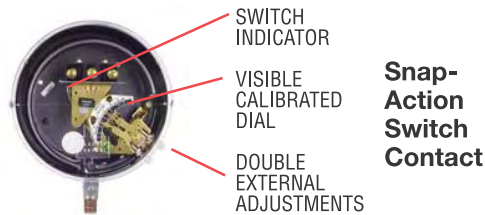
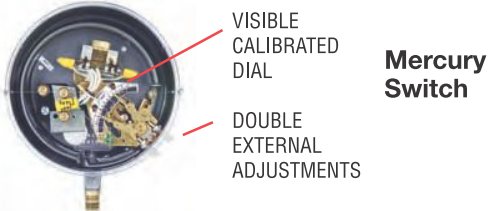


Type DA

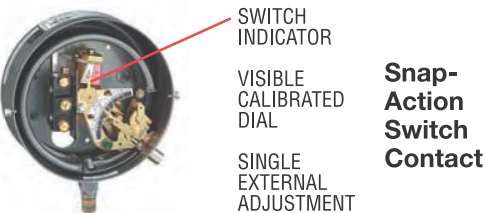
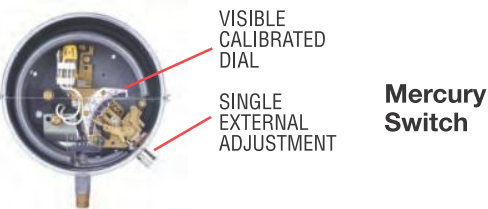
Adjustable Deadband, Fully Automatic, Double Adjustments



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

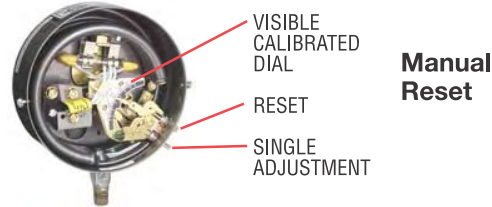
Fixed Deadband, Fully Automatic, Single Adjustment



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



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



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.

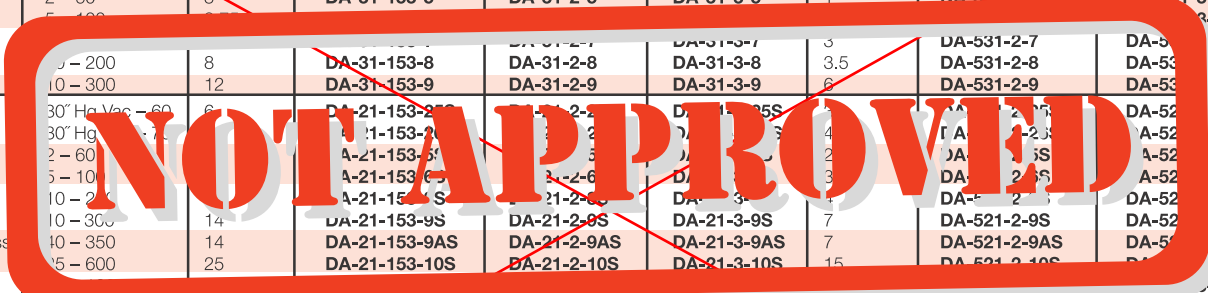


Provides two stage control by actuating one circuit upon a rise or fall in pressure and a second circuit on a further rise or fall. Each setpoint has a fixed deadband.

