



YOUR PRESSURE AND TEMPERATURE SWITCH SOURCE

MULTIFUNCTION PRESSURE AND TEMPERATURE SWITCHES

- SINGLE SETPOINT, FIXED DEADBAND
- SINGLE SETPOINT, ADJUSTABLE DEADBAND
- DUAL SETPOINT



DRESSER INSTRUMENT

BULLETIN SWGL-1

A Halliburton Company

PRODUCT INFORMATION

Dresser Control Instrument Operation is a supplier of highly reliable Ashcroft® switches and controls for industrial and process applications. We stress total value to the customer. We begin with rock-solid designs, matching the most appropriate technology with the safety and reliability requirements of the applications. Materials of construction are specified to the exacting standards of Dresser Instrument Division, and product is built to last in the toughest applications. Our modern, responsive manufacturing facility in Milford, Connecticut is supported by an extensive network of stocking distributors and factory sales offices located in virtually

every part of the world. Special application assistance is always only a telephone call away.

Ashcroft pressure and temperature switches are designed for the tough applications where conventional designs often don't measure up. A rugged 316 SS or epoxy-coated aluminum enclosure gives uncompromising protection. Materials of construction have been selected for long life. A wide variety of precision switch elements, including hermetically sealed contacts for added reliability and safety are available to meet every application requirement. The actuators we use have been proven in more than 30 years of service in the world's plants and

mills. Multiple features such as dual setpoints and adjustable deadbands are offered. Special designs are available for fire safety, limit control and other stringent requirements. Ease of use is stressed to improve reliability of the installation.

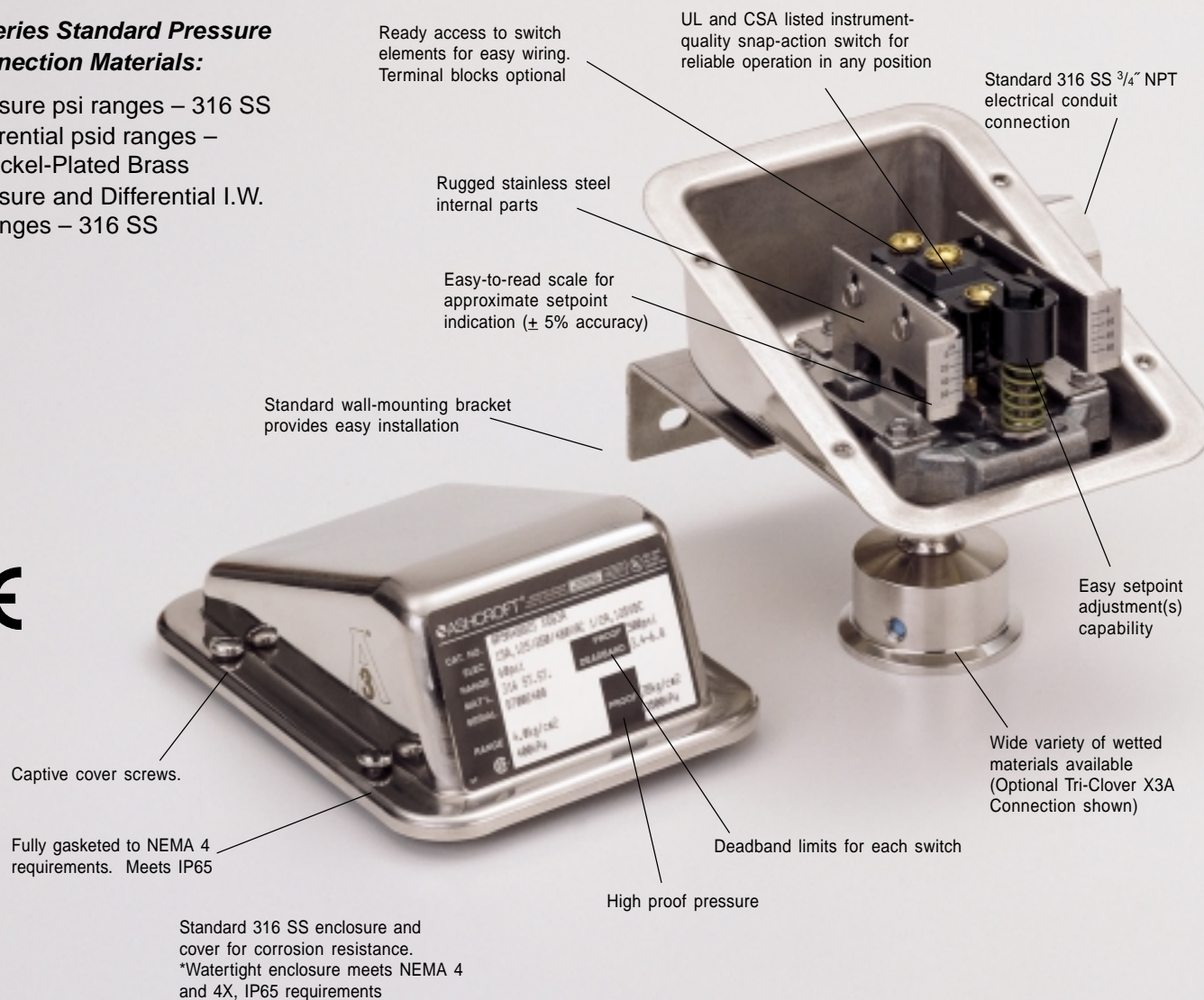
G- and L-Series switches are currently being used successfully in pulp and paper mills, refineries, chemical and petrochemical plants, dairies, breweries, water and sewage treatment plants, steel mills, and other tough environments. Typical applications are on compressors, pumps, paint spraying equipment, boilers and burners, turbines, reverse osmosis systems, filters and presses.

G-SERIES

G-Series Standard Pressure Connection Materials:

Pressure psi ranges – 316 SS
Differential psid ranges –
Nickel-Plated Brass
Pressure and Differential I.W.
ranges – 316 SS

CE



Hermetically Sealed Switch

We recommend hermetically sealed switch elements for improved reliability. The hermetically sealed Ashcroft® switch provides uncompromising contact protection in harsh or corrosive environments. It also satisfies requirements for installation in Division II hazardous areas.

Features:

- UL recognized component, guide WSQ2, File E85076
- All-stainless steel welded construction



Hermetically sealed switch shown above in Ashcroft® 700 series enclosure.

RECOMMENDED PRACTICE:

All controls should be selected considering the media and ambient operating conditions. Improper application can be detrimental to the switch, cause failure and possibly personal injury or property damage.

