
- Terminal Size: 0.25” (0.6cm)
- Capillary Length: 20” to 58” (50.8cm to 147.3cm)
- Agency Certifications:
  - UL SA512

K SERIES TEMPERATURE CONTROLS

The Ranco® K Series Temperature Controls are used globally to control the temperature in commercial and residential refrigeration, air conditioning and heating applications. The K Series Temperature Control is a cycling thermostat with a single pole single throw (SPST) close-on rise switch and narrow differential for custom applications.

Typical uses include refrigerators, freezers, bottle and liquid coolers, refrigerator display cases, and air conditioning units.

Features and Benefits

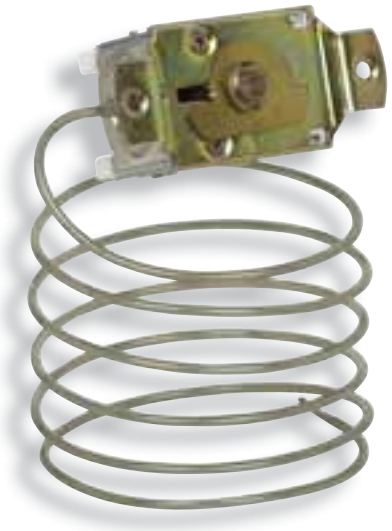
- Compact size
- Switch design eliminates contact arcing
- Adjustable or fixed operating range
- Fixed differential
- Standard mounting or with bracket
- Wide range of capillary lengths from 12" (300mm) to 10' (3m)
- Different forms of bulbs available

Specifications

- Temperature ranges from -40°F to 194°F (-40°C to 90°C)
- Terminal size: 6.3mm or 4.8mm
- Electrical Rating: 6 Amps to 16 Amps continuous at 250V AC (depending on model); 12 Amps at 12V DC
- Agency Certifications:
  - ENEC
  - UL
  - CSA recognized

A SERIES TEMPERATURE CONTROLS

The Ranco® A Series Temperature Controls are designed for refrigeration applications that require defrosting the evaporator coil when the compressor is in the off cycle. The A Series is typically used in vending machines, automatic beverage dispensers, reach-in coolers and medium temperature commercial equipment.



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 .25” (0.6cm) quick-connect terminals with optional screw terminals

Specifications

- Temperature range from -34°F to 67°F (-36°C to 19.4°C)
- Terminal Size: .25” (0.6cm)
- Capillary Length: 12” to 84” (30.5cm to 213.4cm)
- Electrical Rating: 16 Amps or 25 Amps continuous at 240V AC (depending on model)
- Agency Certifications:
  - UL SA512

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RC/TSV/TXV SERIES TEMPERATURE CONTROLS

The Ranco® RC, TSV and TXV Series Temperature Controls are designed for controlling temperature in refrigerators, freezers, air conditioners, water coolers and other applications requiring operation cut-off by temperature. The RC models are traditional and offer ease of use and versatility with a wide range of models. The TSV line incorporates a low-noise electrical switch, and the TXV line includes explosion proof models.

Features and Benefits

- Snap-action switch
- Switch design eliminates contact arcing
- "Drift Guard" feature
- Standard models available for many applications
- Compatible with compressors up to 1/2 HP

Specifications

- Electrical ratings for refrigerators: 40 LRA (locked rotor amperage); 8 FLA (full load amperage); 120/240V AC
- Electrical ratings for air conditioning: 96 LRA / 25 FLA, for SPST or SPDT switch
- Constant differential or constant cut-in versions
- Sensing element: capillary tube or bulb (for cross ambient version)
- Gas used: 131A, R290, SO2
- Agency Certifications:
  - UL E30359 for RC and TSV models
  - TUV for TXV model

RANCO® REFRIGERATION

C SERIES TEMPERATURE CONTROLS

The Ranco® C Series Temperature Controls are designed to replace many OEM controls which govern the on/off compressor function. The C Series Temperature Controls are used in air conditioners such as packaged terminal, through-the-wall, resistance heat, and room heating and cooling 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 setpoints and differentials
- Two stage SPDT switches are staged at 3.5°F (-15.3°C)

Specifications

- Temperature range from 67°F to 205°F (19.4°C to 96.1°C)
- Terminal Size: 0.25” (0.6cm)
- Capillary Length: 9” to 72” (22.9cm to 182.9cm)
- Electrical Rating: 20 Amps continuous, 80 Amps peak at 120V AC/240V AC; 16 Amps continuous, 60 Amps peak at 277V AC (depending on model)
- Agency Certifications:
  - UL SA512

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P30 SERIES LUBE OIL CONTROLS

The Ranco® P30 Series Lube Oil Controls are designed to 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
- Agency Certifications:
  - UL SA512

Specifications

Part Numbers	Description	Pressure Connection Lube and Suction	Time Delay	Pressure Range	Electrical Rating
P30-3601	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	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	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	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	Lube Oil Protection Control	36” Capillary with Flare Nut	120 seconds	9 PSID Fixed	120V AC or 240V AC, Pilot Duty 720VA
P30-5839	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	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

O SERIES TEMPERATURE CONTROLS

The Ranco® O Series Temperature Controls provide a wide range 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.

Designed for flexibility, these controls can be used in numerous applications such as self-contained refrigerators, freezers, coolers, walk-in units, and refrigeration display cases.

Features and Benefits

- Maximum adjustment accuracy with seven 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
- 10 times setting sensitivity of most other wide range controls (O60 series only)
- Gas-filled, nonposition-sensitive bulb (O60 series only)
- Cap included on all Australian controls. Cap is optional on controls for all other regions
- Agency Certifications:
  - CE for EMEA, South American and Australian controls
  - UL for all regions
  - IP44 rated for all Australian controls
  - IP44 rated for EMEA and South American controls with optional cover

O SERIES TEMPERATURE CONTROLS

Specifications

Part Numbers	Description	Switch	Temperature Range	Differential	Capillary Length	Bulb	Packaging	IP44 Cover Part Numbers
O10-1408 (NA)	Low Temperature Control	SPST	-15°F to 40°F	3°F to 20°F	72”	Remote	Bulk (25 PCS)	NA
O10-1409 (NA)	Medium Temperature Control	SPST	0°F to 55°F	3°F to 20°F	72”	Remote	Bulk (25 PCS)	NA
O10-1410 (NA)	High Temperature Control	SPST	25°F to 75°F	3°F to 20°F	72”	Remote	Bulk (25 PCS)	NA
O10-1416 (NA)	Medium Temperature Control	SPST	0°F to 55°F	3°F to 20°F	72”	Cross Ambient	Bulk (25 PCS)	NA
O10-1418 (NA)	Medium Temperature Control	SPST	0°F to 55°F	3°F to 20°F	Air Coil	Remote	Bulk (25 PCS)	NA
O60-100 (NA)	Extra Low-Wide Range Temperature Control	SPDT	-35°F to 95°F	4°F to 50°F	96”	3/8” x 6” Cross Ambient	Bulk (25 PCS)	NA
O16-639-081 (EMEA, SA)	Extra Low Temperature Control	SPDT	-37°C to 9.4°C	1.7°C to 11°C	2000mm	Coiled	Bulk (25 PCS)	206-00232-002
O16-640-081 (EMEA, SA)	Medium Temperature Control	SPDT	-18°C to 13°C	1.7°C to 17°C	2000mm	Cross Ambient (Bulb 1/2" O.D. X 4" L)	Bulk (25 PCS)	206-00232-002
O16-104-081 (EMEA, SA)	Medium Temperature Control	SPDT	-18°C to 13°C	1.7°C to 11°C	2000mm	Coiled	Bulk (25 PCS)	206-00232-002
O16-641-091 (ANZ)	Extra Low Temperature Control	SPDT	-34°C to 32°C	2°C to 28°C	1830mm	Coiled	Bulk (25 PCS)	206-00232-002
O16-640-091 (ANZ)	Medium Temperature Control	SPDT	-18°C to 13°C	1.7°C to 12°C	2000mm	Cross Ambient (Bulb 1/2" O.D. X 4" L)	Bulk (25 PCS)	206-00232-002
O16-642-091 (ANZ)	Medium Temperature Control	SPDT	-5°C to 25°C	1.7°C to 12°C	1830mm	Cross Ambient Bulb	Bulk (25 PCS)	206-00232-002
O16-644-091 (ANZ)	High Temperature Control	SPDT	10°C to 40°C	1.7°C to 12°C	1830mm	Cross Ambient Bulb	Bulk (25 PCS)	206-00232-002
O16-639-091 (ANZ)	Extra Low Temperature Control	SPDT	-35°C to -7°C	1.7°C to 12°C	2000mm	Coiled	Bulk (25 PCS)	206-00232-002
O16-636-091 (ANZ)	Medium Temperature Control	SPDT	-18°C to 13°C	1.7°C to 12°C	1830mm	Coiled	Bulk (25 PCS)	206-00232-002
O16-637-091 (ANZ)	Medium Temperature Control	SPDT	-5°C to 25°C	1.7°C to 12°C	2000mm	Coiled	Bulk (25 PCS)	206-00232-002
O16-643-091 (ANZ)	Low Temperature Control	SPDT	-18°C to 13°C	4°C to 30°C	2000mm	Coiled	Bulk (25 PCS)	206-00232-002

Legend for regions: ANZ - Australia/New Zealand; EMEA - Europe, Middle East, Asia; NA - North America; SA - South America

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

- High-amp rated switch (SPST) design (O10-1402/O10-1483)
- Super Cap® capillary 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)
- Compatible with refrigerants 134A, 401A, 401B, 402A, 402B, 403A, 403B and 404A
- Cap included on all Australian controls. Cap is optional on controls for all other regions
- Agency Certifications:
  - UL
  - CE models O12 and O16
  - IP44 rated for all Australian controls
  - IP44 rated for all EMEA and South American controls with optional cap

O SERIES SINGLE LOW PRESSURE CONTROLS

Specifications

Part Numbers	Description	Reset	Switch	Pressure Range	Differential	Pressure Connection	Capillary Length	IP44 Cover Part Numbers
O10-1402 (NA)	Low Pressure Control	Auto	SPST	12” Hg to 50 PSI (0,4 to 3,5 bar)	5 to 35 PSI (0,3 to 2,4 bar)	1/4” SAE Flare Nut	36” (0,9m)	206-00232-002
O10-1483 (NA)	Low Pressure Control	Auto	SPST	10” Hg to 100 PSI (0,3 to 7 bar)	10 to 40 PSI (1 to 3 bar)	1/4” SAE Flare Nut	36” (0,9m)	206-00232-002
O16-107 (NA) O16-107-057 (EMEA, SA)	Low Pressure Control	Auto	SPDT	10” Hg to 100 PSI (0,3 to 7 bar)	10 to 40 PSI (1 to 3 bar)	1/4” SAE Male Flare Fitting	NA	206-00232-002
O16-527 (NA)	Low Pressure Control	Auto	SPDT	10” Hg to 100 PSI (0,3 to 7 bar)	10 to 40 PSI (1 to 3 bar)	1/4” SAE Flare Nut	36” (0,9m)	206-00232-002
O16-528 (NA) O16-528-081 (EMEA, SA)	Low Pressure Control	Auto	SPDT	10” Hg to 100 PSI (0,3 to 7 bar)	10 to 40 PSI (1 to 3 bar)	Male Connnection 7/16” - 20 UNF for a 1/4” Female Flare 1/4” SAE Male Flare Fitting	NA	206-00232-002
O16-528-091 (ANZ)	Low Pressure Control	Auto	SPDT	-30 to 700 kPa	60 to 300 kPa	Male Connection 7/16”- 20 UNF for a 1/4" Female Flare	NA	206-00232-002
O16-529-090 (ANZ)	Low Pressure Control	Auto	SPDT	-30 kPa To 700 kPa	60 to 300 kPa	1/4” SAE Flare Nut	900mm	206-00232-002
O16-585-000 (EMEA, SA)	Low Pressure Control	Manual	SPDT	10" Hg to 100 PSI (0,3 to 7 bar)	10 PSI (1 bar) Fixed	1/4” SAE Male Flare Fitting	NA	206-00232-001
O16-624 (NA)	Low Pressure Control	Auto	SPDT	12” Hg to 80 PSI (0,4 to 5,5 bar)	5 to 38 PSI (0,3 to 2,6 bar)	1/4” SAE Flare Nut	36” (0,9m)	206-00232-002
O16-638 (NA) O16-638-081 (EMEA, SA)	Low Pressure Control	Manual	SPDT	10” Hg to 100 PSI (0,3 to 7 bar)	9 PSI (0.6 bar) Fixed	Male Connnection 7/16” - 20 UNF for a 1/4” Female Flare	NA	206-00232-002
O16-638-091 (ANZ)	Low Pressure Control	Manual	SPDT	-30 to 700 kPa	60 kPa (Fixed)	Male Connection 7/16”- 20 UNF for a 1/4" Female Flare	NA	206-00232-001

