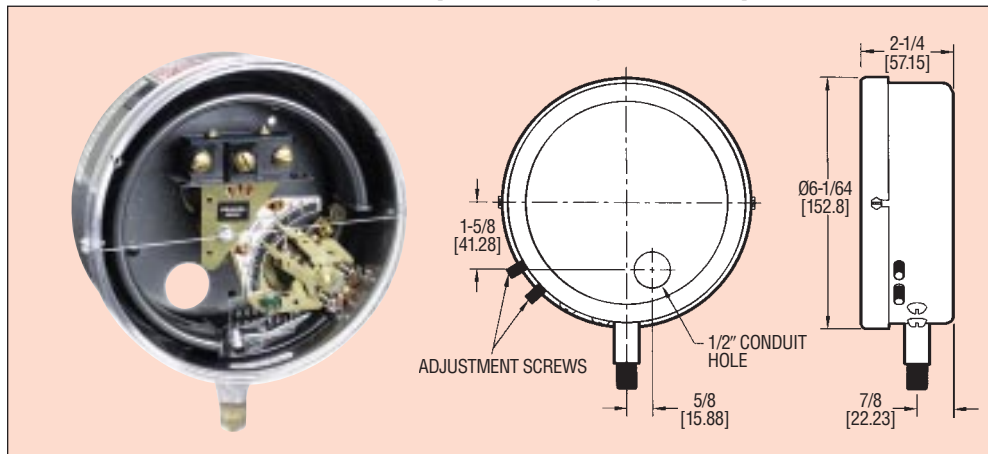




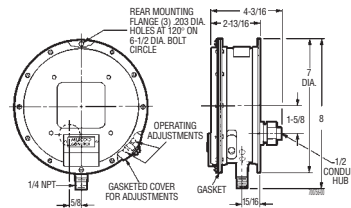
Series  
DA/DS

# Bourdon Tube Pressure Switches

Visible setpoint, adjustable deadband, snap action switch  
pressure ranges to 5000 psi



**Weather-Proof**  
Types DAW, DSW, DRW



**Customers tell us** that this is the best pressure switch made. Our most popular, Mercoïd DA combines extremely high sensitivity and repeatability with easily adjustable set and reset points through non-interactive external adjustments. Visible calibrated dial for setpoints and on/off indicator to indicate switch actuation are included. Choose either high current snap-switch or hermetically sealed contact mercury switch. The DS Model has a fixed deadband.

## FEATURES

- DA Series is equipped with two external adjustments. One sets high pressure operating point, the other sets reset point. Deadband, or the difference between set and reset points is adjustable over the full scale. DS Series has a single external adjustment and fixed deadband.
- Visible calibrated dial, on/off indication.
- SPDT snap-action or sealed mercury switches.
- Minimum deadband obtainable at any point in range.
- Pressure Ranges vacuum to 5000 psig.
- U.L. and C.S.A. listed. Many models FM listed.

## STOCKED MODELS in bold

## PHYSICAL DATA

**Max. Temperature:** 180°F. For higher temperature media applications, a remote connection or siphon (pigtail) should be used.

**Pressure Connection:** 1/4" NPT. (1/2" on range 15S).

**Housing:** pressed steel with transparent cover.

**Wiring Connections:** 3 screw type.

**Wetted Parts:** same as Bourdon tube material.

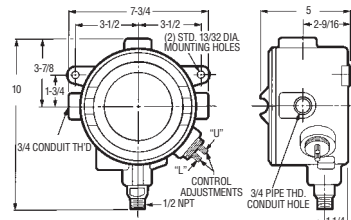
**Weight:** 4 lb. (std); 6 lb. (wea-proof); 8 lb. (exp-proof).

**Max. Press.:** Max. adjustment operating range.

## Suggested Specification

Pressure switch shall be Mercoïd Series DA operated by a (brass) (type 316 stainless steel) (type 403 stainless steel) Bourdon tube actuating a (mercury switch) (snap-switch). Switch shall have deadband fixed or adjustable up to a maximum of 100% of switch range. Switch shall have calibrated dial and one or two pointers indicating set and reset points. Switch shall have visible on/off indication. Setpoints shall be adjustable without removing switch cover or shutting down process.

