

# H-SERIES Miniature Pressure Switches

## Low-Cost Switches with Adjustable Set Points

### Features:

- Field adjustable set points.
- Fixed deadband.
- Choice of open frame type, general purpose or watertight enclosure.
- Small size.
- Mounts in any position.
- Rugged and vibration resistant, e.g., for compressors.
- Visual adjustment scales in psig and bars.

### General Description:

H-Series miniature pressure switches have field adjustable set points and fixed deadband, with diaphragm/piston sensor. They are available in open frame construction, Type 1 general purpose or Type 4 watertight enclosures. The resilient diaphragm/piston construction helps provide long life and maintains set point repeatability despite environmental temperature variations. The full size electrical switch is a precision UL listed, snap-action type. H-Series switches are CSA approved and are UL listed under "Industrial Control Equipment".

### Proof pressure:

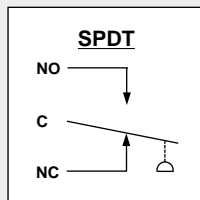
250 psig. (Consult factory for higher pressures).

### Process connection:

Standard: 1/8" NPT Ext, 1/8" NPT Int, 1/4" NPT Ext.  
Optional: 1/4" NPT Int (eighth digit "3").

### Standard Electrical Ratings

15 Amp Res., 125 VAC  
10 Amp Res., 250 VAC  
1/8 HP, 125 VAC  
1/4 HP, 250 VAC  
1/2 Amp Res., 125 VDC  
1/4 Amp Res., 250 VDC



① Open frame construction, UL recognized component.



### Wetted Materials (Process Connection & Diaphragm)

Standard: Brass and Buna "N"

Optional Process Connections:

- 316 SS (sixth digit "4")
- Carbon steel (sixth digit "6")

Optional Diaphragms:

- Viton (seventh digit "2")
- Neoprene (seventh digit "3")
- Ethylene propylene (seventh digit "6")
- Fluorosilicone (seventh digit "7")

### Standard Temperature Ratings

**Ambient:** -4°F (-20°C) to 140°F (60°C)  
**Fluid:** -4°F (-20°C) to 180°F (82°C)

### Switch Options

See page 34 for optional snap switches.

## How to Select and Order

ASCO H-Series switches are a single switch and transducer assembly.

### How to Select

1. Select type of switch (open frame, general purpose or watertight)..
2. Select the adjustable operating range based on the desired actuation pressure.
3. Select desired process connection.

### How to Order

Simply order the selected H-Series pressure switch by catalog number, e.g., HB46A218 describes an open frame pressure switch with adjustable operating range of 4 to 12 psig, 1/8" NPT external brass process connection and Buna "N" diaphragm.