Legend for regions: ANZ - Australia/New Zealand; EMEA - Europe, Middle East, Asia; NA - North America; SA - South America

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
- Compatible with refrigerants 134A, 401A, 401B, 402A, 402B, 403A, 403B and 404A
- Cap included on all Australian controls. Cap is optional on controls for all other regions
- Agency Certifications:
  - UL
  - CE models O12 and O16
  - IP44 rated for all Australian controls
  - IP44 rated for EMEA and South American controls with optional cover

O SERIES SINGLE HIGH PRESSURE CONTROLS

Specifications

Part Numbers	Description	Reset	Switch	Pressure Range	Differential	Pressure Connection	Capillary Length	Replaces	IP44 Cover Part Numbers
O10-2054 (NA)	Single High Pressure Control	Auto	SPST	100 to 400 PSI (7 to 27 bar)	40 to 150 PSI (3 to 10 bar)	1/4" SAE Flare Nut	36" (0,9m)		206-00232-002
O16-108 (NA)	Single High Pressure Control	Auto	SPDT	100 to 400 PSI (7 to 27 bar)	40 to 150 PSI (3 to 10 bar)	1/4" SAE Flare Nut	36" (0,9m)		206-00232-002
O16-200 (NA)	Single High Pressure Control	Manual	SPDT	150 to 450 PSI (10 to 31 bar)	40 PSI (3 bar) Fixed	1/4" SAE Flare Nut	48" (1,2m)		206-00232-001
O20-7006 (NA)	Single High Pressure Control	Auto	DPST	100 to 400 PSI (7 to 27 bar)	40 to 150 PSI (3 to 10 bar)	1/4" SAE Flare Nut	36" (0,9m)		206-00232-002
O16-209-000 (EMEA, SA)	Single High Pressure Control	Manual	SPDT	10" Hg to 100 PSI (0,3 to 7 bar)	40 PSI (3 bar) Fixed	1/4" SAE Male Flare Fitting	NA		206-00232-001
O16-530 (NA) O16-530-081 (EMEA, SA)	Single High Pressure Control	Auto	SPDT	100 to 400 PSI (7 to 27 bar)	40 to 150 PSI (3 to 10 bar)	Male Connection 7/16" - 20 UNF	NA	O16-H6750-101	206-00232-002
O16-530-090 (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	O16-8750	206-00232-002
O16-531-090 (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	O16-8751	206-00232-001
O16-530-091 (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	O16-8750	206-00232-002
O16-531-091 (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	O16-8751	206-00232-001
O16-750 (ANZ)	Single High Pressure Control	Auto	SPDT	700 to 2800 kPa	300 to 1000 kPa	1/4" SAE Flare Male (color silver)	NA	O16-530 O16-8750 O16-6750	206-00232-002
O16-531 (NA) O16-531-081 (EMEA, SA)	Single High Pressure Control	Manual	SPDT	150 to 450 PSI (10 to 31 bar)	40 PSI (3 bar) Fixed	Male Connection 7/16" - 20 UNF	NA	O16-H6751-101	206-00232-001
O16-751 (ANZ)	Single High Pressure Control	Manual	SPDT	1000 to 3000 kPa	350 kPa Fixed	1/4" SAE Flare Male (color silver)	NA	O16-531 O16-8751 O16-6751	206-00232-001
O16-6200-000 (NA)	Single High Pressure Control	Auto	SPDT	200 to 700 PSI (14 to 48 bar)	50 to 250 PSI (3 to 17 bar)	Male Connection 7/16"- 20 UNF for a 1/4" Female Flare	NA	NA	206-00232-002
O16-6201-000 (NA)	Single High Pressure Control	Auto	SPDT	200 to 700 PSI (14 to 48 bar)	50 to 250 PSI (3 to 17 bar)	NA	36" (0,9m)	NA	206-00232-002

Legend for regions: ANZ - Australia/New Zealand; EMEA - Europe, Middle East, Asia; NA - North America; SA - South America

RANCO REFRIGERATION

O SERIES DUAL PRESSURE CONTROLS

The Ranco® O Series Dual Pressure Controls combine the functions of a single high-pressure limit control and a single low-pressure control in one unit.

Features and Benefits

- Convertible feature allows selection of manual or reset function when operating at high pressure
- Replaces wide range of high-pressure manual or automatic reset controls
- High-pressure limit is combined with suction pressure sensing to provide temperature control and/or pump down
- High-limit adjustment screw
- Low-pressure differential and range adjusting screws
- Selector screw for manual or automatic
- Reset button on manual controls
- Low-pressure and high-pressure scale plate
- High-impact plastic cover with center mount screw
- 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
- Compatible with most refrigerants including 134A, 401A, 401B, 402A, 402B, 403A, 403B and 404A
- Cap included on all Australian controls. Cap is optional on controls for all other regions
- Agency Certifications:
  - UL
  - CE models O12 and O16
  - IP44 rated for all Australian controls
  - IP44 rated for EMEA and South American controls with optional cover

Specifications

Part Numbers	Description	Switch	Low Reset	Low Cut-In	Low Differential	High Reset	High Cut-Out	High Differential	Pressure Connection	Capillary Length	Replaces	IP44 Cover Part Numbers
O12-1502 (NA)	Dual Pressure Control	SPST	Auto	12” Hg to 50 PSI (0,4 to 3,5 bar)	5 to 35 PSI (0,3 to 2,4 bar)	Auto	150 to 450 PSI (10 to 31 bar)	70 PSI (5 bar) Fixed	1/4” SAE Flare Nut	36” (0,9m)		NA
O12-1506 (NA)	Dual Pressure Control	SPST	Auto	12” Hg to 50 PSI (0,4 to 3,5 bar)	5 to 35 PSI (0,3 to 2,4 bar)	Auto	100 to 250 PSI (7 to 17 bar)	50 PSI (3,5 bar) Fixed	1/4” SAE Flare Nut	36” (0,9m)		NA
O12-1549 (NA) O12-1549-000 (EMEA, SA)	Dual Pressure Control	SPST	Auto	10” Hg to 100 PSI (0,3 to 7 bar)	10 to 40 PSI (1 to 3 bar)	Auto	150 to 450 PSI (10 to 31 bar)	70 PSI (5 bar) Fixed	1/4” SAE Flare Nut	36” (0,9m)		NA
O12-1550-081 (EMEA, SA)	Dual Pressure Control	SPST	Auto	10” Hg to 100 PSI (0,3 to 7 bar)	10 to 40 PSI (1 to 3 bar)	Auto	150 to 450 PSI (10 to 31 bar)	70 PSI (5 bar) Fixed	Male Connnection 7/16” - 20 UNF for a 1/4” Female Flare	NA		206-00231-003

O SERIES DUAL PRESSURE CONTROLS

Specifications

Part Numbers	Description	Switch	Low Reset	Low Cut-In	Low Differential	High Reset	High Cut-Out	High Differential	Pressure Connection	Capillary Length	Replaces	IP44 Cover Part Numbers
O12-4154 (NA) O12-4154-081 (EMEA, SA)	Dual Pressure Control	SPST	Manual	10" Hg to 100 PSI (0,3 to 7 bar)	10 PSI (1 bar) Fixed	Manual	150 to 450 PSI (10 to 31 bar)	70 PSI (5 bar) Fixed	Male Connnection 7/16" - 20 UNF for a 1/4" Female Flare	NA	NA	206-00231-002
O12-4833 (NA)	Dual Pressure Control	SPST	Auto	12" Hg to 50 PSI (0,4 to 3,5 bar)	5 to 35 PSI (0,3 to 2,4 bar)	Manual/ Auto (Convertible)	150 to 450 PSI (10 to 31 bar)	70 PSI (5 bar) Fixed	1/4" SAE Flare Nut	48" (1,2m)	NA	206-00231-001
O12-4834 (NA)	Dual Pressure Control	SPST	Auto	10" Hg to 100 PSI (0,3 to 7 bar)	10 to 40 PSI (1 to 3 bar)	Manual/ Auto (Convertible)	150 to 450 PSI (10 to 31 bar)	70 PSI (5 bar) Fixed	1/4" SAE Flare Nut	48" (1,2m)	NA	206-00231-001
O12-4860 (NA) O12-4860-081 (EMEA, SA)	Dual Pressure Control	SPST	Auto	10" Hg to 100 PSI (0,3 to 7 bar)	10 to 40 PSI (1 to 3 bar)	Manual/ Auto (Convertible)	150 to 450 PSI (10 to 31 bar)	70 PSI (5 bar) Fixed	Male Connnection 7/16" - 20 UNF for a 1/4" Female Flare	NA	O17-H4705-101 O17-H6705-101	206-00231-001
O12-4900 (NA) O12-4900-081 (EMEA, SA)	Dual Pressure Control	SPST	Auto	10" Hg to 100 PSI (0,3 to 7 bar)	10 to 40 PSI (1 to 3 bar)	Auto	150 to 450 PSI (10 to 31 bar)	70 PSI (5 bar) Fixed	Male Connnection 7/16" - 20 UNF for a 1/4" Female Flare	NA	O17-H6701-101	206-00231-003
O12-4902 (NA)	Dual Pressure Control	SPST	Auto	10" Hg to 100 PSI (0,3 to 7 bar)	10 to 40 PSI (1 to 3 bar)	Auto	145 to 435 PSI (10 to 30 bar)	70 PSI (5 bar) Fixed	1/4" SAE Flare Nut	36" (0,9m)	O17-8711	206-00231-003
O12-4900-091 (ANZ)	Dual Pressure Control	SPST	Auto	-30 to 700 kPa	60 to 300 kPa	Auto	1000 to 3000 kPa	350 kPa Fixed	Male Connection 7/16"- 20 UNF for a 1/4" Female Flare	NA	O17-8701	206-00231-003
O12-4154-091 (ANZ)	Dual Pressure Control	SPST	Manual	-30 to 700 kPa	60 kPa Fixed	Manual	1000 to 3000 kPa	350 kPa Fixed	Male Connection 7/16"- 20 UNF for a 1/4" Female Flare	NA	O17-8703	206-00231-002
O12-4860-091 (ANZ)	Dual Pressure Control	SPST	Auto	-30 to 700 kPa	60 to 300 kPa	Manual/ Auto (Convertible)	1000 to 3000 kPa	350 kPa Fixed	Male Connection 7/16"- 20 UNF for a 1/4" Female Flare	NA	O17-8705	206-00231-001
O12-4902-091 (ANZ)	Dual Pressure Control	SPST	Auto	-30 to 700 kPa	60 to 300 kPa	Auto	1000 to 3000 kPa	350 kPa Fixed	1/4" SAE Flare Nut	920mm	O17-8711	206-00231-003
O12-5501-080 (EMEA, SA)	Dual Pressure Control	SPST	Auto	10" Hg to 100 PSI (0,3 to 7 bar)	9 to 57 PSI (0,6 to 3,9 bar)	Auto	100 to 435 PSI (7 to 30 bar)	50 PSI Fixed	Male Connection 7/16" - 20 UNF for a 1/4" Female Flare	NA	O17-H4703-101	206-00231-003
012-5502-091 (ANZ)	Dual Pressure Control	SPDT	Auto	-30 to 700 kPa	60 to 300 kPa	Auto	1000 to 3000 Kpa	350 kPa Fixed	Male Connection 7/16" - 20 UNF for a 1/4" Female Flare	NA	NA	206-00231-003
012-5002-091 (ANZ)	Dual Pressure Control	SPDT	Manual	-30 to 700 kPa	60 kPa Fixed	Manual	1000 to 3000 kPa	350 kPa Fixed	Male Connection 7/16" - 20 UNF for a 1/4" Female Flare	NA	NA	206-00231-002
012-5003-091 (ANZ)	Dual Pressure Control	SPDT	Auto	-30 to 700 kPa	60 to 300 kPa	Manual/ Auto (Convertible)	1000 to 3000 kPa	350 kPa Fixed	Male Connection 7/16" - 20 UNF for a 1/4" Female Flare	NA	NA	206-00231-001
012-5503-091 (ANZ)	Dual Pressure Control	SPDT	Auto	-30 to 700 kPa	60 kPa to 300 kPa	Auto	1000 to 3000 kPa	350 kPa Fixed	NA	900mm	NA	206-00231-003
012-5500-080 (EMEA, SA)	Dual Pressure Control	SPDT	Auto	10" Hg to 100 PSI (0,3 to 7 bar)	9 to 57 PSI (0,6 to 3,9 bar)	Auto	100 to 435 PSI (7 to 30 bar)	50 PSI (3,5 bar) Fixed	Male Connection 7/16" - 20 UNF for a 1/4" Female Flare	NA	O17-H4701-101	206-00231-003
012-5001-080 (EMEA, SA)	Dual Pressure Control	SPDT	Manual	10" Hg to 100 PSI (0,3 to 7 bar)	9 PSI Fixed (0,6 to 3,9 bar)	Manual	100 to 435 PSI (7 to 30 bar)	50 PSI (3,5 bar) Fixed	Male Connection 7/16" - 20 UNF for a 1/4" Female Flare	NA	O17-H4703-101	206-00231-002
012-5000-080 (EMEA, SA)	Dual Pressure Control	SPDT	Auto	10" Hg to 100 PSI (0,3 to 7 bar)	9 to 57 PSI (0,6 to 3,9 bar)	Manual	100 to 435 PSI (7 to 30 bar)	50 PSI (3,5 bar) Fixed	1/4" SAE Male Flare Fitting	NA	O17-H4705-101	206-00231-001