MODELS

D Series Pressure Switch with Mercury Switch and General Purpose Enclosure

Bourdon Tube Material	Adjustable Operating Range (psig)	Minimum Deadband (psig)	SPDT 4A @ 120 V 2A @ 240 V AC/DC	SPST Open on Increase 10A @ 120 V 5A @ 240 V AC/DC	SPST Close on Increase 10A @ 120 V 5A @ 240 V AC/DC	Minimum Deadband (psig)	SPST 5A @ 120 VAC 2A @ 240 VAC 2.5A @ 120 VDC 1A @ 240 VDC (Open on Increase)	SPST 5A @ 120 VAC 2A @ 240 VAC 2.5A @ 120 VDC 1A @ 240 VDC (Close on Increase)
Brass	0-30" Hg Vac	2" Hg	DA-31-153-2	DA-31-2-2	DA-31-3-2	1" Hg	DA-531-2-2	DA-531-3-2
	10" Hg Vac - 12	1	DA-31-153-3	DA-31-2-3	DA-31-3-3	0.5	DA-531-2-3	DA-531-3-3
	25" Hg Vac - 50	3.5	DA-31-153-27	DA-31-2-27	DA-31-3-27	2	DA-531-2-27	DA-531-3-27
	1/8 - 15	1	DA-31-153-1	DA-31-2-1	DA-31-3-1	0.5	DA-531-2-1	DA-531-3-1
	1/8 - 20	1	DA-31-153-3A	DA-31-2-3A	DA-31-3-3A	0.5	DA-531-2-3A	DA-531-3-3A
	1 - 35	1.75	DA-31-153-4	DA-31-2-4	DA-31-3-4	0.75	DA-531-2-4	DA-531-3-4
	2 - 60	3	DA-31-153-5	DA-31-2-5	DA-31-3-5	1	DA-531-2-5	DA-531-3-5
	5 - 100	5	DA-31-153-6	DA-31-2-6	DA-31-3-6	1.5	DA-531-2-6	DA-531-3-6
	10 - 200	8	DA-31-153-8	DA-31-2-8	DA-31-3-8	3.5	DA-531-2-8	DA-531-3-8
	10 - 300	12	DA-31-153-9	DA-31-2-9	DA-31-3-9	6	DA-531-2-9	DA-531-3-9
403 Stainless Steel	30" Hg Vac - 60	6	DA-21-153-25S	DA-21-2-25S	DA-21-3-25S	3	DA-521-2-25S	DA-521-3-25S
	30" Hg Vac - 75	7	DA-21-153-26S	DA-21-2-26S	DA-21-3-26S	4	DA-521-2-26S	DA-521-3-26S
	2 - 60	9	DA-21-153-5S	DA-21-2-5S	DA-21-3-5S	3	DA-521-2-5S	DA-521-3-5S
	5 - 100	13	DA-21-153-6S	DA-21-2-6S	DA-21-3-6S	3	DA-521-2-6S	DA-521-3-6S
	10 - 200	14	DA-21-153-9S	DA-21-2-9S	DA-21-3-9S	7	DA-521-2-9S	DA-521-3-9S
	10 - 300	14	DA-21-153-9AS	DA-21-2-9AS	DA-21-3-9AS	7	DA-521-2-9AS	DA-521-3-9AS
	40 - 350	14	DA-21-153-9AS	DA-21-2-9AS	DA-21-3-9AS	7	DA-521-2-9AS	DA-521-3-9AS
	15 - 600	25	DA-21-153-10S	DA-21-2-10S	DA-21-3-10S	15	DA-521-2-10S	DA-521-3-10S
	300 - 2500	150	DA-21-153-13S	DA-21-2-13S	DA-21-3-13S	50	DA-521-2-12S	DA-521-3-12S
	500 - 5000	450	DA-21-153-15S	DA-21-2-15S	DA-21-3-15S	200	DA-521-2-13S	DA-521-3-13S
800 - 8000	750	DA-21-153-16S	DA-21-2-16S	DA-21-3-16S	400	DA-521-2-15S	DA-521-3-15S	
316 Stainless Steel	30" Hg Vac - 75	7	DA-41-153-26E	DA-41-2-26E	DA-41-3-26E	3.5	DA-541-2-26E	DA-541-3-26E
	5 - 75	3	DA-41-153-23E	DA-41-2-23E	DA-41-3-23E	2	DA-541-2-23E	DA-541-3-23E
	10 - 100	7	DA-41-153-6E	DA-41-2-6E	DA-41-3-6E	3.5	DA-541-2-6E	DA-541-3-6E
	10 - 150	6	DA-41-153-24E	DA-41-2-24E	DA-41-3-24E	3	DA-541-2-24E	DA-541-3-24E
	10 - 300	18	DA-41-153-9E	DA-41-2-9E	DA-41-3-9E	5	DA-541-2-9E	DA-541-3-9E
	30 - 400	30	DA-41-153-21E	DA-41-2-21E	DA-41-3-21E	15	DA-541-2-21E	DA-541-3-21E
	75 - 800	75	DA-41-153-22E	DA-41-2-22E	DA-41-3-22E	35	DA-541-2-22E	DA-541-3-22E
	100 - 1000	100	DA-41-153-11E	DA-41-2-11E	DA-41-3-11E	45	DA-541-2-11E	DA-541-3-11E
200 - 2500	210	DA-41-153-13E	DA-41-2-13E	DA-41-3-13E	110	DA-541-2-13E	DA-541-3-13E	