### Options

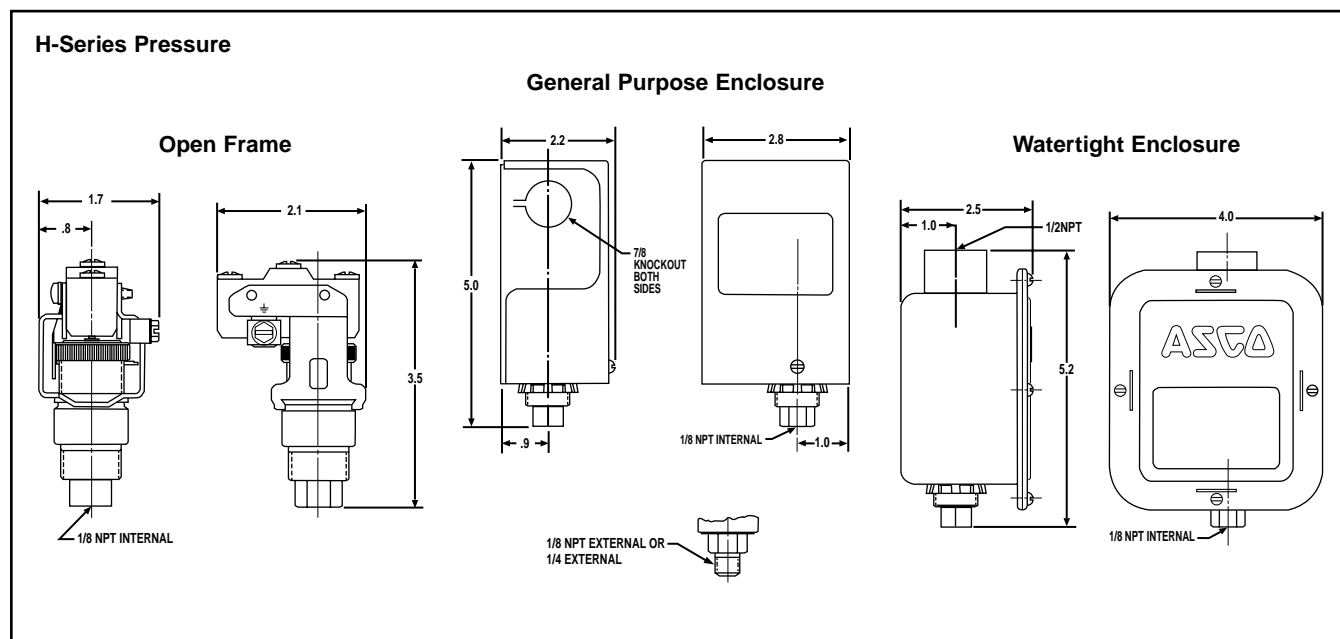
Add appropriate suffix or change appropriate digit in catalog number for desired option, e.g., HB46A2[2]8[P] describes an open frame pressure switch with optional viton diaphragm (seventh digit "2") and gold contact snap switch (suffix "P").

## Select H-Series pressure switch below

Adjustable Operating Range (psig)	Fixed Deadband At Mid-Range (psig) ①	SPDT (Form "C" Contact), Brass and Buna "N"		
		1/8" NPT External Process Connection	1/4" NPT External Process Connection	1/8" NPT Internal Process Connection ②
		Catalog No.	Catalog No.	Catalog No.
<b>Open frame construction</b>				
4 - 12	1.6	HB46A218	HB46A214	HB46A215
8 - 25	1.8	HB36A218	HB36A214	HB36A215
20 - 50	2.4	HB26A218	HB26A214	HB26A215
35 - 80	3.5	HB16A218	HB16A214	HB16A215
40 - 120	7.0	HC26A218	HC26A214	HC26A215
80 - 200	10.0	HC16A218	HC16A214	HC16A215
<b>Type 1 - General purpose enclosure</b>				
4 - 12	1.6	HB40A218	HB40A214	HB40A215
8 - 25	1.8	HB30A218	HB30A214	HB30A215
20 - 50	2.4	HB20A218	HB20A214	HB20A215
35 - 80	3.5	HB10A218	HB10A214	HB10A215
40 - 120	7.0	HC20A218	HC20A214	HC20A215
80 - 200	10.0	HC10A218	HC10A214	HC10A215
<b>Type 4 - Watertight enclosure</b>				
4 - 12	1.6	HB41A218	HB41A214	HB41A215
8 - 25	1.8	HB31A218	HB31A214	HB31A215
20 - 50	2.4	HB21A218	HB21A214	HB21A215
35 - 80	3.5	HB11A218	HB11A214	HB11A215
40 - 120	7.0	HC21A218	HC21A214	HC21A215
80 - 200	10.0	HC11A218	HC11A214	HC11A215

① Values shown are nominal. ② May be used for panel or bracket mounting.

## Dimensions (inches)



# H-SERIES Miniature Pressure Switches

## Suffix S: Low-Cost Switches with Adjustable Set Points and Adjustable Deadband

### Features:

- Field adjustable set points.
- Limited adjustable deadband.
- Choice of open frame type, general purpose or watertight enclosure.
- Small size.
- Mounts in any position.
- Rugged and vibration resistant, e.g., for compressors.
- Visual adjustment scales in psig and bars.

### Standard Ratings and Wetted Materials

(See page 4)

### Dimensions

(See page 5)



### How to Select and Order

ASCO H-Series Suffix S switches are a single switch and transducer assembly.

