invensys™
Controls

invensys™
Controls

191 E. North Avenue
Carol Stream, Illinois 60188 USA
Customer Service Telephone 1.800.304.6563
Customer Service Facsimile 1.800.426.0804
HVACCustomerService@Invensys.com

For Technical Service
Telephone 1.800.445.8299
Facsimile 1.630.260.7294
TechnicalService@Invensys.com

www.invensyscontrols.com

09/12 —150-2387

invensys™

Controls

Commercial Cooking Catalog

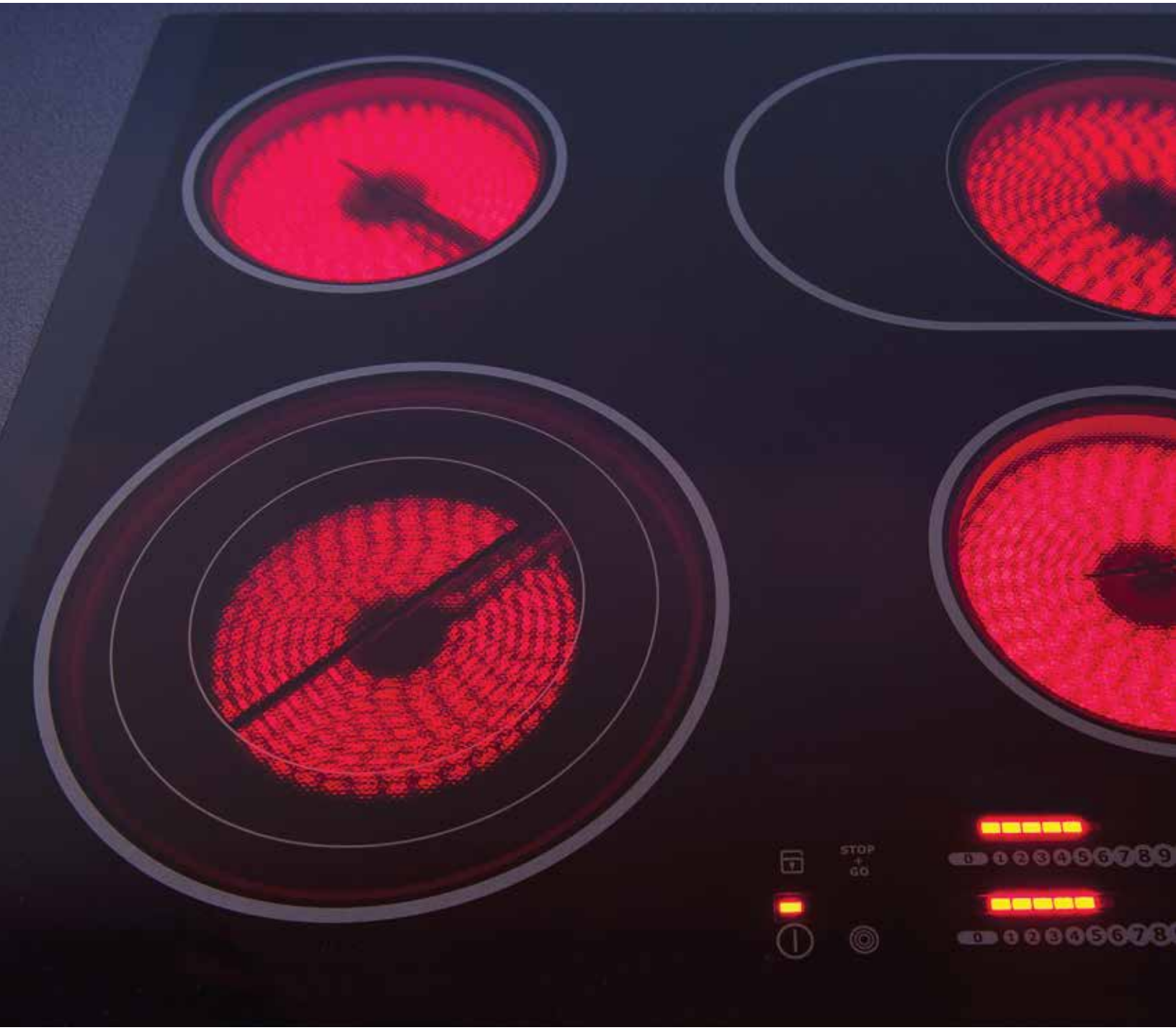
invensys™
Controls

The Robertshaw® commercial cooking line of products offers uncompromising quality in ovens, ranges, griddles, fryers and other devices where precise temperature matters. Trusted by leading manufacturers for over 100 years, Robertshaw products are unrivaled in features, options and performance.

Customized for various applications, these cooking products offer original equipment manufacturers and aftermarket distributors flexible solutions for thermostats, gas valves, infinite switches, limit controls, burners and complimentary components. Robertshaw is Simply the Right Choice™ for industry leading electric and gas cooking technologies.

Table of Contents:

ELECTROMECHANICAL CONTROLS



invensys™
Controls

Quality ingredients and controls are essential to commercial cooks.

They rely on the freshest food for their renowned recipes and the best engineered equipment for optimal cooking controls.

Robertshaw® electromechanical controls offer reliability and custom solutions for setting, controlling and limiting temperatures in commercial cook applications.

Electromechanical Controls

invensys™
Controls

Electric Thermostat

K & S SERIES - 5300 SERIES

The Robertshaw® K and S Series 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 uses silver contacts and has heavy duty terminals for durability and sustained accuracy. The snap action mechanism is precise and reliable. This direct acting series of thermostats is suitable for the commercial cooking industry.

Features and Benefits

- 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.
- Dials of heat resistant plastic available

Specifications

- Ambient temperature: 32°F to 200°F (0°C to 93°C)
  - See charts on pages 8 and 9 for exceptions
- Single pole single throw (SPST) type switch
  - See charts on pages 8 and 9 for options
- Various voltages
- Agency Certifications
  - CSA, UL, AGA and CE available

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

An ISO 9001 – 2008 Certified Company

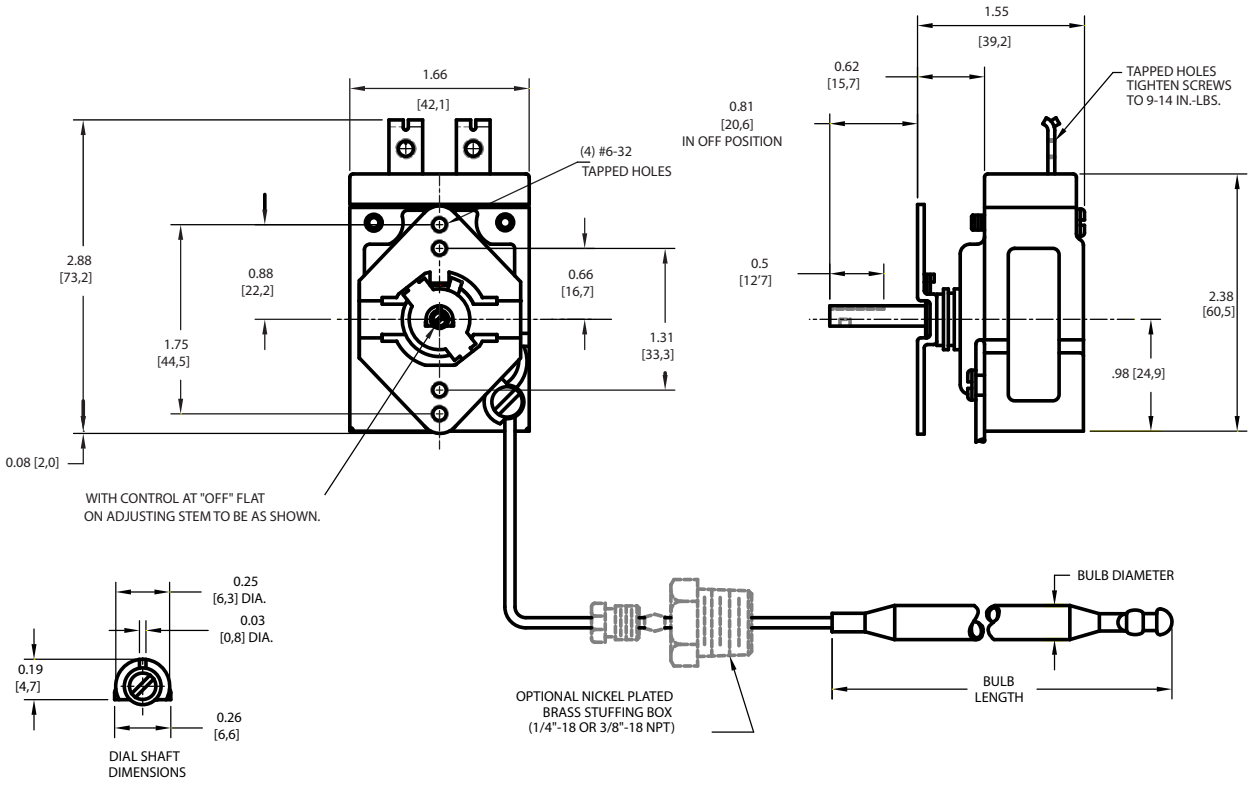
invensys Controls

Electric Thermostat

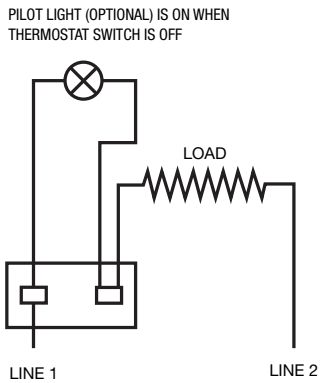
K & S SERIES - 5300 SERIES

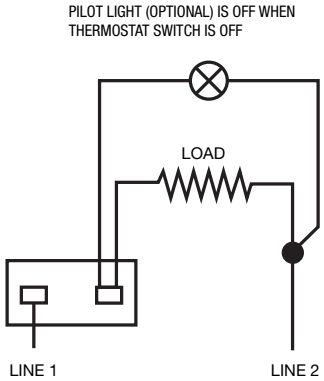
PRODUCT DIMENSIONS

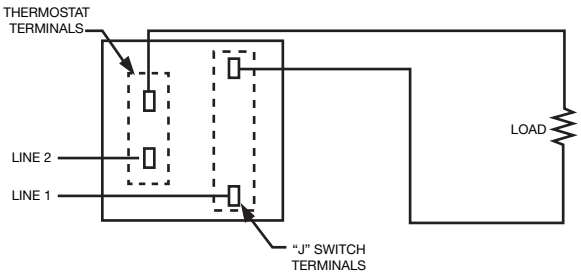
Dimensions are inches and [millimeters]. See page 66 for English to Metric conversions.



WIRING DIAGRAMS







invensys Controls

Electric Thermostat

K & S SERIES - 5300 SERIES

Model S Series

Model[1]	Description	UL Ratings[2]	CSA Ratings[3]	European[4]	AGA[5]
S	SPST-Break on Temperature Rise	277 V AC, 30 A	277 V AC, 30 A	277 V AC, 25 A (Tab Term.)	120-277 V AC, 5 A, 125 V A
		250 V AC, 1200 V A, 18 FLA, 72 LRA	250 V AC, 18 FLA, 72 LRA	277 V AC, 30 A (Screw Term.)	110/120 V AC, 1/6 hp
		251-550 V AC, 125 V A	120-550 V AC, 125 V A	480 V AC, 20 A (Screw Term.)	
		480 V AC, 20 A		226°F Max. Amb.	
SJ	SPST - Break on Temperature Rise With Aux. Switch Break in "OFF" Position	277 V AC, 30 A	120-240 V AC, 13 FLA, 50 LRA	277 V AC, 25 A (Tab Term.)	
		250 V AC, 1200 V A, 18 FLA LA, 72 LRA	120-550 V AC, 125 V A	277 V AC, 30 A (Screw Term.)	
		251-550 V AC, 125 V A	250 V AC, 18 FLA, 72 LRA	480 V AC, 20 A (Screw Term.)	
	"J" Switch has no Ambient Rating	480 V AC, 20 A	480 V AC, 20 A	226°F Max. Amb	
		Aux. Sw. 277 V AC, 30 A	240 V AC, 30 A	240 V AC, 25 A	
SP	SPST - Break on Temperature Rise Except With Positive "OFF" Dial	277 V AC, 30 A	277 V AC, 30 A	277 V AC, 25 A (Tab Term.)	120-277 V AC, 5 A, 125 V A
		250 V AC, 1200 V A, 18 FLA, 72 LRA	250 V AC, 18 FLA, 72 LRA	277 V AC, 30 A (Screw Term.)	110/120 V AC, 1/6 hp
		251-550 V AC, 125 V A			
		480 V AC, 20 A			
			120-550 V AC, 125 V A	480 V AC, 20 A (Screw Term.)	
		277 V AC, 30 A		226°F Max. Amb.	
SR	SPST-Make On Temperature Rise	250 V AC, 1200 V A, 18 FLA, 72 LRA	277 V AC, 30 A		
		251-550 V AC, 125 V A	250 V AC, 18 FLA, 72 LRA		
		480 V AC, 20 A	120-550 V AC, 125 V A		

Model S Series Chart Legend

1. Model SL for temperature limiting applications
2. UL Ratings (UL Guide / XAPX2) - File No. E12103
3. CSA Ratings - CSA File No. LR36461
4. CE Approved - CE: CB Report # US/8299B/UL (2004)
5. AGA - Certification No. 164327-1195960

Model K Series Chart Legend

1. Model KL for temperature limiting applications
2. UL Ratings (UL Guide - XAPX2) - File No. E12103
3. CSA Ratings - CSA File No. LR36461
4. CE Approved - IEC 730-1 (1993), Amd 1 (1994), and IEC 730-2-9
5. AGA - tested per ANSI Z21.23 Certification No. C2765001

Model K Series

Model[1]	Description	UL Ratings[2]	CSA Ratings[3]	European[4]	AGA[5]
K	SPST-Break on Temperature Rise	250 V AC, 25 A, 690 V A, 18 FLA, 72 LRA 120 V AC, 575 V A 277 V AC, 125 V A	120-240 V AC, 13 FLA, 50 LRA 120-550 V AC, 125 V A 250 V AC, 18 FLA, 17 LRA 277 V AC, 25 A	277 V AC, 25 A (Tab Term.) 277 V AC, 25 A (Screw Term.) 480 V AC, 20 A (Screw Term.) 226°F Max. Amb.	Applies to Suffix B, P, R, T Controls 120-277 V AC, 5 A 110/120 V AC, 1/6 hp 200°F Ambient, 250°F, With Suffix "T"
KA	SPST - Break on Temperature Rise With SPST Aux. Switch Break in "OFF" Position	120 V AC, 575 V A 250 V AC, 25 A, 690 V A, 18 FLA, 72 LRA 277 V AC, 125 A Aux. Sw. 240 V AC, 25 A	120-240 V AC, 13 FLA, 50 LRA 120-550 V AC, 125 V A 250 V AC, 18 FLA, 17 LRA 277 V AC, 25 A Aux. Sw. 250 V AC, 25 A	277 V AC, 25 A (Tab Term.) 277 V AC, 25 A (Screw Term.) 480 V AC, 20 A (Screw Term.) 226°F Max. Amb. Aux. Sw. 240 V AC, 25 A	
KB	SPST - Break on Temperature Rise With SPDT Aux. Switch, Break in "OFF" Position	120 V AC, 575 V A 250 V AC, 25 A, 690 V A, 18 FLA, 72 LRA 277 V AC, 125 V A Aux. Sw. 240 V AC, 25 A	120-240 V AC, 13 FLA, 50 LRA 120-550 V AC, 125 V A 250 V AC, 18 FLA, 17 LRA 277 V AC, 25 A Aux. Sw. 250 V AC, 25 A		
KK	SPST-Break on Temperature Rise With Push to Turn	120 V AC, 575 V A 250 V AC, 25 A, 690 V A, 18 FLA, 72 LRA 277 V AC, 125 V A	120-240 V AC, 13 FLA, 50 LRA 120-550 V AC, 125 V A 250 V AC, 18 FLA, 17 LRA 277 V AC, 25 A		Applies to Suffix B, P, R, T Controls 120-277 V AC, 5 A 110/120 V AC, 1/6 hp
KN	SPST - Break on Temperature Rise With NAK Filled Bulb	120 V AC, 575 V A 250 V AC, 1200 V A, 18 FLA, 72 LRA 251-550 V AC, 125 V A 200°F Cook Amb., 225°F Clean Amb.	120-240 V AC, 13 FLA, 50 LRA 120-550 V AC, 125 V A 250 V AC, 18 FLA, 72 LRA 277 V AC, 25 A Non-inductive	277 V AC, 25 A (Tab Term.) 277 V AC, 25 A (Screw Term.) 480 V AC, 20 A (Screw Term.) 226°F Max. Amb.	Also Applies to Suffix P Controls 120 V AC, 5 A 250°F Bake, 275°F Clean Amb.
KP	SPST - Break on Temperature Rise Except With Positive "OFF" Dial	120 V AC, 575 V A 250 V AC, 25 A, 690 V A, 18 FLA, 72 LRA 277 V AC, 125 V A	120-240 V AC, 13 FLA, 50 LRA 120-480 V AC, 125 V A 250 V AC, 18 FLA, 72 LRA 277 V AC, 25 A	277 V AC, 25 A (Tab Term.) 277 V AC, 25 A (Screw Term.) 480 V AC, 20 A (Screw Term.) 226°F Max. Amb.	Applies to Suffix B, P, R, T Controls 110/20 V AC, 1/6 hp
KR	SPST-Make on Temperature Rise	120 V AC, 575 V A 250 V AC, 25 A, 690 V A, 18 FLA, 72 LRA 277 V AC, 125 V A	120-240 V AC, 13 FLA, 50 LRA 120-480 V AC, 125 V A 250 V AC, 18 FLA, 72 LRA 277 V AC, 25 A		Applies to Suffix B, P, R, T Controls 110/20 V AC, 1/6 hp
KX	SPST - Break on Temperature Rise Used on Low Current Pilot Duty Applications	120-277 V AC, 50 V A 221°F Cook Amb., 250°F Clean Amb.	120-277 V AC, 50 V A	120-277 V AC, 50 V A 50/60 Hz	24 V AC, 24 V A PD 1 V AC, 0.25 V A PD 200°F Cook Amb., 250°F Clean
KXA	Similar to KX With Same Aux. Switch As Model KA	120-277 V AC, 50 V A 221°F Cook Amb., 250°F Clean Amb. Aux. Sw. 120-277, 50 V A	120-277 V AC, 50 V A Aux. Sw. 250 V AC, 25 A	120-277 V AC, 50 V A 50/60 Hz Aux. Sw. 240 V AC, 25 A	24 V AC, 24 V A PD
KXN	Similar to KX With NAK Filled Bulb	120-277 V AC, 50 V A 221°F Cook Amb., 250°F Clean Amb.	120-277 V AC, 50 V A		24 V AC, 24 V A PD 1 V AC, 0.25 V A PD 200°F Cook Amb., 250°F Clean
KXR	SPST - Make on Temperature Rise Used on Low Current Pilot Duty Circuits	120-277 V AC, 50 V A 221°F Cook Amb., 250°F Clean Amb.	120-277 V AC, 50 V A		24 V AC, 24 V A PD 1 V AC, 0.25 V A PD 200°F Cook Amb., 250°F Clean

Electric Thermostat

RX MILLIVOLT SERIES - 5300 SERIES

The Robertshaw® RX series 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

- Rated for 0.67 amps at 5 VDC
- Ambient temperature 230°F (110°C)
- Precise and proven snap action mechanism
- Screw type terminals ensure electrical integrity
- Rugged steel case design
- Bulb and capillary assemblies supplied in nickel plated copper or stainless steel

Advantages

- Millivolt/Milliamp control produces reliable low current/low voltage performance
- Sealed contacts provide survival in the harshest environments
- Robust design leads to increased reliability, durability, and reduced down time

Specifications

- 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 Certification Number
  - UL E12103
  - CSA LR36461
  - EC 87/96/240/M4 (2001)