Pressure

D Series Pressure Switch with Snap Action Switch and General Purpose Enclosure

Bourdon Tubular Material	Adjustable Operating Range (psig)	Adjustable Deadband SPDT: 15A @ 120/240 VAC		Fixed Deadband SPDT: 15A @ 120/240 AC		Hermetically Sealed, Fixed Deadband SPDT: 5A @ 120/240 VAC, 5A res. @ 30 VDC	
		Minimum Deadband (psig)	Model Number	Fixed Deadband (psig)	Model Number	Fixed Deadband (psig)	Model Number
Brass	0-30" Hg Vac	9" Hg	DA-7031-153-2	3" Hg	DS-7231-153-2	5" Hg	DS-7331-153-2
	10" Hg Vac - 12	4	DA-7031-153-3	1.5	DS-7231-153-3	3	DS-7331-153-3
	25" Hg Vac - 50	8	DA-7031-153-27	2.5	DS-7231-153-27	3.75	DS-7331-153-27
	1/8 - 15	4	DA-7031-153-1	1.5	DS-7231-153-1	3	DS-7331-153-1
	1/8 - 20	4	DA-7031-153-3A	1.5	DS-7231-153-3A	3	DS-7331-153-3A
	1 - 35	5	DA-7031-153-4	1.5	DS-7231-153-4	3	DS-7331-153-4
	2 - 60	6	DA-7031-153-5	2	DS-7231-153-5	3	DS-7331-153-5
	5 - 100	9	DA-7031-153-6	2.5	DS-7231-153-6	3.75	DS-7331-153-6
	5 - 150	16	DA-7031-153-7	3	DS-7231-153-7	5.25	DS-7331-153-7
	10 - 200	16	DA-7031-153-8	4	DS-7231-153-8	6.75	DS-7331-153-8
10 - 300	25	DA-7031-153-9	5	DS-7231-153-9	9	DS-7331-153-9	
403 Stainless Steel	30" Hg Vac - 60	12	DA-7021-153-25S	3.5	DS-7221-153-25S	5.25	DS-7321-153-25S
	30" Hg Vac - 75	15	DA-7021-153-26S	3.5	DS-7221-153-26S	5.25	DS-7321-153-26S
	2 - 60	9	DA-7021-153-5S	3	DS-7221-153-5S	4.5	DS-7321-153-5S
	5 - 100	13	DA-7021-153-6S	3.5	DS-7221-153-6S	5.25	DS-7321-153-6S
	10 - 200	15	DA-7021-153-8S	4	DS-7221-153-8S	7.125	DS-7321-153-8S
	10 - 300	19	DA-7021-153-9S	6	DS-7221-153-9S	10.5	DS-7321-153-9S
	40 - 350	20	DA-7021-153-9AS	6	DS-7221-153-9AS	10.5	DS-7321-153-9AS
	25 - 600	45	DA-7021-153-10S	10	DS-7221-153-10S	18	DS-7321-153-10S
	50 - 1000	95	DA-7021-153-11S	20	DS-7221-153-11S	33	DS-7321-153-11S
	100 - 1500	130	DA-7021-153-12S	30	DS-7221-153-12S	52.5	DS-7321-153-12S
316 Stainless Steel	30" Hg Vac - 75	10	DA-7041-153-26E	3.5	DS-7241-153-26E	5.25	DS-7341-153-26E
	5 - 75	8	DA-7041-153-23E	4	DS-7241-153-23E	6	DS-7341-153-23E
	10 - 100	10	DA-7041-153-6E	3.5	DS-7241-153-6E	5.25	DS-7341-153-6E
	10 - 150	11	DA-7041-153-24E	4	DS-7241-153-24E	6.75	DS-7341-153-24E
	10 - 300	28	DA-7041-153-9E	8	DS-7241-153-9E	12	DS-7341-153-9E
	30 - 400	52	DA-7041-153-21E	10	DS-7241-153-21E	18	DS-7341-153-21E
	75 - 800	120	DA-7041-153-22E	25	DS-7241-153-22E	37.5	DS-7341-153-22E
	100 - 1000	190	DA-7041-153-11E	35	DS-7241-153-11E	52.5	DS-7341-153-11E
200 - 2500	400	DA-7041-153-13E	75	DS-7241-153-13E	112.5	DS-7341-153-13E	

CALL TO ORDER: U.S. Phone 219 879-8000 • U.K. Phone (+44) (0)1494-461707 • Asia Pacific Phone 61 2 4272-2055