#### How to Select

1. Select type of switch enclosure (open frame, general purpose or watertight).
2. Select the adjustable operating range based on the desired actuation pressure and desired deadband (re-actuation) pressure.
3. Select desired process connection.

#### How to Order

Simply order the selected H-Series Suffix S pressure switch by catalog number, e.g., HB46A218S describes an open frame H-Series Suffix S pressure switch with adjustable operating range of 4 to 12 psig and adjustable deadband at mid-range of 1.5 to 3.5 psig, 1/8" NPT external brass process connection and Buna "N" diaphragm.

#### Options (See page 4)

Change appropriate digit in catalog number for desired option, e.g., HB46A2[2]18S describes an open frame pressure switch with adjustable operating range and deadband with optional viton diaphragm (seventh digit "2").

### Select H-Series Suffix S switch below

Adjustable Operating Range (psig)	Adjustable Deadband At Mid-Range (psig) ①	SPDT (Form "C" Contact), Brass and Buna "N"		
		1/8" NPT External Process Connection	1/4" NPT External Process Connection	1/8" NPT Internal Process Connection ②
		Catalog No.	Catalog No.	Catalog No.
<b>Open frame construction</b>				
4 - 12	1.5 - 3.5	HB46A218S	HB46A214S	HB46A215S
8 - 25	2 - 4	HB36A218S	HB36A214S	HB36A215S
20 - 50	3 - 5	HB26A218S	HB26A214S	HB26A215S
35 - 80	6 - 8	HB16A218S	HB16A214S	HB16A215S
40 - 120	8 - 13	HC26A218S	HC26A214S	HC26A215S
80 - 200	15 - 20	HC16A218S	HC16A214S	HC16A215S
<b>Type 1 - General purpose enclosure</b>				
4 - 12	1.5 - 3.5	HB40A218S	HB40A214S	HB40A215S
8 - 25	2 - 4	HB30A218S	HB30A214S	HB30A215S
20 - 50	3 - 5	HB20A218S	HB20A214S	HB20A215S
35 - 80	6 - 8	HB10A218S	HB10A214S	HB10A215S
40 - 120	8 - 13	HC20A218S	HC20A214S	HC20A215S
80 - 200	15 - 20	HC10A218S	HC10A214S	HC10A215S
<b>Type 4 - Watertight enclosure</b>				
4 - 12	1.5 - 3.5	HB41A218S	HB41A214S	HB41A215S
8 - 25	2 - 4	HB31A218S	HB31A214S	HB31A215S
20 - 50	3 - 5	HB21A218S	HB21A214S	HB21A215S
35 - 80	6 - 8	HB11A218S	HB11A214S	HB11A215S
40 - 120	8 - 13	HC21A218S	HC21A214S	HC21A215S
80 - 200	15 - 20	HC11A218S	HC11A214S	HC11A215S

① Values shown are nominal. ② May be used for panel or bracket mounting.

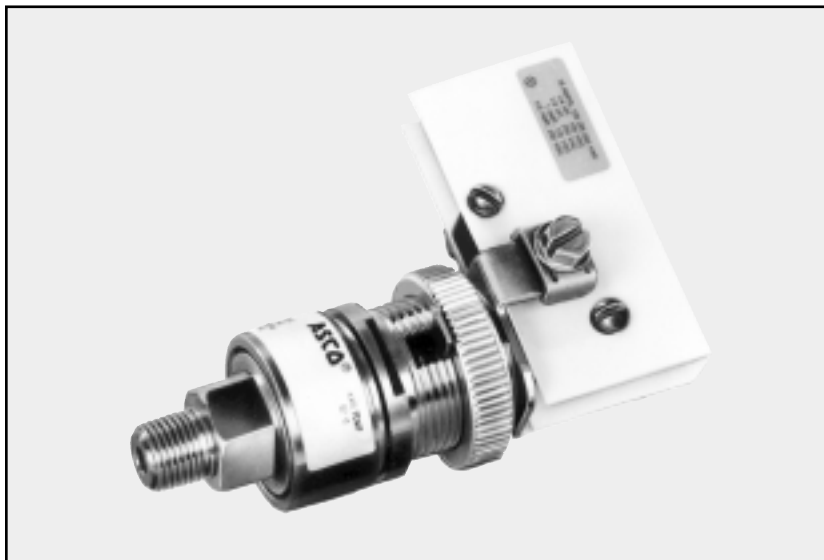
## Suffix L: Lowest-Cost Switches with Adjustable Set Points (Open Frame Construction)