**Explosion-Proof**  
Types DAH, DRH, DSH



BOURDON TUBE MATERIAL	ADJUSTABLE OPERATING RANGE (PSIG)	SNAP ACTION SWITCH – SPDT 15A @ 120/240 VAC		SNAP ACTION SWITCH – SPDT 15A @ 120/240 VAC		MERCURY SWITCH – SPDT 4A @ 120V., 2A @ 240V. AC/DC	
		FIXED DEADBAND PSIG	MODEL NUMBER	MINIMUM DEADBAND PSIG	MODEL NUMBER	MINIMUM DEADBAND PSIG	MODEL NUMBER
BRASS	0-30" Hg. Vac.	3" Hg. Vac.	<b>DS-7231-153-2*</b>	9" Hg. Vac.	<b>DA-7031-153-2*</b>	2" Hg. Vac.	<b>DA-31-153-2*</b>
	1/8-15	1.5	DS-7231-153-1	4	DA-7031-153-1	1	DA-31-153-1
	1/8-20	1.5	DS-7231-153-3A	4	<b>DA-7031-153-3A</b>	1	<b>DA-31-153-3A</b>
	1-35	1.5	DS-7231-153-4	5	DA-7031-153-4	1.75	<b>DA-31-153-4</b>
	2-60	2	DS-7231-153-5	6	<b>DA-7031-153-5</b>	3	<b>DA-31-153-5</b>
	5-100	2.5	DS-7231-153-6	9	<b>DA-7031-153-6</b>	3.75	<b>DA-31-153-6</b>
	5-150	3	<b>DS-7231-153-7</b>	16	<b>DA-7031-153-7</b>	6	<b>DA-31-153-7</b>
	10-200	4	<b>DS-7231-153-8</b>	16	<b>DA-7031-153-8</b>	8	<b>DA-31-153-8</b>
403SS	10-300	5	DS-7231-153-9	25	<b>DA-7031-153-9</b>	12	<b>DA-31-153-9</b>
	2-60	3	DS-7221-153-5S	9	DA-7021-153-5S	4	<b>DA-21-153-5S</b>
	5-100	3.5	DS-7221-153-6S	13	DA-7021-153-6S	6	<b>DA-21-153-6S</b>
	10-200	4	DS-7221-153-8S	15	DA-7021-153-8S	8	<b>DA-21-153-8S</b>
	10-300	6	DS-7221-153-9S	19	DA-7021-153-9S	14	<b>DA-21-153-9S</b>
	25-600	10	DS-7221-153-10S	45	DA-7021-153-10S	25	<b>DA-21-153-10S</b>
	100-1500	30	DS-7221-153-12S	130	DA-7021-153-12S	90	<b>DA-21-153-12S</b>
316SS	500-5000	200	DS-7221-153-15S*	900	DA-7021-153-15S*	450	DA-21-153-15S*
	10-150	4	DS-7241-153-24E	11	DA-7041-153-24E	6	<b>DA-41-153-24E</b>
	10-300	8	DS-7241-153-9E	28	DA-7041-153-9E	18	<b>DA-41-153-9E</b>

Additional features available on special order, include other electrical ratings and circuits, lower minimum differentials, special housings, diaphragm seals and manual reset. For severe vibration, a special Delrin Bushed Movement is available.

\*Range 2 and 15S not FM approved. Other ranges FM approved. For FM approved models specify DAF or DSF. Example DAF-31-153-1.