Legend for regions: ANZ - Australia/New Zealand; EMEA - Europe, Middle East, Asia; NA - North America; SA - South America

TRANSPORTATION

H42 AND H44 AUTOMOTIVE COOLANT VALVES SERIES

The Ranco® H42 and H44 Automotive Coolant Valves Series are designed to offer both internally controlled and externally controlled actuators with two flow options. Both types of actuators are offered in sealed (splash proof) and unsealed versions.

The H42 Series is available in cable, shaft, vacuum and motorized actuation versions. The H44 Series is only available in cable and motorized actuation versions. The H44 Series is designed for high flow with some metering capabilities. It's unique robust seal is engineered to work under extremely harsh conditions in off-road, agriculture and construction equipment.

Features and Benefits

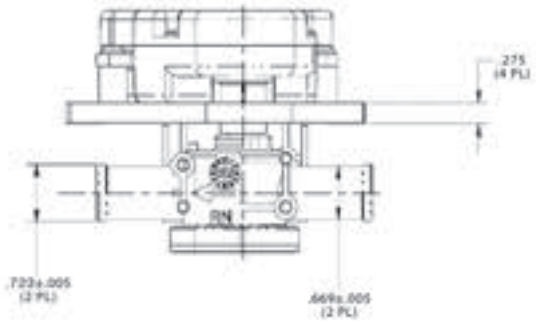
- Available with analog actuator or non-electronic actuator with feedback
- Coolant flow control from fully open/closed non-linear output to reduced flow control linear output (metering)
- Minimal pressure drop in full flow applications
- Port sizes available: 1/2”, 5/8", 3/4"
- Integral electrical interface on the actuator
- Under the hood compatible up to 185°F (85°C)
- Integral mounting bracket
- Improves temperature control in front and/or rear HVAC systems
- Improves performance of stacked core and blend-door HVAC systems
- Controls cooling to protect critical components such as batteries/alternators, Electronic Control Units (ECUs) or other critical components
- Regulates coolant flow in engine cooling applications (bypass, oil cooler, etc.)

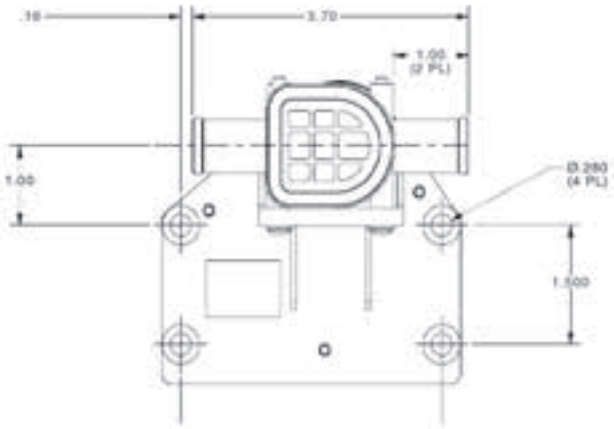
Specifications

- Operating Supply Voltage: 9V DC to 16V DC
- Current Consumption: Approximately 200 ma
- Internal Valve Leakage: 10cc per minute maximum
- Operating Temperature range from -40°F to 185°F (-40°C to 85°C)
- Ambient Temperature range from -40°F to 185°F (-40°C to 85°C)
- Operating Temperature range from -40°F to 248°F (-40° C to 120°C)
- Coolant Temperature range from -40°F to 248°F (-40°C to 120°C)
- Storage Temperature range form -40°F to 185°F (-40°C to 85°C)
- Durability: 100K cycles
- Construction: Nylon 6/6 glass reinforced

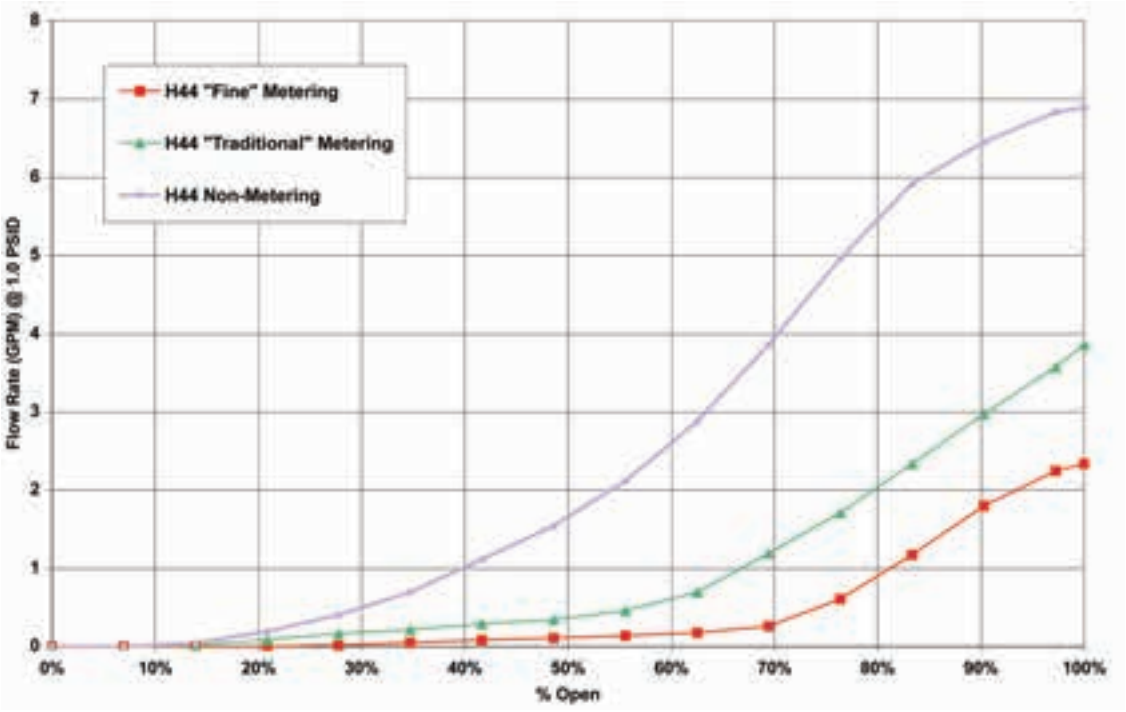
H42 AND H44 AUTOMOTIVE COOLANT VALVES SERIES

PRODUCT DRAWING





H44 FLOW PERFORMANCE: METERING OPTIONS COMPARISON



H43 AUTOMOTIVE CHECK VALVE SERIES

The Ranco® H43 Series Automotive Check Valve Series is designed for use in any internal combustion coolant loop (automobiles, tractors, agricultural, and off-road vehicles) application to limit or stop fluid flow.

The Ranco H43 valve is available in two versions: the H43-1000 is used to limit flow in flow restriction applications, and the H43-5000 is used to stop flow in check valve applications.

As a flow restrictor, the H43-1000 is typically used to protect system components from premature failure due to excessively high pressure and flow rates (flow erosion). Flow needs to be restricted to protect vital components such as heater cores and other types of heat exchangers in glycol-based fluid systems.

As a check valve, the H43-5000 is applied in systems where back flow (created by negative pressures) is undesirable. Negative pressure conditions may exist in parallel loop systems. Parallel loops systems are used for front and rear unit vehicle applications or systems with multiple heat exchangers where isolating individual loops is desired (minivan, people movers, ambulances).

Electric vehicles have multiple evaporators (multiple loops). By virtue of the spring dynamic within the assembly, the H43 series can be utilized to silence the sound of the water hammer effect in a coolant system by dampening system pulsation that sometimes occurs in glycol-based coolant systems.

Features and Benefits

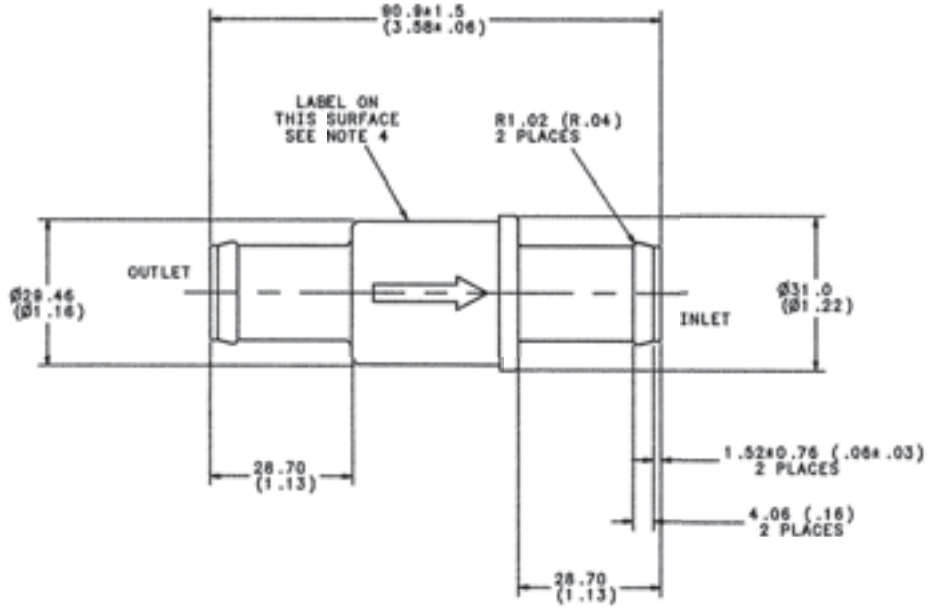
- Versions available for flow restriction and check valve applications
- Minimal pressure drop in full flow applications
- Port sizes available: 5/8" and 3/4”
- Under the hood compatible up to 185°F (85°C)

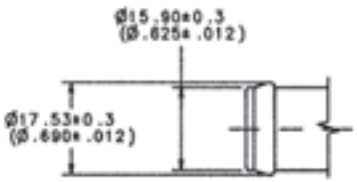
Specifications

- Ambient Temperature range from -40°F to 185°F (-40°C to 85°C)
- Coolant Temperature range from -40°F to 248°F (-40°C to 120°C)
- Storage Temperature range from -40°F to 185°F (-40°C to 85°C)
- Durability: 100K cycles
- Construction: Nylon 6/6 glass reinforced

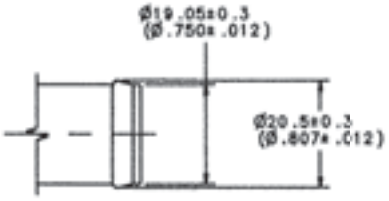
H43 AUTOMOTIVE CHECK VALVE SERIES

PRODUCT DRAWING





5/8" BEAD
STYLE "A"



3/4" BEAD
STYLE "B"

LPC AUTOMOTIVE CHECK VALVE SERIES

The Ranco® LPC Series Automotive Check Valves are designed to meet customer geometric specifications as well as base material selection.

