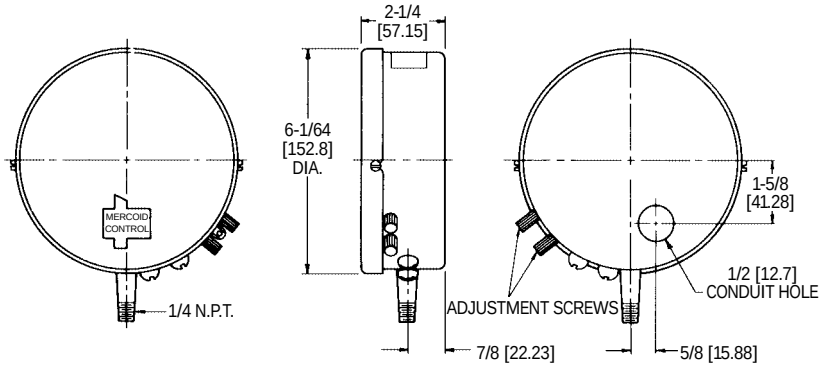
Series DA/DS-7000 Bourdon Tube Pressure Switches

Specifications - Installation and Operating Instructions



Series DA/DS-7000 Bourdon Tube Pressure Switches are SPDT snap-action switches that combine extremely high sensitivity and repeatability with easily adjustable set and reset points through non-interactive external adjustments. These switches have visible calibrated dials for set points and on-off indicators to indicate switch actuation. DA models are equipped with two external adjustments. One sets the high pressure operating point; the other sets the reset point. Deadband or the difference between set and reset points is adjustable over the full scale. DS models have a fixed deadband.

NOTE: The DS7300 has no status indicator.

INSTALLATION

The switch may be mounted in any position. Select a location recommended by equipment manufacturer. Where excessive vibration occurs, mount the switch remotely, using an appropriate remote connection and mounting bracket. See accessories, below.

ACCESSORIES

Mounting Bracket

Remote Connection

Pigtail Siphon

PHYSICAL DATA

Pressure Range: Models range from 0 to 30" Hg (0 to 762.5 mm/Hg) Vac. to 800 to 8000 psig (55.16 to 551.6 bar).

Maximum Temperature: 180°F (82°C). For higher temperature media applications, a remote connection or siphon (pigtail) should be used.

Pressure Connections: 1/4" NPT standard; 1/2" NPT on ranges 500 to 5000 psig and 800 to 8000 psig.

Housing: Pressed steel with transparent cover.

Wiring Connections: Three-screw type.

Wetted Parts: Same as Bourdon tube material (brass, 403SS or 316SS) on all ranges except 23K, 24K, and 9K, which have carbon steel bottom connections.

Weight: 4 lb/1.8 kg (standard); 6 lb/2.7 kg (weatherproof); 8 lb/3.6 kg (explosion-proof)

Max. Pressure: Max. adjustment of operating range.

CAUTIONS:

Control movement must not be oiled. Do not overload. Note electrical rating on name plate and be sure that total current passing through the switch is within specified rating.

When testing a boiler or system, never exceed maximum pressure rating on control or it may be seriously damaged. Remove control if higher pressures are required.

Do not fail to use a siphon on steam where range is 35 lbs (2413 mbar) or more.