**STOCKED MODELS** in bold    **High Current Capacity†** or **Extra Low Deadband Mercury Switches (SPST)†**

BOURDON TUBE MATERIAL	ADJUSTABLE OPERATING RANGE (PSIG)	MERCURY SWITCH – SPST – HIGH CURRENT 10A @ 120V., 5A @ 240V. AC/DC			MERCURY SWITCH – SPST – LOW DEADBAND 5A @ 120VAC., 2A @ 240VAC., 2.5A @ 120VDC		
		MINIMUM DEADBAND PSIG	OPEN ON INC. MODEL NUMBER	CLOSE ON INC. MODEL NUMBER	MINIMUM DEADBAND PSIG	OPEN ON INC. MODEL NUMBER	CLOSE ON INC. MODEL NUMBER
<b>BRASS</b>	0-30" Hg. Vac.	2" Hg. Vac.	DA-31-2-2*	DA-31-3-2*	1" Hg. Vac.	DA-531-2-2*	DA-531-3-2*
	1/8-15	1	DA-31-2-1	DA-31-3-1	0.5	DA-531-2-1	DA-531-3-1
	1/8-20	1	DA-31-2-3A	DA-31-3-3A	0.5	DA-531-2-3A	DA-531-3-3A
	1-35	1.75	DA-31-2-4	DA-31-3-4	0.75	DA-531-2-4	DA-531-3-4
	2-60	3	DA-31-2-5	DA-31-3-5	1.0	DA-531-2-5	DA-531-3-5
	5-100	3.75	DA-31-2-6	DA-31-3-6	2.0	DA-531-2-6	DA-531-3-6
	5-150	6	DA-31-2-7	DA-31-3-7	3.0	DA-531-2-7	DA-531-3-7
	10-200	8	DA-31-2-8	DA-31-3-8	3.5	DA-531-2-8	DA-531-3-8
<b>403SS</b>	10-300	14	DA-31-2-9	DA-31-3-9	6.0	DA-531-2-9	DA-531-3-9
	2-60	4	DA-21-2-5S	DA-21-3-5S	2.5	DA-521-2-5S	DA-521-3-5S
	5-100	6	DA-21-2-6S	DA-21-3-6S	3.0	DA-521-2-6S	DA-521-3-6S
	10-200	8	DA-21-2-8S	DA-21-3-8S	4.0	DA-521-2-8S	DA-521-3-8S
	10-300	14	DA-21-2-9S	DA-21-3-9S	7	DA-521-2-9S	DA-521-3-9S
	25-600	25	DA-21-2-10S	DA-21-3-10S	15	DA-521-2-10S	DA-521-3-10S
<b>316SS</b>	100-1500	90	DA-21-2-12S	DA-21-3-12S	50	DA-521-2-12S	DA-521-3-12S
	500-5000	450	DA-21-2-15S*	DA-21-3-15S*	200	DA-521-2-15S*	DA-521-3-15S*
	10-150	6	DA-41-2-24E	DA-41-3-24E	3.0	DA-541-2-24E	DA-541-3-24E
	10-300	18	DA-41-2-9E	DA-41-3-9E	5.0	DA-541-2-9E	DA-541-3-9E

†Also available in Weather-proof (DAW-33) or Explosion-proof (DAH-31) Housings.

\*Range 2 and 15S not FM approved. Other ranges FM approved. For FM approved models specify DAF or DSF. Example DAF-31-2-1.