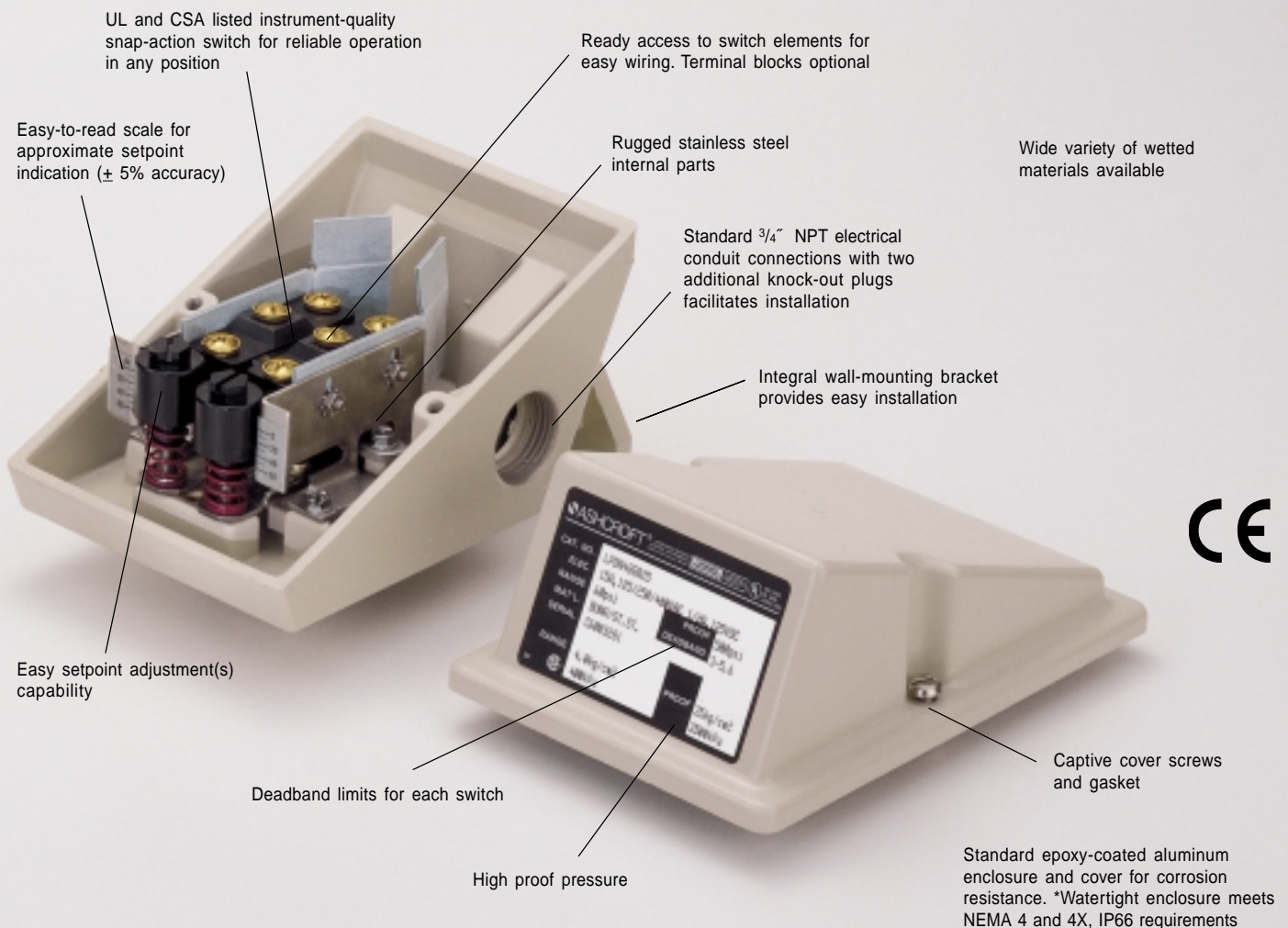
The information in this catalog is offered as a guide to assist in making the proper selection of Ashcroft controls.

Additional information is available from Control Instrument Operations. Sales offices are listed on the back cover.

L-SERIES

L Series Standard Pressure Connection Materials:

Pressure psi ranges – 316 SS
Differential psid ranges –
Nickel-Plated Brass
Pressure and Differential I.W.
ranges – Epoxy Coated
Carbon Steel,



CE

G and L PRESSURE RANGES

Pressure and Differential Pressure Switches

G- and L-Series pressure, differential pressure and vacuum switches use two different actuators depending on setpoint requirements. For setpoints between 2 and 3000 psi, the simple, rugged diaphragm-sealed piston actuator is used. This design features high reliability and a choice of actuator seal materials for virtually every application. An optional welded design is also

available for setpoints up to 1000 psi for maximum reliability. This design is available in 316 SS or Monel. Differential pressure models use a unique dual-diaphragm-sealed piston design that features very high static operating pressures and small size.

For setpoints between 4.5 and 150 inches of H₂O, a large diaphragm is used for increased sensitivity in both pressure and differential pressure designs with good choice

of materials of construction.

All standard models feature ± 1 percent of range setpoint repeatability and a minimum of 400 percent of range proof pressures.

These standard designs perform well in applications where shock and vibration could be a problem and may be used with Ashcroft diaphragm seals in extreme services such as slurries or abrasive process fluids.

PRESSURE/VACUUM SWITCHES												
Nominal Range ⁽¹⁾		Overpressure Ratings		Approximate Deadband (Buna-N Diaphragm) ⁽²⁾								
				LPA-GPA ⁽³⁾	LPS-GPS ⁽⁴⁾				LPD-GPD ⁽⁴⁾			
		Proof psi	Minimum Burst psi		Switch Element							
J, H	G			J, H	K, F	P	GG	JJ, HH	KK,FF	PP		
Vacuum												
-30° Hg	-760mm Hg	250	400	6-24	2.5-4	4-6	1-2	1-2.5	3-5.5	4-6.5	1-2	1-2.5
Compound												
-30° Hg/	-760mm Hg/	250	400	6-24	2.5-4	4-6	1-2	1-2.5	3-5.5	4-6.5	1-2	1-2.5
15 psi	1.0 kg/cm²			3-12	1-2.5	1-3.5	0.5-1.5	0.5-2	1.5-3.5	1.5-4	1-2	1-2
Pressure												
30° H ₂ O	750mm H ₂ O	20	35	4.0-27	1.5-3.5	2.0-4.0	0.5-1.0	0.7-2.0	2.1-4.9	2.8-5.6	0.7-1.4	0.7-2.8
60° H ₂ O	1500mm H ₂ O	20	35	5.0-54	1.5-4	2.5-5.0	0.5-1.4	1.0-2.5	3-5.6	3.5-7.0	0.7-2.0	2-3.5
100° H ₂ O	2500mm H ₂ O	20	35	8.5-90	2.0-5.5	4.0-8.5	1.0-2.0	1.4-3.0	4-7.7	5.6-11.7	1.4-2.8	2-4.2
150° H ₂ O	3750mm H ₂ O	20	35	18-135	5.0-11	10-18	1.5-3.0	2.0-6.0	7.0-16	14-25.1	2.1-4.2	5-9.2
15 psi	1 kg/cm²	500	1000	2.5-13	1.0-1.5	1.0-2.5	0.5-1.0	0.75-1.5	1.4-2.1	1.4-3.5	.7-1.4	1-1.4
30 psi	2 kg/cm²	500	1500	3.0-27	1.0-2.8	1.0-3.2	.75-1.5	1-1.8	1.4-5	3-6	1-2.1	1.4-2.5
60 psi	4 kg/cm²	500	1500	5.0-54	2.0-4.0	2.0-4.5	1.0-2.0	1.0-2.5	3-7	4-8	1.4-2.8	1.4-3.5
100 psi	7 kg/cm²	1000	3000	10-90	3-6	5.0-10	1.0-2.5	1.4-3.2	7-12	7.0-14	1.4-3.5	3-7
200 psi	14 kg/cm²	1000	3000	18-180	7-14	10-18	1.0-4.0	5.0-8.0	10-23	14-25	1.4-5.6	7.0-11.2
400 psi	28 kg/cm²	2400	3000	45-360	16-30	16-45	4.0-8.0	5.0-15	22-42	22-63	5.6-11.2	7.0-21
600 psi	42 kg/cm²	2400	3000	75-540	16-50	20-75	5.0-15	6.0-25	22-70	28-105	7.0-21	8.0-35
1000 psi	70 kg/cm²	12,000	14,000	160-900	75-130	50-160	7.0-30	10-85	70-180	70-223	10-42	14-119
2000 psi	140 kg/cm²	12,000	14,000	350-1800	150-200	150-350	20-50	25-110	209-279	209-488	28-70	35-154
3000 psi	210 kg/cm²	12,000	14,000	400-2600	180-250	180-400	30-70	30-190	251-349	251-558	42-98	42-226
DIFFERENTIAL PRESSURE SWITCHES												
Nominal Range ⁽¹⁾		Overpressure Ratings		Approximate Deadband (Buna-N Diaphragm) ⁽⁵⁾⁽²⁾								
				LDA-GDA ⁽³⁾	LDS-GDS ⁽⁴⁾				LDD-GDD ⁽⁴⁾			
		Static Working Pressure psi	Proof psi		Switch Element							
J, H	G			J, H	K, F	P	GG	JJ, HH	KK,FF	PP		
Pressure												
30° H ₂ O	750mmH ₂ O	5.4	21.6	4.0-27	1.5-3.5	2.0-4.0	0.5-1.0	0.7-2.0	2.1-4.9	2.8-5.6	0.7-1.4	0.7-2.8
60° H ₂ O	1500mmH ₂ O	5.4	21.6	5.0-54	1.5-4.0	2.5-5.0	0.5-1.4	1.0-2.5	2.5-6	3.5-7.0	0.7-2.0	2-3.5
100° H ₂ O	2500mmH ₂ O	5.4	21.6	8.5-90	4.0-5.5	4.0-8.5	1.0-2.0	1.4-3.0	5.6-7.7	5.6-11.9	1.4-2.8	2-4.2
150° H ₂ O	3750mmH ₂ O	5.4	21.6	18-135	5.0-11	10-18	1.5-3.0	2.0-6.0	7.0-15.4	14-25.2	2.1-4.2	2.8-8.4
30 psi	2 kg/cm²	500	2000	3.0-27	1.0-2.5	1.0-3.0	1.0-1.5	1.0-1.8	2-5	3-6	1-2.1	1.4-2.4
60 psi	4 kg/cm²	500	2000	5-54	2-4	2-4.5	1-2	1-2.5	3-7	4-8	1.4-2.8	1.4-3.5
200 psi	14 kg/cm²	1000	4000	18-180	10-15	10-18	1.0-4.0	5.0-8.0	14-23	14-30	1.4-5.6	7.0-11.2
400 psi	28 kg/cm²	1000	8000	45-360	16-30	16-45	4.0-8.0	5.0-15	22-42	22-63	5.6-11	7.0-21