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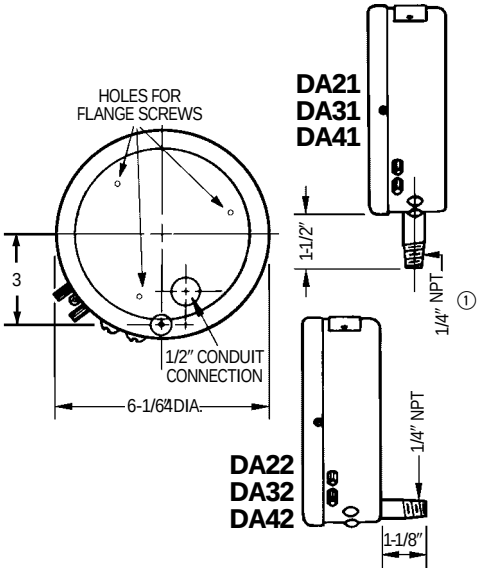
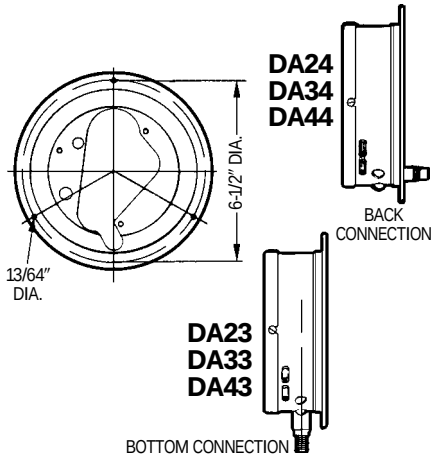
GENERAL PURPOSE CONTROLS, TYPES DA, DL, DR, DS
Mount control in any position. Do not twist the case when installing. Use a wrench on the square part of the control connection. On controls with operating Range No. 15S (500 to 5000 psi (34.47 to 344.75 bar)) or Range No. 16S (800 to 8000 psi (55.16 to 551.6 bar)), be sure the special sealing nut (with Teflon® insert) is turned to the uppermost threaded section of the ½″ pressure connection. Apply a flat open-end wrench to the flat side of the bottom pressure connection when piping the control. After properly connecting the control, tighten the sealing nut to assure a leakproof connection.



General Purpose
Types DA, DS, DR, DL

FLANGED CASE CONTROLS
Mount by means of the three holes in the flange. Note: Series D7030 when used for steam with operating ranges of 35 psi (2.413 bar) or higher, must be siphoned to prevent live steam entering the Bourdon tube. With high-pressure steam exceeding 100 psi (6.895 bar), use a remote connection. (Note accessories on Page 1.)
Series D-7020 incorporate an orifice as standard in the pressure connection to dampen surges or pulsations.



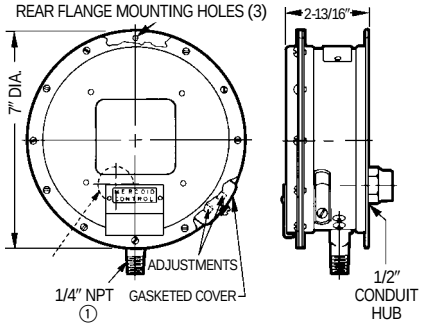
Flange for Surface Mounting

WEATHER-RESISTANT (RAINTIGHT)
NEMA 2, 3, TYPES N3DAW, N3DRW, N3DSW
These switches are supplied with flanged case, bottom connection, for surface mounting.

WATERTIGHT AND WEATHERPROOF
NEMA 2, 3, 4, 5, TYPES DAW, DRW, DSW, C4DAW*, C4DAW*, C5DSW*

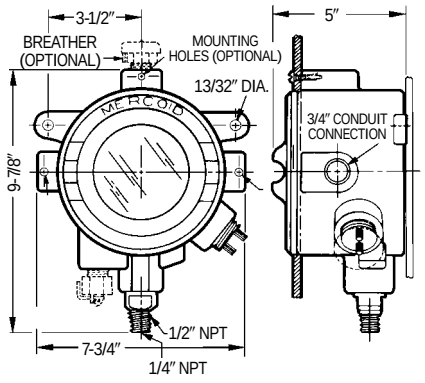
These switches are supplied with flanged case, bottom connection, for surface mounting only.

* Conforms to Canadian Standards Association requirements



Weather-Proof
Types DAW, DSW, DRW

EXPLOSION-PROOF TYPES DAH, DRH, DSH
Mount with mounting lugs attached to control housing.