An ISO 9001 – 2008 Certified Company

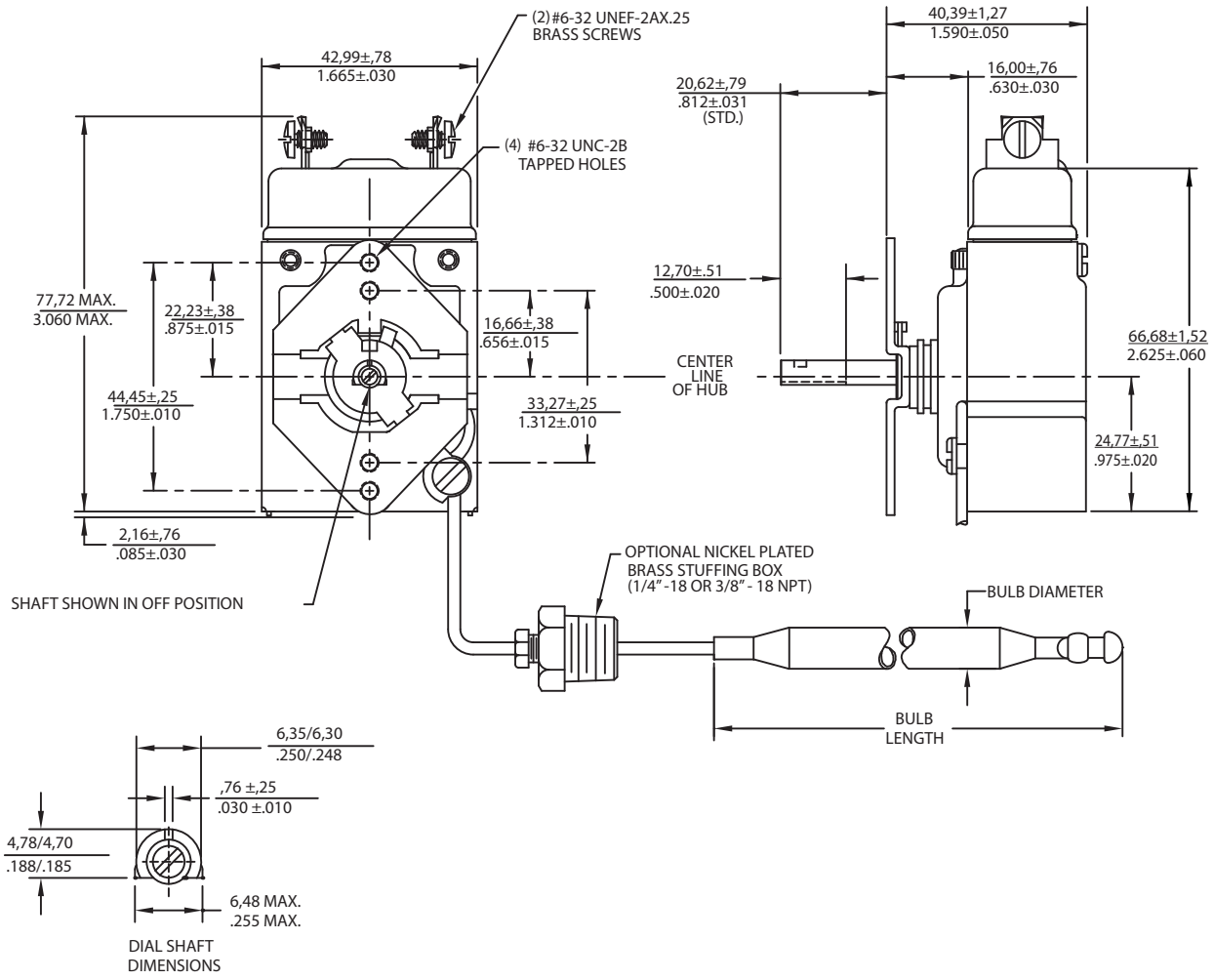
invensys™ Controls

Electric Thermostat

RX MILLIVOLT SERIES - 5300 SERIES

PRODUCT DIMENSIONS

Dimensions are inches and [millimeters]. See page 66 for English to Metric conversions.



AVAILABLE BULB DIAMETERS

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

AVAILABLE CAPILLARY LENGTHS

24" to 120" in 12" increments
610mm to 3048mm in 305mm increments

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

invensys™ Controls

Electric Thermostat

LC SERIES - 5225 SERIES

The Robertshaw® LC Series limit control is designed for any appliance where temperature protection is needed. All LC Series controls are non-adjustable, factory calibrated, and feature negative biased power element diaphragms. The LC Series is a proven safety control for commercial and specialty applications. They are available in automatic or manual reset versions with temperature settings from 340°F to 600°F (170°C to 316°C).

Features and Benefits

- Calibrated temperature settings 340°F to 600°F in 5°F increments (170°C to 316°C)
- Bulb and capillary assemblies available in copper, nickel plated copper or stainless steel
- Available in manual reset or automatic operation
- Control function is designed to interrupt power in the appliance circuit at the calibrated temperature
- Automatic actuation of the control switch at or below the calibrated temperature if the pressure integrity of the thermal element is compromised

Specifications

Model	Description	UL Rating[1]	CSA Rating[2]	European[3]
LCH	SPST - Break on Temperature Rise Manual Reset. Type M2*	30 A, 250 V AC @ 125-480 V AC 35 VA PD @ 24 V, 60 Hz	30 A @ 125-480 V AC	30 A @ 480 V AC
LCHM	SPST - Break on Temperature Rise Manual Reset. Type M2* Millivolt Application	400 mA @ 500 mV DC	125 VA PD @ 250 V AC	480 mA @ 500 mV DC
LCC	SPDT - Make and / or Break on Temperature Rise. Automatic Reset	25 A, 250 VA @ 125-480 V, 60 Hz 35 A@24 V AC	25 A, 250 V AC @ 125-480 V AC 35 VA PD @ 24 V, 60 Hz	25 A @ 480 V AC
LCCM	SPDT - Make and / or Break on Temperature Rise. Automatic Reset. Millivolt Application	125 VA PD @ 125-480 V, 60 Hz 400 mA @ 500 mV DC	25 A, 250 VA @ 125-480 V, 60 Hz 35 VA PD @ 24 V, 60 Hz	480 mA @ 500 mV DC

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

[1] UL Rating (UL Guide / XAPX2) - File No. E12103
[2] CSA Rating - CSA File No. LR36461
[3] CE, LCC, LCCM: EC-87196/239/M3 (2001)
LCH, LCHM: EC-87196/170/M4 (2001)

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

An ISO 9001 – 2008 Certified Company

invensys Controls

Robertshaw®

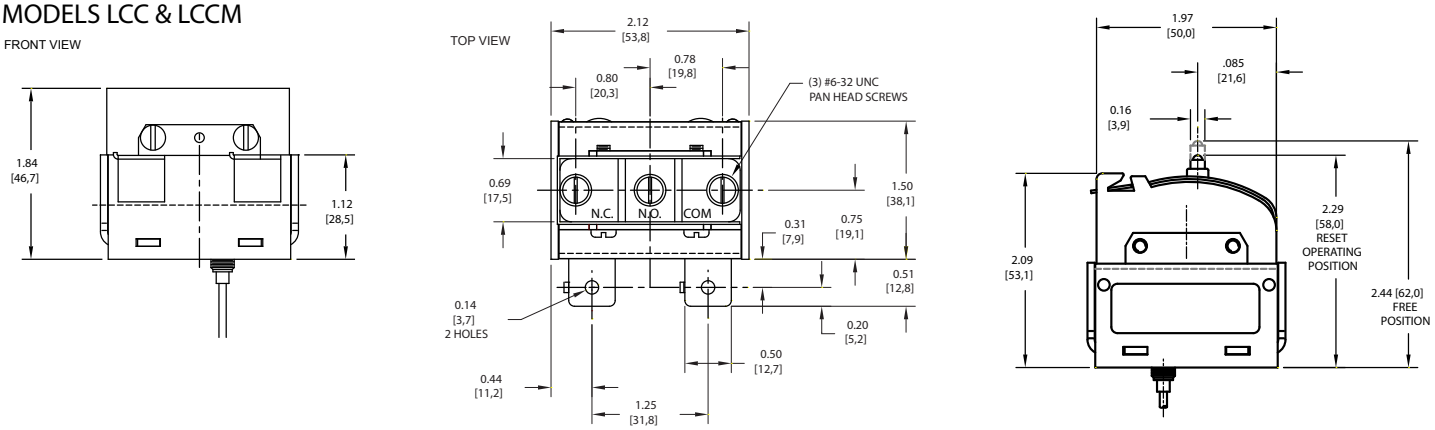
Electric Thermostat

LC SERIES - 5225 SERIES

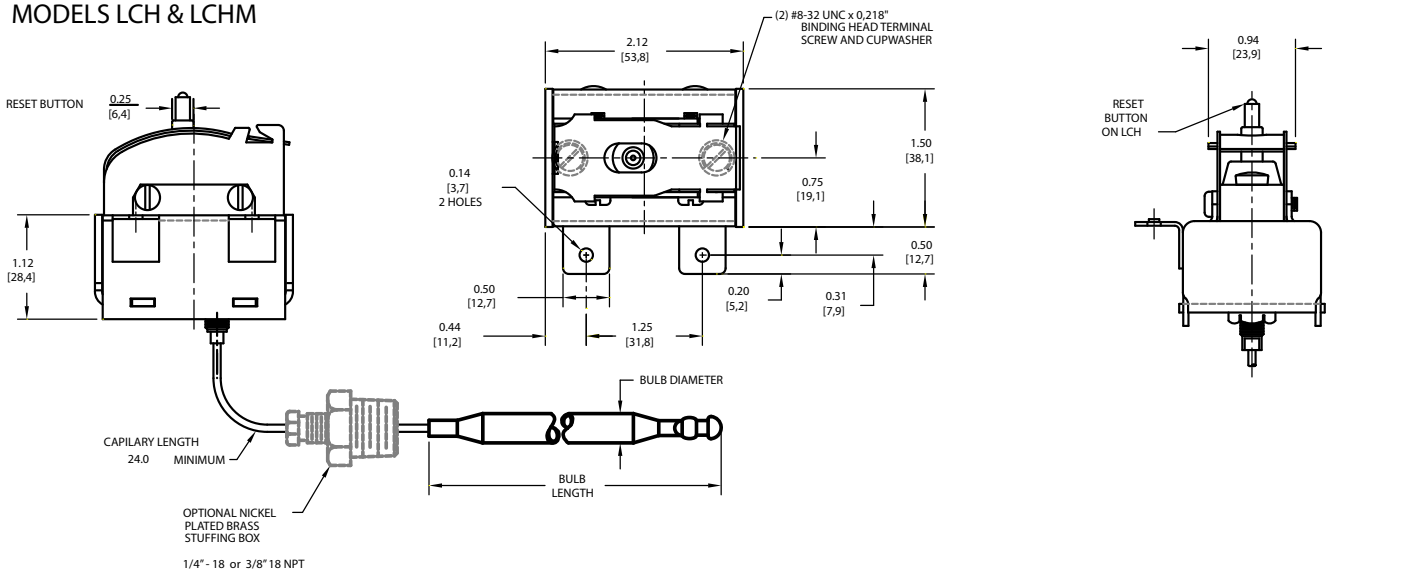
PRODUCT DIMENSIONS

Dimensions are inches and [millimeters]. See page 66 for English to Metric conversions.

MODELS LCC & LCCM



MODELS LCH & 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

invensys™
Controls

Electric Thermostat

B10 SERIES - 5210 SERIES

The Robertshaw® B10 series 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: 32°F to 150°F (0°C to 66°C)
- Electrical Rating:
  20 Amps @ 125 VAC
  15 Amps @ 250 VAC
  125VA PD @ 125 VAC
- Agency Certification Numbers:
  - UL File No. E12103
  - CSA File No. LR36461

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

An ISO 9001 – 2008 Certified Company

invensys Controls

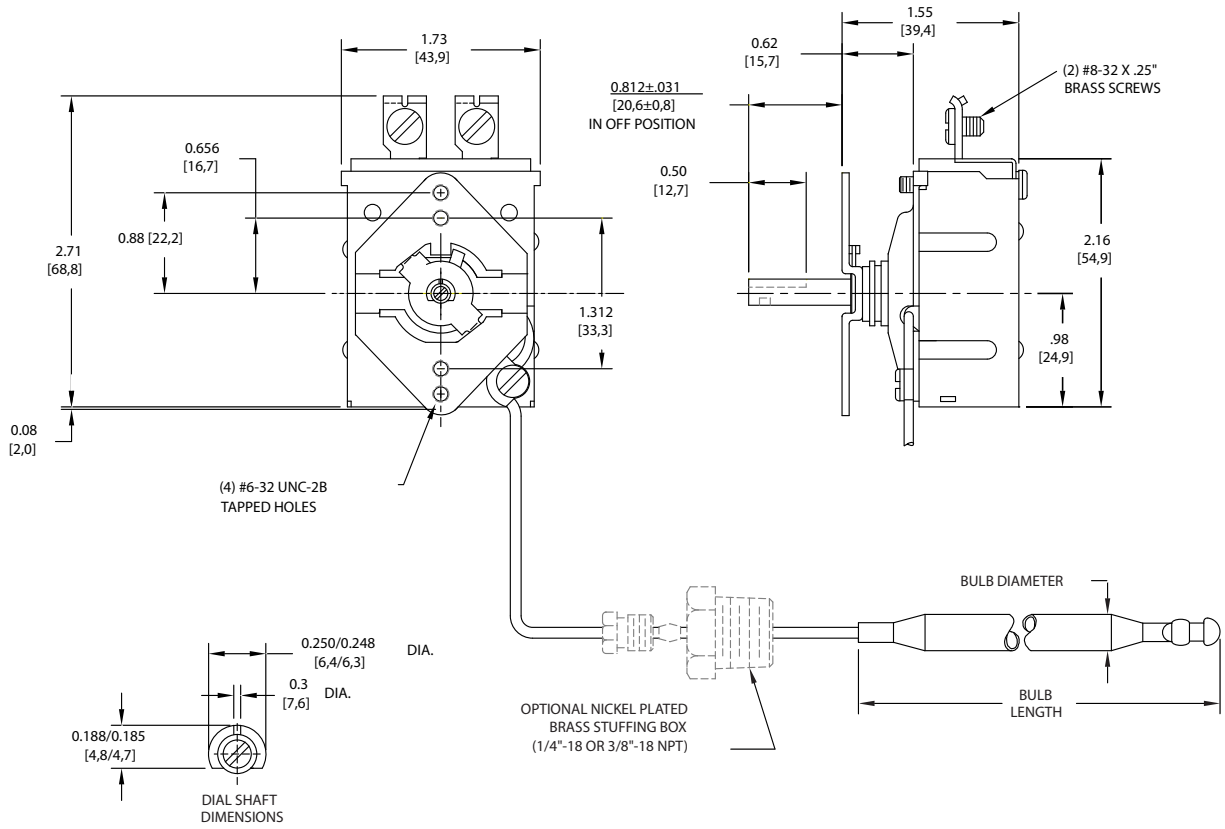
Robertshaw®

Electric Thermostat

B10 SERIES- 5210 SERIES

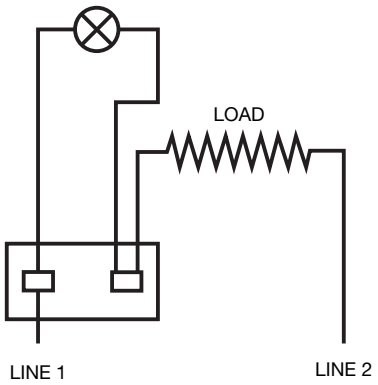
PRODUCT DIMENSIONS

Dimensions are inches and [millimeters]. See page 66 for English to Metric conversions.

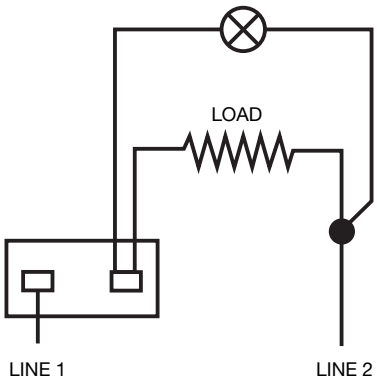


WIRING DIAGRAMS

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



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



invensys™
Controls

Electric Thermostat

D1 - D18 SERIES - 5000 SERIES

The Robertshaw® D1/D18 series is a heavy duty thermostat designed for use in harsh applications where precise temperature control is required. The control uses a double pole single throw (DPST) snap action mechanism with a positive OFF switch. It is recommended for use on applications that require double pole operation and accurate temperature control.

Features and Benefits

- Temperature ranges to 650°F (343°C)
- DPST with positive OFF
- Mechanical snap action is instantaneous, positive and non-fatiguing. Reacts to exceedingly small movements of the diaphragms for very close temperature differential.
- Diaphragm assembly features two stainless steel diaphragms electrically welded together. Maximum sensitivity without overstressing the metal.
- Supplied with terminals mounted in four different positions
- Bulb and capillary available in copper, nickel plated copper, or stainless steel
- Plastic coating available to protect against moisture, dust, etc

Specifications

- Ambient temperature:
  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
- 120, 277 VAC @ 30A
  480 VAC @ 10A
  277 VAC @ 250VA
  125 VAC @ 125VA
- Agency, Certification Numbers:
  - UL Guide No. XAPX2
  - UL and CSA File No. E12103
  - CSA Class 4823 02

Additional Options

Dial

- Multiple temperature ranges available
- Available in black and red

Bezel

- Not for use with case assembly
- Chrome plated brass

Protective Case Assembly

- Plated steel case
- Brass protective sleeve (optional)

CE cULus *An ISO 9001 – 2008 Certified Company*

invensys Controls

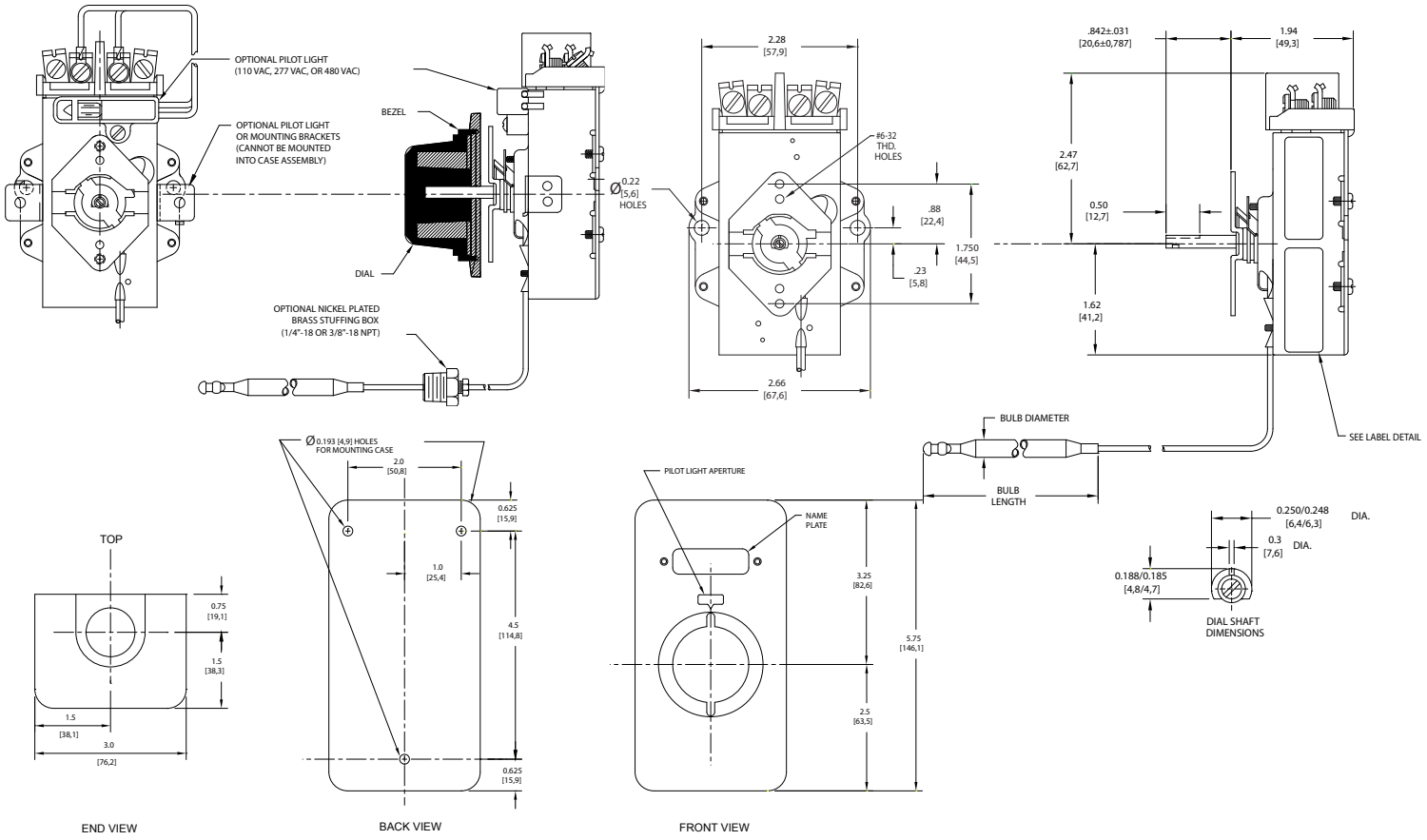
Robertshaw®

Electric Thermostat

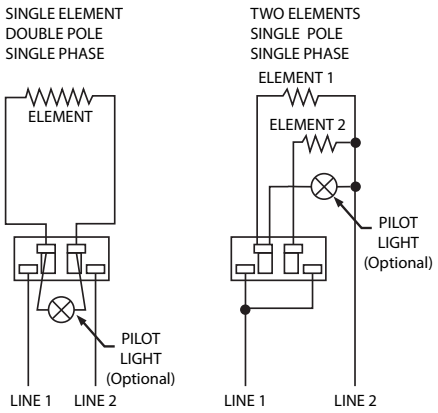
D1 - D18 SERIES - 5000 SERIES

PRODUCT DIMENSIONS

Dimensions are inches and [millimeters]. See page 66 for English to Metric conversions.