MODELS

D Series Pressure Switch with Mercury Switch and Weatherproof Enclosure								
Bourdon Tube Material	Adjustable Operating Range (psig)	Adjustable Deadband						
		Minimum Deadband (psig)	SPDT 4A @ 120 V 2A @ 240 V AC/DC	SPST Open on Increase 10A @ 120 V 5A @ 240 V AC/DC	SPST Close on Increase 10A @ 120 V 5A @ 240 V AC/DC	Minimum Deadband (psig)	SPST Open on Increase 5A @ 120 VAC 2A @ 240 VAC 2.5A @ 120 VDC 1A @ 240 VDC	SPST Close on Increase 5A @ 120 VAC 2A @ 240 VAC 2.5A @ 120 VDC 1A @ 240 VDC
Brass	0-30" Hg Vac	2" Hg	DAW-33-153-2	DAW-33-2-2	DAW-33-3-2	1" Hg	DAW-533-2-2	DAW-533-3-2
	10" Hg Vac - 12	1	DAW-33-153-3	DAW-33-2-3	DAW-33-3-3	0.5	DAW-533-2-3	DAW-533-3-3
	25" Hg Vac - 50	3.5	DAW-33-153-27	DAW-33-2-27	DAW-33-3-27	2	DAW-533-2-27	DAW-533-3-27
	1/8 - 15	1	DAW-33-153-1	DAW-33-2-1	DAW-33-3-1	0.5	DAW-533-2-1	DAW-533-3-1
	1/8 - 20	1	DAW-33-153-3A	DAW-33-2-3A	DAW-33-3-3A	0.5	DAW-533-2-3A	DAW-533-3-3A
	1 - 35	1.75	DAW-33-153-4	DAW-33-2-4	DAW-33-3-4	0.75	DAW-533-2-4	DAW-533-3-4
	2 - 60	3	DAW-33-153-5	DAW-33-2-5	DAW-33-3-5	1	DAW-533-2-5	DAW-533-3-5
	5 - 100	3.75	DAW-33-153-6	DAW-33-2-6	DAW-33-3-6	2	DAW-533-2-6	DAW-533-3-6
	5 - 150	6	DAW-33-153-7	DAW-33-2-7	DAW-33-3-7	3	DAW-533-2-7	DAW-533-3-7
	30" Hg Vac - 60	6	DAW-23-153-25S	DAW-23-2-25S	DAW-23-3-25S	6	DAW-523-2-25S	DAW-523-3-25S
30" Hg Vac - 75	8	DAW-23-153-26S	DAW-23-2-26S	DAW-23-3-26S	4	DAW-523-2-26S	DAW-523-3-26S	
2 - 60	4	DAW-23-153-5S	DAW-23-2-5S	DAW-23-3-5S	3.5	DAW-523-2-5S	DAW-523-3-5S	
5 - 100	8	DAW-23-153-6S	DAW-23-2-6S	DAW-23-3-6S	4	DAW-523-2-6S	DAW-523-3-6S	
10 - 200	13	DAW-23-153-8S	DAW-23-2-8S	DAW-23-3-8S	6	DAW-523-2-8S	DAW-523-3-8S	
10 - 300	19	DAW-23-153-9S	DAW-23-2-9S	DAW-23-3-9S	7	DAW-523-2-9S	DAW-523-3-9S	
40 - 350	20	DAW-23-153-9AS	DAW-23-2-9AS	DAW-23-3-9AS	7	DAW-523-2-9AS	DAW-523-3-9AS	
25 - 600	25	DAW-23-153-10S	DAW-23-2-10S	DAW-23-3-10S	7.5	DAW-523-2-10S	DAW-523-3-10S	
50 - 1000	60	DAW-23-153-11S	DAW-23-2-11S	DAW-23-3-11S	40	DAW-523-2-11S	DAW-523-3-11S	
100 - 1500	90	DAW-23-153-12S	DAW-23-2-12S	DAW-23-3-12S	50	DAW-523-2-12S	DAW-523-3-12S	
300 - 2500	150	DAW-23-153-13S	DAW-23-2-13S	DAW-23-3-13S	100	DAW-523-2-13S	DAW-523-3-13S	
30" Hg Vac - 75	7	DAW-43-153-26E	DAW-43-2-26E	DAW-43-3-26E	3.5	DAW-543-2-26E	DAW-543-3-26E	
5 - 75	3	DAW-43-153-23E	DAW-43-2-23E	DAW-43-3-23E	2	DAW-543-2-23E	DAW-543-3-23E	
10 - 100	7	DAW-43-153-6E	DAW-43-2-6E	DAW-43-3-6E	3.5	DAW-543-2-6E	DAW-543-3-6E	
10 - 150	6	DAW-43-153-24E	DAW-43-2-24E	DAW-43-3-24E	3	DAW-543-2-24E	DAW-543-3-24E	
10 - 300	18	DAW-43-153-9E	DAW-43-2-9E	DAW-43-3-9E	5	DAW-543-2-9E	DAW-543-3-9E	
30 - 400	30	DAW-43-153-21E	DAW-43-2-21E	DAW-43-3-21E	15	DAW-543-2-21E	DAW-543-3-21E	
75 - 800	75	DAW-43-153-22E	DAW-43-2-22E	DAW-43-3-22E	35	DAW-543-2-22E	DAW-543-3-22E	
100 - 1000	100	DAW-43-153-11E	DAW-43-2-11E	DAW-43-3-11E	45	DAW-543-2-11E	DAW-543-3-11E	
200 - 2500	210	DAW-43-153-13E	DAW-43-2-13E	DAW-43-3-13E	110	DAW-543-2-13E	DAW-543-3-13E	