Features and Benefits

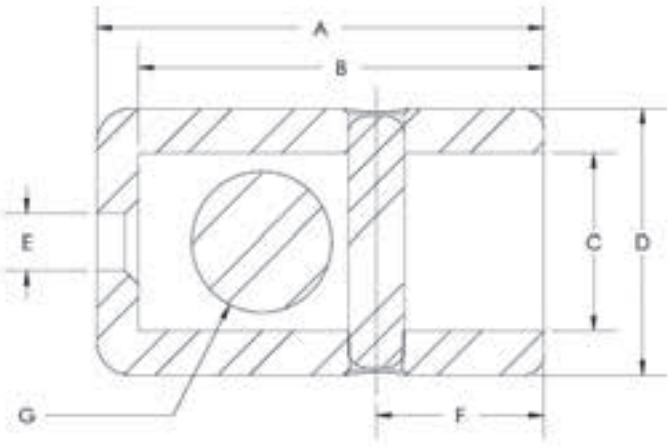
- 100% performance verification
- Precision machining
- High production capabilities
- Semi-automated assembly
- Customizable
- Brass and plastic available

Specifications

- Maximum Diameter (D) 0.75” (1.9cm)
- Maximum Length (A) 1.5” (3.8cm)
- Press fit pin

LPC AUTOMOTIVE CHECK VALVE SERIES

PRODUCT DRAWING



SOLENOID ACTION COOLANT VALVE SERIES

The Ranco® Solenoid Action Coolant Valve Series controls the secondary heating coil in vehicles with rear cabin HVAC systems. Vehicles include people movers, fire trucks, and ambulances.

Features and Benefits

- Valve driven by actuator
- Saves energy compared to traditional solenoid valve
- Does not require constant power to keep valve in closed position
- Valve moves to open position in case of energy loss
- Capacitor internal to actuator provides back-up power
- Minimal pressure drop in full flow applications
- Two terminal electrical interface on the actuator
- Integral mounting bracket

Specifications

- Port size: 5/8“ (16mm)
- Operating Supply Voltage: 9V DC to 16V DC
- Internal Valve Leakage: 10cc per minute maximum
- Ambient Operating Temperature range from -40°F to 185°F (-40°C to 85°C)

ME56 ELECTRONIC THERMOSTAT SERIES

The Ranco® ME56 Electronic Thermostat Series, formally known as E56, is used primarily as an HVAC clutch cycling thermostat where fine temperature sensing is desired. It is available in 12V DC and 24V DC versions with 5 Amp and 2.5 Amp load capabilities respectively and can be produced with a number of different termination configurations.

Features and Benefits

- Electronic sensors provide higher accuracy and are integral parts of today's computerized automotive systems
- Electronic thermostats and sensors provide an economical way to sense temperature when sufficient Engine Control Module (ECM) memory is available
- Both fin and air sensing element styles are available
- Electronic thermostats can switch loads ranging from ECM logic level currents to full clutch loads
- Electronic thermostats are fully sealed for under-hood use and applications
- EMI resistant
- Different packaging and termination options are available to meet a wide range of application needs

Specifications

- Operating Temperature range from -40°F to 185°F (-40°C to 85°C)
- Storage Temperature range from -67°F to 248°F (-55°C to 120°C)
- Operating Voltage: 12V DC; 24V DC
- Operating Current: 5 Amps; 2.5 Amps
- Probe length available from 1.25" to 7.5" (3,2cm to 19,1cm)
- Cut-In range from 39°F to 42°F (3.9°C to 5.6°C)
- Cut-Out range from 31°F to 34°F (-0.6°C to 1.1°C)
- ISO and QS-9000 certified for all automotive thermostats and sensors
- Meets the EMC requirements of ISO 14982, EN 13309 and ISO 7637-2

RANCO TRANSPORTATION

L53/L59 SENSOR AND SENSOR PROBES SERIES

The Ranco® L53/L59 Sensor and Sensor Probes Series are designed for use in car, truck, off-road, and agricultural vehicle HVAC system applications. The L53/L59 Series is an electronic alternative to traditional mechanical capillary tube thermostats. The L53/L59 Series is suitable for use in systems in which clutch cycling and other system logic decisions are made by an Automatic Temperature Control (ATC) module.

The L53/L59 Series sensor is a sealed NTC (Negative Temperature Coefficient) thermistor used in conjunction with a regulated 5V DC supply. These sensors are designed to replicate the physical construction of a mechanical thermostat's capillary and are typically placed directly into the fins of the HVAC system's evaporator unit. An assortment of standard probe lengths are available to accommodate either cold side or warm side applications. Several popular automotive connector options are available as well as various cable lengths to service a wide range of application needs.

Features and Benefits

- Used as an input device in systems with an ECM (Engine Control Module)
- Sealed NTC (Negative Temperature Coefficient) thermistor
- Assortment of standard probe lengths are available
- Available in several popular automotive connector options
- Designed for use in car, truck, off-road, and agricultural vehicle HVAC system applications
- Used primarily as a freeze protection sensor on evaporators
- Electronic alternative to traditional mechanical capillary tube thermostat
- Accommodates either cold side or warm side applications

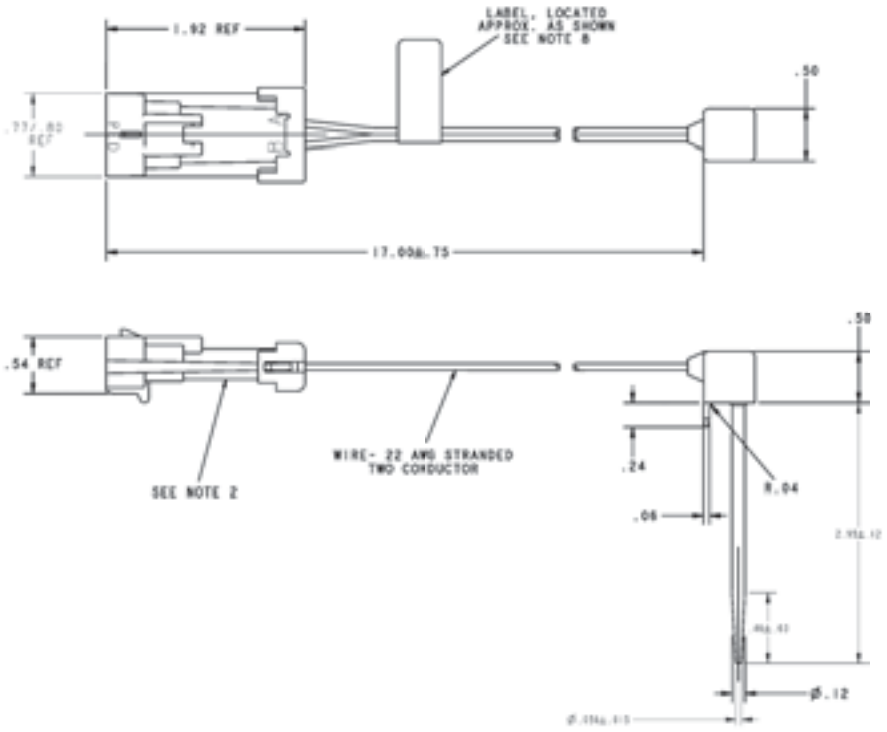
Specifications

- Ranges of Probe: (L59) 5.50" ± 0.25" (14cm ± .06cm); 8.00" ± 0.25" (20,3cm ± .06cm); 10." ± 0.25" (25,4cm ± .06cm)
- Overall Length: (L59) 17.75" ± 0.75" (45,1cm ± 1,9cm); 20.25" ± 0.75" (51,4cm ± 1,9cm); 22.25" ± 0.75" (56,5cm ± 1,9cm)
- Voltage: (L59) 5V DC
- Temperature Sensors based on NTC Thermistor

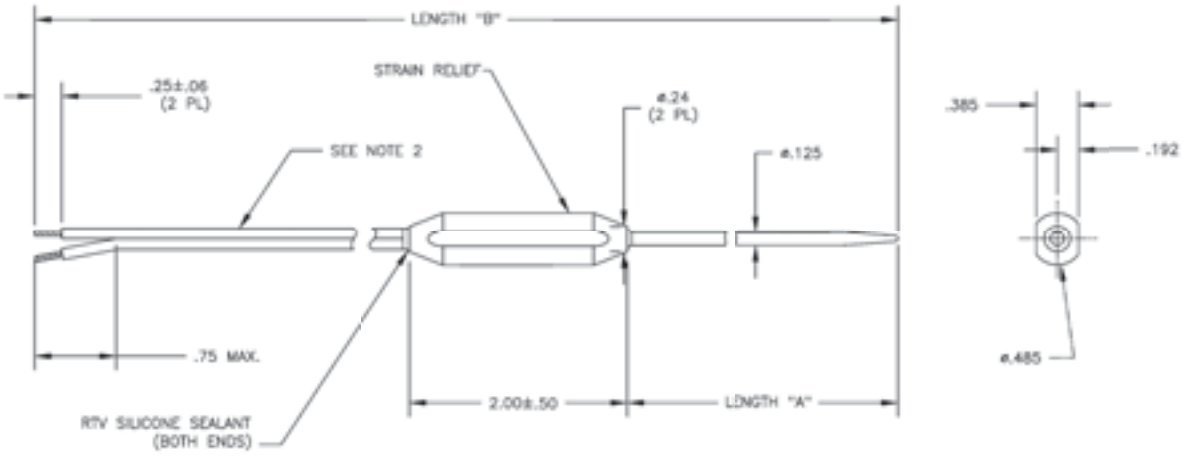
L53/L59 SENSOR AND SENSOR PROBES SERIES

PRODUCT DRAWING

L53



L59



WATER VALVES

738 SERIES PRESSURE SWITCH

The Robertshaw® 738 Series Pressure Switch is designed with a large diaphragm that offers proven reliability and maximum sensitivity in sump pump, water treatment, and other commercial applications. The exposed diaphragm design senses pressure change directly without an inlet or an air trap arrangement.

Features and Benefits

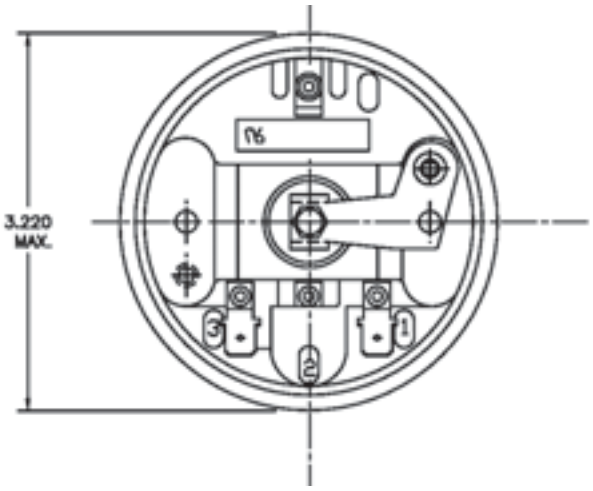
- Strong phenolic housing and steel mounting for rugged environments
- One-piece blade assembly with oversized fine silver contacts

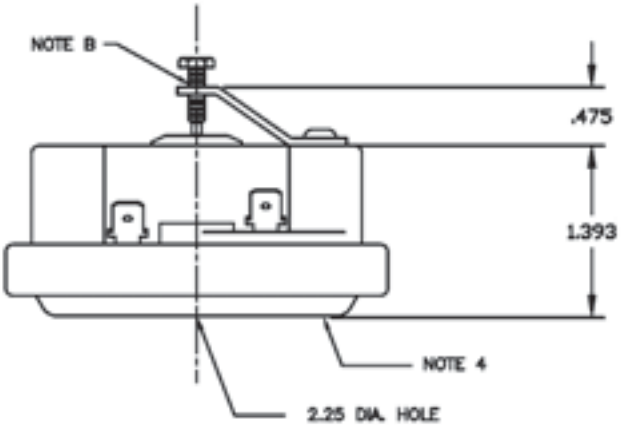
Specifications

- Terminals: 1/4“ (6.35mm) male spade
- Electrical Ratings: 1/2 HP / 0.373 kW at 125/250V AC; 12 Amps - 125V AC, 10 Amps - 250V AC
- Calibration Range for Reset Differential:
  - Minimum 2" W.C. / 482 PA / 0.005 ATM
  - Maximum 20" W.C. / 4965 PA / 0.05 ATM
- Trip Point:
  - Minimum 4" W.C. / 965 PA / 0.009 ATM
  - Maximum 25" W.C. / 6207 PA / 0.06 ATM
- Agency Certifications:
  - UL E12459
  - CSA 94559

738 SERIES PRESSURE SWITCH

PRODUCT DRAWING





S-101 SERIES WATER VALVE

The Robertshaw® S-101 Series Water Valve is a single solenoid valve for dishwashing machines, coffee brewers, cappuccino machines and tea brewers. The S-101 has a robust 3/8” brass inlet connection. The S-101 features the low profile Hydra® solenoid produced using a fully automated arc weld process to eliminate open circuit concerns in the field.