WIRING DIAGRAMS



AVAILABLE BULB DIAMETERS

inches	0.187*	0.250	0.312	0.375
[millimeters]	4,8	6,4	7,9	9,5

* 0.187 inch diameter bulb is most common

AVAILABLE CAPILLARY LENGTHS

24” to 120” in 12” increments

60mm to 3048mm in 305mm increments

invensys Controls

Infinite Switch

M SERIES - 5500 SERIES

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

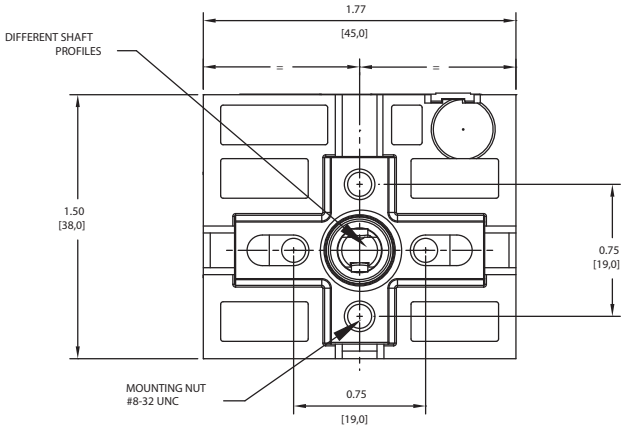
- Smaller compact design
- Single, dual or triple outputs
- Uses 8-32 UNC nut for mounting with 2.5 threads of screw engagement compared to stamped threaded hole with one helix
- Multiple terminal options for the H1, H2 and L1 terminals
- Double line break (except triple output)
- Clockwise or counterclockwise rotation
- Variety of shaft lengths and configurations
- Screw mount or bushing mount
- Push-To-Turn (PTT) or Non-Push-To-Turn (Non-PTT)

Specifications

- Maximum 13 Amps at 125°C (257°F) or 15 Amps at 100°C (210°F)
- On time 2% to 9% at low (45° arc)
- Full dial (360°) or half dial (180°) rotation
- Wattage range of 100 Watts to 3600 Watts at 240 VAC
- Voltage ratings of 120, 208, 240 Volts
- "B" Calibration with 22.5% on time at low
- Agency Certification Number - UL File # E112536

SINGLE AND DUAL PRODUCT DIMENSIONS

Dimensions are inches and [millimeters]



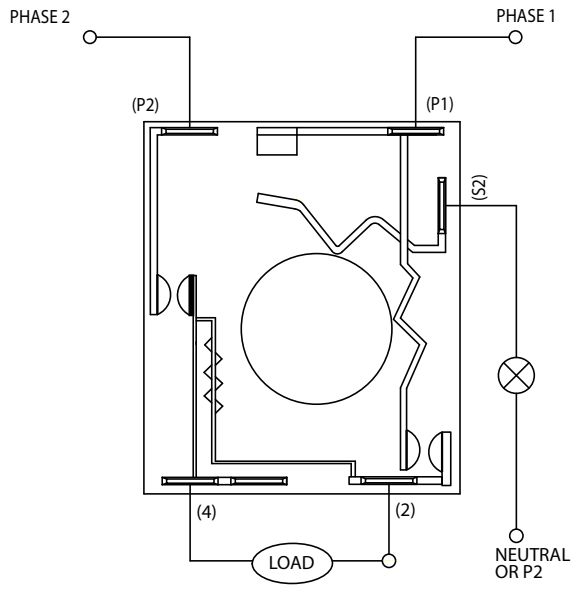
An ISO 9001 – 2008 Certified Company

invensys Controls

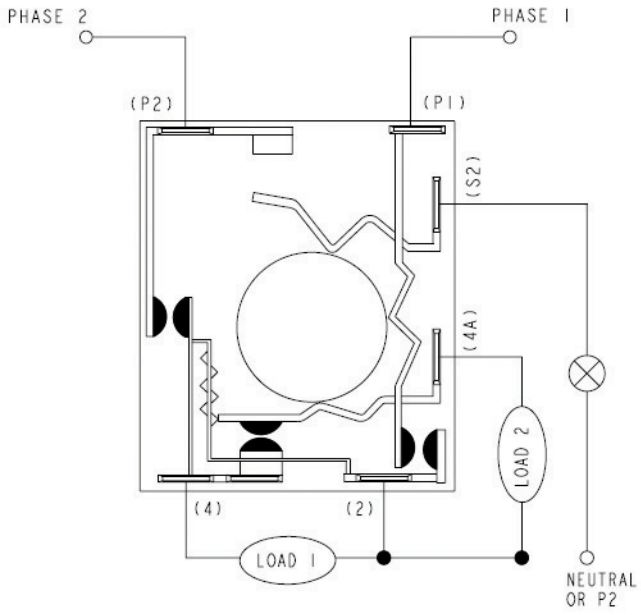
WIRING DIAGRAMS

Dimensions are inches and [millimeters]. See page 66 for English to Metric conversions.

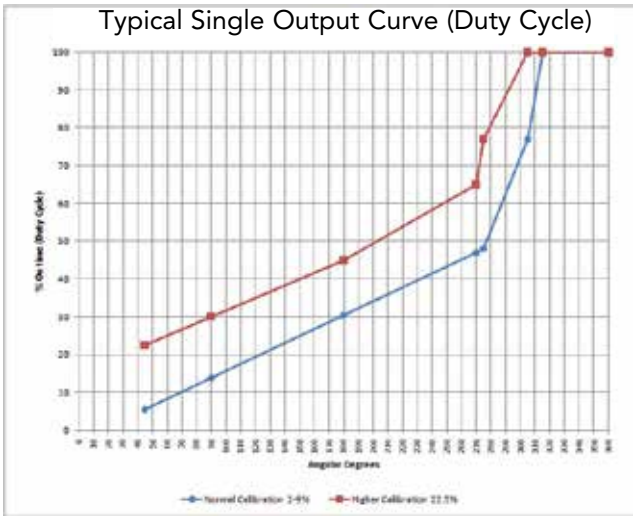
Single



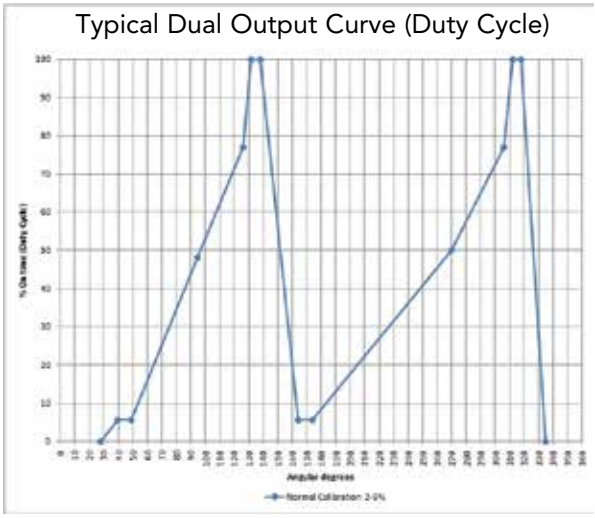
Dual



Typical Single Output Curve (Duty Cycle)



Typical Dual Output Curve (Duty Cycle)



GAS COOKING CONTROLS

invensys™
Controls

Combining compatible flavors is as important as matching integrated control components.

For best in class appliances, manufacturers select compatible controls for their commercial cooking applications just like cooks carefully combine hand-picked ingredients to make amazing flavors. The Robertshaw® gas thermostats, valves and burners offer a plethora of mix and match solutions designed for manufacturers to make cooking systems.

Gas Cooking Controls

invensys™
Controls

Gas Thermostat

BJWA SERIES - 4350 SERIES

The Robertshaw® BJWA control is a combination gas cock and by-pass type thermostat. It is available with both by-pass and pilot adjustments. With the 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.

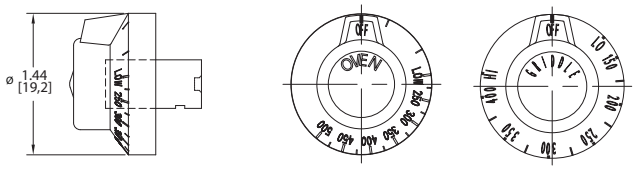
Features and Benefits

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

Specifications

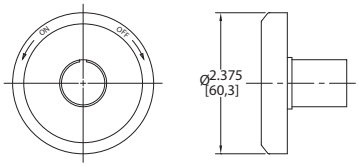
- Ambient temperature: 32°F to 350°F (0°C to 177°C)
- Maximum inlet pressure: 0.5 PSI
- Capacity (Natural Gas) to 70,000 BTU/HR
- Agency Certification Numbers:
  - CSA Certificate # 164327-1177534
  - BSi Certificate # EC-87/96/12/M5-2009
  - CE Certification applies only to BJWE models

DIAL SUBASSEMBLIES



OTHER DIAL LAYOUTS AVAILABLE

BEZEL SUBASSEMBLIES

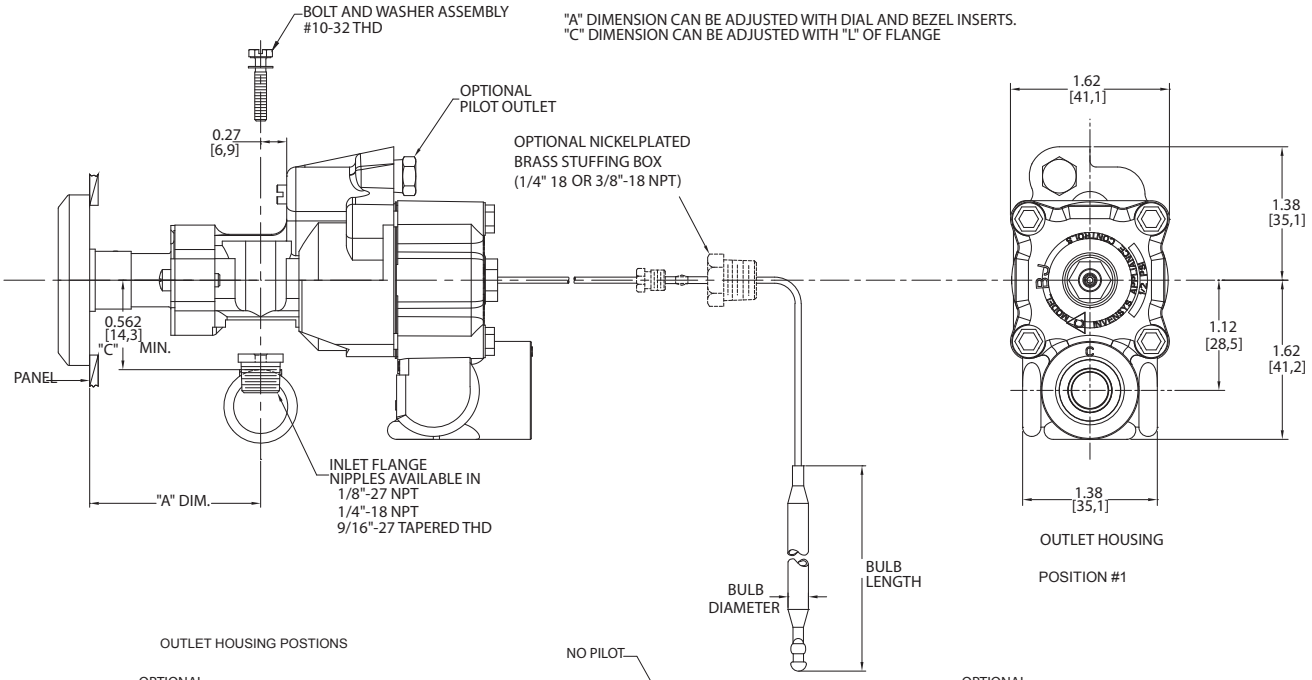


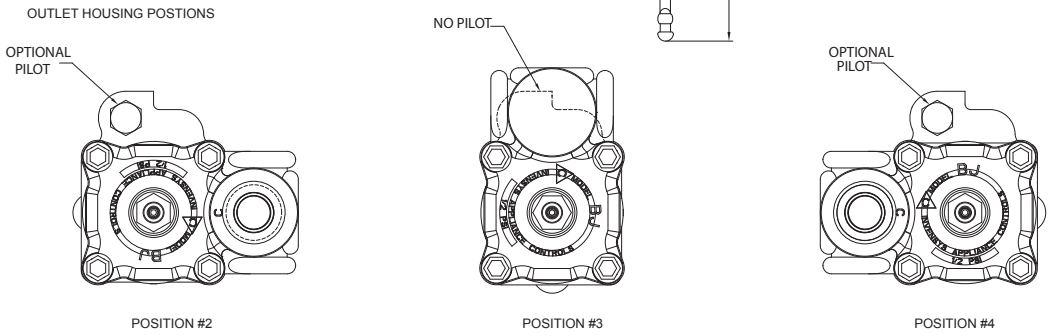
An ISO 9001 – 2008 Certified Company

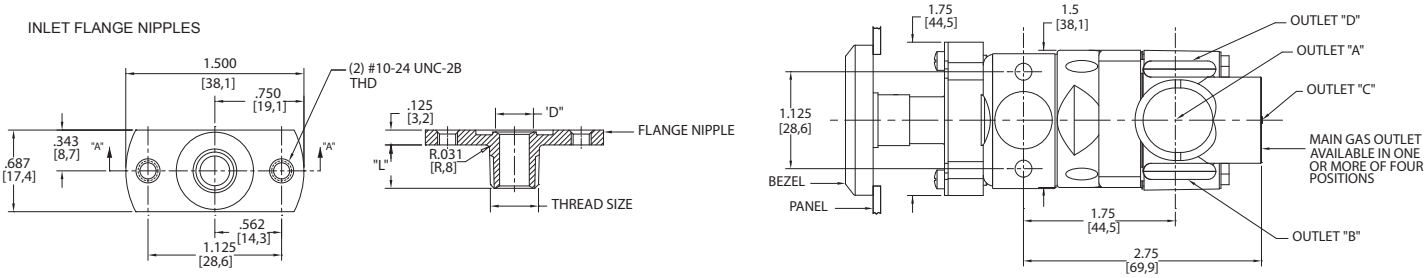
invensys Controls

PRODUCT DIMENSIONS

Dimensions are inches and [millimeters]. See page 66 for English to Metric conversions.







Gas Thermostat

FD SERIES - 4200 SERIES

The Robertshaw® FD series features heavy duty, high capacity gas thermostats. These units are available with modulating only or with modulating snap-acting bypass. Both pilot and bypass adjustments are provided. Pilot outlets and customized settings are optional. Available for a wide variety of applications including typical 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
- Front adjustment
- The pilot and bypass keys are accessible and the pilot and keys are slotted for easy adjustment from the front of the control
- Provides temperature control on most gas appliance systems
- Allows for low temperature control
- Modulates the main gas supply and controls the bypass gas with a snap under the same thermostatic action
- Bulb and capillary assemblies supplied in copper, nickel plated copper or steel
- Heat resistant plastic dials available in black with white characters
- RoHS Compliant

Specifications

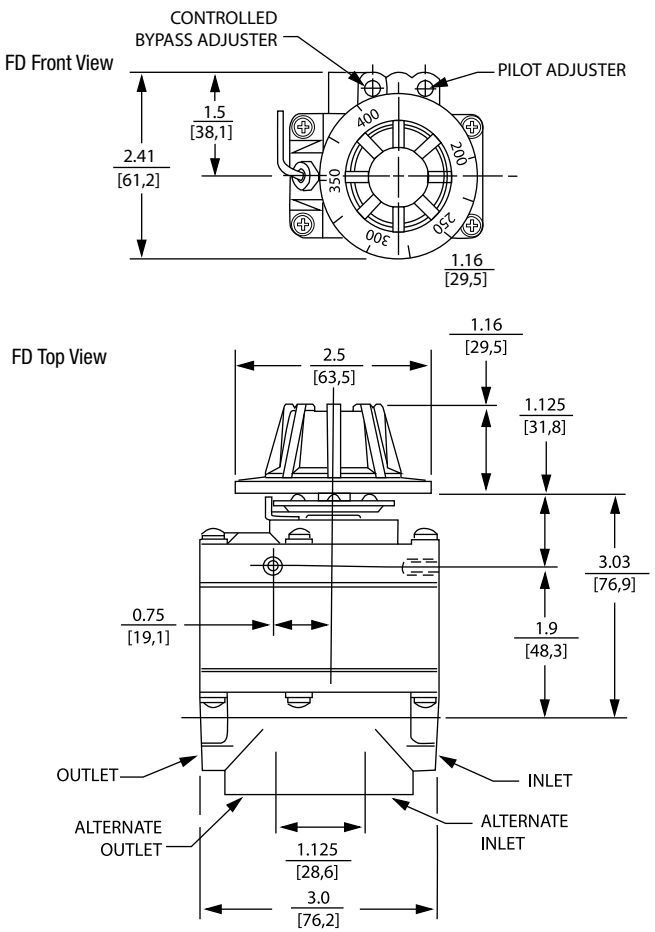
- Ambient temperature: 32°F to 350°F (0°C to 177°C)
- Maximum inlet pressure: 0.5 PSI
- Capacity (Natural Gas):
  - 3/8" pipe in and out 100,000 BTU/HR
  - 1/2" pipe in and out 100,000 BTU/HR
  - 7/16" tubing in and out 100,000 BTU/HR
- Agency Certification Numbers:
  - CSA 164327-1195899
  - Versions available with BSi EN 257
  - BSi Certificate# EC-87/96/61/M5 2009)
  - CE Certification applies only to FDTOE, FDTHE and FDTSE models

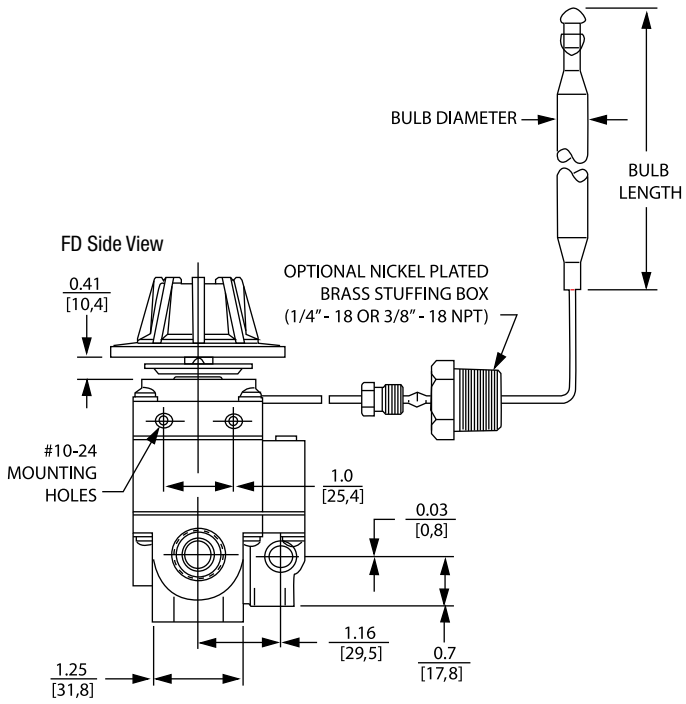
An ISO 9001 – 2008 Certified Company

invensys Controls

PRODUCT DIMENSIONS

Dimensions are inches and [millimeters]. See page 66 for English to Metric conversions.