**STOCKED MODELS** in bold    **Weather-proof Models**

Bourdon Tube Material	Adjustable Operating Range (PSIG)	SNAP ACTION SWITCH – SPDT 15A @ 120/240 VAC		SNAP ACTION SWITCH – SPDT 15A @ 120/240 VAC		MERCURY SWITCH – SPDT 4A @ 120V., 2A @ 240V. AC/DC	
		Fixed Deadband PSIG	Model Number	Minimum Deadband PSIG	Model Number	Minimum Deadband PSIG	Model Number
<b>BRASS</b>	0-30" Hg. Vac.	3" Hg. Vac.	DSW-7233-153-2*	9" Hg. Vac.	DAW-7033-153-2*	2" Hg. Vac.	DAW-33-153-2*
	1/8-15	1.5	DSW-7233-153-1	4	DAW-7033-153-1	1	DAW-33-153-1
	1/8-20	1.5	DSW-7233-153-3A	4	DAW-7033-153-3A	1	DAW-33-153-3A
	1-35	1.5	DSW-7233-153-4	5	DAW-7033-153-4	1.75	DAW-33-153-4
	2-60	2	DSW-7233-153-5	6	DAW-7033-153-5	3	DAW-33-153-5
	5-100	2.5	DSW-7233-153-6	9	DAW-7033-153-6	3.75	DAW-33-153-6
	5-150	3	DSW-7233-153-7	16	DAW-7033-153-7	6	DAW-33-153-7
	10-200	4	DSW-7233-153-8	16	DAW-7033-153-8	8	DAW-33-153-8
<b>403SS</b>	10-300	5	DSW-7233-153-9	25	DAW-7033-153-9	14	DAW-33-153-9
	2-60	3	DSW-7223-153-5S	9	DAW-7023-153-5S	4	DAW-23-153-5S
	5-100	3.5	DSW-7223-153-6S	13	DAW-7023-153-6S	6	DAW-23-153-6S
	10-200	4	DSW-7223-153-8S	15	DAW-7023-153-8S	8	DAW-23-153-8S
	10-300	6	DSW-7223-153-9S	19	DAW-7023-153-9S	14	DAW-23-153-9S
	25-600	10	DSW-7223-153-10S	45	DAW-7023-153-10S	25	DAW-23-153-10S
<b>316SS</b>	100-1500	30	DSW-7223-153-12S	130	DAW-7023-153-12S	90	DAW-23-153-12S
	500-5000	200	DSW-7223-153-15S*	900	DAW-7023-153-15S*	450	DAW-23-153-15S*
	10-150	4	DSW-7243-153-24E	11	DAW-7043-153-24E	6	DAW-43-153-24E
	10-300	8	DSW-7243-153-9E	28	DAW-7043-153-9E	18	DAW-43-153-9E

\*Range 2 and 15S not FM approved. All other DAW ranges are FM approved.

**POPULAR MODELS**    **Explosion-proof Models**

BOURDON TUBE MATERIAL	ADJUSTABLE OPERATING RANGE (PSIG)	SNAP ACTION SWITCH – SPDT 15A @ 120/240 VAC		SNAP ACTION SWITCH – SPDT 15A @ 120/240 VAC		MERCURY SWITCH – SPDT 4A @ 120V., 2A @ 240V. AC/DC	
		FIXED DEADBAND PSIG	MODEL NUMBER	MINIMUM DEADBAND PSIG	MODEL NUMBER	MINIMUM DEADBAND PSIG	MODEL NUMBER
<b>BRASS</b>	0-30" Hg. Vac.	3" Hg. Vac.	DSH-7231-153-2*	9" Hg. Vac.	DAH-7031-153-2*	2" Hg. Vac.	DAH-31-153-2*
	1/8-15	1.5	DSH-7231-153-1	4	DAH-7031-153-1	1	DAH-31-153-1
	1/8-20	1.5	DSH-7231-153-3A	4	DAH-7031-153-3A	1	DAH-31-153-3A
	1-35	1.5	DSH-7231-153-4	5	DAH-7031-153-4	1.75	DAH-31-153-4
	2-60	2	DSH-7231-153-5	6	DAH-7031-153-5	3	DAH-31-153-5
	5-100	2.5	DSH-7231-153-6	9	DAH-7031-153-6	3.75	DAH-31-153-6
	5-150	3	DSH-7231-153-7	16	DAH-7031-153-7	6	DAH-31-153-7
	10-200	4	DSH-7231-153-8	16	DAH-7031-153-8	8	DAH-31-153-8
<b>403SS</b>	10-300	5	DSH-7231-153-9	25	DAH-7031-153-9	14	DAH-31-153-9
	2-60	3	DSH-7221-153-5S	9	DAH-7021-153-5S	4	DAH-21-153-5S
	5-100	3.5	DSH-7221-153-6S	13	DAH-7021-153-6S	6	DAH-21-153-6S
	10-200	4	DSH-7221-153-8S	15	DAH-7021-153-8S	8	DAH-21-153-8S
	10-300	6	DSH-7221-153-9S	19	DAH-7021-153-9S	14	DAH-21-153-9S
	25-600	10	DSH-7221-153-10S	45	DAH-7021-153-10S	25	DAH-21-153-10S
<b>316SS</b>	100-1500	30	DSH-7221-153-12S	130	DAH-7021-153-12S	90	DAH-21-153-12S
	500-5000	200	DSH-7221-153-15S*	900	DAH-7021-153-15S*	450	DAH-21-153-15S*
	10-150	4	DSH-7241-153-24E	11	DAH-7041-153-24E	6	DAH-41-153-24E
	10-300	8	DSH-7241-153-9E	28	DAH-7041-153-9E	18	DAH-41-153-9E