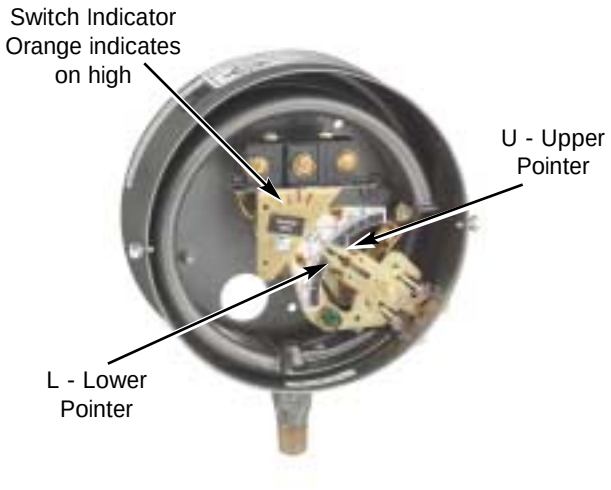


Explosion-Proof
Types DAH, DRH, DSH

WIRING
Wire in accordance with the National Electrical Code and local regulations. For general purpose controls, use a short piece of BX between the rigid conduit and the control so the control will not be subjected to conduit expansion and contraction. Where the control is directly connected into the load circuit, it should be connected into the hot side of the line. Do not exceed electrical rating as stamped on the control nameplate. DS-7300 controls are equipped with a terminal block. Field connection should be made to terminal block pole in common with required pole of the control's switch. The color code is:
Black - Common
Blue - ON Hi
Red - ON Lo

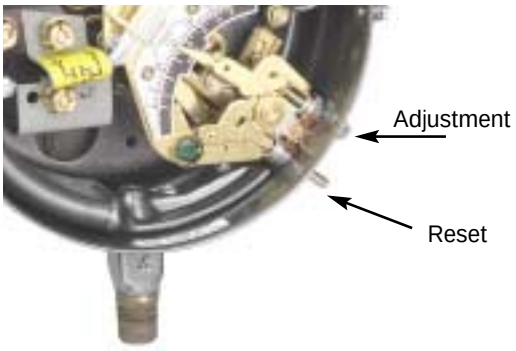
ADJUSTMENTS: HOW TO SET OPERATING POINT

Double Adjustment Types - Fully Automatic:
With double-adjustment switches (prefixed DA, DAH or DAW), adjust the upper pointer "U" to set HIGH PRESSURE POINT for switch operation and adjust the lower pointer "L" to set LOW PRESSURE OPERATING POINT. The difference between the "U" and "L" pointers is the operating differential between "on-off" switch operation.



Double-Adjustment Types
Fully Automatic

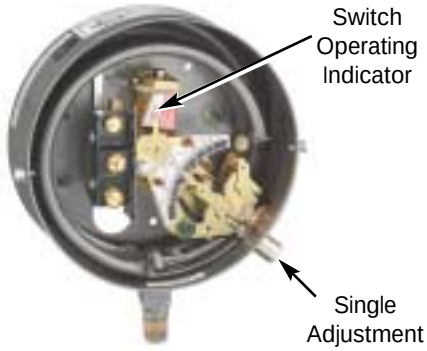
Semi-Automatic Control with Manual Reset:
Models prefixed DR, DRH, DRW and with suffix L or U (example: DR-7021-153U) have a single adjustment that sets the operating point for automatic operation. A push-button reset must be operated manually to restore the circuit to the original position after automatic operation. Example: Type DR-7021-153L has a circuit that opens automatically on a pressure rise to the pressure indicated by the pointer on the scale; no matter how much the pressure drops, the circuit will not re-close until the reset button is operated. Suffix L denotes control will operate automatically on an increase. Suffix U denotes control will operate automatically on an decrease.



Semi-Automatic Types
with Manual Reset

SINGLE ADJUSTMENT TYPES—FULLY AUTOMATIC:

Models prefixed DS, DSH, DSW, N3DSW are equipped with a single adjustment. Differential is fixed (not adjustable). The single pointer on the scale sets the pressure at which switch operation occurs. Differential is listed in chart indicates approximate fixed differential.



Single Adjustment Types Fully Automatic

LOCKING DEVICE

When the control has been adjusted to desired range, the locking bar may be inserted between the adjustment screws with the slot passing over the projecting lugs. By placing a sealing wire between the locking bar and the hole in the lug protruding from the adjustment assembly, adjustments cannot be tampered with.