Available Bulb Diameters

inches	0.187*	0.250	0.312	0.375
[millimeters]	4,8	6,4	7,9	9,5

* Most common diameter

Model	General Description
FDO	Modulating with snap bypass - 550°F (288°C) max. setpoint
FDTO	Modulating - 550°F (288°C) max. setpoint
FDH	Modulating with snap bypass - 650°F (343°C) max. setpoint
FDTH	Modulating - 650°F (343°C) max. setpoint
FDL	Modulating with snap bypass - Liquid immersion sensor
FDS	Modulating with snap bypass - Surface contact sensor
FDTS	Modulating - Surface contact sensor

invensys Controls

Gas Thermostat

GS SERIES - 4290 SERIES

The Robertshaw® GS thermostat is a snap-acting hydraulic thermostat and is 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 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
- Adjustable bypass key and bypass settings are optional
- 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: 32°F to 300°F (0°C to 93°C)
- Maximum inlet pressure: 0.5 PSI
- Capacity (Natural Gas):
  - 3/8" pipe in and out 30,000 BTU/HR
  - 7/16" tubing in and out 30,000 BTU/HR
  - 1/4" tubing in and out 9,000 BTU/HR
- Agency Certification Numbers:
  - CSA 164327-1195957
  - BSi EN 257 (1992)
  - CE Certification applies only to GSE models
  - Certification EC 87/96/11/MS (2009)
  - CE 0086

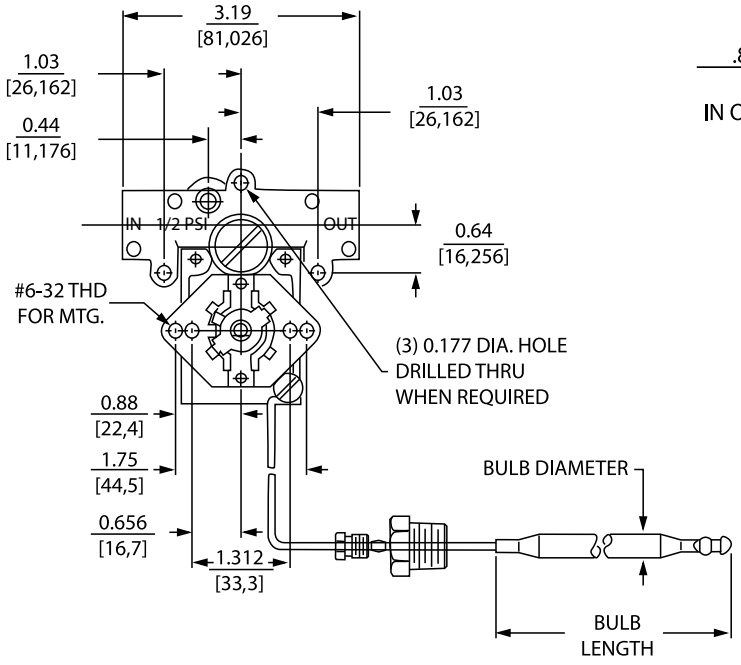
An ISO 9001 – 2008 Certified Company

invensys Controls

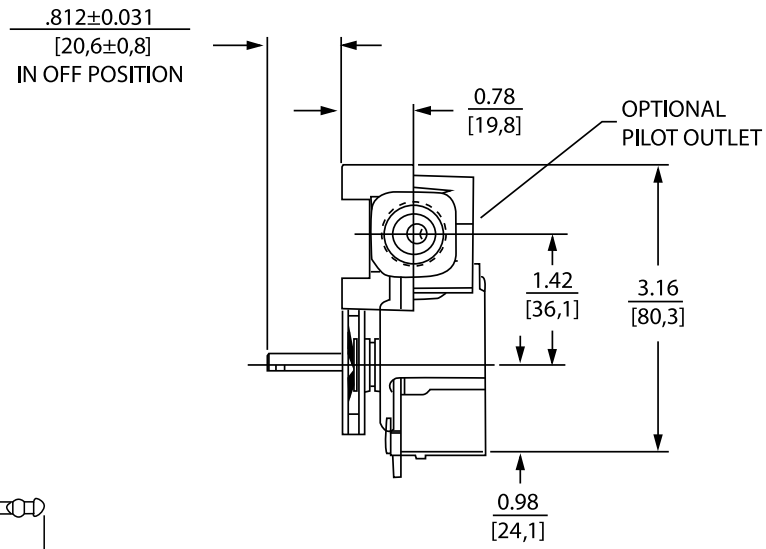
PRODUCT DIMENSIONS

Dimensions are inches and [millimeters]. See page 66 for English to Metric conversions.

GS Front View



GS Right View



Available Bulb Diameters

inches	0.187*	0.250	0.312	0.375
[millimeters]	4,8	6,4	7,9	9,5

* Most common diameter

Thermomagnetic Safety Valves

TS SERIES - 1720 SERIES

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 energized by voltage generated by a thermocouple that is heated by the pilot flame. When this flame is extinguished, the thermocouple voltage decreases until a spring overcomes the magnetic force and closes off both the pilot and main gas. This control can be used for commercial and residential ovens, infrared heaters, chicken and pig brooders, recreational vehicle gas appliances and many more applications requiring automatic safety valves.

Features and Benefits

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

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

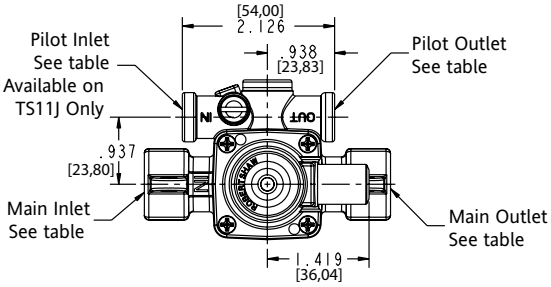
An ISO 9001 – 2008 Certified Company

invensys Controls

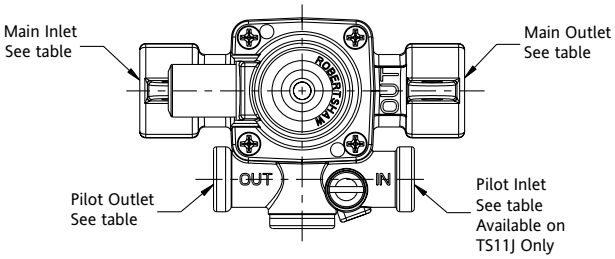
PRODUCT DIMENSIONS

Dimensions are inches and [millimeters]. See page 66 for English to Metric conversions.

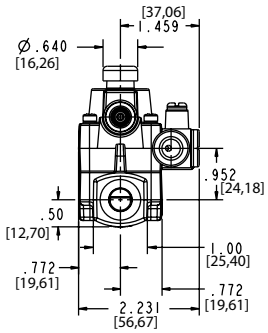
TS11J Top



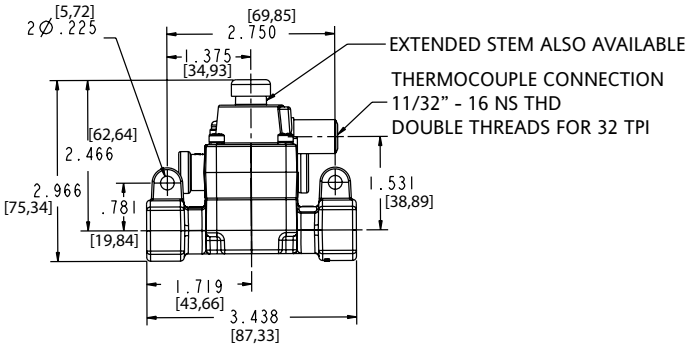
TS11J Top (rotated 180°)



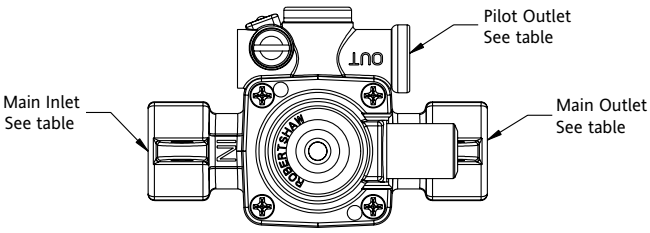
TS11J Side



TS11J Front



TS11K Top with no Pilot Inlet



Solenoid Gas Valves

FJT/FJTDO SERIES - 4075 SERIES

The Robertshaw® FJT series gas solenoid is designed to control the flow of gas in cooking appliances. Both single FJT and Dual FJTDO models are available for a wide variety of applications such as ovens, griddles and fryers. 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 filtered screen
- Gas types: Natural, manufactured, fixed, LP and LP/air mixtures
- Terminal and mounting brackets available
- RoHS compliant
- AC rectification for silent operation
- Pilot outlet available on both single and dual models

Specifications

- Ambient temperature: -40°F to 275°F (-40°C to 135°C)
- Capacity up to 119,000 BTU/HR at 1" WC pressure drop
- 24, 120 or 240 VAC at 50/60 Hz
- Maximum pressure: 0.5 PSI
- Agency Certification Numbers:
  - CSA Certification 164327-1177530
  - EN Certification EC-87/06/022M1
  - CE 0086

An ISO 9001 – 2008 Certified Company

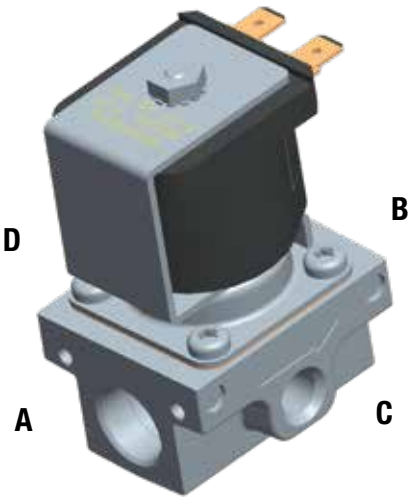
invensys Controls

Solenoid Gas Valves

FJT/FJTDO SERIES - 4075 SERIES

BODY STYLE CODES

	Inlet		Outlet	
Code	Main A	Main B	Main C	Main D
01	3/8 Pipe	3/8 Pipe	None	None
02	3/8 Pipe	3/8 Pipe	1/8 Pipe*	1/8 Pipe*
03	3/8 Pipe	3/8 Pipe	1/8 Pipe*	None
04	3/8 Pipe	3/8 Pipe	None	1/8 Pipe*
05	3/8 Pipe	3/8 Pipe	1/8 Pipe**	1/8 Pipe**
06	3/8 Pipe	3/8 Pipe	1/8 Pipe**	None
07	3/8 Pipe	3/8 Pipe	None	1/8 Pipe**
08	3/8 Pipe	3/8 Pipe	1/8 Pipe*	1/8 Pipe**
09	3/8 Pipe	3/8 Pipe	1/8 Pipe**	1/8 Pipe*
10	3/8 Tube	3/8 Tube	None	None
11	3/8 Tube	3/8 Tube	1/8 Pipe*	1/8 Pipe*
12	3/8 Tube	3/8 Tube	1/8 Pipe*	None
13	3/8 Tube	3/8 Tube	None	1/8 Pipe*
14	3/8 Tube	3/8 Tube	1/8 Pipe**	1/8 Pipe**
15	3/8 Tube	3/8 Tube	1/8 Pipe**	None
16	3/8 Tube	3/8 Tube	None	1/8 Pipe**
17	3/8 Tube	3/8 Tube	1/8 Pipe*	1/8 Pipe**
18	3/8 Tube	3/8 Tube	1/8 Pipe**	1/8 Pipe*



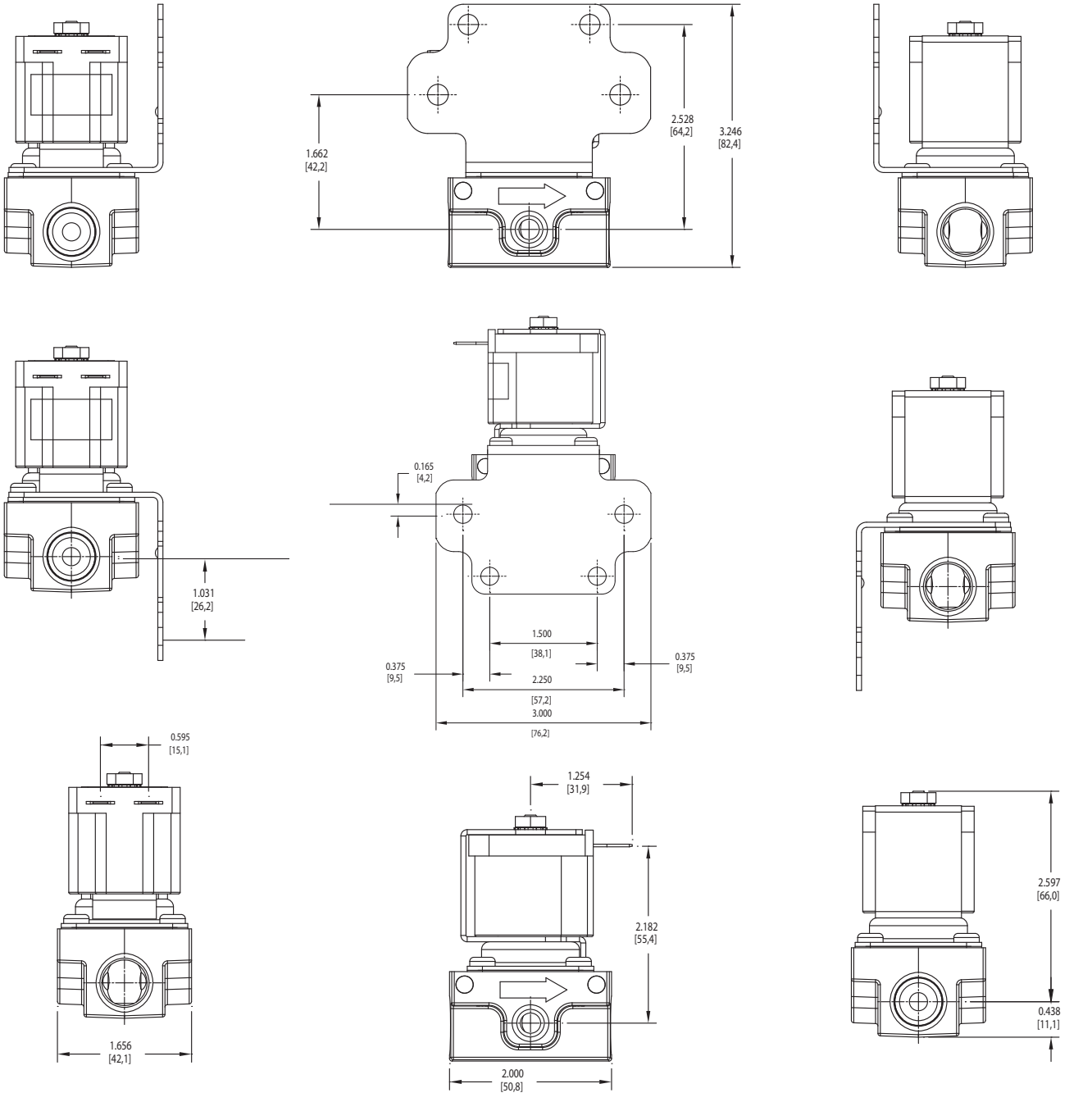
* Outlet is drilled so gas flows when solenoid is closed.
** Outlet is drilled so gas flows only when solenoid is open.

Solenoid Gas Valves

FJT SERIES

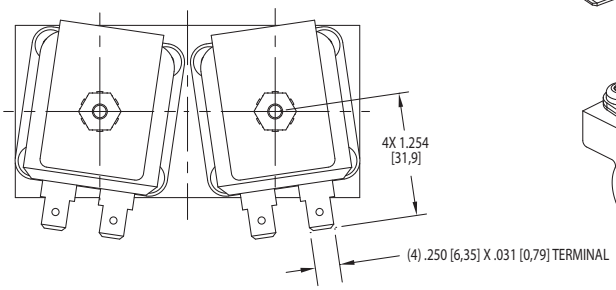
PRODUCT DIMENSIONS

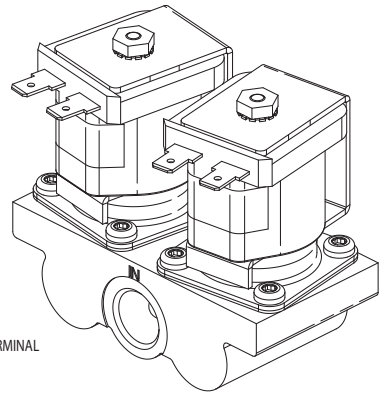
Dimensions are inches and [millimeters]. See page 66 for English to Metric conversions.



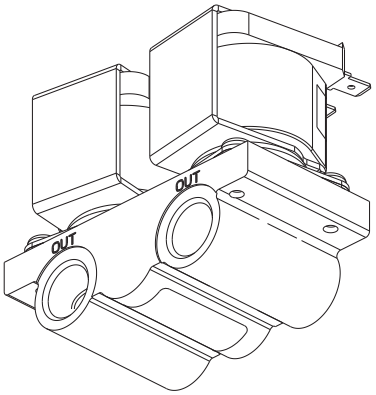
PRODUCT DIMENSIONS

Dimensions are inches and [millimeters]. See page 66 for English to Metric conversions.

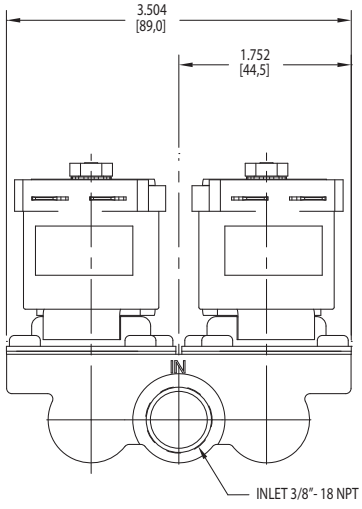


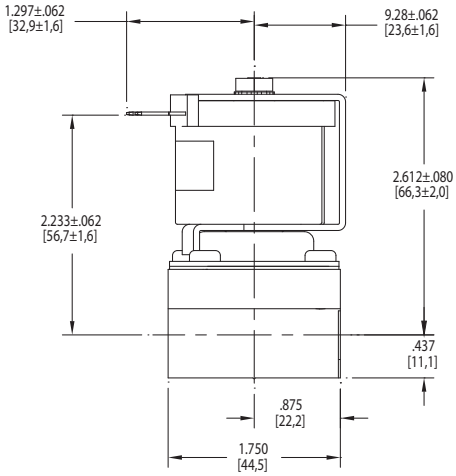


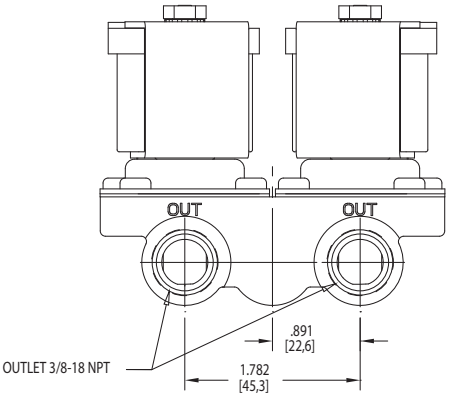
3-D INLET VIEW



3-D OUTLET VIEW







Solenoid Gas Valves

SGV SERIES

The Robertshaw® SGV valve has a rugged design which exceeds current qualifications. Its function is 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 filtered screen
- Various gas types: natural, manufactured, mixed, LP, and LP/air mixtures
- Multiple terminal and mounting brackets and bracket configurations available
- RoHS compliant

Specifications

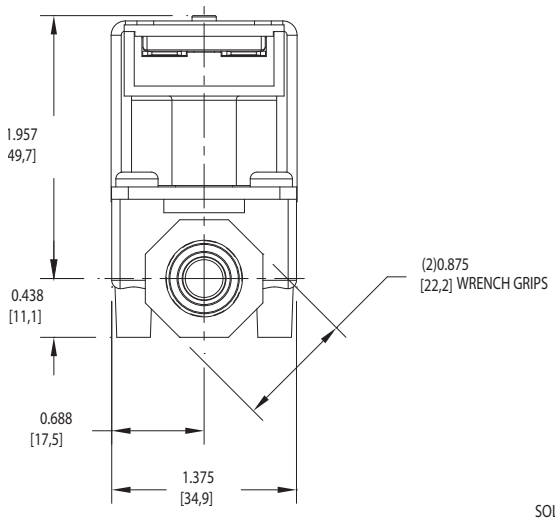
- Ambient temperature:
  - 32°F to 300°F (0°C to 149°C) maximum
- Capacity up to 30,000 BTU at 1" WC pressure drop
- 24 VAC, 50/60 Hz, 0.56 Amp
- 120 VAC, 50/60 Hz, 0.13 Amp
- Maximum pressure: 0.5 PSI
- Agency Certification Numbers:
  - CSA Certification 164327-1177530
  - EN Certification EC-86/10/187 (2011)
  - CE 0086

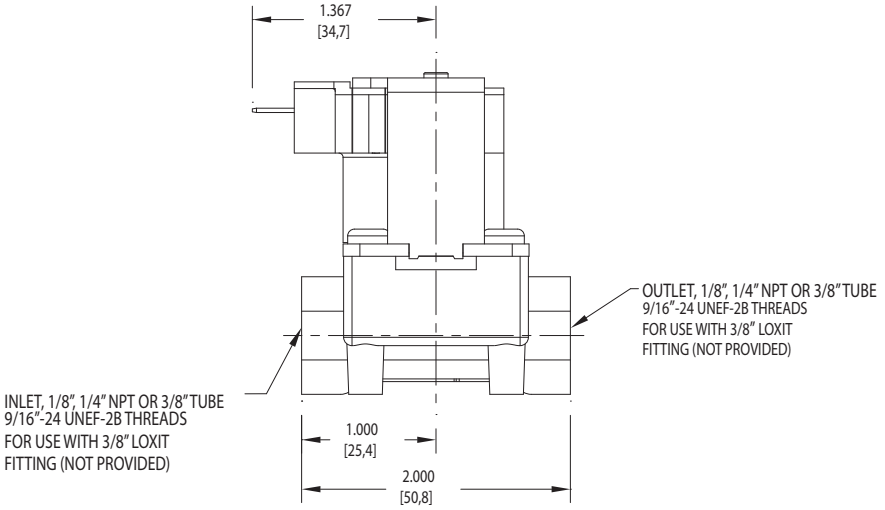
An ISO 9001 – 2008 Certified Company

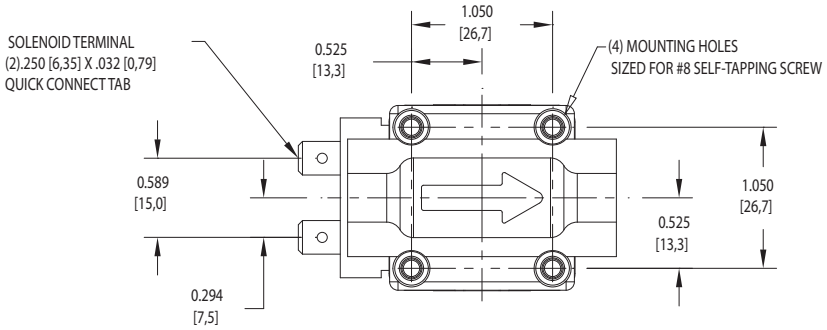
invensys Controls

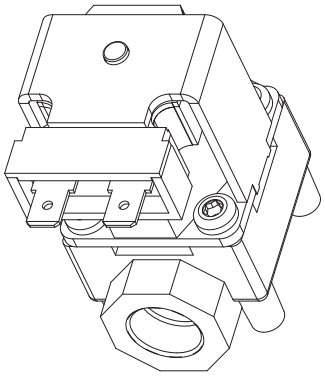
PRODUCT DIMENSIONS

Dimensions are inches and [millimeters]. See page 66 for English to Metric conversions.