### Features:

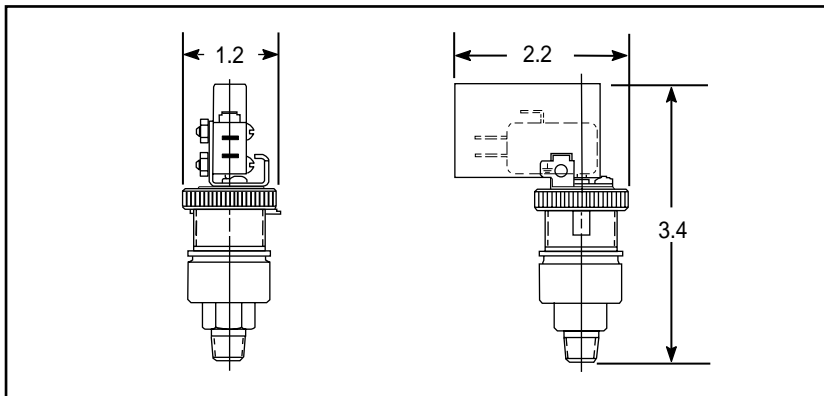
- Low cost for OEM applications.
- Miniature size.
- Wide selection of adjustable ranges.
- Fixed deadband.
- Resilient diaphragm/piston sensor for long life.
- Precision single-pole, double-throw snap switch with quick-connect 1/4" spade terminals.

### Standard Ratings and Wetted Materials

(See page 4)



### Dimensions (inches)



### How to Select and Order

ASCO H-Series Suffix L switches are a single switch and transducer assembly.

#### How to Select

1. Select the adjustable operating range based on the desired actuation pressure.
2. Select desired process connection.

#### How to Order

Simply order the selected H-Series Suffix L pressure switch by catalog number, e.g., HB46A218L describes an open frame pressure switch with adjustable operating range of 4 to 12 psig, 1/8" NPT external brass process connection and Buna "N" diaphragm.

#### Options (See page 4)

Change appropriate digit in catalog number for desired option, e.g., HB46A228L describes an open frame pressure switch with adjustable operating range and optional viton diaphragm (seventh digit "2").

**Note:** Optional snap switches not available on suffix "L" units.

### Select H-Series Suffix L switch below

Adjustable Operating Range (psig)	Fixed Deadband At Mid-Range (psig) ①	SPDT (Form "C" Contact), Brass and Buna "N"		
		1/8" NPT External Process Connection	1/4" NPT External Process Connection	1/8" NPT Internal Process Connection ②
		Catalog No.	Catalog No.	Catalog No.
4 - 12	3.0	HB46A218L	HB46A214L	HB46A215L
8 - 25	3.6	HB36A218L	HB36A214L	HB36A215L
20 - 50	5.5	HB26A218L	HB26A214L	HB26A215L
35 - 80	7.0	HB16A218L	HB16A214L	HB16A215L
40 - 120	14.0	HC26A218L	HC26A214L	HC26A215L
80 - 200	21.0	HC16A218L	HC16A214L	HC16A215L

① Values shown are nominal. ② May be used for panel or bracket mounting.

# OPTIONS Pressure/Temperature Switches

## H-Series, P-Series and S-Series Snap-Action Switch Options

Optional snap-action switches to meet specific electrical loads or application conditions are available on most ASCO TRI-POINT switch units. Generally, the construction of a switch unit with optional snap-action switches contains other specific parts and may be ordered only as a factory-built unit. To specify a particular optional construction, add the appropriate suffix to the switch unit catalog number, e.g., SA10D with optional gold contact snap-action switch (suffix "P") would become SA10D[P].