Features and Benefits

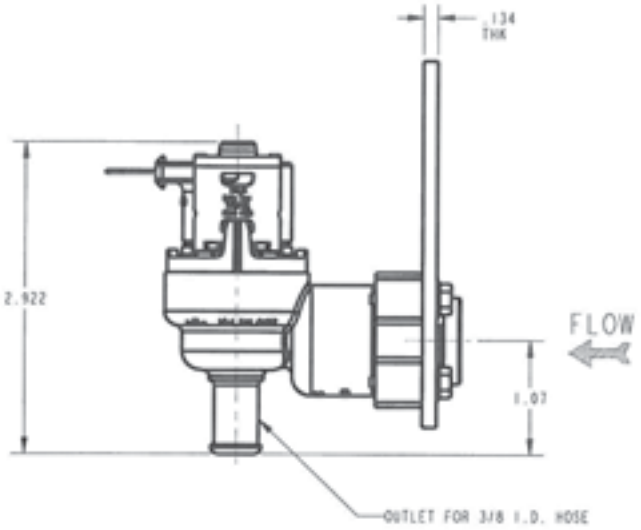
- Pilot-operated diaphragm provides high flow capacity with minimum power requirements
- Soft close operator design reduces water hammer and extends valve life
- Encapsulated coil provides high mechanical and dielectric strength, and is moisture resistant
- Body material withstands a variety of harsh water conditions
- Suitable for applications using water at temperatures up to 160°F (71°C)
- Tested and field proven EPDM materials for North American water conditions
- Multiple mounting bracket and inlet screen options available

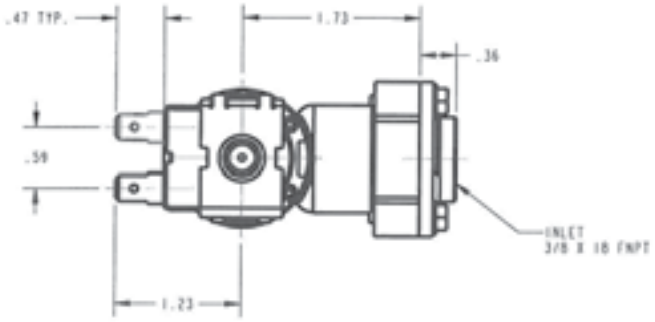
Specifications

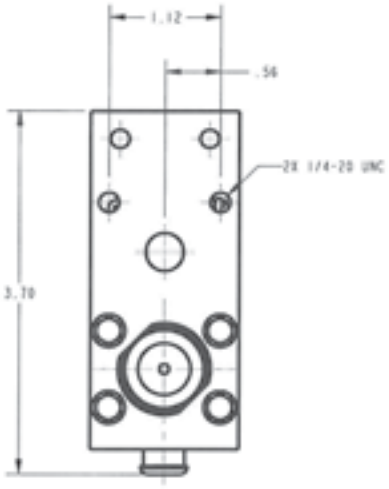
- Terminals: 1/4" (6.35mm) Male spade or RAST 2.5
- Electrical Rating: 24V AC, 120V AC, 240V AC, 24V DC
- Body Material: Polypropylene
- Inlet Size: 3/8" FNPT
- Outlet: 3/8" or 1/2" ID hose barb
- Operating Pressure: 20 PSI to 120 PSI
- Flow Rate: Various options from 2.5 to 16 LPM
- Operating Cycle: 1-1/2 minutes ON, 3 minutes OFF
- Ambient Temperature: 77°F (25°C) maximum
- Differential: 175 PSI maximum
- Coil Insulation: UL rated Class A (105°C)
- Agency Certifications:
  - UL MH6499
  - CSA
  - ANSI/NSF Standard 169

S-101 SERIES WATER VALVE

PRODUCT DRAWING







S-102 SERIES WATER VALVE

The Robertshaw® S-102 Series Water Valve is a general purpose valve commonly used in appliance and commercial applications. The S-102 has a cost effective 3/4” inlet connection. The S-102 features the low profile Hydra® solenoid produced using a fully automated arc weld process to eliminate open circuit concerns in the field.

Features and Benefits

- Pilot-operated diaphragm provides high flow capacity with minimum power requirements
- Soft close operator design reduces water hammer and extends valve life
- Encapsulated coil (HB or V0 rated) provides high mechanical and dielectric strength, and is moisture resistant
- Body material withstands a variety of harsh water conditions
- Suitable for applications using water at temperatures up to 160°F (71°C)
- Tested and field proven EPDM materials for North American water conditions
- Multiple mounting bracket and inlet screen options available

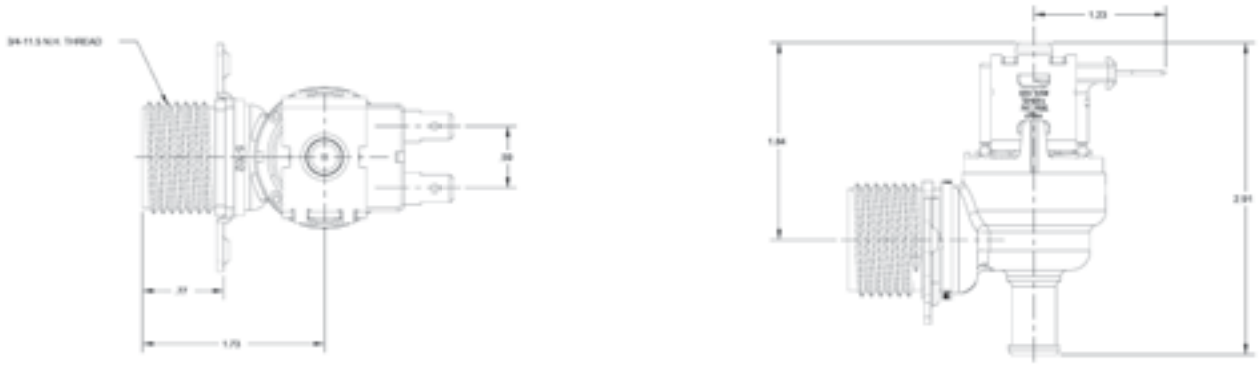
Specifications

- Terminals: 1/4" (6.35mm) Male spade or RAST 2.5
- Electrical Rating: 24V AC, 120V AC, 240V AC, 24V DC
- Body Material: Polypropylene
- Inlet Size: 3/4" - 11-1/2" NH thread
- Outlet: 3/8" or 1/2" ID hose barb
- Operating Pressure: 20 to 120 PSI
- Flow Rate: Various options from 2.5 to 16 LPM
- Operating Cycle: 1-1/2 minutes ON, 3 minutes OFF
- Ambient Temperature: 77°F (25°C) maximum
- Differential: 175 PSI maximum
- Coil Insulation: UL rated Class A (105°C)
- Agency Certifications:
  - UL MH6499
  - CSA
  - ANSI/NSF Standard 169

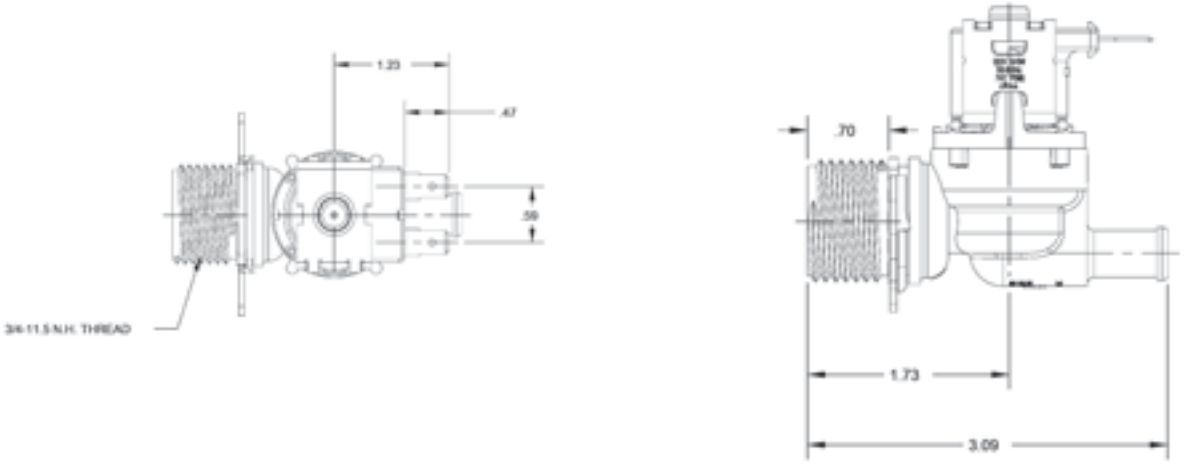
S-102 SERIES WATER VALVE

PRODUCT DRAWING

S-102H



S-102H ST



S-55 SERIES WATER VALVE

The Robertshaw® S-55 Series Water Valve is a general purpose, normally-closed valve used to purge residual water or water with compatible chemicals from commercial ice machines, dishwashers, evaporators, and steam tables.

Features and Benefits

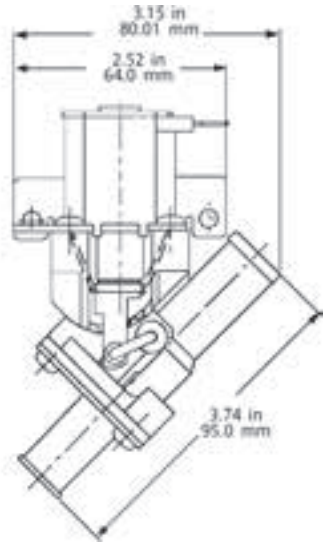
- Direct-acting design provides high flow at low head pressure
- Mechanical flapper allows large particles or debris to easily pass through
- Encapsulated coil provides high mechanical and dielectric strength, and is moisture resistant
- High temperature (HT) version available

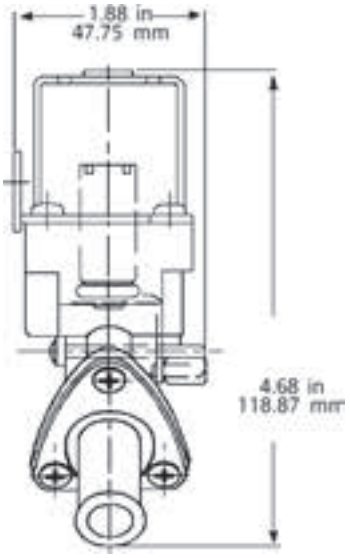
Specifications

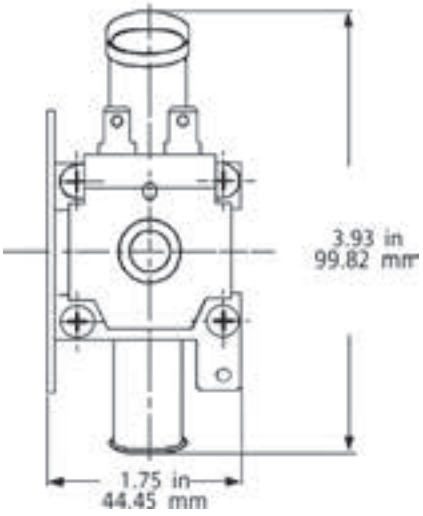
- Terminals: 1/4” (6.35mm) Male spade
- Electrical Rating: 120V AC, 60 Hz; 208/230V AC, 60 Hz; 240V AC, 50/60 Hz, 24V AC 60 Hz
- Operating Cycle: 28 Watts: 30 seconds ON, 3 minutes OFF; 38 Watts: 75 seconds ON, 10 minutes OFF
- Coil Power: 28 Watts
- Body Material: Polypropylene
- Inlet Size: 11/16” ID hose barb
- Outlet: 5/8” ID hose barb
- Operating Pressure: 7 PSI (0.5 bar) maximum
- Ambient Temperature: 77°F (25°C) maximum
- Flow Rate: 5 GPM @ 6 PSI
- Coil Insulation: UL rated Class A (105°C)
- Differential: 7 PSI (0.5 bar) maximum
- Maximum Water Temperature: 165°F (73°C), HT version rated up to 210°F (98°C)
- Agency Certifications:
  - UL MH6499
  - ANSI/NSF Standard 169