Burners

B SERIES - 48 SERIES

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

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

Features and Benefits

- Available as straight, angle and "T" burners
- Good ignition
- Clean burning blue flame
- High efficiency
- Mounting simplicity
- Light weight

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

- Supplied in either 1.00"or 1.25" diameters
- Used with natural, LP, mixed or manufactured gases
- The location of the burner porting is variable and can be supplied, depending on your output needs, in one to seven row configurations of incrementally positioned ports
- Oven burners have capabilities of various outputs depending on application and design
- Steel grade for both burners is AISI #C1008

Burners

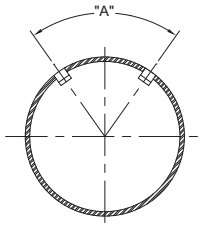
B SERIES - 48 SERIES

DESIGN SPECIFICATIONS

The Robertshaw® extensive family of atmospheric gas burners offers great versatility. These burners can be custom designed to fit almost any application.

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



Orifice Hood Features

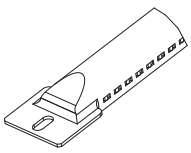
DIAMETERS AVAILABLE							
1" Burners	0.455" (std.)	0.250"	0.375"	0.406"	0.500"	0.580"	0.609"
[25,40mm]	[11,56mm]	[6,35mm]	[9,53mm]	[9,53mm]	[12,70mm]	[14,73mm]	15,47mm]
1.25" Burners	0.578" (std.)	to	0.325" (max)				
[31,75mm]	[14,68mm]		[8,26mm]				

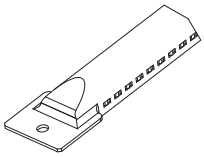
Venturi Lengths

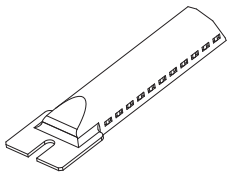
1" Burners [25,40mm]	5.25"
	[133,35mm]
1.25" Burners [31,75mm]	5.50"
	[139,70mm]

OPTIONS

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







Inshot Burners

Z93 SERIES

The Robertshaw® inshot burners offer highly efficient, low cost alternatives for many cooking applications. The single port concept, 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 our 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
- 0.500" orifice cap
- Consistent ignition
- Clean burning blue flame
- High efficiency draft induced
- Mounting simplicity
- Light weight
- Low cost

Applications

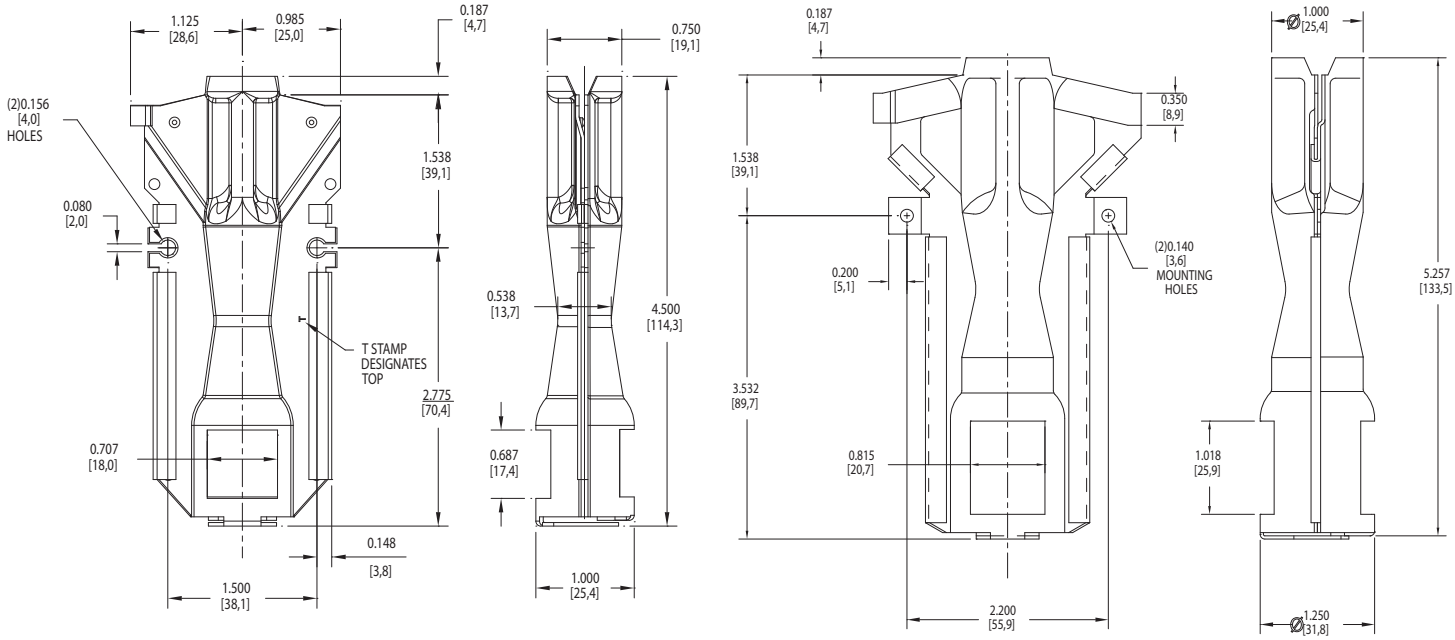
- Comfort Heating – Commercial and residential
- Cooking Appliance – Fryers and steamers
- Specialized – Space heaters

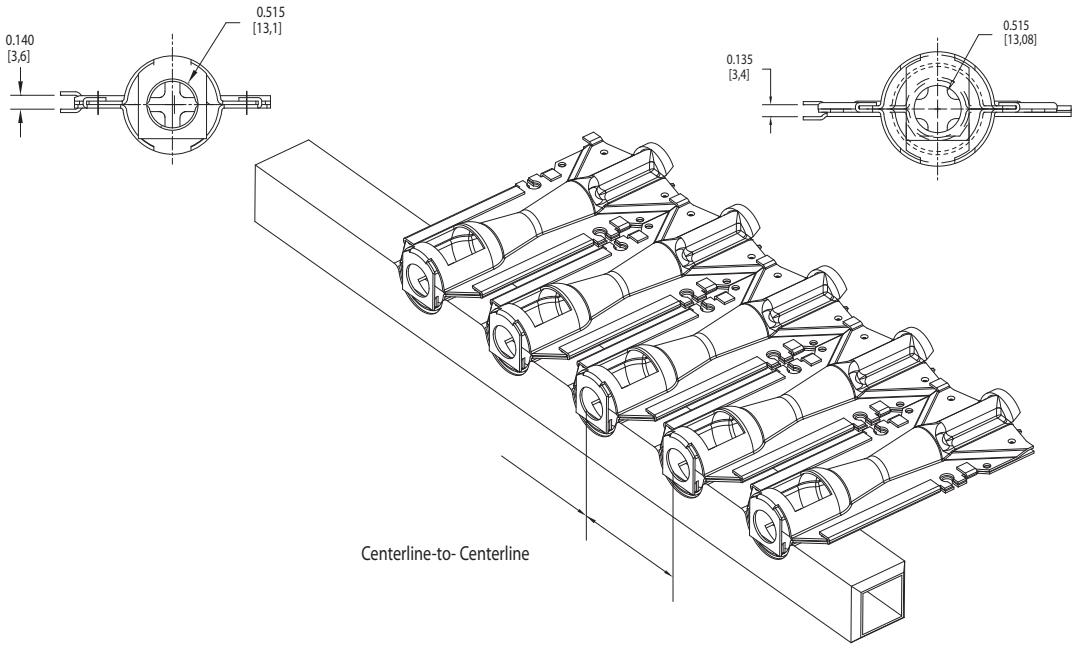
Specifications

- 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

PRODUCT DIMENSIONS

Dimensions are inches and [millimeters]. See page 66 for English to Metric conversions.





invensys™
Controls

GAS VALVES

Regulating precise BTU output is more than just an exact science.

It requires commitment and ingenuity from engineering, manufacturing and operations to be technology leaders in everything we control. The Robertshaw® gas valves offer superior quality with the largest gas valve offering in the industry to meet your specific regulation and redundancy requirements.

Gas Valves

invensys™
Controls

Standard Gas Valves

UNITROL® 7000 - 700 SERIES

The Robertshaw® Unitrol® 7000 is Simply the Right Choice™ for gas cooking controls. The Unitrol 7000 models combine a manual main and pilot gas valve, a separate automatic safety pilot valve, pilot adjustment valve, and a diaphragm valve. The regulated models also feature "straight line" gas pressure regulation.

Robertshaw diaphragm gas valves are single function, and are excellent replacements for solenoid gas valves. Models are available with or without a gas cock and regulated or non-regulated. Standard features include pilot outlet, pilot gas filter and pilot adjustment key.

Features and Benefits

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

Specifications

- Sequentially controlled lighting
- Soft ignition available
- Built-in self protection
- Various inlet and outlet sizes available
  - $^{3}/_{8}$, $^{1}/_{2}$, $^{3}/_{4}$, 1"
- Works with various ignition types
  - Hot Surface Ignition (HSI)
  - Direct Spark Ignition (DSI)
  - Intermittent Pilot Ignition (IPI)
  - Standing Pilot
- Agency Certification
  - CE0085
  - AGA, CSA and British Gas Certified

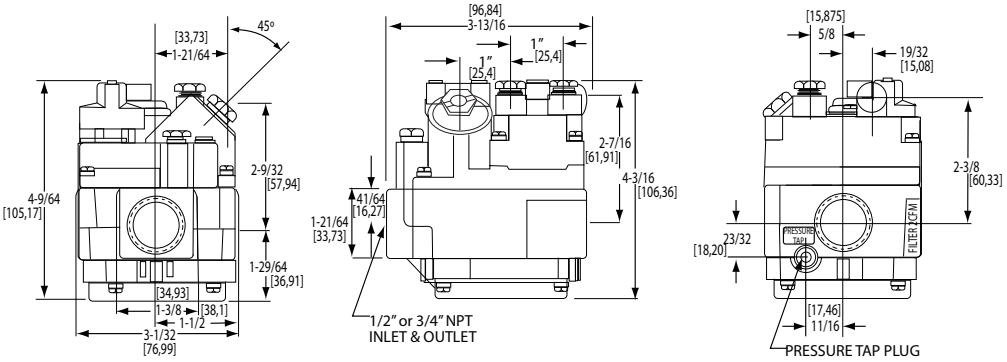
An ISO 9001 – 2008 Certified Company

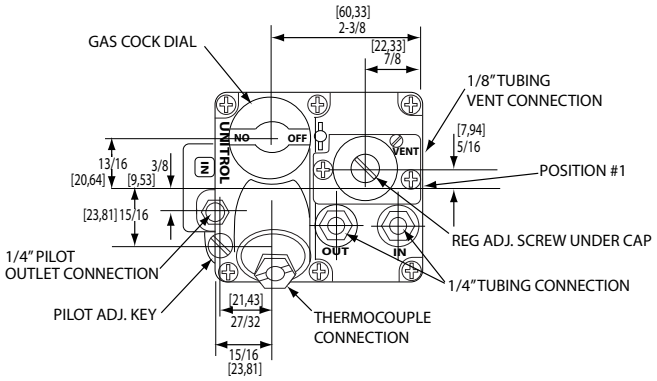
invensys Controls

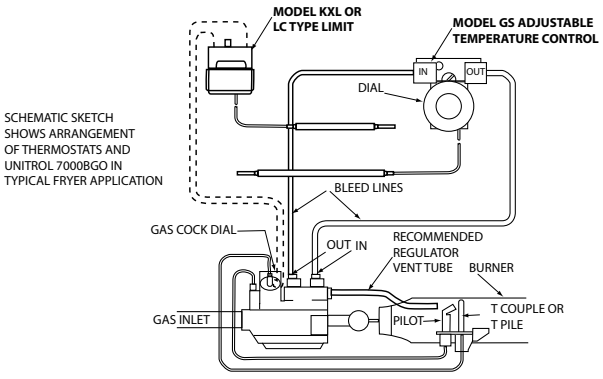
PRODUCT DIMENSIONS

Dimensions are inches and [millimeters]. See page 66 for English to Metric conversions.

Drawings reflect 7000 GO bleed gas model.



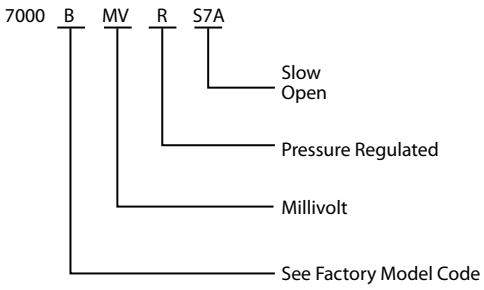




REGULATION CAPACITIES

Factory Model	Inlet x Outlet"	Natural Gas BTU @ 1" WC PD	Natural Gas Min - Max BTU Capacity	LP BTU @ 1" WC PD	LP Min - Max BTU Capacity
7000	3/4 x 3/4	300,000	10,000-720,000	485,000	10,000-900,000
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
7000 ER	1/2 x 1/2	240,000	29,000-290,00	390,000	45,000-455,000
7500	1/2 x 1/2	100,00	6,700-160,000	162,000	12,000-226,000

PART NUMBER NOMENCLATURE



1" WC PD Pressure Drop (PD)
Capacity – BTU Per Hour

invensys Controls

FACTORY MODEL CODE IDENTIFICATION

Factory Model Number 7000	2000	7200		DESCRIPTION
•			**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
•			**CSTR**	Convertible Hydraulic Actuator - From natural to LP gas
•	•	•	**D**	Solenoid Valve - Pilot Gas - Single coil operated on AC
•	•	•	**E**	Electric Actuator - 24VAC
•			**E12**	Electric Actuator - 12VAC
•	•	•	**E120**	Electric Actuator - 120VAC
•		•	**E240**	Electric Actuator - 240VAC
•			**EH**	Electric Heat Motor Actuator (obsolete)
•			**EM**	Electric Actuator with manual override (obsolete)
•			**ESTR-SS**	Electric Solid-State Actuator (obsolete)
•			**F**	Factory Fixed (not adjustable regulator setting (3.5° to 5.0° 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
•			**-1H**	Remote dual hydraulic type - dual bellows
•	•		**HC**	High Capacity Body
•			**HHC**	High Capacity Body AGA rated for side ways or vertical mounting. Can be replaced by HC model
•	•	•	**IPER**	Intermittent Pilot Ignition Gas Valve - regulated
•			**L**	Relight Interlock type. A European requirement
•	•		**LC**	Low Capacity Body - 710 Series
•	•	•	**LP**	For Liquefied Petroleum Gases
•			**M**	Manual Actuator
•			**MS**	Millivolt Safety Magnet - uses thermopile type safety
•			**MV**	Millivolt Actuator
•		•	**P**	Pulse Combustion
•	•	•	**R**	Regulator Type
•		•	**RS**	Adjustable (High - Low) pressure regulator adjusts percentage of output. -3 = 50% of full flow -4 = 60% of full flow -5 = 70% of full flow -6 = 80% of full flow

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

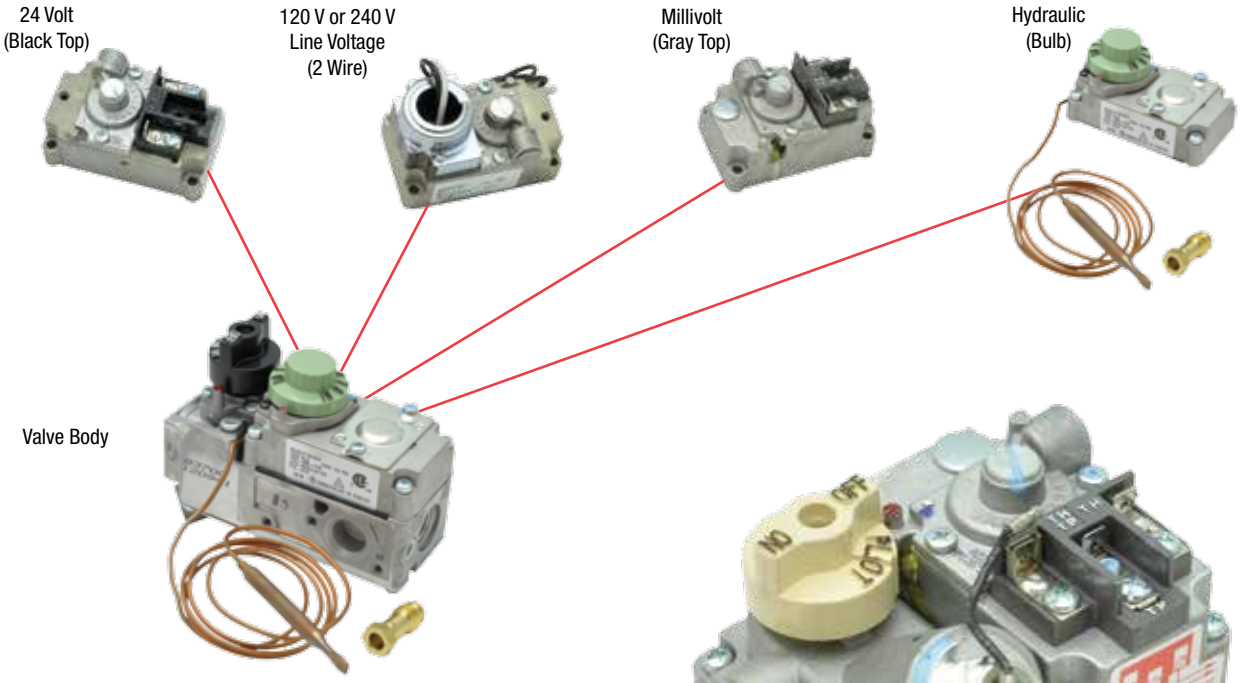
invensys™ Controls

Standard Gas Valves

UNITROL® 7000 - 700 SERIES

ACTUATORS AVAILABLE FOR ALL UNITROL 7000 VALVES (STD, HC, LC, E, ER MODELS)					
FEATURES	12 VOLT DC	24 VOLT	LINE VOLTAGE	MILLIVOLT	HYDRAULIC
Model	7000E, E12	7000E	7000E120 or 7000E240	7000MV	7000S
Ambient Temp	-40°F to 175°F (-40°C to 80°C)	-40°F to 175°F (-40°C to 80°C)	40°F to 175°F (-40°C to 80°C)	40°F to 225°F (-40°C to 107°C)	STD: 58°F to 90°F (14°C to 32°C) HI: 100°F to 250°F (38°C to 120°C)
Power	2.2 Watts	5 Watts	4 Watts	Pull-in Voltage 100mV Drop-out Voltage 15mV	
Current	0.18 Amps @ 12 VDC	0.2 Amps @ 24 VAC	0.034 Amps @ 120V 0.017 Amps @ 240V		
NEC	Class 2	Class 2	Class 1		

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



Low Capacity valve body shown along with Hydraulic bulb actuator

Standard 7000 shown with Millivolt gray top actuator

High Capacity Gas Valves

UNITROL® 7000 HC

The Robertshaw® Unitrol 7000 high capacity (HC) models combine a manual main and pilot gas valve, a separate automatic safety pilot valve, pilot adjustment valve and a diaphragm valve. The regulated models of the Unitrol 7000 series also feature "straight line" gas pressure regulation.