## P-Series Switch Options

**Panel Mount** – Open frame P-Series compact switch units are available for panel mounting with the switch unit inside and the transducer outside. The panel separates the fluid sensing portion from the electromechanical portion. Five holes for bolts and operating stem must be drilled or punched through the panel. Three constructions are available: add the suffix listed below to the switch unit catalog number for the desired thickness.

Description	Electrical Rating	Catalog Suffix	Deadband Variation From Listing
DC Rating 1 Amp Double Break	5 Amp, 125, 250 VAC 1/4 HP, 125 VAC 1/2 HP, 250 VAC 1 Amp, 125 VDC 1/2 Amp, 250 VDC	G	SA: +50% SB, SC, PA: +100% H: +200% PB: +400%
DC Rating 10 Amps, SPDT	10 Amp, 125 VAC, VDC 1/8 HP, 125 VAC, VDC	M	SA: +50% SB, SC, PA: +100% H: +120% PB: +400%
Double-pole Double-throw (Two SPDT Switches with Common Lever) Gold Contact Dry Circuit SPDT	5 Amp, 125, 250 VAC 1/8 HP, 125 VAC 1/4 HP, 250 VAC 1/2 Amp, 125 VDC 1/4 Amp, 250 VDC 1 Amp, 28 VAC 1 Amp, 28 VDC	K  P	SA, SB, SD, SE, PB: +50%  SA, SB, SC, PA: +25% H: +50% PB, PC: +100%
Hermetically Sealed SPDT	25 Amp Res, 28 VDC 10 Amp Ind, 28 VDC 5 Amp Motor, 28 VDC 3 Amp Lamp, 28 VDC 1 Amp, 125 VAC	H	SA, PA: +100% H: +200% PB: +600%
High Ambient 250°F SPDT	5 Amp, 125, 250 VAC 1/8 HP, 125 VAC 1/4 HP, 250 VAC 1/2 Amp, 125 VDC 1/4 Amp, 250 VDC	F	SA, SB, SC: +25%
High Power 1 HP SPDT	20 Amp, 125, 250 VAC 1 HP, 125 VAC 2 HP, 250 VAC 1/2 Amp, 125 VDC 1/4 Amp, 250 VDC	W	SA: +50% SB, SC: +100% PB: +400%
Moisture Resistant Sealed Switch SPDT	5 Amp, 125, 250 VAC 1/8 HP, 125 VAC 1/4 HP, 250 VAC 1/2 Amp, 125 VDC 1/4 Amp, 250 VDC	J	SA: None SB, SC, PA: +25% PB, H: +50%
Tight Fixed Deadband SPDT	5 Amp, 125, 250 VAC 1/8 HP, 125 VAC 1/4 HP, 250 VAC 1/2 Amp, 125 VDC	T	SB, SC: -50%

Panel Thickness	Suffix
10 Ga (.135±.005)	10
14 Ga (.075±.005)	11
16 Ga (.060±.005)	12

## S-Series Switch Options

**Industrial Adjusting Nut Covers** – Available in clear plastic or metal to prevent tampering with set point adjusting nuts.

**Clear plastic cover:** To order, add suffix "1" to the switch unit catalog number, or order separately as SP01.  
**Metal cover:** To order, add suffix "2" to the switch unit catalog number, or order separately as SP02.

**JIC Construction** – A switch unit having the electrical and adjusting nut covers attached to the switch body by a chain. Also designed to Type 13 specifications. To order, add suffix "3" to the switch unit catalog number, or order separately as SP03.

**Terminal Block** – Applicable to switch units with one single-pole double-throw switch. The terminal strip is prewired to the snap-action switch. To order, add suffix "4" to the switch unit catalog number, or order separately as SP04.

**Factory Sealed** – Explosion-proof units may be ordered with a factory seal separating the electrical chamber from the conduit hubs and 24" long #14 AWG 105°C. rated lead wires. To order, change the fourth digit of the switch unit catalog number from "2" to "3", e.g., SA1[2]D becomes SA1[3]D.

