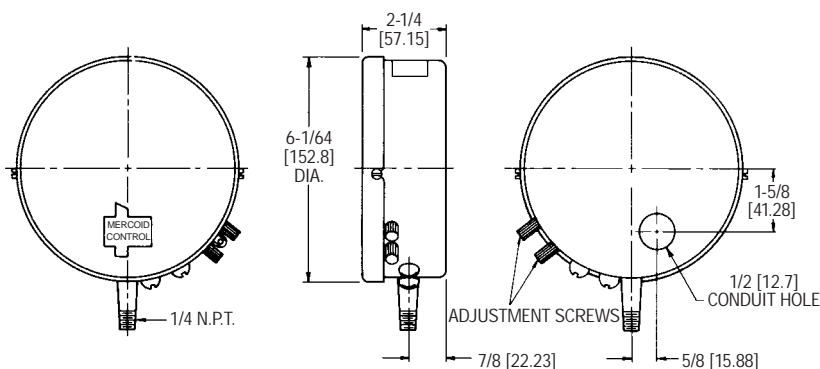


Series DA/DS-7000 Bourdon Tube Pressure Switches

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

SPECIFICATIONS

Wetted Materials: Brass, 403 SS, or 316 SS.

Temperature Limit: 180°F (82°C).

Pressure Limit: Maximum pressure of the operating range.

Enclosure Rating: General purpose, weatherproof or explosion-proof.

Repeatability: ±1% of full operating range.

Switch Type: See circuit chart.

Electrical Rating: See electrical ratings chart.

Electrical Connections: Screw terminal.

Conduit Connection: General purpose: 1/2" hole for conduit hub. Weatherproof: 1/2" conduit hub. Explosion-proof: 3/4" female NPT.

Process Connection: General purpose and weatherproof: 1/4" male NPT, 1/2" male NPT on ranges 15S and 16S. Explosion-proof: 1/2" male NPT and 1/4" female NPT.

Mounting Orientation: Vertical.

Set Point Adjustment: Thumbscrew.

Weight: General Purpose: 4 lb (1.8 kg), weatherproof: 6 lb (2.7kg), explosion-proof: 8 lb (3.5 kg).

Deadband: See Ranges and Differentials Chart.

CAUTIONS:

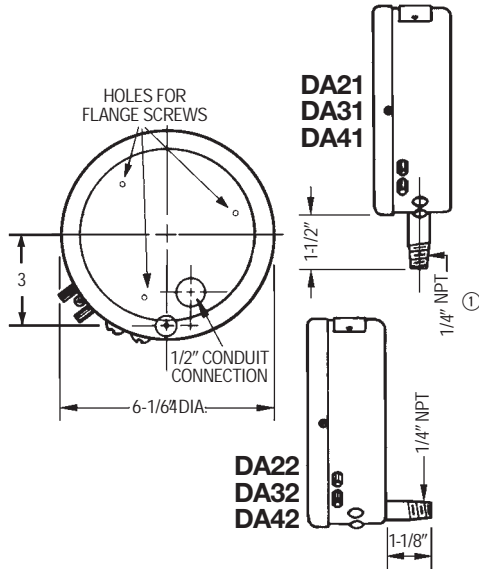
Control movement must not be oiled. Do not overload. Note electrical rating on name plate and be sure that total current passing through the switch is within specified rating.

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.

GENERAL PURPOSE CONTROLS, TYPES DA, DL, DR, DS

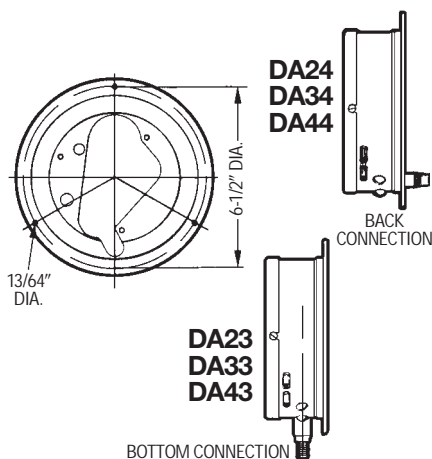
Mount control in any position. Do not twist the case when installing. Use a wrench on the square part of the control connection. On controls with operating Range No. 15S (500 to 5000 psi (34.47 to 344.75 bar)) or Range No. 16S (800 to 8000 psi (55.16 to 551.6 bar)), be sure the special sealing nut (with PTFE insert) is turned to the uppermost threaded section of the 1/2" 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 leak-proof 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