For DRF, DAW, DRW, adjusting knob cover may be sealed in place with sealing wire through cover bolt hole. For DAH, sealing wire may pass through locking bar and hole in hub above adjusting knobs.

DELRIN® BUSHED MOVEMENT "B"

Delrin® bushed movements prolong control life by alleviating wear of metal surfaces due to excessive vibration and/or pulsation. They also prolong switch life in environments where corrosion may be a factor. Models with Delrin movements are identified by the letter "B after the suffix number. Examples: -153B, -153UB, etc.

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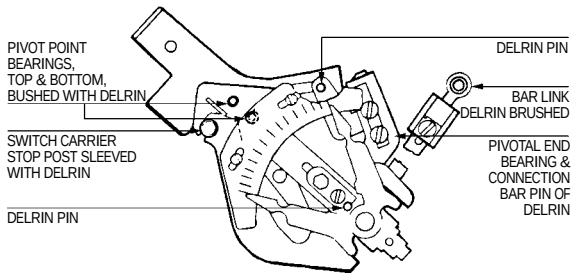
CONTROL NUMBER

Part of the control number (the fourth number in the sequence) identifies the type of control case. Digit 1 of 7021, 7031, 7041, denotes a plain case with bottom connection. Digit 2 of 7022, 7032, etc., denotes a plain case with back connection. Digit 3 of 7023, 7033, 7043, etc., denotes a flanged case with bottom connection. Digit 4 of 7024, 7034, etc., denotes a flanged case with back connection. (Digit 3 of 7321, 7331, 7341, etc., denotes hermetically sealed snap switch.)



Delrin® Bushed Movement "B"

CIRCUITS (SWITCH OPERATION)

Suffix number after control number denotes switch action:
Suffix -153 designates SPDT; one circuit closes as other circuit opens.
Suffix - 804 designates two SPDT switches; two close, two open.