NOTES:

1. Switches may generally be set between 15% and 100% of nominal range on increasing or decreasing pressure. Consult factory for applications where setpoints must be lower.

2. All deadbands are given in English units as shown in the nominal range column. Deadbands shown are for switches with Buna N diaphragm.
Approximate deadbands for optional diaphragms:
Viton: Multiply Buna N value by 1.4
Teflon: Multiply Buna N value by 1.2
Stainless Steel: Multiply Buna N value by 1.7
Monel: Multiply Buna N value by 1.7

3. Deadbands for LPA, LDA, GPA, and GDA are adjustable between the values shown.

4. Deadbands for LPS, LPD, LDS, LDD, and GPS, GPD, GDS, GDD models are fixed within the range of values shown.

5. Deadbands given are for zero static working pressure.

G and L SERIES PRESSURE SWITCH AND DIFFERENTIAL PRESSURE SWITCH ORDERING INFORMATION

1			2		3		4	5		6			7
G	P	D	N	4	G	G	B	2	5	X	K	3	30 PSI

1 – FUNCTION

GPS/LPS - Pressure control, single setpoint, fixed deadband.
GPA/LPA - Pressure control, single setpoint, adjustable deadband.
GPD/LPD - Pressure control, two independently adjustable setpoints, fixed deadband.
GDS/LDS - Differential pressure control, single setpoint, fixed deadband.
GDA/LDA - Differential pressure control, single setpoint, adjustable deadband.
GDD/LDD - Differential pressure control, two independently adjustable setpoints, fixed deadband.

2 – ENCLOSURE

N4 - NEMA 4, 4X

L Series: Epoxy Coated, Die Cast Aluminum, IP66
 G Series: 316 SS IP65

3 – SWITCH ELEMENTS FOR GPA/LPA, GDA/LDA CONTROLS

Code	Description/Maximum Electrical Ratings UL/CSA listed
H	General purpose 10A, 125/250 Vac 1/2A, 125 Vdc 1/4A, 250 Vdc
J	Hermetically sealed switch, general purpose 11A, 125/250 Vac 5A, 30 Vdc

SWITCH ELEMENTS FOR FOR GPD/LPD, GPS/LPS, LDD/GDD & LDS/GDS CONTROLS

Code		Switch elements UL/CSA listed	
Single (PS)	Dual (PD)		
K ⁽⁴⁾	KK	Narrow deadband	15A, 125/250 Vac
F ⁽⁴⁾	FF	Sealed environment proof	15A, 125/250 Vac
G ⁽⁵⁾	GG	General purpose	15A, 125/250/480 Vac 1/2A, 125 Vdc 1/4A, 250 Vdc
P ⁽³⁾	PP	Hermetically sealed switch, narrow deadband	5A, 125/250 Vac
J	JJ	Hermetically sealed switch, general purpose	11A, 125/250 Vac 5A, 30 Vdc

4 – ACTUATOR SEAL⁽¹⁾

Code & Material	Process Temp. ⁽²⁾ °F	Vac "H ₂ O"	Range 0-600 psi	1000 psi	2000-3000 psi
B-Buna-N	0 to 150	●	●	●	●
V-Viton	20 to 300	●	●	●	●
T-Teflon	0 to 150	●	●	●	●
S-St.St ⁽¹³⁾	0 to 300	●	●	●	●
P-Monel ⁽¹³⁾	0 to 300	●	●	●	●

5 – PRESSURE CONNECTION⁽¹⁾

Order Code	
25	1/4 NPT Female Standard on Pressure and D/P
06	1/4 NPT Female and 1/2 NPT Male Combination Pressure Only
07	1/2 NPT Female Pressure Only

7 – NOMINAL RANGE

See page 4

NOTES:

- These items are wetted by process fluid.
- Ambient operating temperature limits -20 to 150°F, all styles. Setpoint shift of ±1% of range per 50°F temperature change is normal.
- Estimated dc rating, 2.5A, 28 Vdc (not UL listed).
- Estimated dc rating, 4A, 28 Vdc (not UL listed).
- Not UL listed at 480 Vac.
- Standard on G Series "H₂O" ranges.
- Supply static pressure for D/P switches.
- Stainless steel diaphragm only.
- Not available with Buna-N diaphragm.
- Available with LPS and LDS models.
- LPS, Buna N and Viton diaphragm only.
- LPS, stainless steel diaphragm only.
- Available on pressure models only.
- Order switch and 15-320SX-02T CG seal.
- Order switch and 20-320SX-02T CG seal.