Robertshaw diaphragm gas valves are single function, diaphragm types and are excellent replacements for solenoid gas valves. Models are available with or without a gas cock and regulated or non-regulated. Standard features include pilot outlet, pilot gas filter and pilot adjustment key.

Features and Benefits

- Valves can be mounted in any position except upside down
- High Capacity up to 1,150,000 BTU for LP
- Normally closed solenoid
- High flow rates
- Standard NEMA terminals
- Inlet filtered screen
- Various gas types: natural, manufactured, mixed, LP, and LP/air mixtures
- Multiple actuators available
- RoHS compliant

Specifications

- Sequentially controlled lighting
- Soft ignition available
- Built-in self protection
- Various inlet and outlet sizes available
- Works with various ignition types
  - Hot Surface Ignition (HSI)
  - Direct Spark Ignition (DSI)
  - Intermittent Pilot Ignition (IPI)
  - Standing Pilot
- Agency Certifications
  - CE0085
  - AGA, CSA and British Gas Certified

REGULATION CAPACITIES

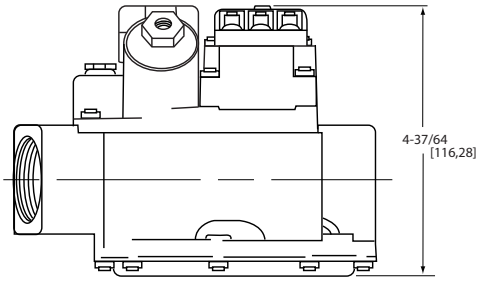
Factory Model	Inlet x Outlet"	Natural Gas BTU @ 1" WC PD	Natural Gas Min - Max BTU Capacity	LP BTU @ 1" WC PD	LP Min - Max BTU Capacity
7000 HC	¾ x ¾	450,000	200,000 - 580,000	730,000	200,000 - 730,000
7000 HC	1 x 1	600,000	200,000- 800,000	972,000	300,000- 1,150,000

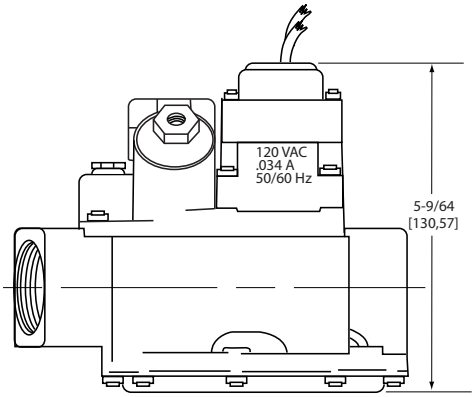
An ISO 9001 – 2008 Certified Company

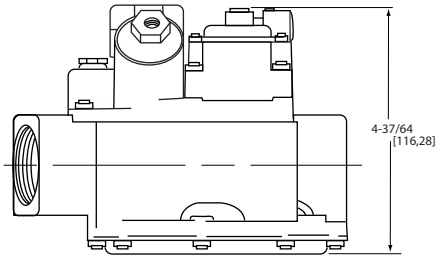
invensys Controls

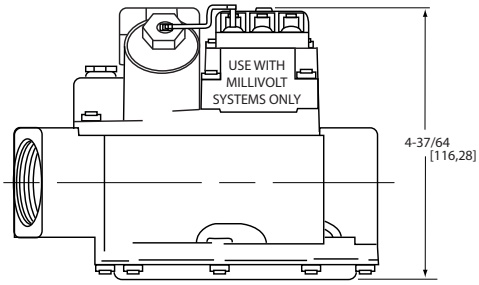
PRODUCT DIMENSIONS

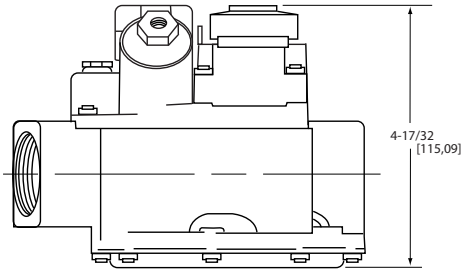
Dimensions are inches and [millimeters]. See page 66 for English to Metric conversions.

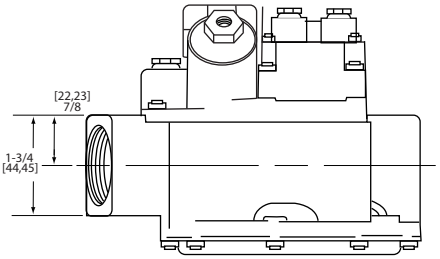


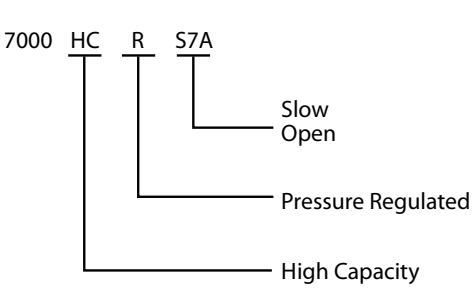


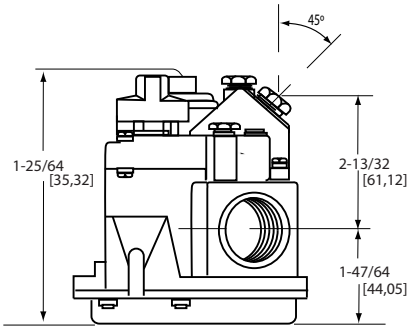


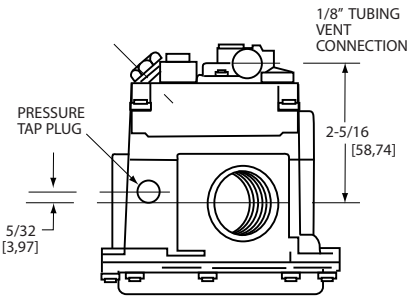












UNITROL 7000GORHC

Low Capacity Gas Valves

UNITROL® 7000 LC - 710 SERIES

The Robertshaw® Unitrol 7000 low capacity (LC) models have a control body of extremely compact size. A variety of operators make this control field upgradable for various applications. The valve's optional inlet sizes plus optional outlet sizes and positions enable this control to be used in very limited space applications such as gas log fireplaces, recreational vehicle heaters, commercial cooking and other lower capacity applications.

Features and Benefits

- Low Capacity (LC) compact size
- Outlet Screen
- Pressure taps for checking inlet and outlet gas pressure (optional)
- Convenient 1/4" and 3/16" spade connectors to prevent mis-wiring
- Multi-position mounting. Any angle between 0° and 90° from upright
- Pilot gas filters
- Field upgradable
- Pilot capacity 2CFH

Specifications

- Range of regulation adjustment:
  - 3.0" to 5.0" WC Natural Gas
  - 8.0" to 12.0" WC LP
- Straight-line regulation
- Maximum operating pressure is 0.5 PSI
- Outlet positions and sizes: straight out, 90° angles 3/8", 1/2" NPT and BSP and 1/2" NPT and BSP inverted flare
- Inlet positions and sizes: straight in 3/8" and 1/2" NPT and BSP
- Electrical rating: millivolt, 12 VDC, 24 VAC, 120 VAC, 240 VAC
- Ambient temperature ratings: -40°F to + 175°F (-40°C to 80°C)
- Agency Certification Numbers
  - CE 0085
  - IAS (#L2755010)
  - UL (#MH7925) certifications and seal for commercial cooking

C SP® US CE *An ISO 9001 – 2008 Certified Company*

invensys™ Controls

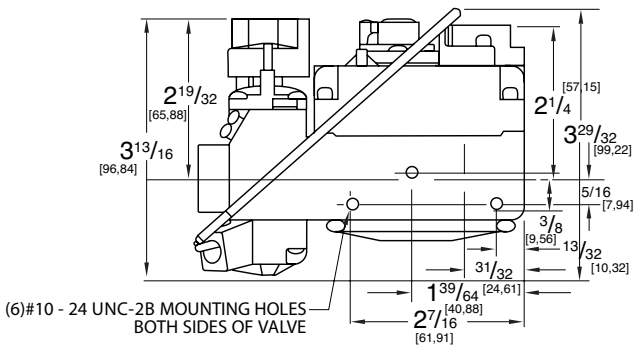
Robertshaw®

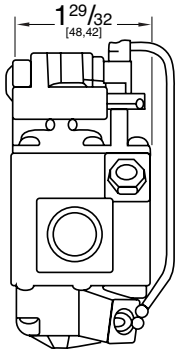
Low Capacity Gas Valves

UNITROL® 7000 LC - 710 SERIES

PRODUCT DIMENSIONS

Dimensions are inches and [millimeters]. See page 66 for English to Metric conversions.

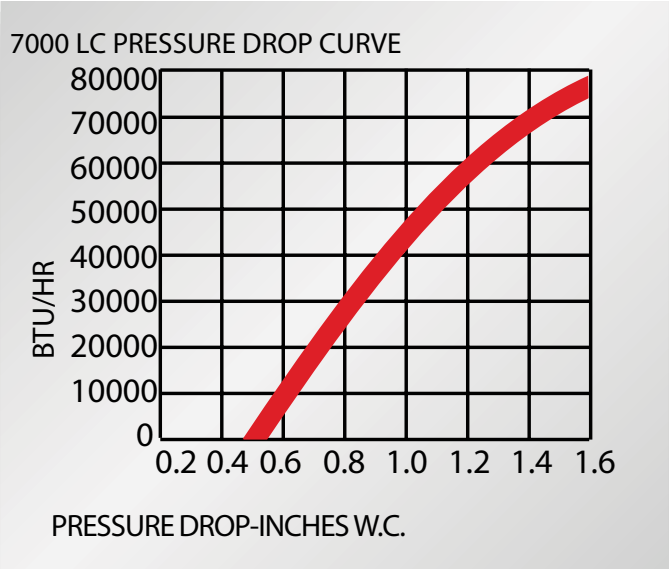




REGULATION CAPACITIES

Factory Model	Inlet x Outlet"	Natural Gas BTU @ 1" WC PD	Natural Gas Min - Max BTU Capacity	LP BTU @ 1" WC PD	LP Min - Max BTU Capacity
7000 HC	3/8 x 3/8	40,000	5,000 - 70,000	65,000	5,000-110,000
7000 LC	1/2 x 1/2	40,000	5,000-70,000	65,000	5,000-110,000

OUTLET PRESSURE DROP CURVE



invensys™ Controls

Electric Regulated Gas Valves

UNITROL® 7000E AND 7000ER

The Robertshow® Unitrol 7000 electric regulated gas heating controls are designed and developed for a variety of applications. The 7000E and 7000ER are compact controls combining:

- Manual and pilot gas valve
- Separate automatic safety pilot valve
- Pilot adjustment valve
- Pilot and bleed gas filtration
- Automatic electric main diaphragm valve

The 7000ER also includes gas pressure regulation so it can be applied to a wide range of capacity requirements without regulator readjustment.

7000E
700-401

7000ER
700-402

Features and Benefits

- Electric gas valve with or without regulation
- Normally closed solenoid
- Compact size with high flow rates
- Standard NEMA terminals
- Inlet filtered screen
- Various gas types: natural, manufactured, mixed, LP, and LP/air mixtures
- Multiple actuators available
- RoHS compliant

Specifications

Ambient Temperature	-40°F to +175°F (-40°C to 80°C)
Power Consumption	5 Watts
Current @ 24 VAC	0.2 Amps
NEC	Class 2
Pressure Rating	0.5 PSI maximum
Mounting	Limited horizontal and vertical
Voltages	24, 120 or 240VAC
Agency Certifications	CE 0085 and CSA

An ISO 9001 – 2008 Certified Company

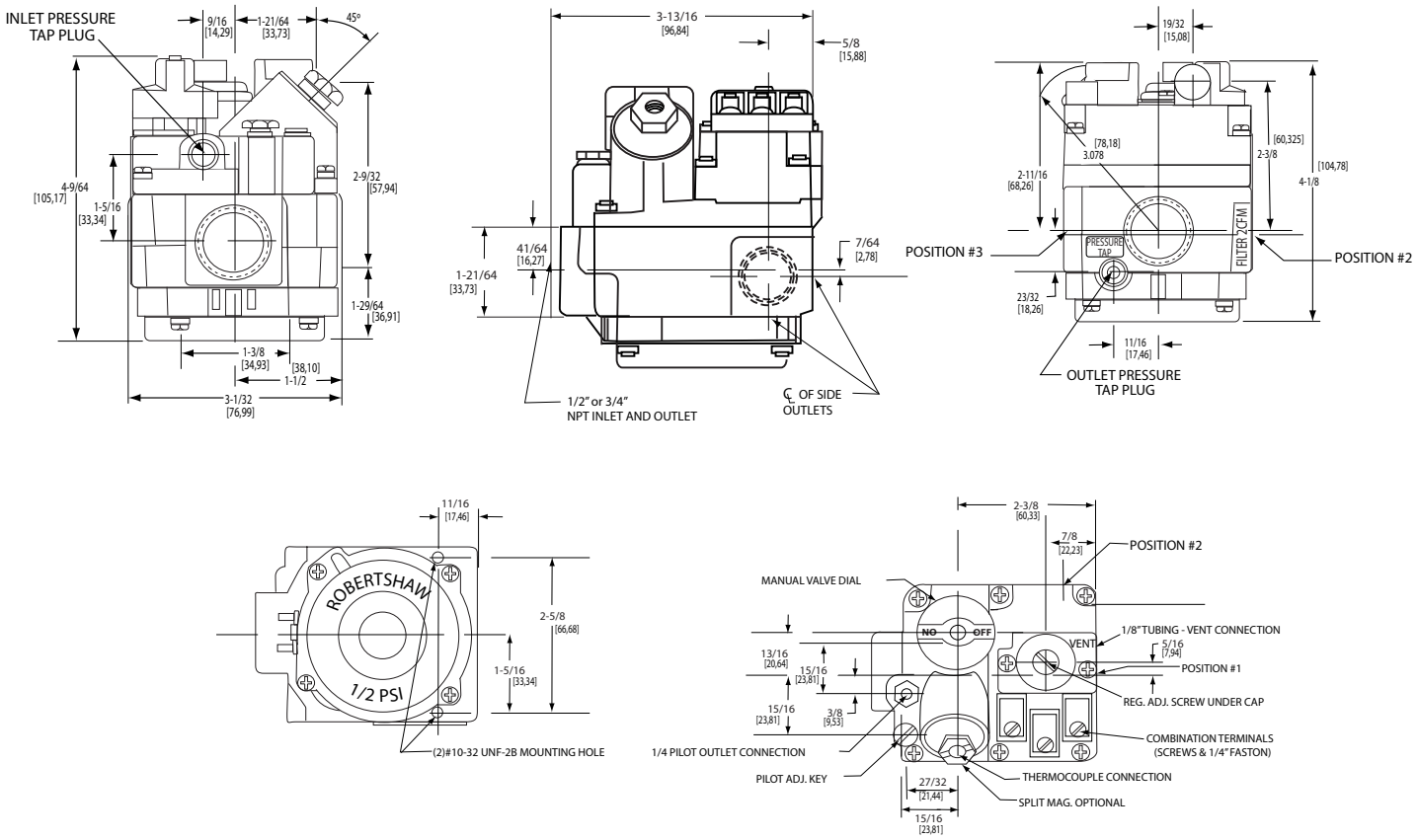
invensys Controls

Electric Regulated Gas Valves

UNITROL® 7000E AND 7000ER

PRODUCT DIMENSIONS

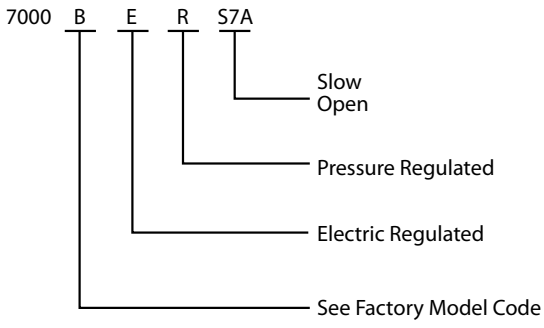
Dimensions are inches and [millimeters]. See page 66 for English to Metric conversions.



REGULATION CAPACITIES

Factory Model	Inlet x Outlet"	Natural Gas BTU @ 1" WC PD	Natural Gas Min - Max BTU Capacity	LP BTU @ 1" WC PD	LP Min - Max BTU Capacity
7000 AER	3/8 x 3/8	100,000	10,000 - 140,000	160,000	10,000 - 225,000
7000 AER	1/2 1/2	100,000	10,000 - 140,000	160,000	10,000 - 225,000
7000 BER	1/2 x 1/2	240,000	29,000 - 290,000	377,000	45,000 - 455,000
7000 BER	3/4 x 3/4	300,000	34,500 - 370,000	485,000	34,500 - 560,000

PART NUMBER NOMENCLATURE



invensys Controls

Millivolt Gas Valves

7500 MV - 750 SERIES

The Robertshaw® 7500 Millivolt (MV) gas valve is a stand alone unit powered by a current generated by the pilot flame on a thermocouple and/or thermopile. It incorporates a manual valve, automatic actuator valve, main gas regulator and pilot gas adjustment. The manual valve has positions for Off, Pilot and On. The safety magnet valve is activated when the Pilot position is selected. The 7500 MV gas valves are designed for commercial cooking, space heating, fireplaces, infrared heating and other light commercial applications.