\*Range 2 and 15S not FM approved. Other ranges FM approved. For FM approved models specify DAHF or DSHF. Example DAHF-31-153-1.

Pressure

## Type DA

**Adjustable Deadband, Fully Automatic, Double Adjustments**



VISIBLE CALIBRATED DIAL  
DOUBLE EXTERNAL ADJUSTMENTS

**Snap Action Switch**



SWITCH INDICATOR  
VISIBLE CALIBRATED DIAL  
DOUBLE EXTERNAL ADJUSTMENTS

**Mercury Switch Contact**

Equipped with two external adjustments, one for setting *high* pressure operating point, the other for setting *low* pressure operating point. Deadband, or the difference between high and low setpoints, is adjustable over full scale. Mercoid's most popular operating mode, available on most Series D pressure and temperature controls.

## Type DS

**Fixed Deadband, Fully Automatic, Single Adjustment**



VISIBLE CALIBRATED DIAL  
SINGLE EXTERNAL ADJUSTMENT

**Snap Action Switch**



SWITCH INDICATOR  
VISIBLE CALIBRATED DIAL  
SINGLE EXTERNAL ADJUSTMENT

**Mercury Switch Contact**

Equipped with single adjustment for setting operating point only. A single pointer on scale sets pressure point at which switch action occurs. Fixed deadband is factory set and cannot be altered in the field. Available on series D-200, D-7200 and D-9200 only.

## Type DR

**Semi-Automatic, Manual Reset, Single Adjustment**



VISIBLE CALIBRATED DIAL  
RESET  
SINGLE ADJUSTMENT

**Manual Reset**  
(-2 or -3 circuits only)

Equipped with a single adjustment for setting operating point to operate the circuit automatically upon a pressure increase or decrease. Pushbutton reset must be operated manually to restore the circuit to original position after automatic operation. Suffix "L," i.e. DR-31-153L denotes control will operate automatically on *increase*; suffix "U" denotes control will operate automatically on *decrease*.

## Type DL

**Semi-Automatic, Manual Lock Reset, Single Adjustment**



VISIBLE CALIBRATED DIAL  
RESET  
SINGLE EXTERNAL ADJUSTMENT

**Manual Lock Reset**  
(-2 or -3 circuits only)

Equipped with a single adjustment for setting operating point. Control will operate at setpoint only upon a *decrease* in pressure. Manual lock feature permits circuit to be reset and locked in position. Lock remains in effect until pressure rises above control setting. Lock then releases and circuit is held in reset position until further automatic operation upon pressure decrease.

## Type D-400, DA-7400

**Two-Stage, Fully Automatic, 2 Set Pts.**



Provides two stage control by actuating one circuit upon a rise or fall in pressure and a second circuit on a further rise or fall. Each setpoint has a fixed deadband.