# Definitions and Fluid Compatibility Guide

## Definitions

**Accuracy** – The maximum deviation from the set point under specified operating condition (ambient temperature, barometric pressure, etc.).

**Adjustable Deadband** – Refers to the capability of a pressure or temperature switch to allow the deadband to be adjusted over a given range. Certain ASCO TRI-POINT switches have an adjustable deadband which can be adjusted over the total operating range of the switch.

**Adjustable Operating Range** – The pressure or temperature range of the switch within which the set point may be adjusted.

**Differential Pressure** – The difference between two pressures. A differential pressure switch senses two pressure sources and can be adjusted to actuate on a desired difference between them.

**Gauge Pressure** – The actual reading of a typical pressure gauge and is the difference between the pressure within a vessel and the atmospheric pressure surrounding it. It is normally measured in pounds per square inch (psig).

**Manual Reset** – The switch is a semi-automatic device which operates automatically with a signal change in one direction but must be manually reset once the signal returns to its original position.

**Proof Pressure** – A pressure which a device can be subjected to for extended periods of time without changes in its operating characteristics.

**Rated Overrange Temperature** – A temperature which a device can be subjected to for extended periods of time without changes in its operating characteristics.

**Repeatability** – The closeness of agreement among a number of consecutive measurements of the output for the same value of input under the same operating conditions approaching from the same direction. Repeatability is normally specified as a percentage of the upper limit of the operating range.

Example: Operating range 5-100 psig with  $\pm 1\%$  repeatability; equals  $\pm 1\%$  of 100 psig or  $\pm 1$  psig.

**Reset Point** – After a pressure or temperature switch has reached its set point and operated the electrical switch, it must return to a point called the reset point before the electrical switch can return to its original position.

**Set Point** – The pressure reading at which the electrical switch element changes contact position (it can be specified either increasing or decreasing).

**Switch Unit** – ASCO uses the term “switch unit” to describe the electromechanical portion of a pressure or temperature switch. This is used in conjunction with a transducer unit to form a complete pressure or temperature switch.

**Transducer Unit** – ASCO uses the term “transducer unit” to describe that portion of a pressure or temperature switch to which a pressure or temperature is applied which converts the input signal to another form of energy to operate the switch unit.

**Two-Stage (Dual)** – ASCO uses the term “two stage” to describe a pressure or temperature switch which is equivalent to two pressure or temperature switches which are independently adjustable. This switch is equivalent to two fixed deadband switches.

**Deadbands** – The deadband is the difference between the set point and reset point readings. Deadbands are listed in the specification tables at nominal values. They are representative of the deadbands of the units at the middle of the range.

The deadband values for the full range adjustable deadband switches and limited adjustable deadband switches indicate the values through which the deadband may be adjusted.

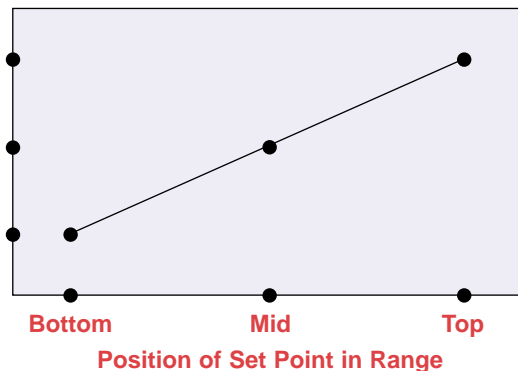
Generally, as the set point is adjusted through the operating range, the deadband will vary. Normally, it will become narrower as the set point is towards the bottom of the range, and will become wider when the set point is towards the top of the range. The graph shown below indicates representative trends of this type of deadband variation.

### Deadbands

1.5 x Catalog Value

Catalog Value

Half Catalog Value



Temperature switch deadbands are a result of the characteristics of the vapor pressure curve as well as other factors. Normally, this results in a deadband which is narrower in the top third of the range than in the bottom third of the range. The values published are nominal and representative of mid-range set points.