Features and Benefits

- Eliminates the need for a regulator kit - field convertible, adjusting for natural gas or LP at the installation point
- Reduces inventory for manufacturers and distributors
- Makes servicing easy by locating the outlet, pilot outlet and thermocouple connections on same surface
- Incorporates the tightest leakage requirement (less the 400cc internal / 60cc external)
- Comes in compact size with enhanced aesthetics and design flexibility
- Includes pressure taps for checking inlet and outlet gas pressure
- Includes convenient $^{1}/_{8}$" and $^{3}/_{16}$" spade connectors
- Allows for multi-position mounting between 0° and 90° from upright
- Uses pilot gas filters

Specifications

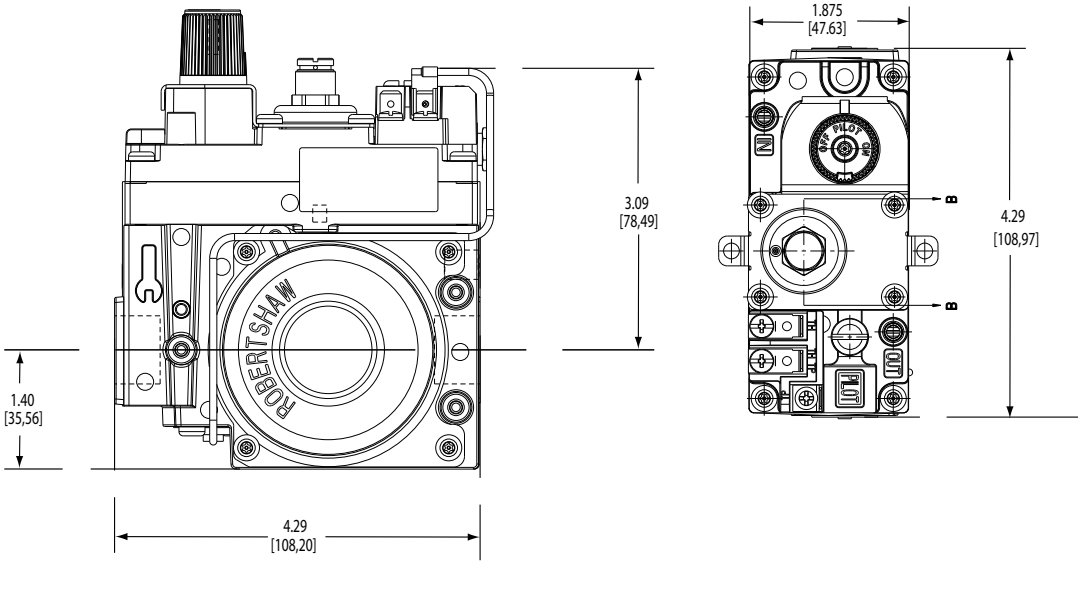
- Range of regulation adjustment:
  - 3.0" to 5.0" WC Natural Gas or 8.0" to 12.0" WC LP
- BTU rating up to 160,000 for natural gas
- Hi/Lo regulator allows for up to 50% flow reduction straight-line regulation
- Maximum operating pressure is 0.5 PSI
- Outlet positions and sizes: straight out or bottom outlet $^{3}/_{8}$", $^{1}/_{2}$", NPT and BSP
- Inlet positions and sizes: straight in $^{3}/_{8}$", $^{1}/_{2}$", NPT and BSP
- Ambient temperature ratings: 0°F to 185°F (-18°C to 85°C)
- Pilot filter capacity 2 cu. ft/hr.
- Pull-in voltage: 110 mV maximum
- Drop-out voltage: 25 mV minimum
- Agency Certifications
  - CSA, CE, and AGA certified
  - CE 0085

C SP® US CE *An ISO 9001 – 2008 Certified Company*

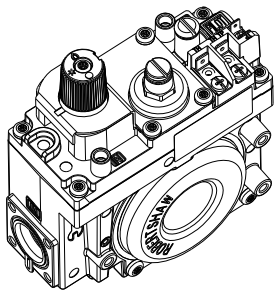
invensys™ Controls

PRODUCT DIMENSIONS

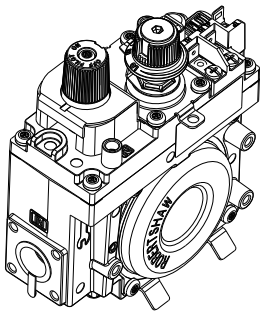
Dimensions are inches and [millimeters]. See page 66 for English to Metric conversions.



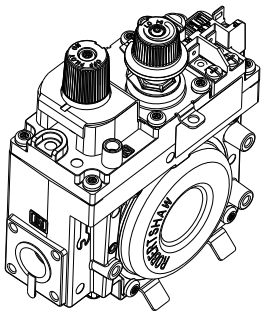
OPTIONAL MODELS



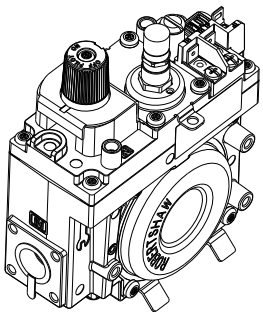
U7500MVR



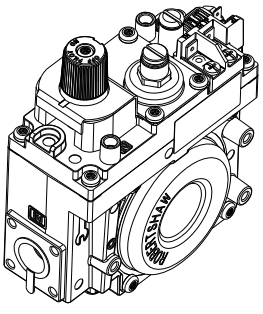
7500MVRBC



7500MVRB & 7500MVRB-LP



7500MVRC



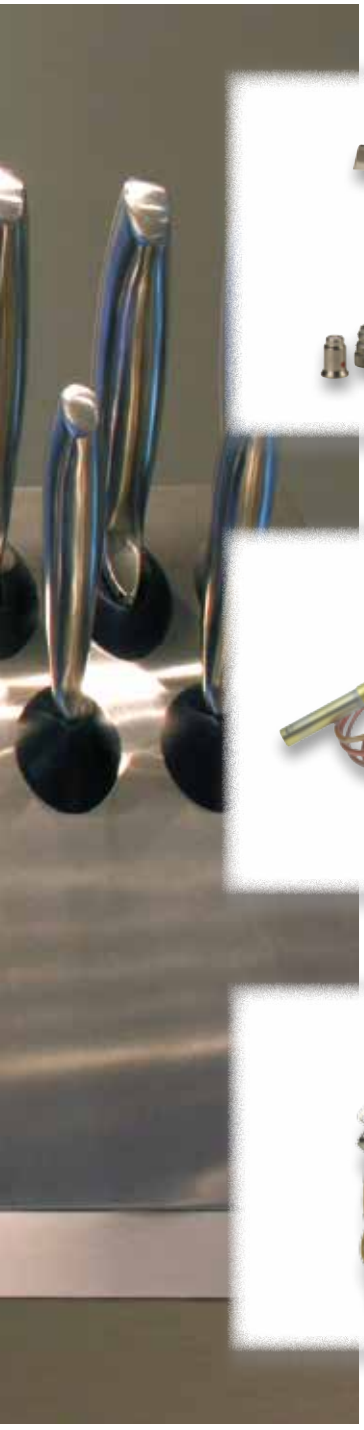
7500MVR & 7500MVR-LP

Optional flange inlet fittings: $^{3}/_{8}$", $^{1}/_{2}$", NPT and BSP

Optional pilot outlet fittings: $^{1}/_{8}$", $^{3}/_{16}$", and $^{1}/_{4}$" Tubing

COMPLIMENTARY COMPONENTS

invensys™
Controls



Uniquely customize your cooking solutions with the right complimentary components.

Finding appropriate accessories for starting and detecting heat in commercial cooking is important to safety and complimenting the appliance. The Robertshaw® pilots, sensors and ignitors are highly dependable and designed to deliver individualized commercial cooking solutions.

Complimentary Components

invensys™
Controls

Pilots and Ignitors

C AND S SERIES - 1830 SERIES

1820 SERIES PG9 REPLACEMENT PILOT UNI-KITS®

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

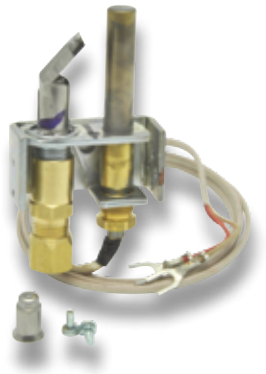
1830 (2CH & 2C SERIES) INCINERATOR-TARGET PILOT UNI-KITS

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

1830-700 SERIES PILOT ELECTRODES

The 1830-700 Series Pilot Uni-Kits are designed for use with the OEM-style Pilot Ignition systems. The electrode is permanently riveted to the pilot frame and the spark gap is fixed at 1/8". These pilots can be used to replace existing pilot assemblies or for retrofitting standing pilot applications when an exact replacement is desired.

2CH
1820-009



6CH24-6
1830-490

6S14-2ER
1830-717

Features and Benefits

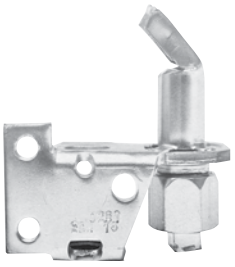
- Many flame pattern types available
- Thermocouple or thermopile options
- Spark electrode available
- Horizontal or vertical gas inlet
- Several mounting bracket types available
- Aerated pilots with non-linting characteristics

Specifications

- Pilot tubing size is typically ¼"
- Incinerator type pilots
- Natural gas orifice installed typically with separate LP gas orifice
- Various lead lengths 13" to 48" [330 mm to 1220 mm]
- Various flame hoods (1, 2 or 3) with different orientations
- Left or right hand flame orientations

An ISO 9001 – 2008 Certified Company

PILOT MODEL TYPE IDENTIFICATION



HOOD TYPE
(5 Types)

PILOT TYPE

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

Note: Uni-Kits® are "CH" type with adaptor to convert to "C" type

2 CH AL 24-6

DRAFT SHIELD
(Optional)

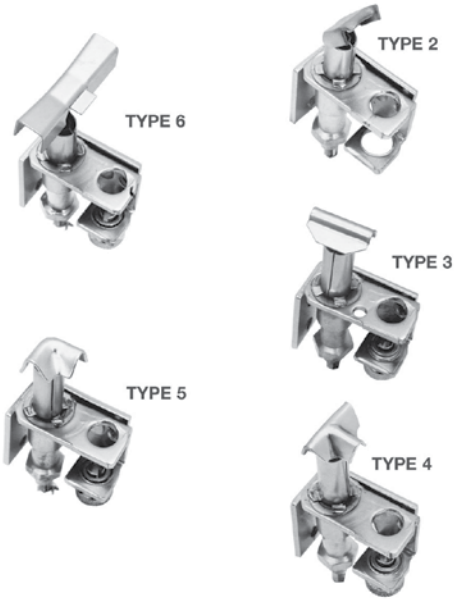
FLAME PATTERN
"L" for Left Hand
"R" for Right Hand

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

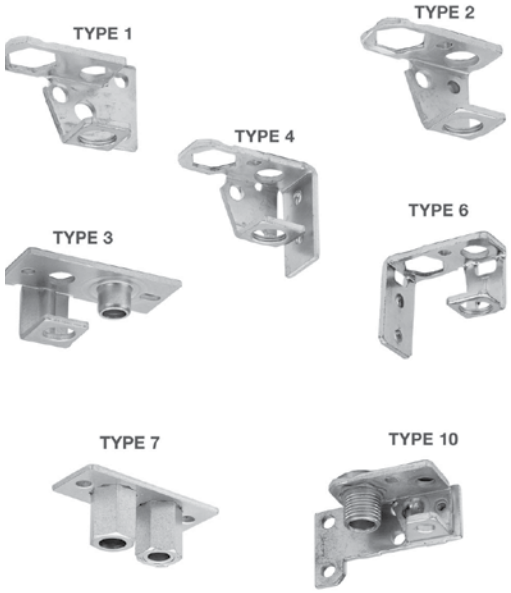
BRACKET TYPE
(7 Types)

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]

HOOD TYPE

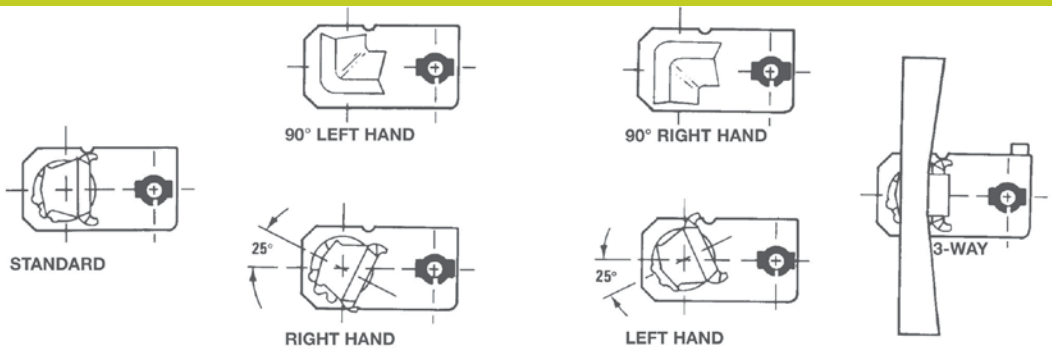


MOUNTING BRACKET TYPE



Note: Additional mounting bracket types available

FLAME PATTERN TYPE



invensys Controls

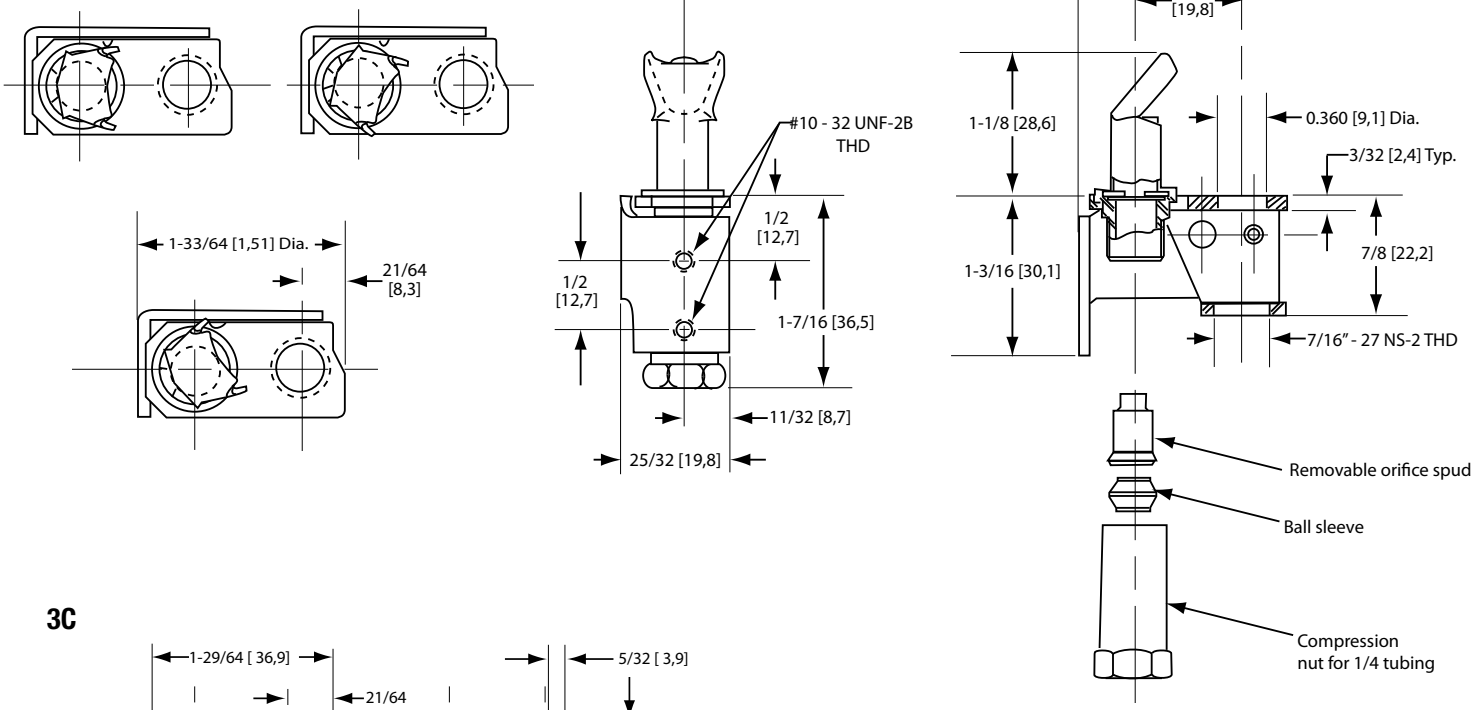
Pilots and Ignitors

C AND S SERIES - 1830 SERIES

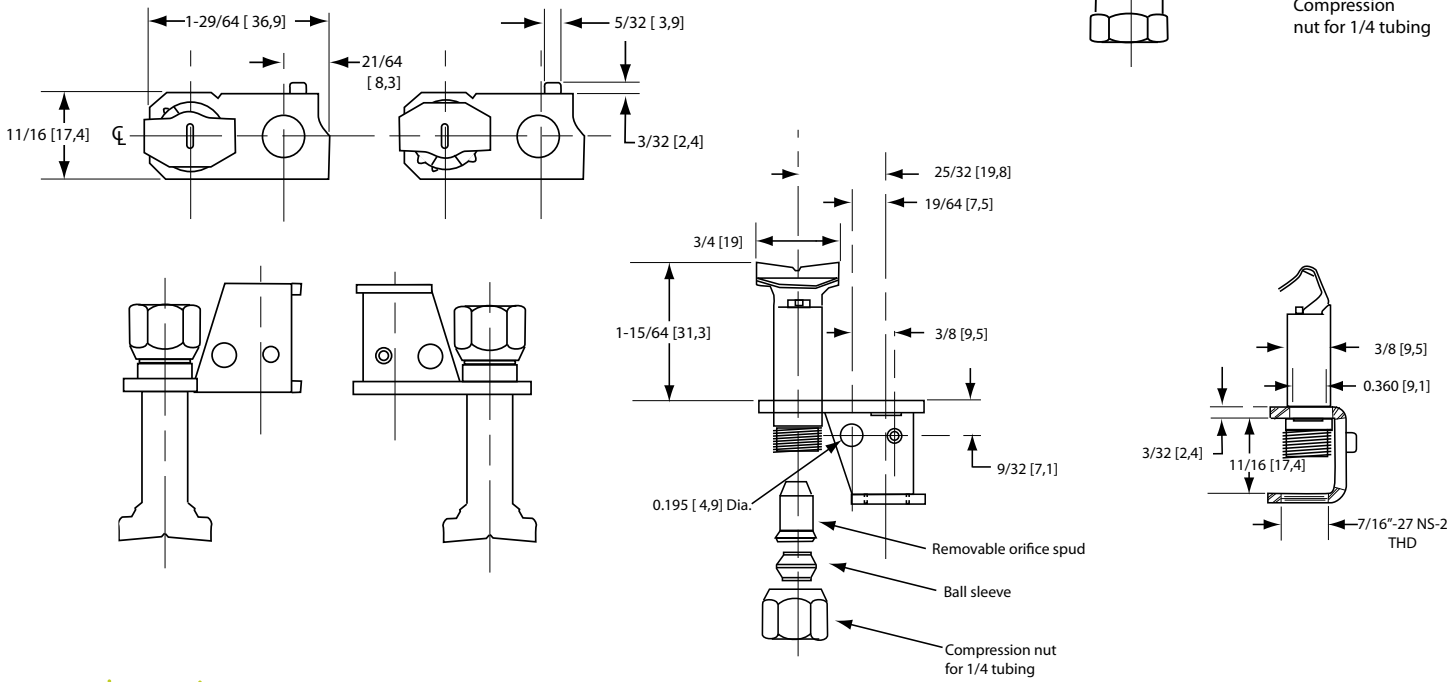
PRODUCT DIMENSIONS

Dimensions are inches and [millimeters]. See page 66 for English to Metric conversions.

2C



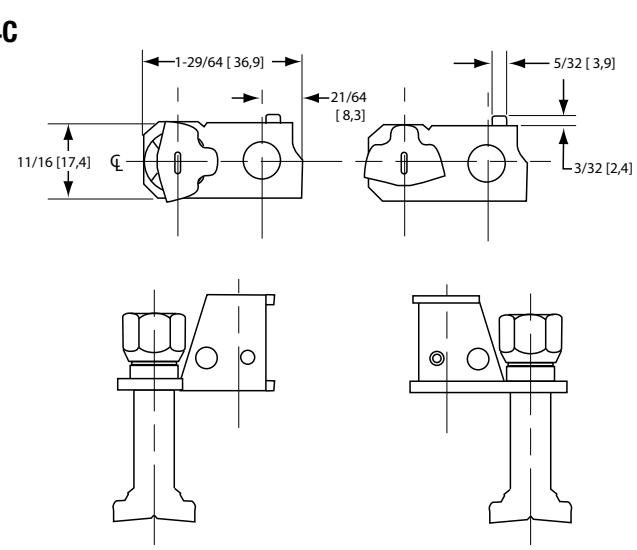
3C

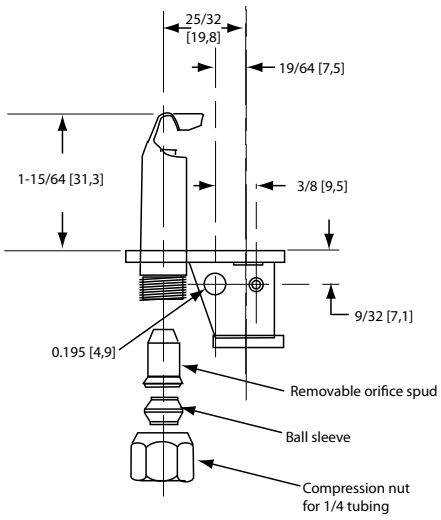


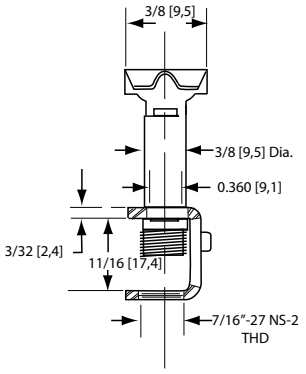
PRODUCT DIMENSIONS

Dimensions are inches and [millimeters]. See page 66 for English to Metric conversions.