6 – G-, L-SERIES PRESSURE SWITCH OPTIONS

CodeDescription		Available Series		Pressure		Differential Pressure	
		G	L	psi	"H ₂ O	psid	"H ₂ O
XCH	Chained Cover	•	•	•	•	•	•
XFP	Fungus Proof	•	•	•	•	•	•
XFS ⁽⁷⁾	Factory-Adjusted Setpoints	•	•	•	•	•	•
XG5 ⁽¹¹⁾	Gas/Oil UL Limit Control to 150 "H ₂ O LDS only		•				•
XG6 ⁽¹³⁾	Gas/Oil UL Limit Control to 600 psi LPS only		•	•			
XG8 ⁽¹²⁾	Steam Limit Control to 300 psi		•	•			
XG9 ⁽⁸⁾	Fire Safe Actuator		•	•			
XHX	High Operating Pressure for H ₂ O Ranges:	•	•		•		•
	40 PSI Static (Pressure and D/P)						
	100 PSI Proof (Pressure)						
	160 PSI Proof (D/P)						
XJL	¾" to ½" Reducing Bushing	•	•	•	•	•	•
XK3	Terminal Blocks	•	•	•	•	•	•
XNH	Tagging Stainless Steel	•	•	•	•	•	•
XPK	Pilot Lights		•	•	•	•	•
XPM	¾" Sealed Conduit Connection with 16" Lead Wires	•	•	•	•	•	•
XTA ⁽⁶⁾	316SS Pressure Connection for "H ₂ O" Ranges	•	•		•		•
XUD	316SS Pressure Connection for psid Ranges	•	•			•	
X2C ⁽¹⁰⁾	DPDT with Single Setpoint Adjustment	•	•	•	•	•	•
X6B ⁽⁹⁾	Cleaned for Oxygen Service	•	•	•		•	
XFM	FM Approval		•	•	•	•	•
X3A	1½" Sanitary Seal with Glycerin Fill ⁽¹⁴⁾	•			•		
	2" Sanitary Seal with Glycerin Fill ⁽¹⁵⁾	•			•		
XHS	High Static Operating Pressure for PSI Range D/P	•	•			•	

G and L TEMPERATURE SWITCHES

Temperature Switches

G- and L-Series temperature switches feature a SAMA Class II vapor pressure thermal system. This system provides quick, accurate response to process temperature changes with negligible ambient temperature effects. This is inherent in the design due to the precise relationship between temperature and pressure according to the vapor pressure laws. A wide selection of sensing bulb and armored capillary lengths are available. The vapor pressure system design features small bulb sizes, making installation easy and cost-effective.

All models feature ± 1 percent of span setpoint repeatability with very high overtemperature ratings.

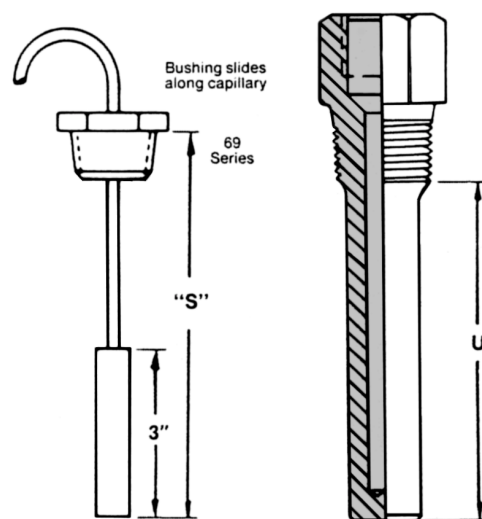
These standard designs perform well in applications where shock and vibration could be a problem and should be used with Ashcroft thermowells for bulb protection and ease of installation and maintenance.

Thermowells

Thermowells must be used on any application where the stem of the temperature switch may be exposed to pressure, corrosive fluids or high velocity. Additionally, the use of a thermowell permits instrument interchange or calibration check without disturbing or closing down the process.

Ashcroft temperature switches have bulb diameters to match $\frac{3}{8}$ " nominal bore thermowells. The bulbs have a sensitive portion length of $2\frac{1}{4}$ " which can be used with $2\frac{1}{2}$ " "U" dimensioned thermowells or longer. For maximum accuracy, a thermowell "U" dimension should be selected to permit complete immersion of the sensitive portion plus 1" when measuring the temperature of liquids; an extra 3" should be allowed when measuring the temperature of gases.

Thermowell bushings should be used with remote mount temperature switches. We recommend the standard 3" bulb and code 69 Series bushings for use with any thermowell "U" dimension. A split rubber grommet allows easy installation and "S" dimension adjustment.



TEMPERATURE RANGE SELECTION											
Nominal Range		Max.		Approximate Deadband ⁽²⁾							
			LTA-GTA ⁽³⁾	LTS-GTS ⁽⁴⁾				LTD-GTD ⁽⁴⁾			
°F	°C	Temp. °F		Switch Element							
			J, H	G	J, H	K, F	P	GG	JJ, HH	KK, FF	PP
-40 to 60	-40 to 16	400	18-90	4.0-10	9.0-18	1.5-3	2-5	4-10	9.0-18	1.5-3	2-5
0 to 100	-20 to 40	400	30-90	5.0-15	10-30	1.5-5	3-7	5-15	10-30	1.5-4.5	3-7
75 to 205	20 to 95	400	34-120	6.0-18	10-34	3-5.5	3-8	6-18	10-34	3-5.5	3-8
150 to 260	65 to 125	400	25-100	3-13	9.0-25	1.5-4	3-7	3-13	9.0-25	1.5-4	3-7
235 to 375	110 to 190	500	35-130	6-19	10-35	2-5.5	3-8	6-17	10-35	2-5.5	3-8
350 to 525 ⁽⁵⁾	175 to 275	700	40-165	5-27	15-40	3-7	3.5-11	5-27	15-40	3-7	3.5-11
500 to 750 ⁽⁵⁾⁽⁶⁾	260 to 400	900	50-200	20-36	36-60	5-10	6-21	20-36	36-60	5-10	6-21

NOTES:

- Switches may generally be set between 15% and 100% of nominal range on increasing or decreasing temperature. Consult factory for applications where setpoints must be lower.
- All deadbands are given in °F.

- Deadbands for LTA and GTA are adjustable between the values shown.
- Deadbands for LTS, GTS, LTD and GTD models are fixed within the range of values shown. Manufacturing and parts variances result in variation from one unit to another.

- Not available with $2\frac{3}{4}$ " stem
- Available with remote mount thermal system only.

G and L TEMPERATURE SWITCH ORDERING INFORMATION

1	2	3	4	5	6	7	8
G	T	A	N	4	H	0	5
A	7	0	3	0	X	N	H
							150°-260°F

1 – FUNCTION CODE

GTS/LTS	Temperature Control, Single Setpoint, Fixed Deadband
GTA/LTA	Temperature Control, Single Setpoint, Adjustable Deadband
GTD/LTD	Temperature Control, Two Independently Adjustable Setpoints, Fixed Deadband

2 – ENCLOSURE

N4	NEMA 4, 4X
L SERIES:	Epoxy Coated, Die Cast Aluminum, IP66
G SERIES:	316 SS IP65

3 – SWITCH ELEMENTS FOR GTA/LTA CONTROLS

Order Code	Description/Maximum Electrical Ratings UL/CSA listed S.P.D
H	General purpose 10A, 125/250 Vac 1/2A, 125 Vdc 1/4A, 250 Vdc
J	Hermetically sealed switch, general purpose 11A, 125/250 Vac 5A, 30 Vdc

SWITCH CONTROLS FOR GTD/LTD & GTS/LTS CONTROLS

Code		Switch elements UL/CSA listed	
Single (LS)	Dual (LD)		
K ⁽²⁾	KK	Narrow deadband	15A, 125/250 Vac
F ⁽²⁾	FF	Sealed environment proof	15A, 125/250 Vac
G ⁽³⁾	GG	General purpose	15A, 125/250/480 Vac 1/2A, 125 Vdc 1/4A, 250 Vdc
P ⁽¹⁾	PP	Hermetically sealed switch, narrow deadband	5A, 125/250 Vac
J	JJ	Hermetically sealed switch, general purpose	11A, 125/250 Vac 5A, 30 Vdc

4 – LINE LENGTH SELECTION⁽⁴⁾

DIRECT MOUNT		
Order Code	Line Length ft	Style
00	Not Applicable	Rigid
REMOTE MOUNT		
05	5	Capillary with Armor (Std.)
10	10	
15	15	
20	20	
25	25	

5 – THERMAL SYSTEM SELECTION

LINE MATERIAL	
DIRECT MOUNT	
Order Code	Description
	No entry required for direct mount
REMOTE MOUNT	
A7	SS Armor (Std.)