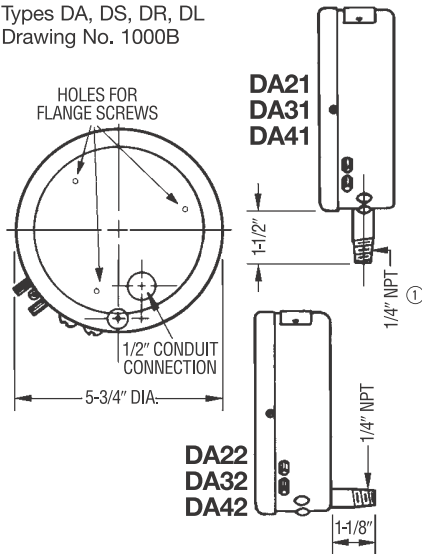
NOT APPROVED

D Series Pressure Switch with Snap Action Switch and Weatherproof Enclosure

Bourdon Tube Material	Adjustable Operating Range (psig)	Adjustable Deadband SPDT: 15A @ 120/240 VAC		Fixed Deadband SPDT: 15A @ 120/240 VAC		Hermetically Sealed, Fixed Deadband SPDT: 5A @ 120/240 VAC, 5A res.@30 VDC	
		Minimum Deadband (psig)	Model Number	Fixed Deadband (psig)	Model Number	Fixed Deadband (psig)	Model Number
Brass	0-30" Hg Vac	9" Hg	DAW-7033-153-2	3" Hg	DSW-7233-153-2	5" Hg	DSW-7333-153-2
	10" Hg Vac - 12	4	DAW-7033-153-3	1.5	DSW-7233-153-3	3	DSW-7333-153-3
	25" Hg Vac - 50	8	DAW-7033-153-27	2.5	DSW-7233-153-27	3.75	DSW-7333-153-27
	1/8 - 15	4	DAW-7033-153-1	1.5	DSW-7233-153-1	3	DSW-7333-153-1
	1/8 - 20	4	DAW-7033-153-3A	1.5	DSW-7233-153-3A	3	DSW-7333-153-3A
	1 - 35	5	DAW-7033-153-4	1.5	DSW-7233-153-4	3	DSW-7333-153-4
	2 - 60	6	DAW-7033-153-5	2	DSW-7233-153-5	3	DSW-7333-153-5
	5 - 100	9	DAW-7033-153-6	2.5	DSW-7233-153-6	3.75	DSW-7333-153-6
	5 - 150	16	DAW-7033-153-7	3	DSW-7233-153-7	5.25	DSW-7333-153-7
	10 - 200	16	DAW-7033-153-8	4	DSW-7233-153-8	6.75	DSW-7333-153-8
10 - 300	25	DAW-7033-153-9	5	DSW-7233-153-9	9	DSW-7333-153-9	
403 Stainless Steel	30" Hg Vac - 60	12	DAW-7023-153-25S	3.5	DSW-7223-153-25S	5.25	DSW-7323-153-25S
	30" Hg Vac - 75	15	DAW-7023-153-26S	3.5	DSW-7223-153-26S	5.25	DSW-7323-153-26S
	2 - 60	9	DAW-7023-153-5S	3	DSW-7223-153-5S	4.5	DSW-7323-153-5S
	5 - 100	13	DAW-7023-153-6S	3.5	DSW-7223-153-6S	5.25	DSW-7323-153-6S
	10 - 200	15	DAW-7023-153-8S	4	DSW-7223-153-8S	7.125	DSW-7323-153-8S
	10 - 300	19	DAW-7023-153-9S	6	DSW-7223-153-9S	10.5	DSW-7323-153-9S
	40 - 350	20	DAW-7023-153-9AS	6	DSW-7223-153-9AS	10.5	DSW-7323-153-9AS
	25 - 600	45	DAW-7023-153-10S	10	DSW-7223-153-10S	18	DSW-7323-153-10S
	50 - 1000	95	DAW-7023-153-11S	20	DSW-7223-153-11S	33	DSW-7323-153-11S
	100 - 1500	130	DAW-7023-153-12S	30	DSW-7223-153-12S	52.5	DSW-7323-153-12S
300 - 2500	260	DAW-7023-153-13S	60	DSW-7223-153-13S	90	DSW-7323-153-13S	
500 - 5000	900	DAW-7023-153-15S	200	DSW-7223-153-15S	300	DSW-7323-153-15S	
800 - 8000	1500	DAW-7023-153-16S	500	DSW-7223-153-16S			
316 Stainless Steel	30" Hg Vac - 75	10	DAW-7043-153-26E	3.5	DSW-7243-153-26E	5.25	DSW-7343-153-26E
	5 - 75	8	DAW-7043-153-23E	4	DSW-7243-153-23E	6	DSW-7343-153-23E
	10 - 100	10	DAW-7043-153-6E	3.5	DSW-7243-153-6E	5.25	DSW-7343-153-6E
	10 - 150	11	DAW-7043-153-24E	4	DSW-7243-153-24E	6.75	DSW-7343-153-24E
	10 - 300	28	DAW-7043-153-9E	8	DSW-7243-153-9E	12	DSW-7343-153-9E
	30 - 400	52	DAW-7043-153-21E	10	DSW-7243-153-21E	18	DSW-7343-153-21E
	75 - 800	120	DAW-7043-153-22E	25	DSW-7243-153-22E	37.5	DSW-7343-153-22E
	100 - 1000	190	DAW-7043-153-11E	35	DSW-7243-153-11E	52.5	DSW-7343-153-11E
	200 - 2500	400	DAW-7043-153-13E	75	DSW-7243-153-13E	112.5	DSW-7343-153-13E