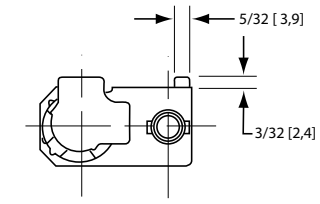
4C

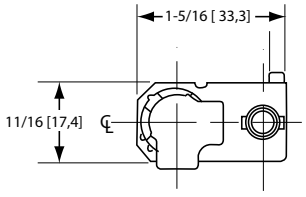


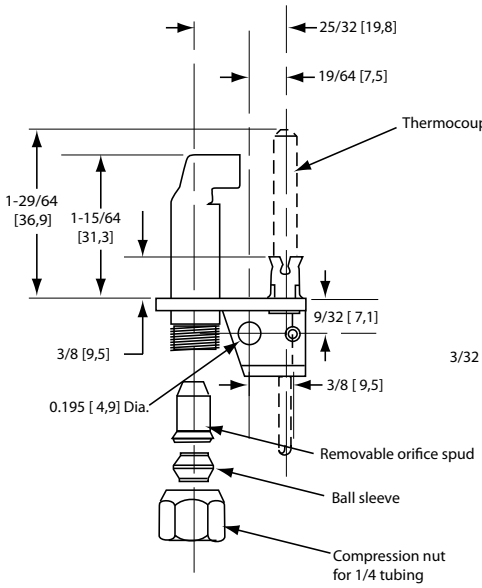


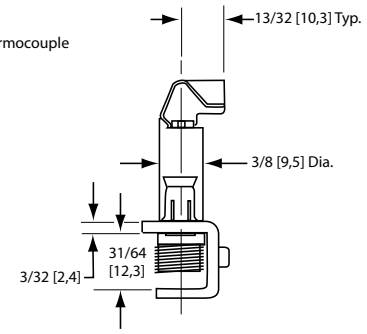


5C









Thermocouples

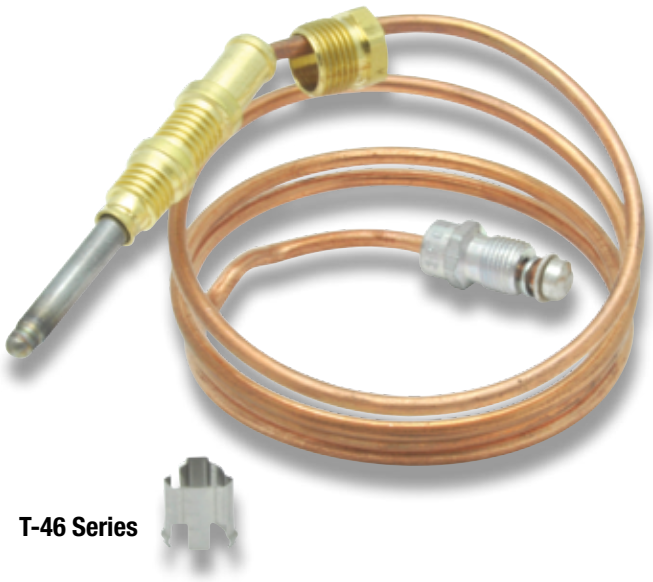
T46 AND 2C SERIES - 1900 AND 1980 SERIES

Robertshaw® thermocouples are the industry leader for gas heating and appliances. Their primary function is to ensure a standing pilot light is operative so that on a call for heat, the main burner gas will be properly ignited. Thermocouples are placed in gas applications to detect existence of a flame for safety purposes by shutting off the potential gas flow to a burner.

The Robertshaw thermocouples are made of two different metals with various lengths. A thermocouple 18" [460 mm] long has a lower resistance and higher electrical output compared to a 72" [1830 mm] thermocouple which has a higher resistance (longer wire) and, therefore, lower electrical output.

The 1980 Series are T-46 thermocouples which have a threaded nut attached and a tinnerman clip included.

The 1980 Series Snap-Fit® thermocouples, also known as 2C thermocouples, offer easy installation into the majority of pilot burners. Both slim and standard thermocouple types are available in the 1980 Series. They are manufactured without complicated adaptors, but with extra insulation that the brass sheath provides under high ambient temperatures.



T-46 Series

Features and Benefits

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

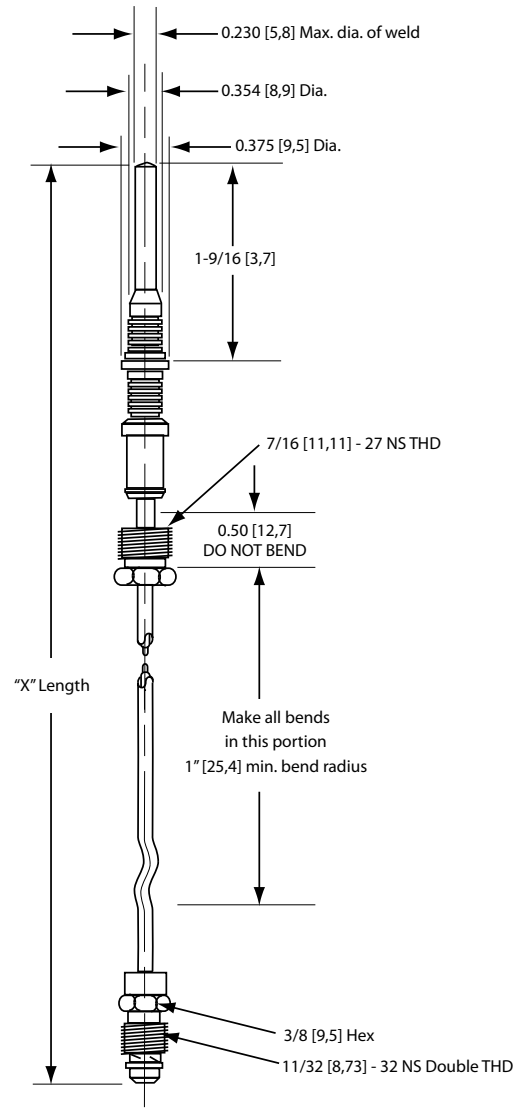
Specifications

- Lead lengths range from 12 to 72" [305 to 1830 mm]
- Open circuit output: 25 and 30 millivolts
- Connection Type: Male connector nut

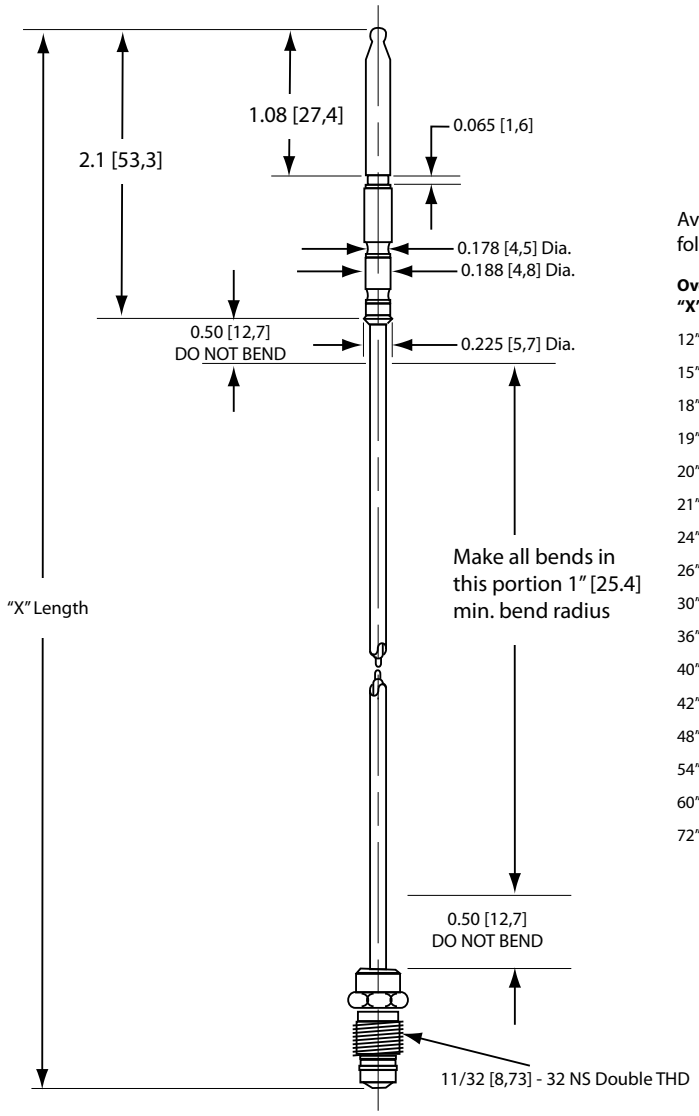
PRODUCT DIMENSIONS

Dimensions are inches and [millimeters]. See page 66 for English to Metric conversions.

T-46 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]

Thermopiles

TP-75 AND CP-2 SERIES / 1950 AND 1951 SERIES

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

A thermopile is the assembly of many thermocouples to increase the millivolt output. Robertshaw thermopiles have two types of connections: coaxial and two-wire spade connectors.

The 1950 thermopiles, also known as TP-75, are two-wire spade connectors. The 1951 thermopiles, also known as CP-2 (500-600 millivolts) are coaxial connectors.

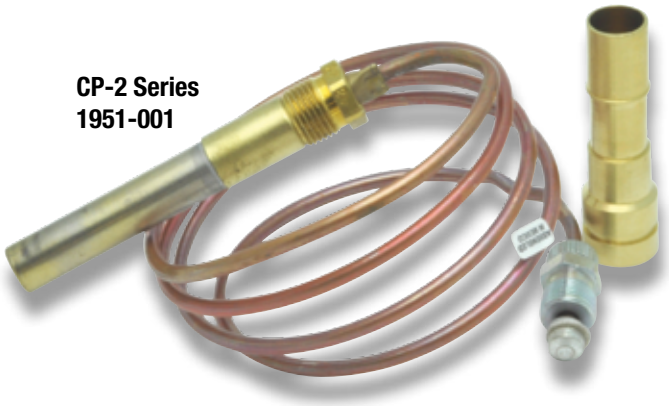
The 1950 and 1951 Series Thermopiles (pilot generators) are designed for use on self-powered gas control systems. They can be used to replace similar competitive devices.

TP-75 Series
1950-001

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

CP-2 Series
1951-001



Specifications

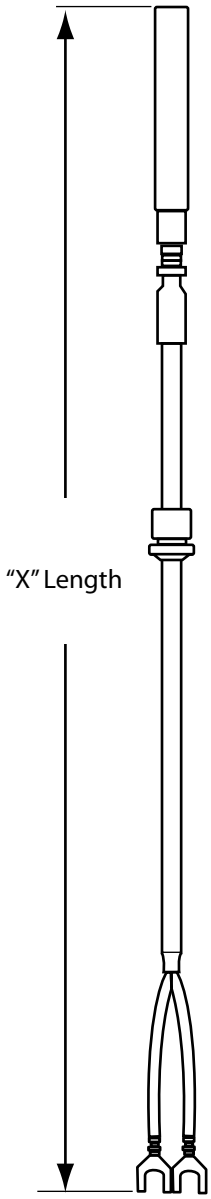
- Lead lengths range from 18 to 60" (460 to 1525 mm)
- Open circuit output: 500-750 millivolts
- Connection Type: Male connector nut
- Includes PG9 Pilot Adaptor

An ISO 9001 – 2008 Certified Company

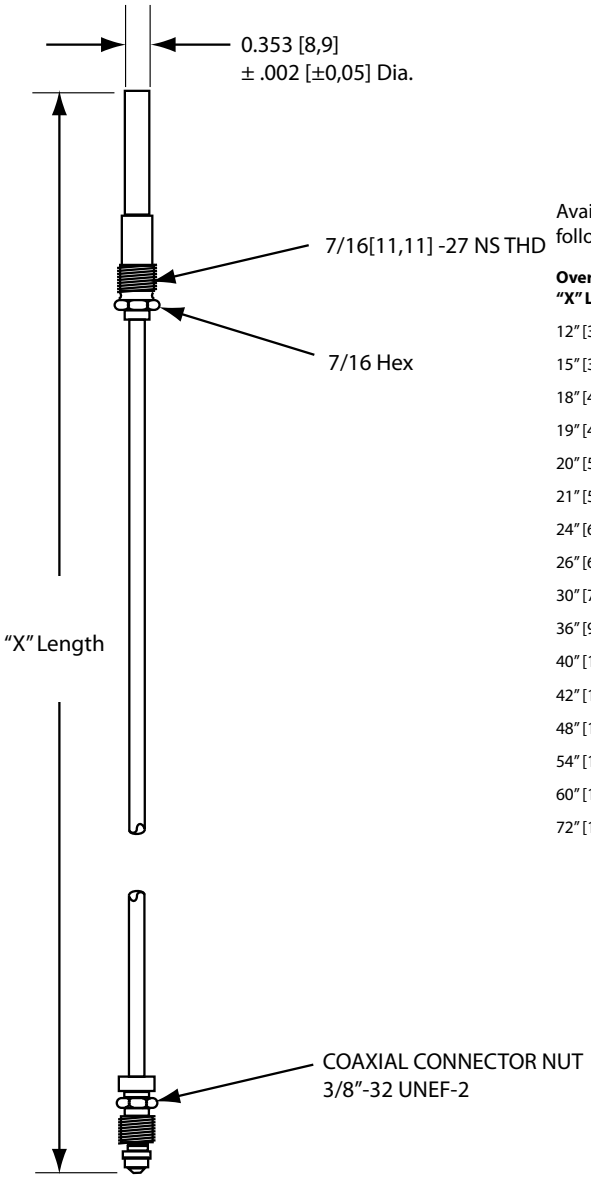
PRODUCT DIMENSIONS

Dimensions are inches and [millimeters]. See page 66 for English to Metric conversions.

TP-75 Series



CP-2 Series



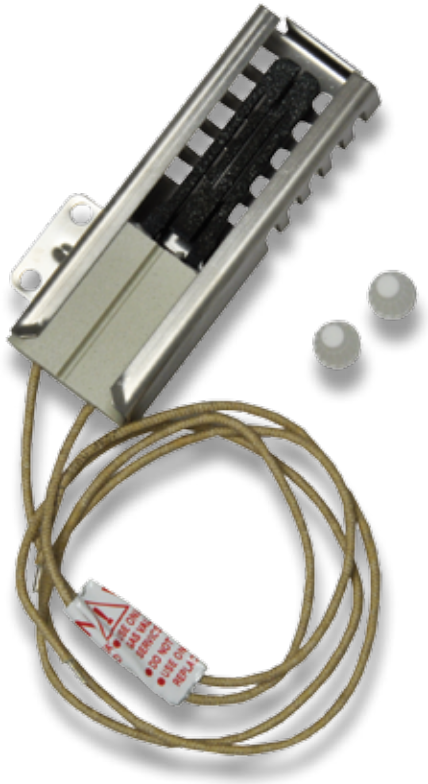
Available in the following lengths:

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]

Cooking Hot Surface Ignitors

41-200 SERIES

Robertshaw® hot surface ignitors are engineered to meet all your gas range and oven needs. These ignitors are used in the ranges of most major appliance OEMs. In addition, these ignitors are designed to match the Robertshaw bi-metal gas valves.



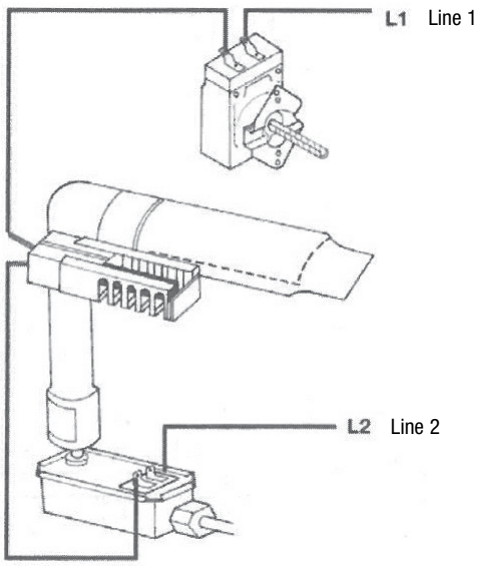
Features and Benefits

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

Specifications

- Commercial 24 VAC and residential 120 VAC versions available
- Ratings of 1.4 to 3.6 Amps available
- Replaces carborundum style ignitors
- Leads available in 4.5" to 40" [114mm to 1016mm]

TYPICAL APPLICATION



An ISO 9001 – 2008 Certified Company

invensys Controls

Cooking Hot Surface Ignitors

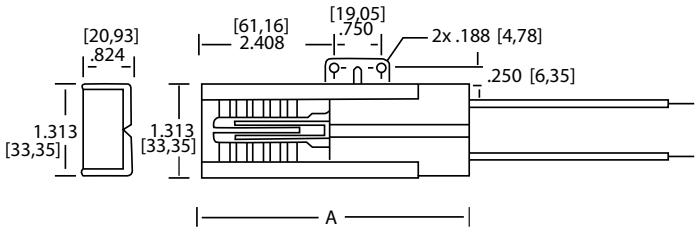
41-200 SERIES

PRODUCT DIMENSIONS

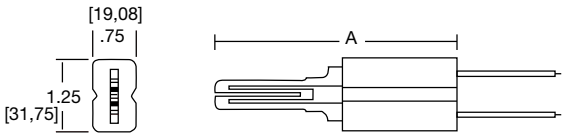
Dimensions are inches and [millimeters]. See page 66 for English to Metric conversions.

Four examples of the many styles available.

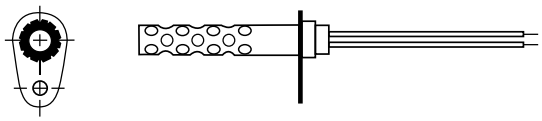
TYPE 501A & 551A (Blue Ceramic)



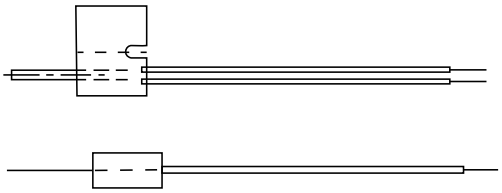
TYPE 501



TYPE 401 XM



TYPE 401 N



PART NUMBER SELECTION

Part	Length A	Lead Length	Type	Amp Rating	Operating Voltage	Comments
41-202	5½" [140mm]	16¾" [426mm]	501A	3.2 to 3.6 A	120 VAC	
41-203	6¼" [159mm]	11½" [292mm]	501A	3.2 to 3.6 A	120 VAC	
41-204	4½" [114mm]	14½" [368mm]	501A	3.2 to 3.6 A	120 VAC	
41-205	3½" [89mm]	19" [483mm]	501A	3.2 to 3.6 A	120 VAC	
41-206	7¼" [184mm]	8 3/8" [213mm]	501	3.2 to 3.6 A	120 VAC	No Shield 5½" [140mm] Ceramic
41-207	7½" [191mm]	12" [305mm]	501A	3.2 to 3.6 A	120 VAC	
41-208	4½" [114mm]	4¼" [108mm]	551A	2.5 to 3.0 A	120 VAC	Replaces Round Carborundum Ignitors - Blue Ceramic
41-209	3½" [89mm]	16¾" [426mm]	501	3.2 to 3.6 A	120 VAC	Has Plug Adaptor
41-210	3¾" [95mm]	8 3/8" [213mm]	501	3.2 to 3.6 A	120 VAC	No Shield
41-224	NA	36" [914mm]	401XM	1.4 to 2.1 A	24 VAC	
41-423	NA	40" [1016mm]	401N	1.4 to 2.1 A	24 VAC	

WARNING: It is the responsibility of the OEM to determine if flame sensing through the ignitor is viable for each application.

CATALOG INDEX

ENGLISH TO METRIC CONVERSIONS
1 BTU = 0,252 kilocalories
1 PSI = 68,95 millibars
1 inch = 25,40 millimeters
1 inch - lbs = 0,113 newton meters

Customer Toolbox for 24/7 Real Time Information and Support

This secure site enables you access to track order status, accounts receivable, pricing, invoicing, sales tools, online literature orders, training resources and much more. Register Today.

http://toolbox.InvensysControls.com

Enhanced Websites and Tools

Visit **www.InvensysControls.com** for complete product information and the industry's most complete and up-to-date cross reference tool.

ITALY - Eliwell Controls s.r.l. - Pieve d'Alpago (Belluno)

Telephone +39 0437 986 111
Fax +39 0437 989 066
Sales +39 0437 986 100
Email saleseliwell@invensys.com
Technical Support +39 0437 986 300
Email techsuppeliwell@invensys.com

RUSSIA - Moscow

Telephone +7 499 611 79 75
Fax +7 499 611 78 29

CHINA - Invensys Automation and Controls Systems Co. Ltd - Shanghai

Telephone +86 21 614 511 88
Fax +86 21 614 511 89
Email eliwell.china@invensys.com

UNITED STATES - Invensys Controls Headquarters - Carol Stream, IL

Commercial Sales +1 630 260 7155
Customer Service +1 800 304 6563
Email HVACCustomerService@Invensys.com
Technical Support +1 800 445 8299
Email TechnicalService@Invensys.com

www.invensyscontrols.com