Series  
DA

# Bourdon Tube Pressure Switches — General Data and Accessories

## FEATURES

- External Setpoints
- Deadband Adjustable (over 100% of scale) or Fixed
- Visible Calibrated Dial, PSI/kg
- Visible Operation
- On/Off Indication
- Repeatability  $\pm 1\%$  of full scale
- Minimum Deadband Obtainable at any Point in Range
- Welded Stainless Steel Bourdon Tubes Provide Reduced Chance of Leakage in Case of Fire
- Pressure Ranges to 8000 psig
- UL, CSA Listed (most models, features)

## PHYSICAL DATA

- Max. Temp.:** 180°F. For higher media applications, a remote connection or siphon (pig-tail) should be used.
- Pressure Connection:** 1/4" NPT std. 1/2" NPT on range 15S, 16S
- Wetted Parts:** Same as bourdon tube material except range 23K, 24K, 9K.
- Weight:** 4 lb. std., 6 lb. weatherproof 8 lb. exp. proof
- Max. Press.:** Max. adjustment operating range. Use of a surge tank, snubber or capillary tubing connection is recommended where pulsation, pressure surge or water hammer may occur.

## Suggested Specification

Pressure switch shall be Mercoïd Series DA operated by a (brass) (type 316 stainless steel) (type 403 stainless steel) Bourdon tube actuating a (mercury switch) (snap-switch). Switch shall have deadband adjustable up to a maximum of 100% of switch range. Switch shall have calibrated dial and two pointers indicating set and reset points. Switch shall have visible on/off indication. Setpoints shall be adjustable without removing switch cover or shutting down process.

## Mounting Flange

### For Surface Mounting (Field Installation)

For DA, DAF, DS, DSF, DR, DRF and DL controls only. May be ordered separately for field installation.

- Part No. 17-26** (except on 15S, 16S)
- Part No. 17-31** (for range 15S, 16S only)

## Mounting Bracket



For use with standard NEMA 1 enclosure general purpose controls only: Series DA, DAF, DS, DSF, DR, DRF, DL. Note: *not* adaptable for Range 15S and 16S.

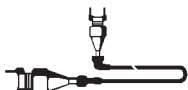
- Part No. 33-25**

## Conduit Hub

For 1/2" rigid conduit. Mercury switch type controls with standard general purpose NEMA-1 or optional weather-resistant NEMA-3 or NEMA-4 enclosures are suitable for Class 1, Div. 2 applications when ordered with this hub. Available for DA Series.

- Part No. 42-413**

## Remote Connections



- Part No. 49-62HP** – 6 ft. copper remote connection, 2500 psig max.
- Part No. 49-210** – 12 ft. 316 s.s. connection with 303 s.s. fittings, 3000 psig max.

## Breathers & Drains



STANDARD BREATHER

STANDARD DRAIN

For Class I, Groups C, D and Class II, Groups E, F, G (water only). Mercoïd s.s. drains are flame-tight, but not watertight which permits water to escape continuously.

Mercoïd s.s. breathers include a water shedding cap and provide effective case ventilation.

For Series DAH, DAHF, DRH, DRHF, DSH, DSHF.

- Part No. 42-274** – Standard drain.

- Part No. 42-276** – Standard breather.

For Series DAE, DRE.

- Part No. 42-275** – Drain with 1/4" connection.

- \*Part No. 42-276** – Standard breather with 1/2" connection.

- \*Part No. 42-279** – Reducer (3/4" to 1/2") for breather.

\*Breather and reducer must be ordered together.

## Pigtail Siphon



Recommended for steam applications 35 psig or higher. For Series D-30, D-530, D-230, D-7030, D-7230 pressure controls. Please specify.

- Part No. 42-58** 2000 psig max.