S-55 SERIES WATER VALVE

PRODUCT DRAWING







GS-56 SERIES WATER VALVE

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

Features and Benefits

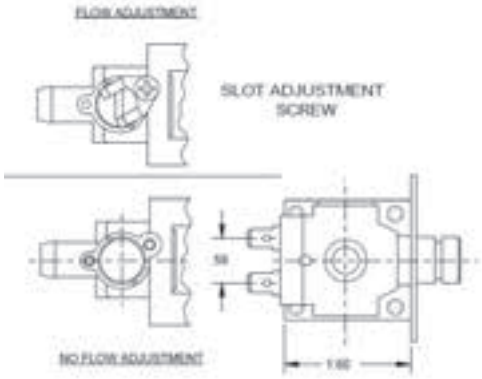
- External flow adjustment screw slotted or hex
- Vent tube option available
- Polysulfone body material for good chemical resistance and high temperature stability
- Diode rectified coil for quiet AC operation
- Red silicone diaphragm material for good chemical and scaling resistance
- Approved for food zone contact

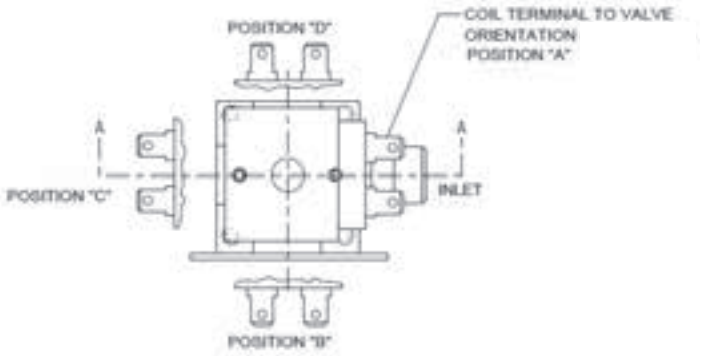
Specifications

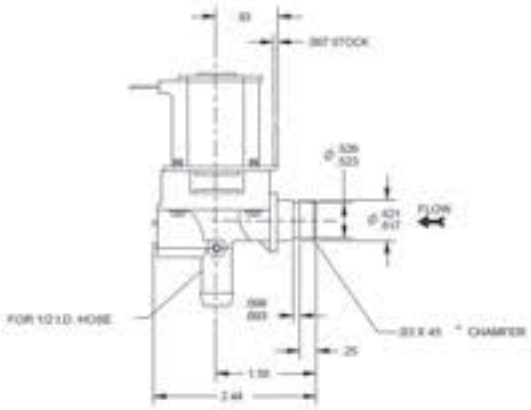
- Terminals: 1/4” (6.35mm) Male spade
- Electrical Rating: 120V AC, 240V AC
- Power Consumption: 12 Watts, 28 Watts, 35 Watts
- Body Material: Polysulfone
- Inlet Size: 5/8” OD with "O" ring groove
- Outlet: 1/2” ID hose barb
- Operating Pressure: 1-1/2 PSI maximum
- Operating Cycle: 50% (12 Watts); 1 minute ON, 6 minutes OFF (35 Watts)
- Ambient Temperature: 77°F (25°C) maximum
- Differential: 1-1/2 PSI maximum
- Coil Insulation: UL rated Class A (105°C)
- Maximum Water Temperature: 200°F (93°C)
- Flow rate: Up to 1.5 GPM
- Agency Certifications:
  - UL MH6499
  - ANSI/NSF Standard 169

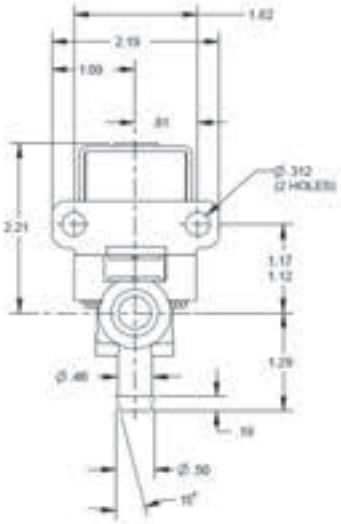
GS-56 SERIES WATER VALVE

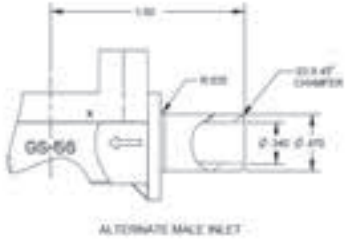
PRODUCT DRAWING



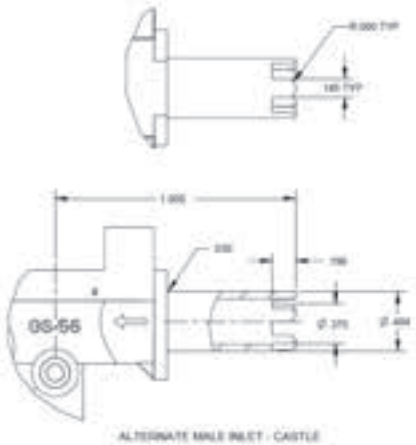




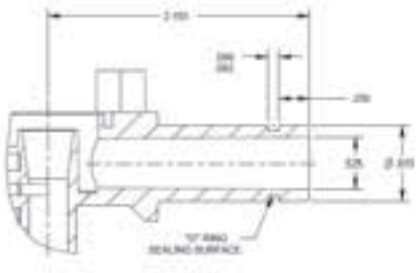




ALTERNATE MALE INLET



ALTERNATE MALE INLET - CASTLE



ALTERNATE MALE INLET - LONG

GS-76 SERIES WATER VALVE

The Robertshaw® GS-76 Series Water Valve is a direct-acting, gravity-fed design for commercial ice equipment. The GS-76 delivers high flow output with minimal head pressure.

Features and Benefits

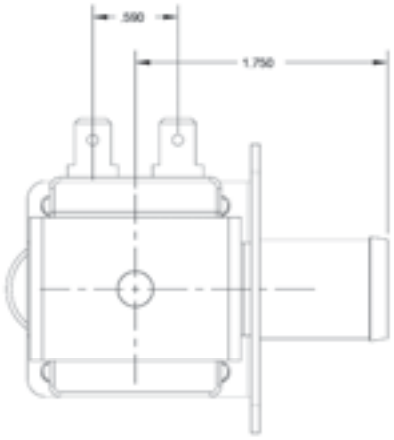
- Diode rectified coil for quiet AC operation
- Durable and chemical resistant construction with silicone diaphragm
- Reliable operation up to 36” head height (60” upon request)

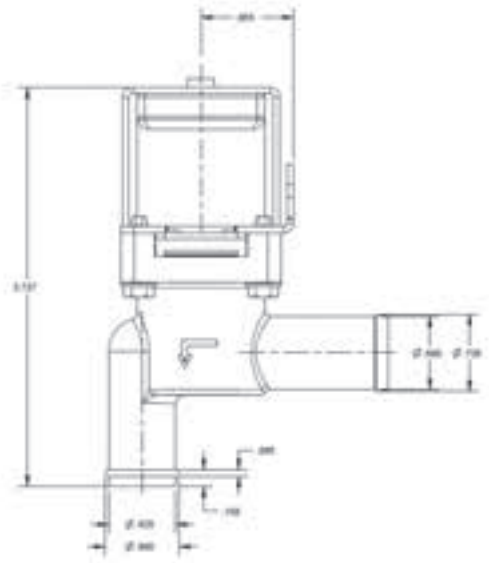
Specifications

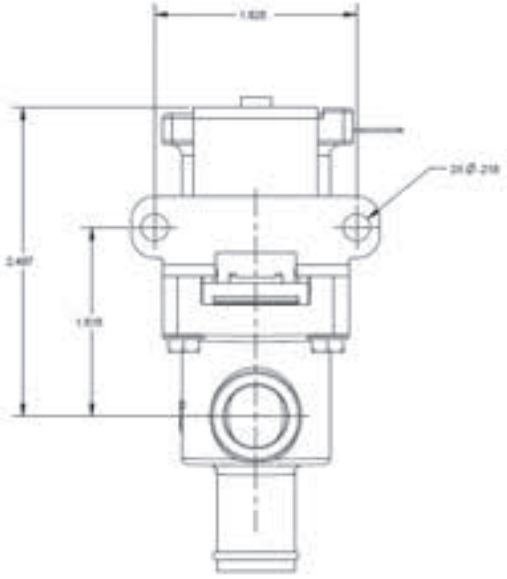
- Terminals: 1/4” (6.35mm) Male spade
- Electrical Rating: 120V AC, 240V AC
- Coil Power: 16 Watts
- Coil insulation: UL rated Class A (105°C)
- Body Material: Polypropylene
- Flow Rate: Up to 2.5 GPM
- Inlet Size: 11/16” ID hose barb
- Outlet: 11/16” ID hose barb
- Operating Pressure: Up to 36” W.C.
- Agency Certifications:
  - UL MH6499
  - ANSI/NSF Standard 169
  - CE

GS-76 SERIES WATER VALVE

PRODUCT DRAWING







FP35/45 SERIES FREEZE PROTECTION VALVE

The Robertshaw® FP35/45 Series Freeze Protection Valve is designed to protect solar collectors and exposed pipes from freezing. The valve operates without any electrical power or sensors. In solar applications, the gate of the valve typically opens as temperatures decrease, allowing the liquid to spill and to be replaced by warmer water when the water is near the freezing point in solar panels. When warmer water enters, the gate of the valve is closed and the removal of water is interrupted.

Features and Benefits

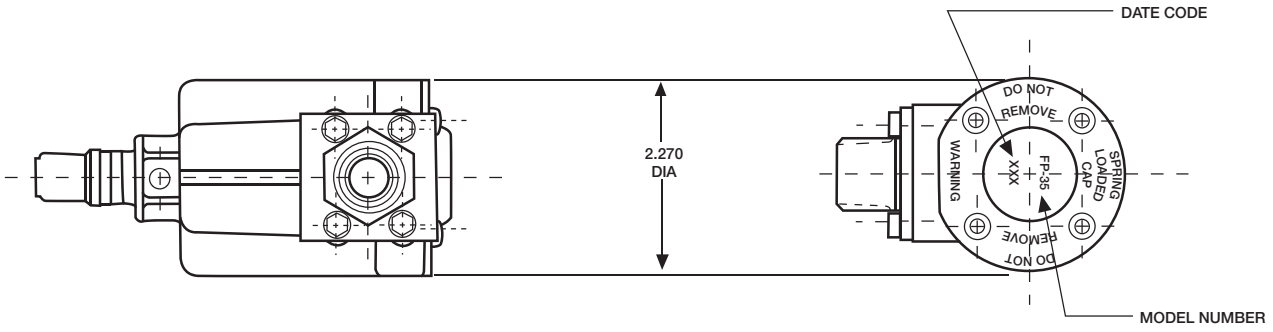
- Protects solar collectors and exposed pipes from freezing
- Easily installed on existing systems
- Corrosion and tamper resistant cover
- Ideal for back-up freeze protection
- Anti-siphon and alternate discharge port

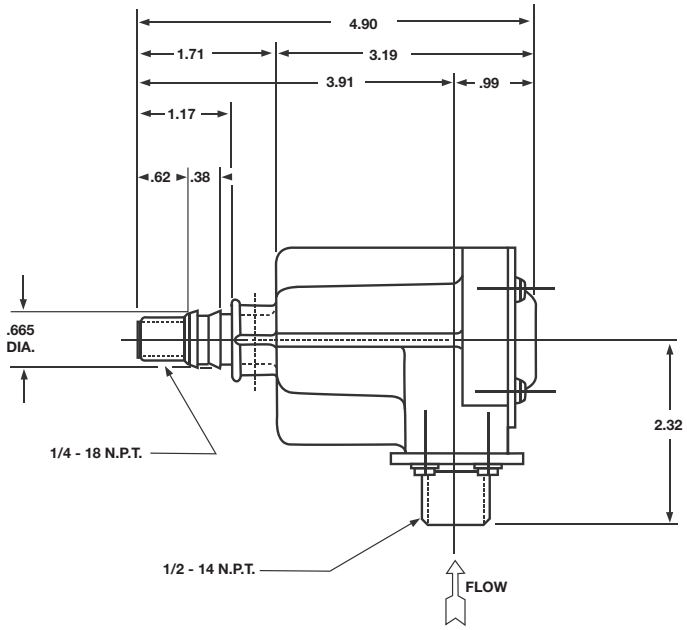
Specifications

- Nominal start-to-open water temperature is 38°F (3.33°C) (FP-35) or 43°F (6.11°C) (FP-45)
- Maximum operating pressure: 125 PSI
- Inlet size: 1/2” brass MPT
- Outlet size: 1/4” plastic pipe or 5/8” ID hose
- High temperature U.V. stabilized body material
- 1/2” brass male pipe thread inlet port for positive seal
- Standard low lead brass

FP35/45 SERIES FREEZE PROTECTION VALVE

PRODUCT DRAWING





QUICK-CONNECT UNIONS AND TRANSITION FITTINGS SERIES

Robertshaw® offers a full line of quick-connect unions and transition fittings for residential refrigeration and commercial applications. These products allow an easy and reliable connection for either polyethylene, polypropylene, or soft metal tubing.