## Fluid Compatibility Guide

These recommendations are to be used as a guide only, as service life of material is dependent on temperature, concentrations, or catalysts that may be added and other conditions which are beyond our control.

Consult ASCO for specific service applications.

**Note:** Items in black circles are standard catalog units.  
All others available on factory order.

**P** - Indicates preferred construction. **S** - Indicates satisfactory construction.

Transducer Material Code of Two Digits represents process connection material and diaphragm material, respectively; these are the sixth and seventh positions of the pressure transducer catalog number.

**Process Connection: 6th Position      Diaphragm: 7th Position**

- |            |               |            |                      |
|------------|---------------|------------|----------------------|
| 1 Aluminum | 4 316 S.S.    | 1 Buna "N" | 4 316 S.S.           |
| 2 Brass    | 7 Nylon/Brass | 2 Viton    | 6 Ethylene Propylene |
| 3 303 S.S. |               | 3 Neoprene | 7 Fluorosilicone     |

Ranges Available	Material Code	11	12	13	16	17	21	22	23	26	27	31	32	33	36	37	42	44	71	
	Vacuum	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
	Inches of Water	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No
P.S.I.G. ⑤ to	400	400	400	400	400	3500	3500	3500	3500	3500	3500	8000	8000	8000	8000	8000	8000	400	200	
Acetic Acid														S	S				P	
Acetylene	P	S		S								S	S		S		S	S		
Air	P	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	P	
Ammonia																			P	
Argon-Welding ①	P	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	P	
Benzene-Benzol		P						S					S				S	S		
Butane	P	S				S	S					S	S				S	S		
Carbon Tetrachloride													P				P	S		
Cellulube		P		S				S		S			S		S		S	S		
Coke Oven Gas													P				P	S		
Ethyl Alcohol (denatured)	P	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S		
Ethylene Glycol	P	S	S	S		S	S	S	S			S	S	S	S		S	S		
Freon Refrigerants																			P	
Freon Solvents ("MF", "TF", "BF")						P	S					S	S				S	S		
Fuel Oils and Diesel ④	P	S				S	S					S	S				S	S		
Gasoline																			P	
Gas, Inert	P	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	P	
Gas (natural and manufactured) ④	P	S	S		S	S	S	S			S	S	S	S		S	S	S		
Helium	P	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	P	
Hydrogen	P	S	S	S		S	S	S	S			S	S	S	S		S	S		
Jet Fuel (JP1 to JP6)		P			S		S				S		S			S	S	S		
Kerosene	P	S				S	S					S	S					S		
Methyl Alcohol (Methanol)	P		S	S	S	S		S	S	S	S		S	S	S	S	S	S		
Naphtha	P	S				S	S					S	S				S	S		
Nitrogen	P	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	P	
Oils (coolant, hydraulic, lubricating and motor)	P	S				S	S					S	S				S	S	P	
Oxygen, Gaseous ②		S	P		S		S	S			S		S	S		S	S	S		
Potassium Sulfate	P	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S		
Propane Gas and Liquid	P	S	S			S	S	S				S	S	S			S	S		
"Pydraul" ("Monsanto")		P			S		S				S		S			S	S	S		
Steam ③						P	S		S	S	S	S	S		S	S	S	S		
Steam Condensate						P	S		S	S	S	S	S		S	S	S	S	P	
Stoddard Solvent	P	S				S	S					S	S				S	S		
Toluene (Tolulo)		P					S						S				S	S		
Vacuum	P	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S		
Vegetable Oil	P	S	S		S							S	S	S		S	S	S		
Vinegar													S		S	S	S	P		
Water, Fresh, Boiler Feed						P	S		S	S	S	S	S		S	S	S	S	P	
Water (Distilled, Deionized, Demineralized)												P	S	S	S	S	S	S		
Water, Sea																			S	

**Notes:** ① For high purity applications use stainless steel transducers. ② Oxygen service requires special cleaning, specify suffix "H". ③ For steam service a condensate loop (pigtail) is required. ④ For pressure transducers for combustion service see pages 20-23. ⑤ Material availability refers to standard gauge pressure constructions only.