6 – BULB LENGTH SELECTION⁽⁵⁾

DIRECT MOUNT		
Order Code	"S" Dimension	Minimum Thermowell "U" Dimension
027	2 3/4"	—
040	4"	2 1/2"
060	6"	4 1/2"
090	9"	7 1/2"
120	12"	10 1/2"
REMOTE MOUNT		
030	3"	2 1/2"

7 – G- L-SERIES TEMP. SWITCH OPTIONS

Code	Description
XCH	Chained Cover
XFP	Fungus Proof
XFS	Factory Adjusted Setpoints
XJL	3/4" to 1/2" Reducing Bushing
XK3	Terminal Blocks
XNH	Tagging Stainless Steel
XPK	Pilot Lights
XPM	3/4" Sealed Conduit Connection with 16" Lead Wires
X2C ⁽⁶⁾	DPDT with Single Setpoint Adjustment
XBX	69 Series Bushing for Thermowell Systems

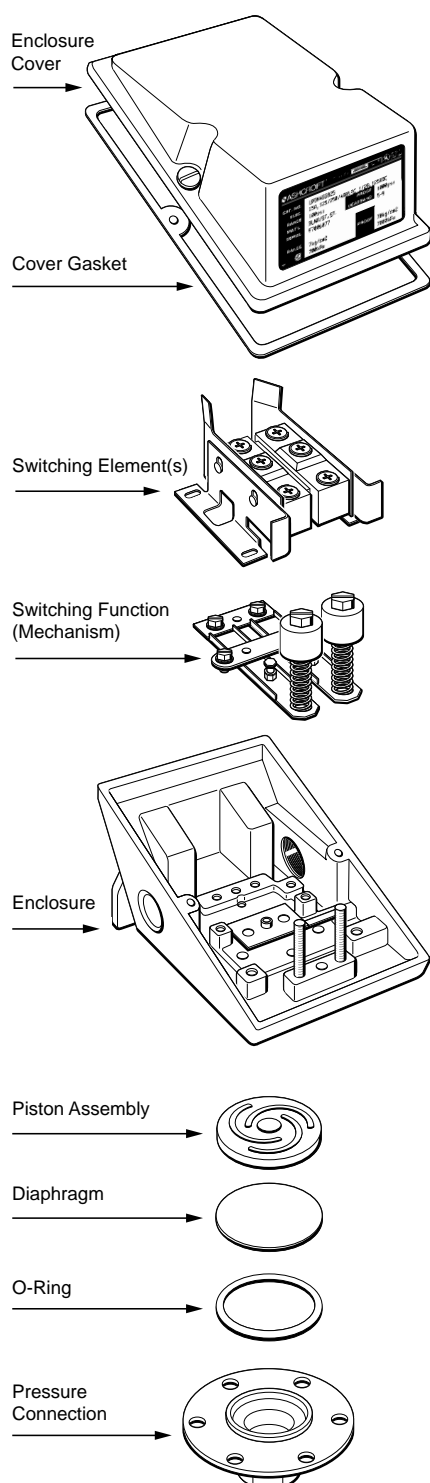
8 – STANDARD TEMPERATURE RANGES

See page 6

NOTES:

1. Estimated dc rating, 2.5A, 28 Vdc (not UL listed)
2. Estimated dc rating, 0.4A, 120 Vdc (not UL listed)
3. Not UL listed at 480 Vac
4. Additional line lengths available, call factory.
5. Additional bulb lengths available, call factory.
6. Available with LTS models only.

SWITCH SELECTION INFORMATION



PRESSURE, TEMPERATURE AND DIFFERENTIAL PRESSURE SWITCH SELECTION

Before making your selection, please consider the following:

1. Actuator

The actuator responds to changes in pressure, temperature or differential pressure and operates the switch element in response to these changes.

The actuator is normally exposed to process fluid and must therefore be chemically compatible with it. The following may be used to help select actuator type:

For nominal pressure ranges 0-15 psi through 0-3000 psi, Dresser's standard actuator is a diaphragm-sealed piston. In this actuator, process pressure acting on the piston causes it to overcome the adjustment spring force and actuate a snap-action switch. A diaphragm and O-ring seal the process media from this mechanism. These are available in Buna-N, Teflon and Viton. The standard process connection is stainless steel. Optional all-welded diaphragms and pressure connections are available in 316 SS and Monel.

For "H₂O Pressure and Differential Pressure Ranges, a diaphragm actuator is used. In this design, the standard pressure connections are carbon steel. Diaphragms are available in Viton, Buna N and Teflon. Always review process temperature limits before making seal selections. Optional stainless steel pressure connections are available (option XTA).

For High Differential Pressure Actuator Ranges, 3-15 to 60-600 psid, a dual diaphragm sealed piston actuator is used. This actuator is designed for high static-pressure applications. The standard pressure connections are nickel-plated brass. Diaphragms are available in Viton, Buna N and Teflon. Always review process temperature limits before making seal selections. Optional stainless steel pressure connections are available (option XUD).

For all temperature ranges, the standard Ashcroft temperature actuator operates on the vapor pressure principle: The vapor pressure in a sealed thermal system is applied to a sensing element, which in turn actuates a switch. This is known as a SAMA Class II system. Various filling materials are used, including Propane, Butane, Methyl Alcohol, N Propyl Alcohol and Xylene. High overtemperature capability is possible with this type of system. The interface between liquid and vapor is the point at which

sensing occurs. This is the "sensitive" portion of the bulb. Bulb extensions and capillary are normally filled with vapor and have little effect on the setpoint, regardless of ambient temperature variations; therefore, no ambient compensation is required. For best results, the bulb should be mounted within 60 degrees of vertical to assure the liquid remain in the bulb.

2. Enclosure

The enclosure protects the switch element and mechanism from the environment and has provisions for mounting and wiring. Ashcroft switch enclosures are epoxy-coated aluminum or stainless steel for maximum corrosion resistance. Choose between watertight NEMA 4, 4X for most industrial applications and 316 SS for more corrosive environments.

Ashcroft enclosures include watertight cover gaskets, external mounting holes and one or two 3/4 NPT electrical conduit holes for ease of installation. Pressure switches may also be mounted directly to the process by means of the standard 1/4 NPTF or optional 1/2 NPTM pressure connection.

Note: When installing Ashcroft switches, refer to instruction sheets included with each switch, the National Electrical Code, and any other local codes or requirements to assure safety.