Features and Benefits

- Constructed using NSF approved materials
- Color coded body and collets based on tubing diameter
- Double O-ring seal against tube
- Rotating collet for anti-scratch tubing interface
- Optional clip protects against accidental disengagement

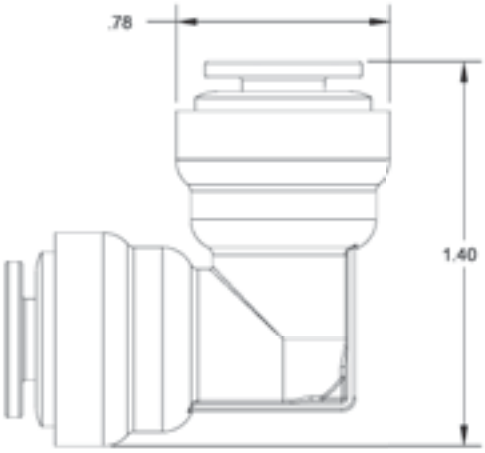
Specifications

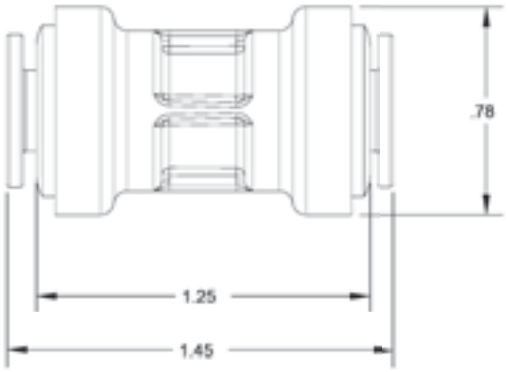
- Connections: 1/4” (6.35mm), 5/16” (8mm)
- Body Material: Polypropylene
- Body Orientation: Straight (180°), Right angle (90°)
- Operating Pressure: 150 PSI maximum

Description	Body Color
1/4” x 1/4” Connector	Yellow
5/16” x 1/4” Connector	Blue
5/16” x 5/16” Connector	Green

QUICK-CONNECT UNIONS AND TRANSITION FITTINGS SERIES

PRODUCT DRAWING





S-45 SERIES WATER VALVE

The Robertshaw® S-45 Series Water Valve is designed as a general purpose valve for energy conserving plumbing and heating applications. Commercial applications include hands-free faucets, boilers, icemakers and coffee brewers. The S-45 is an inlet valve with a brass body. The S-45P is a similar valve with a plastic body.


S-45P


S-45

Features and Benefits

- Pilot operated design for high flow applications with minimal power requirements
- In-line "Y" serviceable filter
- 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
- EPDM diaphragm (Viton available by request)
- Options available to comply with lead content requirements for “lead free” plumbing as defined by California, Vermont, Maryland, and Louisiana state laws and the U.S. Safe Drinking Water Act

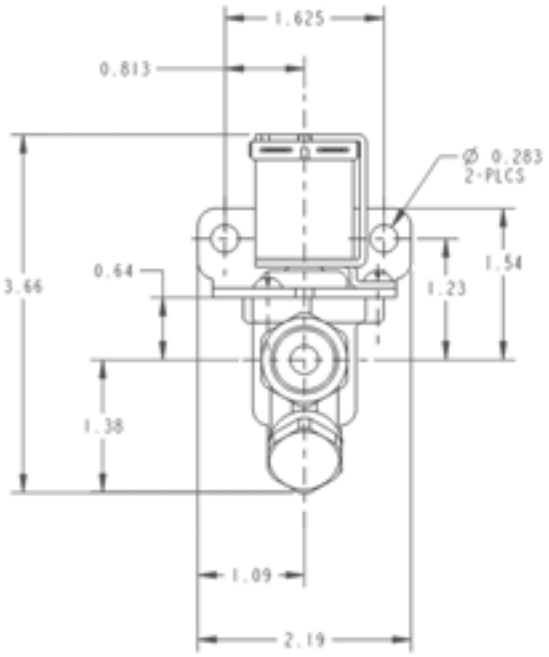
Specifications

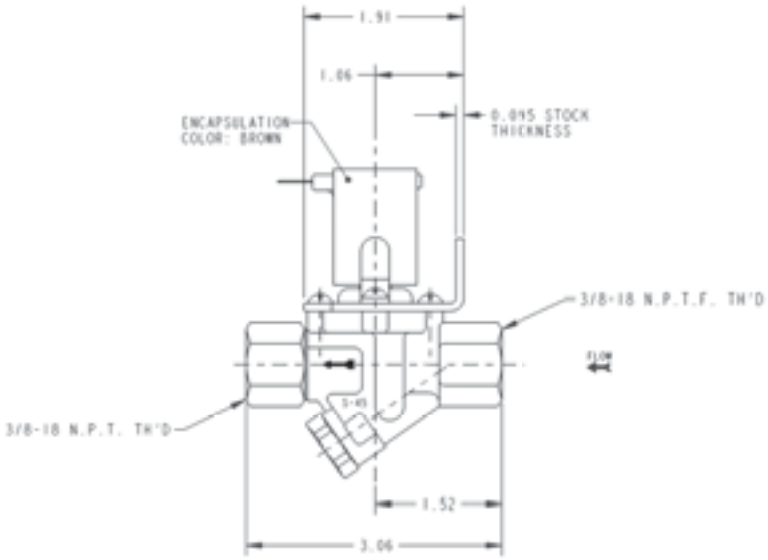
- Body Material: Brass or Glass filled polypropylene
- Terminals: 1/4” Male spade
- Electrical Rating: 120V AC, 240V AC, 12V AC, 24V AC, 12V DC, 24V DC
- Power Consumption: 7 Watts
- Operating Cycle: Continuous
- Inlet: 3/8”-18 NPT; 1/4”-18 NPT
- Outlet: 3/8”-18 NPT; 1/4”-18 NPT, 7/16”-20 Flare
- Coil Insulation: UL rated Class A (105°C)
- Flow Rate: Up to 5.0 GPM
- Operating Pressure: 120 PSI maximum
- Differential: 120 PSI maximum
- Maximum Water Temperature: 180°F (82°C)
- Agency Certifications:
  - UL MH6499
  - CSA
  - ANSI/NSF Standard 169

S-45 SERIES WATER VALVE

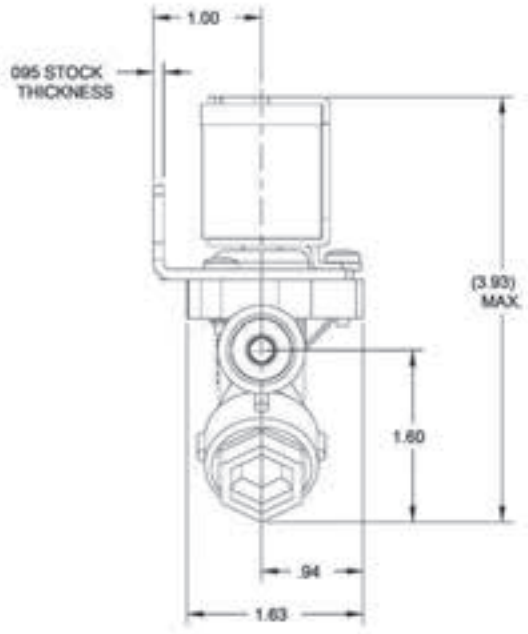
PRODUCT DRAWING

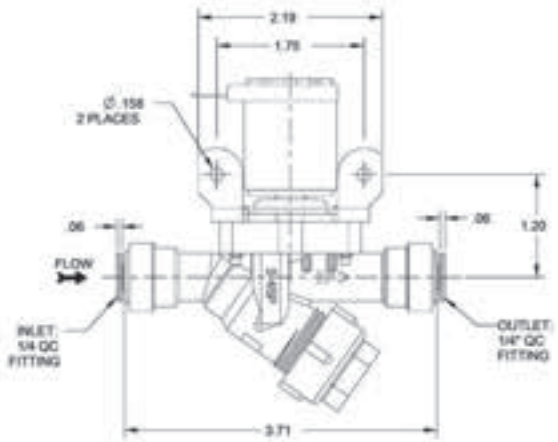
S-45 Brass





S-45P Plastic





N-86 SERIES WATER VALVE

The Robertshaw® N-86 Series Water Valve is designed for low flow applications in the residential and appliance market. The valve has a single inlet, controls dual outputs, and features the low profile Hydra® solenoid produced using a fully automated arc weld process to eliminate open circuit concerns in the field.

Features and Benefits

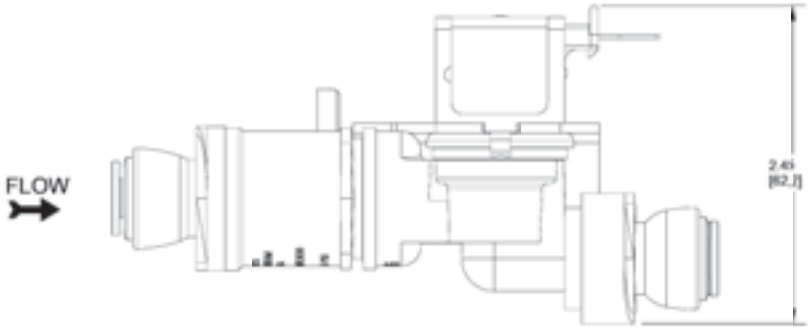
- Encapsulated coil provides high mechanical and dielectric strength, and is moisture resistant
- Body material provides high resistance to corrosion and mineral deposits
- Modular design allows physical fit and plumbing optimization
- Self-centering armature delivers superior contamination resistance

Specifications

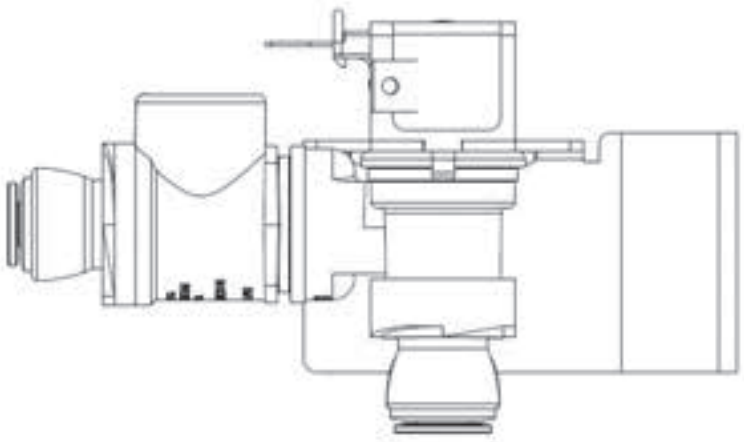
- Body Material: Polypropylene
- Body Configuration: Right angle, straight through
- Electrical Connection: 1/4” or 3/16” spade, RAST 2.5
- Electrical Rating: 110/120-127V AC, 50/60 Hz; 220-240V AC, 50/60 Hz
- Power Consumption: 20 Watts, others depending on application
- Inlet Size: 1/4” or 5/16” quick-connect, 1/4" compression
- Outlet Size: 1/4” or 5/16” quick-connect
- Maximum Water Temperature: 100°F (37.8°C)
- Ambient Temperature: 77°F (25°C) maximum
- Coil Insulation: UL rated Class A (105°C)
- Flow Rate: Up to 1 GPM
- Differential: 175 PSI maximum
- Agency Certifications:
  - UL MH6499
  - CSA 62581
  - Certain models conform to IEC 60730-1 and IEC 60730-2-8
  - ANSI/NSF Standard 169, WRAS versions available on request
  - Meets low lead requirements for UL372

PRODUCT DRAWING

N-86H ST



N-86H



S-86 SERIES WATER VALVE

The Robertshaw® S-86 Series Water Valve is designed for low flow applications in the residential and appliance market. The valve has a single inlet, controls one output, and features the low profile Hydra® solenoid produced using a fully automated arc weld process to eliminate open circuit concerns in the field.