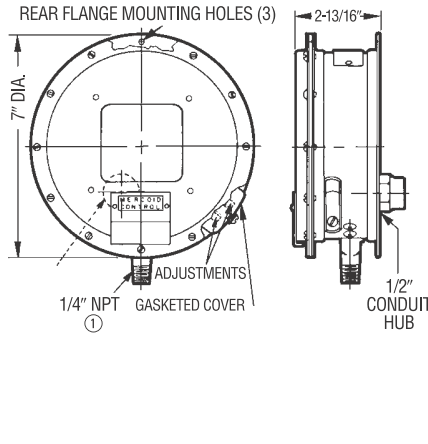
General Purpose

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



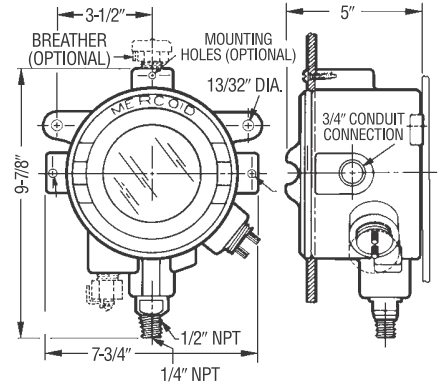
Weatherproof

Types DAW, DSW, DRW
Drawing No. 1062



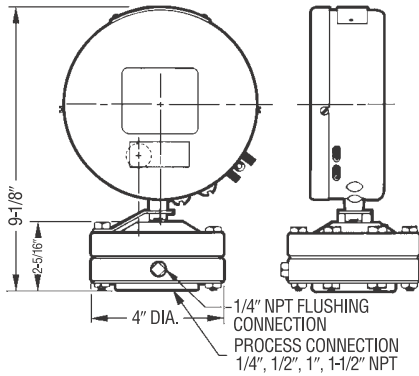
Explosion-Proof

Types DAH, DRH, DSH
Drawing No. 1350



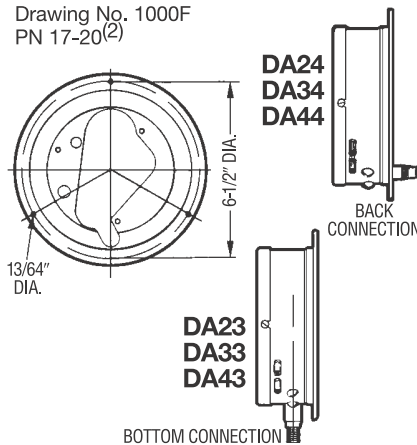
Diaphragm Seal

Types MSAG
Drawing No. 2305



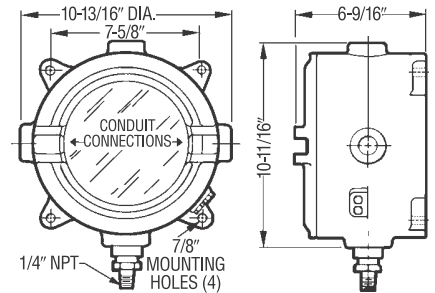
Flange for Surface Mounting

Drawing No. 1000F
PN 17-20⁽²⁾



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 lb (1.8 kg). See above for dimensions. *Furnished as standard unless otherwise specified.*

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 lb (1.8 kg). 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 lb (2.7 kg). See above for dimensions. *Optional, add "W" to prefix, i.e. DAW, DRW, DSW, when ordering.*

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 lb (2.7 kg). 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" male NPT x 1/4" female NPT. 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).