## Factory Mutual Approved Series D Pressure Switches



Cover Over External Adjustments

## Miscellaneous

### Oxygen & Acetylene Service

Spec. 23444

### Fungus Proof

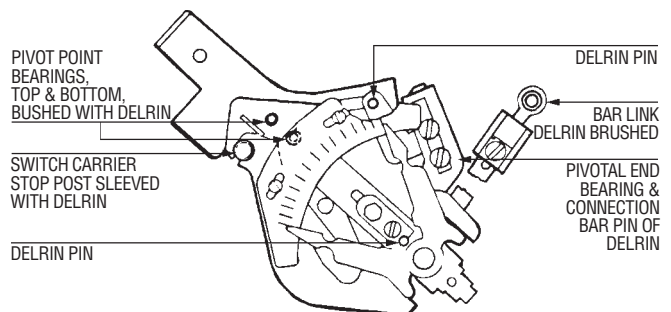
Spec. 23720

### FM Approval –

DAF, DRF, DSF

## DELTRIN\* Bushed Movement "B"

\*Registered Trademark of E.I. DuPont de Nemours & Co.



PIVOT POINT BEARINGS, TOP & BOTTOM, BUSHED WITH DELTRIN

SWITCH CARRIER STOP POST SLEEVED WITH DELTRIN

DELTRIN PIN

DELTRIN PIN

BAR LINK DELTRIN BRUSHED

PIVOTAL END BEARING & CONNECTION BAR PIN OF DELTRIN

Provides longer service life for Series D pressure and temperature controls. Vibration and pulsation are the prime causes of control wear. Almost all types of vibration will have some effect on the life and continued accuracy of controls.

To offset the wearing of metal surfaces found in bearings and pivot

points, the control mechanism is designed to incorporate Delrin bushed movements at each possible wear point. Also for environments where corrosion may be a factor.

**Add Letter B After Type and Suffix Nos.** Example: DS-221-2B, DA-31-3B, DAH-41-3B.



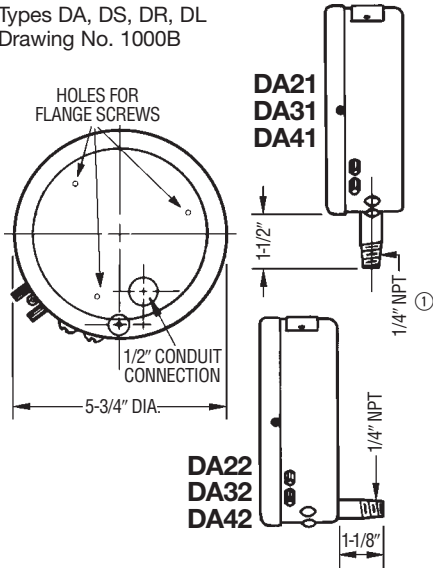


Series  
DA

# Bourdon Tube Pressure Switches — Control Dimensions

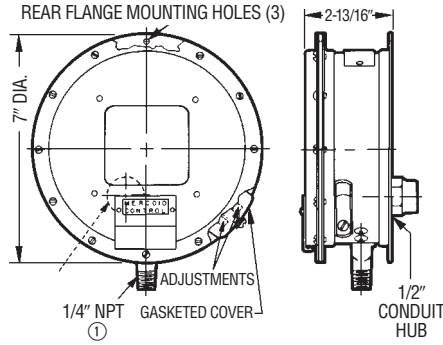
## General Purpose

Types DA, DS, DR, DL  
Drawing No. 1000B



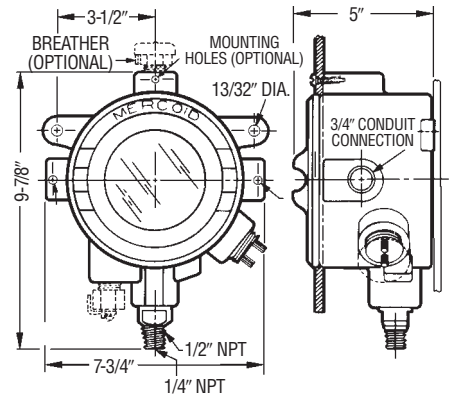
## Weather-Proof

Types DAW, DSW, DRW  
Drawing No. 1062



## Explosion-Proof

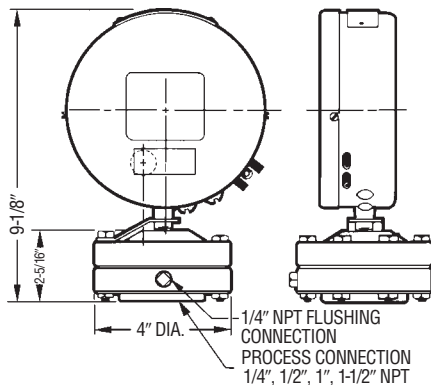
Types DAH, DRH, DSH  
Drawing No. 1350



\*Consult factory for Cenelec approved DAH models.