3. The Switching Function

Next, consider the switching function. Most applications for alarm and shutdown are satisfied by single setpoint, fixed deadband models. For high/low or alarm and shutdown, the dual setpoint models may be selected. For pump, compressor, level and other control applications, an adjustable deadband model is often the best choice.

4. The Switch Element

Finally, the electrical switching element must be compatible with the electrical load being switched. For ease of selection, all electrical switching elements are snap-acting, SPDT (single pole-double throw), or 2 (SPDT). Refer to catalog pages for switch element choices. Select a switch element with electrical rating that exceeds the electrical rating of the device being controlled by the switch. For better reliability and safety, optional hermetically sealed switching elements may be specified.

SWITCH SELECTION INFORMATION

Accuracy – (See repeatability). Accuracy normally refers to conformity of an indicated value to an accepted standard value. There is no indication in switch products; thus, instead, the term repeatability is used as the key performance measure.

Automatic Reset Switch – Switch which returns to normal state when the actuating variable (pressure or temperature) is reduced.

Adjustable or Operating Range – That part of the nominal range over which the switch setpoint can be adjusted. Normally about 15% to 100% Of the nominal range for pressure and differential pressure switches, and the full span for temperature switches.

Burst Pressure – The maximum pressure that may be applied to a pressure switch without causing leakage or rupture. This is normally at least 400% of nominal range for Ashcroft switches. Switches subjected to pressures above the nominal range can be permanently damaged.

Deadband – The difference between the setpoint and the reset point, normally expressed in units of the actuating variable. Sometimes referred to as differential.

Division 1 – A National Electrical Code Classification of hazardous locations. In Division 1 locations, hazardous concentrations of flammable gases or vapors exist continuously, intermittently or periodically under normal conditions; frequently because of repair or maintenance operation/leakage or due to breakdown or faulty operation of equipment or processes which might also cause simultaneous failure of electrical equipment. Explosion-proof NEMA 7/9 enclosures are required in Division 1 locations.

Division 2 – A National Electrical Code Classification of hazardous locations. In Division 2 hazardous locations, flammable or volatile liquid or flammable gases are handled, processed or used, but will normally be confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown or in case of abnormal operation of equipment. Either NEMA 7/9 explosion-proof enclosures or any enclosure with hermetically sealed switch contacts may be used in Division 2 locations.

Explosion Proof – A term commonly used in industry referring to enclosures capable of withstanding an internal explosion of a specified gas without igniting surrounding gases. Strict installation practices in accordance with the national electrical code is also required for safety.

Fixed Deadband – The difference between the setpoint and the reset point of a pressure or temperature switch. It further signifies that this deadband is a fixed function of the pressure switch and not adjustable.

Hermetically Sealed Switch – A switch element whose contacts are completely sealed from the environment to provide additional safety and reliability. Contact arc cannot cause an explosion and atmospheric corrosive elements cannot affect the contacts.

Manual Reset Switch – Pressure or Temperature switch in which contacts remain actuated even after the actuating variable returns to normal. On Ashcroft manual reset switches, a button must be pushed to reset the contacts.

National Electrical Manufacturers Association (NEMA) – This group has defined several categories of enclosures, usually referred to as "types." Further, they designate certain features and capabilities each type must include. For example, among other features, a NEMA 4 enclosure must include a threaded conduit connector, external mounting provision and cover gaskets. When selecting a NEMA 4 enclosure from any manufacturer, a buyer is assured of receiving these features.

NEMA 4 – Watertight and dusttight enclosures intended for use indoors or outdoors to protect the equipment against splashing, falling or hose-directed water, external condensation and water seepage. They are also sleet-resistant.

NEMA 4X – Watertight, dusttight and corrosion resistant enclosures with same qualifications as NEMA 4, but with added corrosion resistance.

NEMA 7 – Enclosures for indoor Class I, Division 1 Hazardous locations with gas or vapor atmospheres.

NEMA 9 – Enclosures for indoor Class II, Division 1 hazardous locations with combustible dust atmospheres.

Normal Switch Position – Contact position before actuating pressure (or variable) is applied. Normally closed contacts open when the switch is actuated. Normally open contacts close when the switch is actuated

Normally Closed – Refers to switch contacts that are closed in the normal switch state or position (unactuated). A pressure change opens the contacts.

Normally Open Switch – Refers to the contacts that are open in the normal switch state or position (unactuated). A pressure change closes the contacts.

Overpressure Rating(s) – A nonspecific term that could refer to either burst or proof pressure, or both.

Proof Pressure – The maximum pressure which may be applied without causing damage. This is determined under strict laboratory conditions including controlled rate of change and temperature. This value is for reference only. Consult factory for applications where switch must operate at pressures above nominal range.

Repeatability (Accuracy) – The closeness of agreement among a number of consecutive measurements of the output for the same value of the input under the same operating conditions, approaching from the same direction, for full range traverses.

Note: It is usually measured as nonrepeatability and expressed as repeatability in percent of span or nominal range. It does not include hysteresis or deadband.

Reset Point – The reset point is the pressure, temperature or differential pressure value where the electrical switch contacts will return to their original or normal position after the switch has activated.

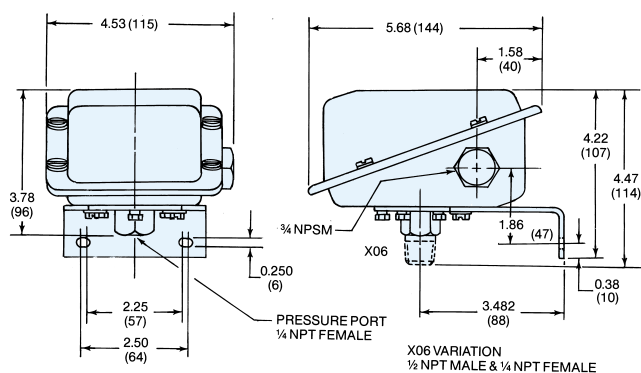
Setpoint – The setpoint is the pressure, temperature or differential pressure value at which the electrical circuit of a switch will change state or actuate. It should be specified either on increase or decrease of that variable. (See also reset point.)

Single Pole Double Throw (SPDT) Switching Element – A SPDT switching element has one normally open, one normally closed, and one common terminal. The switch can be wired with the circuit normally open (N/O), or normally closed (N/C), or both. SPDT is standard with most Ashcroft pressure and temperature switches.

Snap Action – In switch terminology, snap action generally refers to the action of contacts in the switch element. These contacts open and close quickly and snap closed with sufficient force to firmly establish an electrical circuit. The term distinguishes products from mercury bottle types that were subject to vibration problems.

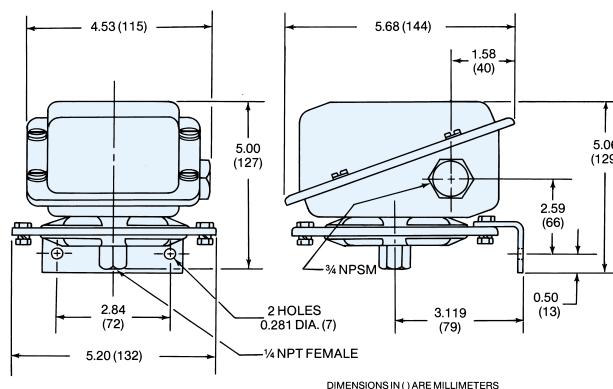
Static Pressure – For differential pressure switches static pressure refers to the lower of the two pressures applied to the actuator.