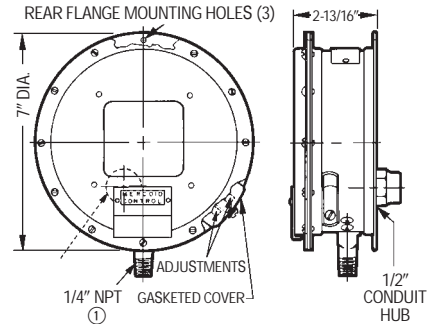
**WEATHER-RESISTANT (RAINTIGHT)
NEMA 2, 3, TYPES N3DAW, N3DRW, N3DSW**

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.

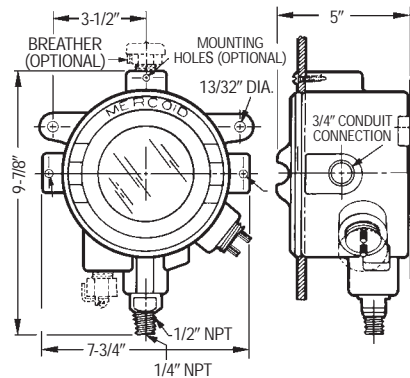
* Conforms to Canadian Standards Association requirements



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

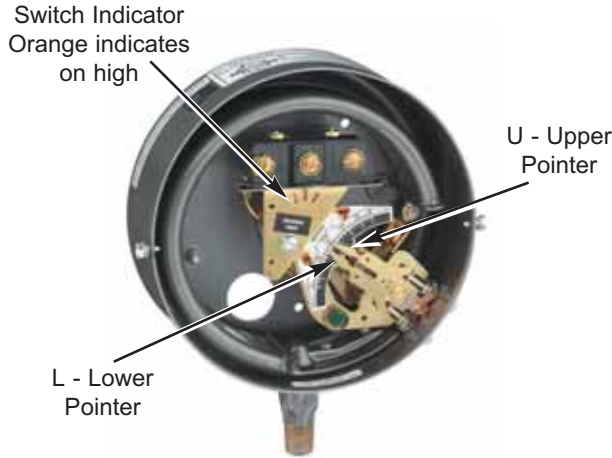
Wire in accordance with the National Electrical Code and local regulations. For general purpose controls, use a short piece of BX between the rigid conduit and the control so the control will not be subjected to conduit expansion and contraction. Where the control is directly connected into the load 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:

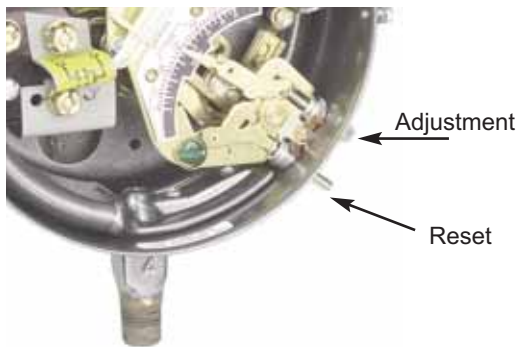
With double-adjustment switches (prefixed DA, DAH or DAW), adjust the upper pointer "U" to set HIGH PRESSURE POINT for switch operation and adjust the lower pointer "L" to set LOW PRESSURE OPERATING POINT. The difference between the "U" and "L" pointers is the operating differential between "on-off"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



Double-Adjustment Types Fully Automatic

Semi-Automatic Control with Manual Reset:

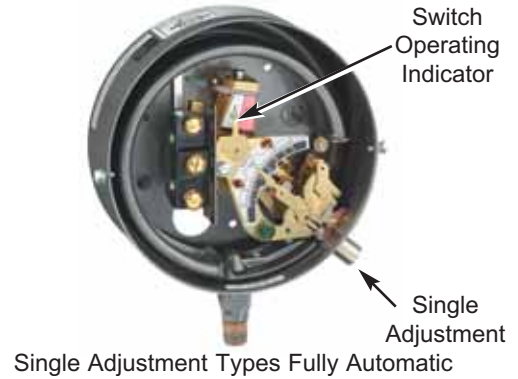
Models prefixed DR, DRH, DRW and with suffix L or U (example: DR-7021-153U) have a single adjustment that sets the operating point for automatic operation. A push-button reset must be operated manually to restore the circuit to the original position after automatic operation. Example: Type DR-7021-153L 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 a 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.



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.

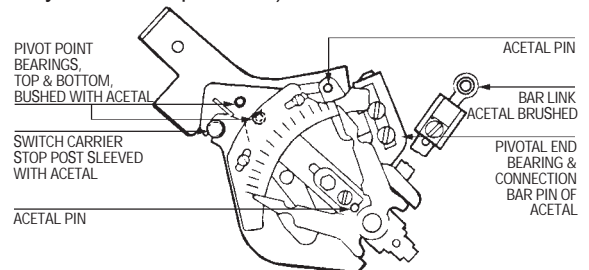
For DRF, DAW, DRW, adjusting knob cover may be sealed in place with sealing wire through cover bolt hole. For DAH, sealing wire may pass through locking bar and hole in hub above adjusting knobs.

ACETAL BUSHED MOVEMENT "B"

Acetal 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 Acetal movements are identified by the letter "B" after the suffix number. Examples: -153B, -153UB, etc.

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.)



Acetal 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 (psig)	TYPE DS Single Adjustment Fixed Differential (psig)			
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	13.5" Hg	3" Hg	2.5" Hg	5" Hg	
	3	1.0" Hg Vac-12	6	1.5	1.25"	3"	
	1	1/8-15	6	1.5	1.25	3	
	3A	1/8-20	6	1.5	1.25	3	
	4	1-35	7	1.5	1.5	3	
	27	25" Hg Vac-50	12	2.5	2	3.75	
	5	2-60	9	2	1.5	3	
	6	5-100	13.5	2.5	2	3.75	
	7	5-150	24	3.5	3.5	5.25	
	8	10-200	24	4.75	4	6.75	
9	10-300	37.5	37.5	6	6	9	
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-60	18	3.5	3	5.25	
	26S	30" Hg Vac-75	22.5	3.5	3	5.25	
	5S	2-60	13.5	3	2.5	4.5	
	6S	5-100	19.5	3.5	3	5.25	
	8S	10-200	22.5	4.75	4	7.125	
	9S	10-300	28.5	7	6	10.5	
	9AS	40-350	30	7	6	10.5	
	10S	25-600	67.5	12	10	18	
	11S	50-1000	142.5	22	20	33	
	12S	100-1500	195	35	30	52.5	
	13S	300-2500	390	60	50	90	
	15S	500-5000	1350	200	110	300	
	16S	800-8000	2250	500	180	750	
	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	15	3.5	4	5.25
23E		5-75	12	4	2.5	6	
6E		10-100	15	3.5	4	5.25	
24E		10-150	16.5	4.5	3	6.75	
9E		10-300	42	8	6	12	
21E		30-400	78	12	10	18	
22E		75-800	180	25	17	37.5	
11E		100-100	285	35	30	52.5	
13E		200-2500	600	75	95	112.5	
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	12	4	2.5	6
		24K	10-150	16.5	4	3	6
	9K	10-300	42	8	6	12	
Electrical Ratings			See Code F*	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	10A	10A	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.	Switch Action on Pressure Increase	Electrical Rating Code					
		D-7000	D-7200	D-7300			
-153	SPDT: one OPENS as one CLOSES	D	E	K			
-804	(2) SPDT: two OPEN as two CLOSE	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.							