Series
D

Options and Accessories

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.

Miscellaneous

Oxygen & Acetylene Service
Spec. 23444

Fungus Proof
Spec. 23720

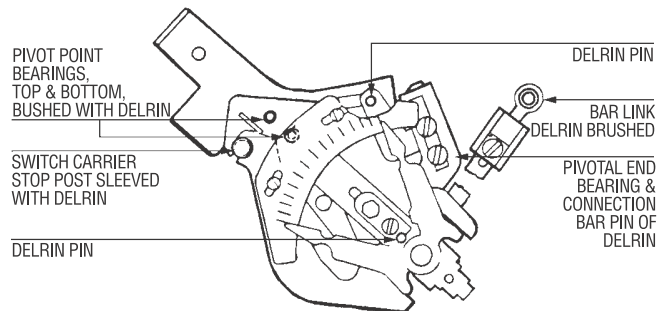
FM Approval –
DAF, DRF, DSF

Factory Mutual Approved Series D Pressure Switches

Cover Over
External
Adjustments

Acetal Bushed Movement "B"

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



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 Acetal 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
D-900

Bourdon Tube Pressure Switches — Over-Pressure Diaphragm Controls



OPERATING RANGES

Brass Bourdon Tube, with Mercury Switch

RANGE NO. Adjustable	Operating Range (psig)	MIN. DEADBAND (psig)		FIXED DEADBAND
		DA-931	DA-9531	DS-9231
3	10" Hg. Vac. 12 PSIG*	1.5	0.75	3 oz.
1	1-14	1.5	0.75	3 oz.
4	1-35	3.5	1.5	7 oz.

*Operation not recommended for processes that do not go below 0 PSIG.

Steel Bourdon Tube, with Mercury Switch

RANGE NO. Adjustable	Operating Range (psig)	MIN. DEADBAND (psig)		FIXED DEADBAND
		DA-921	DA-9521	DS-9221
5S	2-60	4	2	7 oz.
6S	5-100	6	3	12 oz.
8S	10-200	8	4	12 oz.
9S	20-300	14	7	1 psig
10S	50-600	50	25	2.5 psig
11S	75-1000	75	40	10 psig
12S	100-1500	100	50	12 psig
13S	300-2500	150	100	45 psig

NOTES: Above controls must have seal attached
DA-9 = Indicates slugged bourdon tube

FEATURES

Protects to 2,500 psig • Available to 5,000 psig • External adjustment • Adjustable or fixed deadband • Integral over-pressure seal • 316 Stainless Steel diaphragm • Operates in ambient temperatures -10 to +140°F. • Available with mercury or snap switch.

APPLICATION

For low pressure setpoints in a system where normal pressures may rise to 5,000 psig. An over-pressure seal protects the control beyond a predetermined pressure. When that pressure is exceeded, the diaphragm seats and no further motion is transmitted.



Series
D

Bourdon Tube Pressure Switches — Pipe-Mounted Diaphragm Seals

Type MSAG/MSAH



SEAL WITH TYPE DA
PRESSURE
CONTROL



Type MSAG
(PLAIN)



Type MSAH
(CLEAN-OUT)

FEATURES

Maximum seal design pressure is 2500 psig for MSAG and MSAH, 100 psig XTBX. Seals can be filled after installation via Bleed Screw (7) in diagram at right. Thin, flexible diaphragm (2) is actuated by system pressure. Diaphragm transmits system pressure to seal's liquid fill (3) to operate the Bourdon tube of the protected control which attaches at (1). Chemical corrosion or other damage to seal from system's pressure medium can be prevented by proper selection of materials for the diaphragm, (2) bottom bowl (8) and other surfaces which the pressure medium will contact.

APPLICATION

Mercoïd® diaphragm seals prevent corrosive, viscous or other damaging pressure media (gas, liquid, etc.) from entering the pressure power element (Bourdon tube) in pressure or differential pressure controls. Plain seals cannot be field-disassembled for cleaning or other purposes.