Pressure Switch – psi Ranges



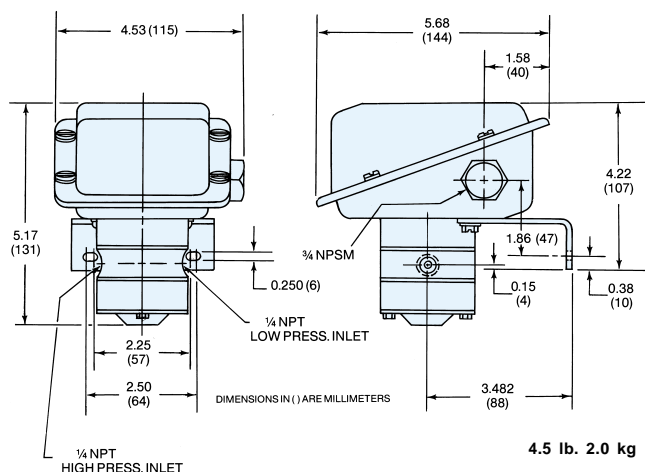
2.7 lb, 1.2 kg

Pressure Switch – Inches Of Water Ranges



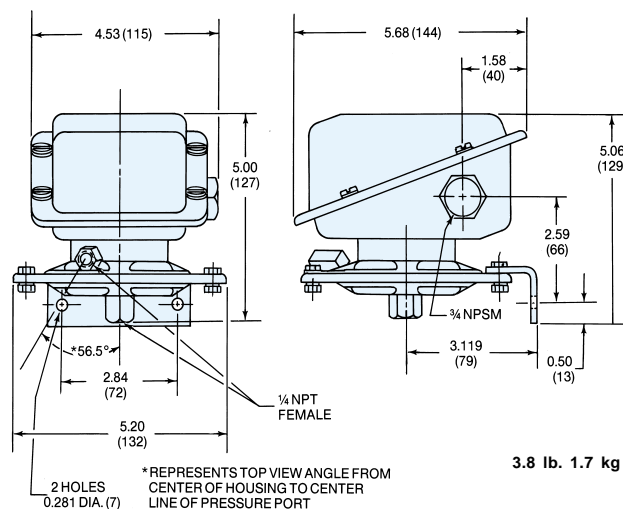
3.6 lb, 1.6 kg

Differential Pressure Switch – psi Differential Ranges



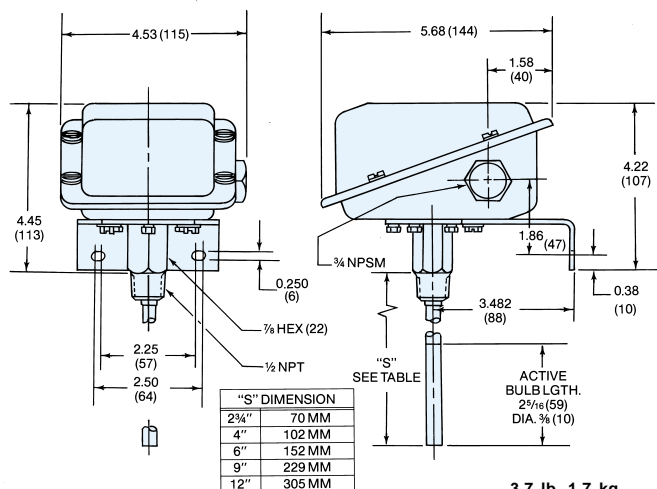
4.5 lb. 2.0 kg

Differential Pressure Switch – Inches Of Water Ranges



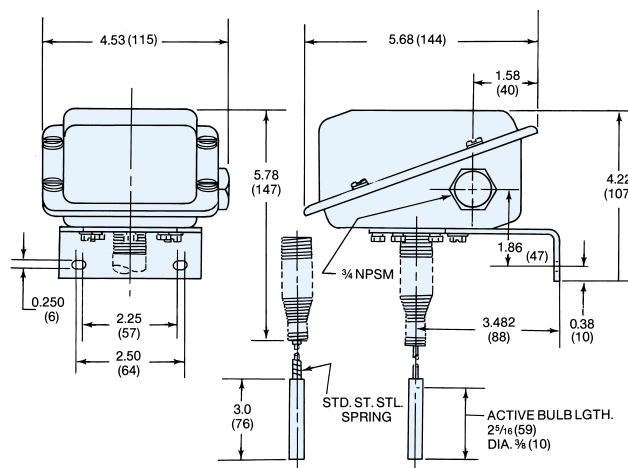
3.8 lb. 1.7 kg

Temperature Switch – Direct Mount



3.7 lb. 1.7 kg

Temperature Switch – Remote Mount

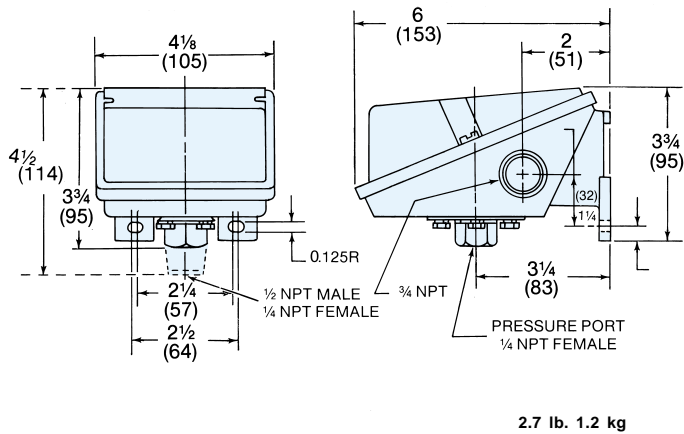


4.5 lb. 2.0 kg

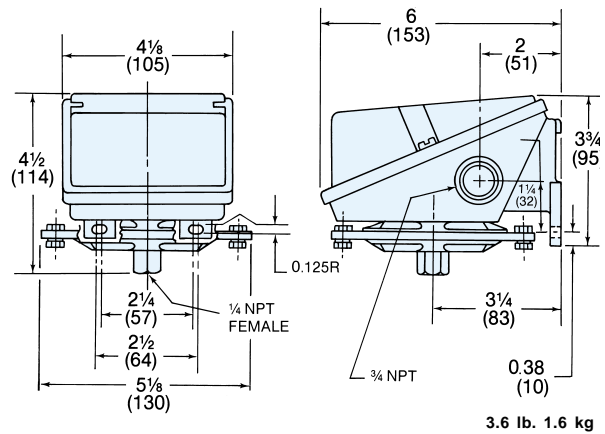
Dimensions in () are millimeters

DIMENSIONS – L-SERIES ENCLOSURE

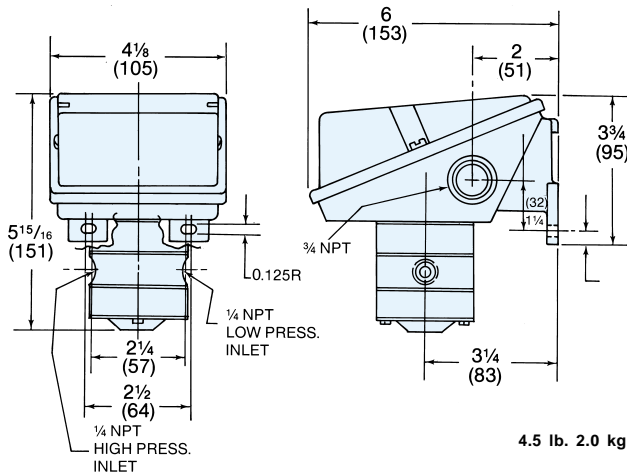
Pressure Switch – psi Ranges



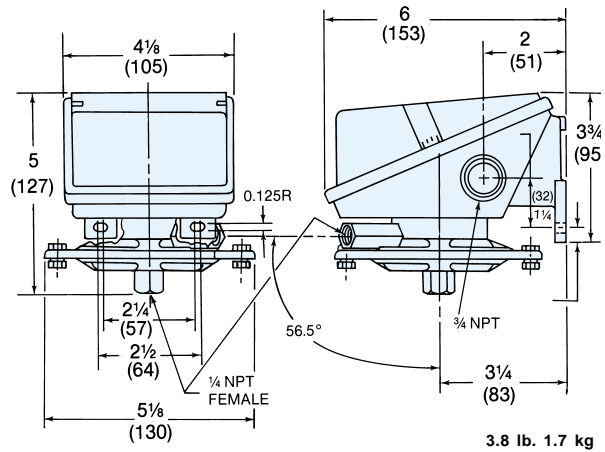
Pressure Switch – Inches Of Water Ranges



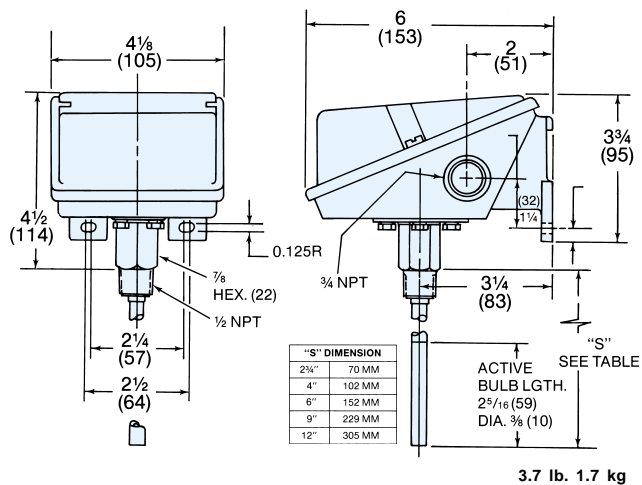
Differential Pressure Switch – psi Differential Ranges



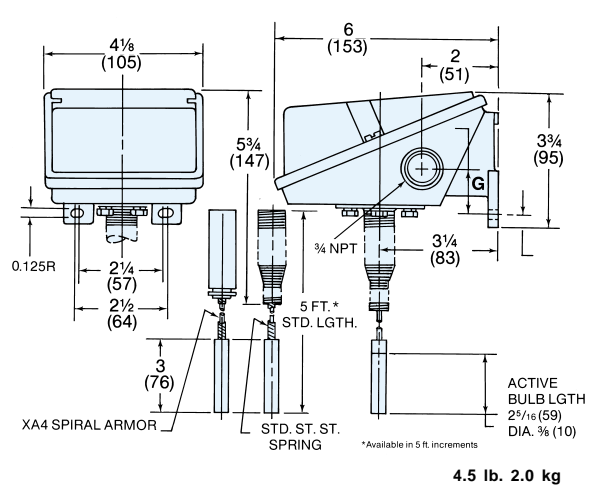
Differential Pressure Switch – Inches Of Water Ranges



Temperature Switch – Direct Mount



Temperature Switch – Remote Mount



Dimensions in () are millimeters

U.S. Headquarters

**Control Instrument Operation
Milford, Connecticut**
210 Old Gate Lane
Milford, CT 06460
Tel: (203) 878-5641
FAX: (203) 878-8519

U.S. Sales Offices

Chicago, Illinois
400 W. Lake Street
Suite 318
Roselle, IL 60172-3573
Tel: (630) 980-9030
FAX: (630) 980-9440

Hartford, Connecticut
1501 East Main Street
Meriden, CT 06450-2860
Tel: (203) 235-0450
FAX: (203) 235-0593

Houston, Texas
3838 North Sam Houston
Parkway East
Suite 120
Houston, TX 77032
Tel: (281) 590-1092
FAX: (281) 590-7100

Los Angeles, California
3931 MacArthur Blvd.
Suite 202
Newport Beach, CA 92660
Tel: (949) 852-8948
FAX: (949) 852-8971

Mobile, Alabama
851 South Beltline Hwy.
Suite 402, 4th Floor
Mobile, AL 36606
Tel: (334) 473-1692
FAX: (334) 473-1782

International Headquarters

Stratford, Connecticut
250 E. Main Street
Stratford, CT 06614-5245