Features and Benefits

- Encapsulated coil provides high mechanical and dielectric strength, and is moisture resistant
- Body material provides high resistance to corrosion and mineral deposits
- Modular design allows physical fit and plumbing optimization
- Self-centering armature delivers superior contamination resistance

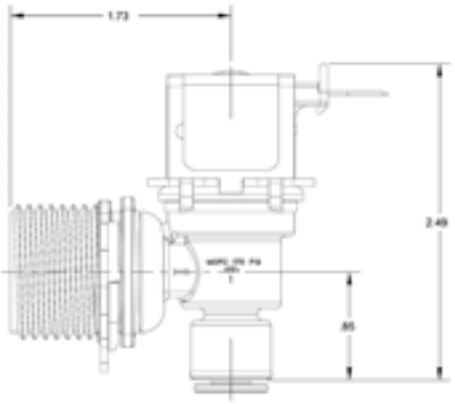
Specifications

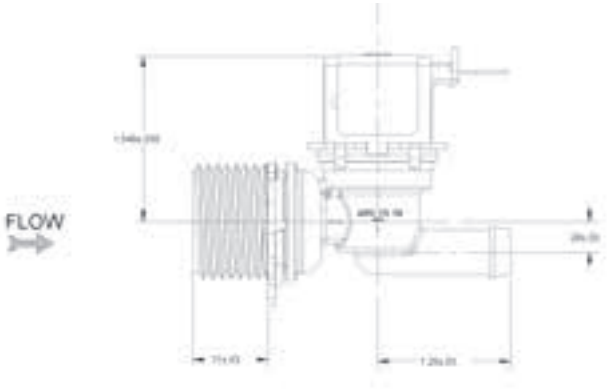
- Body Material: Polypropylene
- Body Configuration: Right angle, straight through
- Electrical Connection: 1/4” or 3/16” spade, RAST 2.5
- Electrical Rating: 110/120-127V AC, 50/60 Hz; 220-240V AC, 50/60 Hz
- Power Consumption: 20 Watts, others depending on application
- Inlet Size: 1/4” or 5/16” quick-connect, 1/4" compression or 3/4” garden hose
- Outlet Size: 1/4” or 5/16” quick-connect, 3/8” hose barb
- Maximum Water Temperature: 100°F (37.8°C)
- Ambient Temperature: 77°F (25°C) maximum
- Coil Insulation: UL rated Class A (105°C)
- Flow Rate: Up to 1 GPM
- Differential: 175 PSI maximum
- Agency Certifications:
  - UL MH6499
  - CSA 62581
  - Certain models conform to IEC 60730-1 and -2, and IEC 60730-2-8
  - ANSI/NSF Standard 169, WRAS versions available on request
  - Meets low lead requirements for UL372

S-86 SERIES WATER VALVE

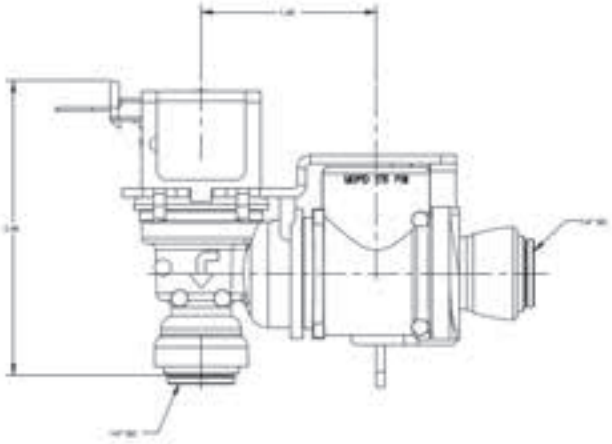
PRODUCT DRAWING

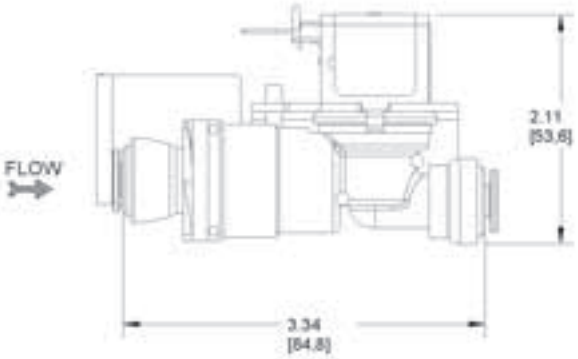
S-86 Garden Hose





S-86 Quick-Connect





G SERIES FLOW REGULATORS

The Robertshaw® G Series Flow Regulators, formerly branded Dole, are designed for water and energy critical applications. The wide range of flexible orifice designs tightly control the desired flow output over a wide pressure drop range. The G Series is used in a broad range of applications including tankless heaters, cooling towers, fan coils, water softeners, pumps, drinking fountains, eye washes, fire sprinklers, filling equipment, dispensing machines, and water filters.

Features and Benefits

- Threshold pressure acts as a fixed orifice (Flow Characteristics on next page)
- Orifice maintains desired output even when threshold points cause the insert to distort (Chart on next page)
- Flow rates maintained to within ±15% up to a pressure drop of 125 PSI (Flow rate varies due to manufacturing tolerances and water temperatures)
- Regulators meet up to a maximum system pressure of 200 PSI
- Multi-orifice flow inserts in regulators with rates between 1 GPM and 4 GPM break up the water discharge pattern and minimize the sound made when water passes through the restriction

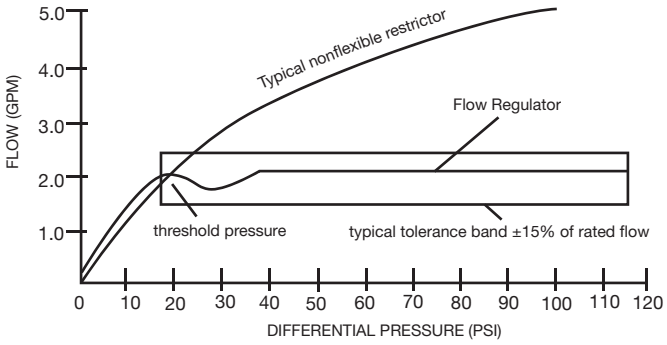
Specifications

- Body Material: steel, stainless steel, brass
- Body Configuration: Straight through
- Inlet and Outlet Configurations range from 1/8" flare to 8" MNPT
- Maximum System Pressure: 200 PSI
- Agency Certifications:
  - Most models meet the NSF low lead requirements

G SERIES FLOW REGULATORS

PRODUCT DRAWING

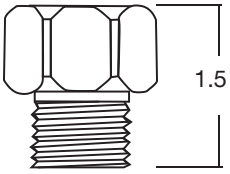
FLOW CHARACTERISTICS



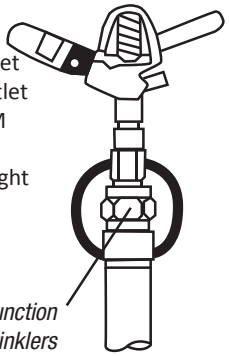
1. Calculated flow through 1/8" diameter orifice
2. Typical flow curve of 2 GPM Flow Regulator
3. Threshold pressure will vary with flow rating

OPERATING PRINCIPLE

GY SERIES FLOW REGULATOR

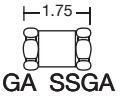


- 3/4" MNPT - Inlet
- 3/4" FNPT - Outlet
- 1.0 to 11.5 GPM
- Brass Housing
- 4.5 oz. Net Weight

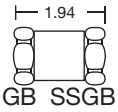


Commonly used in conjunction with impact sprinklers

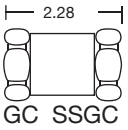
G SERIES FLOW REGULATORS: Brass Housing/Nickel Plated or 316 Stainless Housing



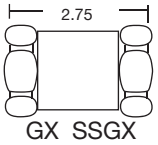
- 3/8" FNPT - Inlet Outlet
- 0.06 to 1.0 GPM
- 3 oz. Net Weight



- 1/2" FNPT - Inlet Outlet
- 1.0 to 6.0 GPM
- 4 oz. Net Weight



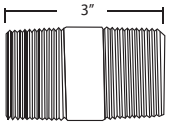
- 3/4" FNPT - Inlet Outlet
- 1.0 to 11.5 GPM
- 8 oz. Net Weight



- 1" FNPT - Inlet Outlet
- 30.0 to 90.0 GPM
- 3 lb. Net Weight

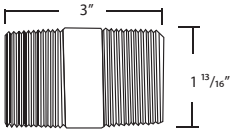
G SERIES FLOW REGULATORS: Steel Housing/Zinc Plated

GP



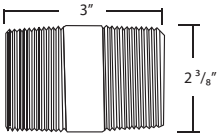
- 1-1/4" MNPT - Inlet Outlet
- 1.0 to 30.0 GPM
- 12 oz. Net Weight

GT



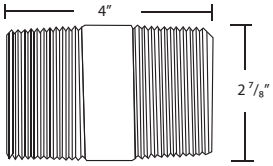
- 1-1/2" MNPT - Inlet Outlet
- 1.0 to 30.0 GPM
- 1 lb. Net Weight

GF



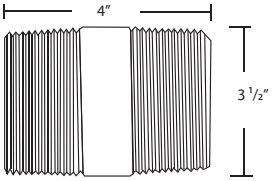
- 2" MNPT - Inlet Outlet
- 10.0 to 30.0 GPM
- 1 lb. 10 oz. Net Weight

GH



- 2-1/2" MNPT - Inlet Outlet
- 30.0 to 90.0 GPM
- 3 lb. Net Weight

GK



- 3" MNPT - Inlet Outlet
- 30.0 to 120.0 GPM
- 3 lb. 7 oz. Net Weight

ELECTRONICS

Robertshaw® ELECTRONICS

Robertshaw® knows electronics. And customers seeking rapid and robust electronic solutions trust Robertshaw to get them to market first with customized controls. Our engineering capabilities cover every aspect of electronics from the design and manufacturing, to the integration of a control into a custom commercial application.

What makes Robertshaw's electronics engineering special is our unique experience in power switching boards and user interface designs. Drawing upon a global library of design knowledge, our engineers create concepts and prototypes to streamline the manufacturing of these controls as individual components or as ready-to-install control assemblies. And there's more, like our firmware development, product and component testing, development of alternative technologies, and USB/Ethernet connectivity – just to name a few.

Power Switching Capabilities

- PCBA Expertise
  - Low Power Loads: lights, small motors, fans, solenoid valves
  - High Power Loads: circuit design experience, pump motors, refrigeration compressors, heating elements
  - Multilayer high density
- Energy Management
  - Switch mode power designs from 2.5 Watts to 65 Watts
  - Standby power of .250 Watts
  - Control modules designed into existing appliances to meet EU standby power requirements
- Modulated element cycling and 3-phase cooking controls
- Diagnostic circuitry
- Robustness and Reliability
  - EMI
  - Power surge
  - Elevated temperature exposure
  - Component life requirements

Recent projects include Direct Spark Ignition (DSI) boards for residential ovens, power/communication boards for commercial washers, and motor controls for dishwashers.

User Interface Capabilities

- Global Supplier Management
  - Development of molders, display and keyboard manufacturers
  - Co-development of aesthetic standards and specifications
- Leverage existing and latest technology
  - Capacitive and Resistive Touch, Membrane, Tactile, Rotary
  - LED, VTN, LCD, QVGA, OLED, Dead Front
  - Through-Metal, Inductive Touch, Projective Capacitive Touch, Haptic Feedback
  - Memory LCD – Ultra-low power high resolution monochrome display
  - Mechatronics-enhancing UIs with controlled mechanical motion

Recent projects include an award winning spa control panel and control, residential refrigerators with touchscreens and wireless diagnostics, and wall oven electronic control panels.

Certified UL and CSA Test Capabilities

- Power Input, Voltage Variation and Overload
- Strain Relief and Insulation Resistance
- Mold Stress
- Electric and Magnetic Field
- Endurance, Thermal Cycling and Humidity
- Vibration, Impact and Jarring

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