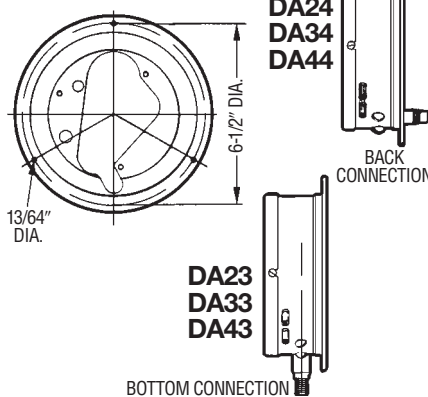
## Diaphragm Seal

Types MSAG  
Drawing No. 2305



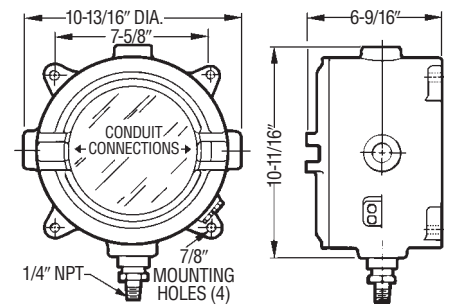
## Flange for Surface Mounting

Drawing No. 1000F  
PN 17-20<sup>(2)</sup>



## Explosion-Proof

Types DAE, DRE, DSE  
Drawing No. 98D



(1.) 1/2" NPT Connection for ranges 15S, 16S  
(2.) Use PN 17-31 for ranges 15S, 16S



### General Purpose

NEMA 1 Enclosure

For indoor use and other general purpose applications under normal atmospheric conditions. Provides protection against dust and light splashing. Heavy gauge plain steel case. Flanged case available. Transparent cover for visible on-off operation. Locking device prevents tampering. Pressure connection, 1/4" NPT. Electrical connection back of case for 1/2" conduit or BX. Shipping wt. 4 lbs. See above for dimensions. *Furnished as standard unless otherwise specified.*



### Watertight, Dust-tight/Type W

NEMA 3S, 4, & 4X Enclosure

For outdoor or indoor applications. Complies with hose test and requirements for watertight, dust-tight, drip-tight weatherproof, weather-resistant, splash-proof, sleet-proof, and moisture-resistant. Flanged, heavy gauge steel case with transparent cover for visible on-off operation. External adjustments protected by cover. Bottom pressure connection, 1/4" NPT. Electrical connection back of case for 1/2" conduit, removable 1/2" hub. Shipping wt. 6 lbs. See above for dimensions. *Optional, add "W" to prefix, i.e. DAW, DRW, DSW, when ordering.*



### Explosion-Proof Type H

Hazardous Area Enclosure suitable for Class I, Groups C & D, Class II, Groups E, F & G; NEMA 7 & 9 applications. Control mechanism is an integral part of enclosure and cannot be

replaced in the field. For surface, panel or pipe mounting. Aluminum case with glass window in cover for visible on-off operation. Bottom pressure connection, 1/2" NPT male x 1/4" NPT female. External adjustments. Available with breather and drain. Shipping wt. 8 lbs. (3.6 kg.). See above for dimensions. Optional housing, to order add "H" to prefix. Example: DAH, DRH, or DSH. Not available on D80 Series.

NOTE: Standard general purpose NEMA 1 and NEMA 4 enclosures are suitable for Class I, Division 2 applications with addition of conduit hub (mercury switch models only).