RANGES:			TYPE DA Double Adjustment Minimum Differential	TYPE DS Single Adjustment Fixed Differential		
Bourdon Tube Material	**Range Number**	**Adjustable Operating Range (PSIG)**	**SPDT DA-7031-153 DAW-7033-153 DAH-7031-153**	**SPDT DS-7231-153 DSW-7233-153 DSH-7231-153**	**(2) SPDT DS-7231-804 DSW-7233-804 DSH-7231-804**	**SPDT DS-7331-153 DSW-7333-153 DSH-7331-153**
Brass Bourdon Tube	2	0-30" Hg Vac	9" Hg	3" Hg	2.5" Hg	5" Hg
	3	1.0" Hg Vac-12 psig	4 psig	1.5 psig	1.25" psi	3" psi
	1	1/8-15 psig	4 psig	1.5 psig	1.25 psig	3 psig
	3A	1/8-20 psig	4 psig	1.5 psig	1.25 psig	3 psig
	4	1-35 psig	5 psig	1.5 psig	1.5 psig	3 psig
	27	25" Hg Vac-50 psig	8 psig	2.5 psig	2 psig	3.75 psig
	5	2-60 psig	6 psig	2 psig	1.5 psig	3 psig
	6	5-100 psig	9 psig	2.5 psig	2 psig	3.75 psig
	7	5-150 psig	16 psig	3.5 psig	3.5 psig	5.25 psig
	8	10-200 psig	16 psig	4.75 psig	4 psig	6.75 psig
	9	10-300 psig	16 psig	6 psig	6 psig	9 psig
403SS Bourdon Tube	**Range Number**	**Adjustable Operating Range (PSIG)**	**SPDT DA-7021-153 DAW-7023-153 DAH-7021-153**	**SPDT DS-7221-153 DSW-7223-153 DSH-7221-153**	**(2) SPDT DS-7221-804 DSW-7223-804 DSH-7221-804**	**SPDT DS-7321-153 DSW-7323-153 DSH-7321-153**
	25S	30" Hg Vac-50 psig	12 psig	3.5 psig	3 psig	5.25 psig
	26S	30" Hg Vac-75 psig	12 psig	3.5 psig	3 psig	5.25 psig
	5S	2-60 psig	9 psig	3 psig	2.5 psig	4.5 psig
	6S	5-100 psig	13 psig	3.5 psig	3 psig	5.25 psig
	8S	10-200 psig	15 psig	4.75 psig	4 psig	7.125 psig
	9S	10-300 psig	20 psig	7 psig	6 psig	10.5 psig
	9AS	40-350 psig	19 psig	7psig	6 psig	10.5 psig
	10S	25-600 psig	45 psig	12 psig	10 psig	18 psig
	11S	50-1000 psig	95 psig	22 psig	20 psig	33 psig
	12S	100-1500 psig	130 psig	35 psig	30 psig	52.5 psig
	13S	300-2500 psig	260 psig	60 psig	50 psig	90 psig
	15S	500-5000 psig	900 psig	200 psig	110 psig	300 psig
	16S	800-8000 psig	1500 psig	500 psig	180 psig	750 psig
316SS Bourdon Tube	**Range Number**	**Adjustable Operating Range (PSIG)**	**SPDT DA-7041-153 DAW-7043-153 DAH-7041-153**	**SPDT DS-7241-153 DSW-7243-153 DSH-7241-153**	**(2) SPDT DS-7241-804 DSW-7243-804 DSH-7241-804**	**SPDT DS-7341-153 DSW-7343-153 DSH-7341-153**
	26E	30" Hg Vac- 75 psig	10 psig	3.5 psig	4 psig	5.25 psig
	23E	5-75 psig	8 psig	4 psig	2.5 psig	6 psig
	6E	10-100 psig	10 psig	3.5 psig	4 psig	5.25 psig
	24E	10-150 psig	11 psig	4.5 psig	3 psig	6.75 psig
	9E	10-300 psig	28 psig	8 psig	6 psig	12 psig
	21E	30-400 psig	52 psig	12 psig	10 psig	18 psig
	22E	75-800 psig	120 psig	25 psig	17 psig	37.5 psig
	11E	100-100 psig	190 psig	35 psig	30 psig	52.5 psig
	13E	200-2500 psig	400 psig	75 psig	95 psig	112.5 psig
316SS Bourdon Tube Carbon Steel Bottom Connection	**Range Number**	**Adjustable Operating Range (PSIG)**	**SPDT DA-7041-153 DAW-7043-153 DAH-7041-153**	**SPDT DS-7241-153 DSW-7243-153 DSH-7241-153**	**(2) SPDT DS-7241-804 DSW-7243-804 DSH-7241-804**	**SPDT DS-7341-153 DSW-7343-153 DSH-7341-153**
	23K	5-75 psig	8 psig	4 psig	2.5 psig	6 psig
	24K	10-150 psig	11 psig	4 psig	3 psig	6 psig
	9K	10-300 psig	28 psig	8 psig	6 psig	12 psig
	Two SPDT Switches* Electrical Ratings		See Code F See Code D	See Code E	See Code D	See Code K

	ELECTRICAL RATINGS		
	AC Capacity	**DC Capacity**	**AC Horsepower**
Code	120V 240V 480V	120V 240V	120V 240V
D	15A 15A NA	.5A .25A	1/8 1/4
E	15A 15A 15A	NA NA	1/4 1/2
F	12A 10A 5A	.5A .25A	1/4 1/2
G	5A @ 250 AC. Resistive & Inductive; 30V DC Resistive		
K	5A @ 125/250 AC, Resistive; 30V DC Resistive		

Circuit Suffix No.
-153
-804

Switch Action on Pressure/Temperature Increase

SPDT: one OPENS as one CLOSES
(2) SPDT: two OPEN as two CLOSE

Electrical Rating Code

D-7000	D-2000	D-7300
D	E	K
F*	G	

***Note:** Minimum differentials increase when using multiple circuits. Controls using #804 circuits in ranges over 35 psig have 30% higher minimum differentials; ranges under 35 psig are not available in Code F.

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