Tel: (203) 378-8281
FAX: (203) 385-0357

International Operations

Brazil
Dresser Industria e
Comercio Ltda.
Divisao Manometros Willy
Caixa Postal 212
09510 Sao Caetano do Sul
Sao Paulo, Brazil
Tel: 55-11-453-5477
FAX: 55-11-453-8710

Canada
Dresser Canada, Inc.
2135 Meadowpine Blvd.
Mississauga,
Ontario L5N 6L5
Canada
Tel: 905-826-8411
FAX: 905-826-9106

China
Dresser Trading
Room 3, 24th Floor
CITIC Bldg.
19 Jianguo Menwai St.
Beijing, P.R.C.
Tel: 86-1-6500-3139
FAX: 86-1-6512-0300

France
Dresser Europe GmbH
5, Rue d'Antony
F-94563 Rungis Cedex
Silic 192, France
Tel: 33-1-49-79-22-80 or 81
FAX: 33-1-46-86-25-24

Germany
Dresser Europe GmbH
Postfach 11 20
Max-Planck-Str. 1
D-52499 Baesweiler
Germany
Tel: 49-2401-8080
FAX: 49-2401-7027

Japan

Dresser Japan Ltd.
Room 318, Shin Tokyo Building
3-1 Marunouchi 3-Chome,
Chiyoda-ku, Tokyo, Japan
Tel: 813-3201-1501/1506
FAX: 813-3213-6567/6673

Korea

Dresser International S.A.
Korea Office
#2107 Kuk Dong Bldg.
60-1, 3-KA, Choongmu-Ro,
Chungku, Seoul, Korea 100-705
Tel: 82-2-274-079-2/3
FAX: 82-2-274-0794

Mexico

Dresser Instrument Division
Henry Ford No. 114,
Esq. Foulton, Fracc
Industrial San Nicolas
Tlalneplantla edo
de Mexico 54030
Tel: 011-52-5-310-7217
FAX: 011-52-5-310-2608

Saudi Arabia

Dresser Al Rushaid
P.O. Box 10145
Jubail Industrial City
Saudi Arabia 31961
Tel: 966-3-341-0278
FAX: 966-3-341-7624

Singapore

Dresser Singapore Pte Ltd.
Instrument Operations
Block 1004 Toa Payoh North
#07-15/17
Singapore 318995
Tel: 65-252-6602
FAX: 65-252-6603

United Kingdom

Dresser Europe GmbH
Rufford Court
Hardwick Grange
Warrington, Cheshire
England WA1 4RF
Tel: 44-1925-853708
FAX: 44-1925-816378

Venezuela

Manufacturas Petroleras
Venezolanas S.A.
Apartado Postal 617
Maracaibo, Venezuela
Tel: 58-61-579-762 or 070
FAX: 58-61-579-461

*For more application information, drawings and other
Ashcroft pressure and temperature switches visit our
web site at www.dresser.com/instruments*