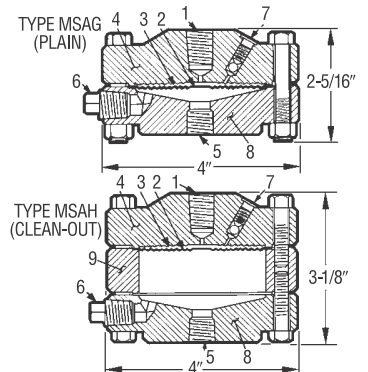
Mercoïd® clean-out type diaphragm seals *can* be field-disassembled for cleaning or other purposes. Top bowl (Key #4 in diagram at right) with both clean-out ring (9) and control attached can be removed while bottom bowl (8) is still connected to system. However, system must be shut down beforehand.

Seals cannot be used below 10" Hg vacuum.

To Order Seals — Plain or Clean-Out Types

When ordering, specify all of the following:

- Type and pressure range of control which seal is to protect.
- Diaphragm seal type desired.
- Diaphragm material — 316 stainless steel, FEP-coated 316 stainless steel, or Tantalum.
- Pressure medium-to-seal contact surfaces material-resistant finish or 316 stainless steel.
- Size of seal-to-system connection 1/4", 1/2", 1", or 1 1/2" NPT.
- Temperature range of pressure medium.
- Ambient temperatures.



- 1 Pressure Control Connection
- 2 Diaphragm: 316SS, FEP-Coated 316SS or Tantalum
- 3 Liquid Fill
- 4 Top Bowl, rust-resistant finish
- 5 Seal-to-System Connection
- 6 Flushing Connection (1/4" NPT) and Removable Plug
- 7 Bleed Screw
- 8 Bottom Bowl, rust-resistant finish steel or 316SS
- 9 Clean-Out Ring

Mercoïd® diaphragm seals are not available for Range 15S & 16S Mercoïd Pressure Controls

NOTE: Controls and gauges with diaphragm seals can be affected by ambient and system temperature changes, particularly at low pressures. For these conditions, Mercoïd® Controls can be furnished with ambient temperature compensation (available only when control is mounted on seal). Write for details.

Most seals can be furnished with a remote copper or S.S. tubing connection between seal and control. A mounting bracket (No. 33-25) may be used for remote mounted controls. Specify if remote connection is desired.

TYPE	MATERIAL
	EXPOSED SURFACES
MSAG	Steel or 316 SS
MSAH	Steel or 316 SS
XTBX	FEP and PVC

How Pressure Switches & Temperature Switches Work

Using This Guide

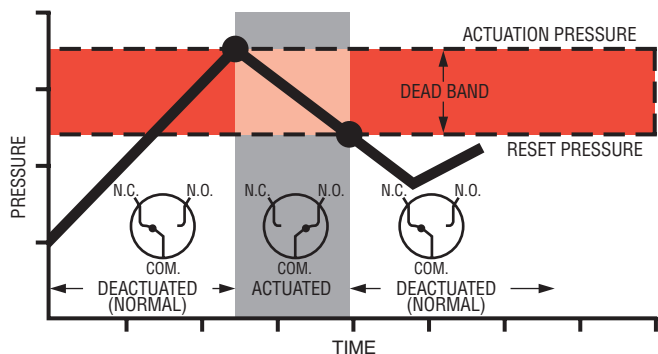
This introduction to Mercoïd® pressure, and temperature switches contains information to assist the specifying engineer in selecting the proper switch for the application. A careful reading of this section will help specify a control that is not only best for the application, but also one that does not have unnecessary features or capability, (which reduces cost) and one that probably is available from stock, which speeds delivery. Mercoïd® maintains a generous stock of the more widely used models suitable for most applications, specifying one of these “standard” models will benefit the customer. Even if ordering a replacement special control, a review of this guide is encouraged to see if a “standard” model is now appropriate. If necessary, Mercoïd® offers a wide selection of special options to suit almost any application. Technical assistance is readily available from our headquarters or the nearest sales office.

What are they?

A pressure switch is a device which utilizes air, gas or liquid pressures which are higher than, or positive to, atmospheric pressure to actuate an electric switch at a preset actuation point. A vacuum switch performs the same function for pressures which are lower than, or negative to, atmospheric pressure. A differential pressure switch is a device which utilizes differential pressure to actuate an electric switch at a pre-set actuation point. This may be the difference between two positive or two negative pressure, one of each, or a positive and atmospheric or a negative and atmospheric pressure. A temperature switch merely substitutes “temperature” for “pressure” in the above descriptions. In all cases the electric switch thus actuated may be used to start or stop motors, fans or pumps, open or close valves, dampers or louvers, sound an alarm, light a warning signal, provide a computer input signal, etc.

The setpoint is that pressure or temperature (positive, negative, or differential) at which the electric switch operates and, in most Mercoïd® controls, it is field adjustable by means of a visible calibrated scale. It is usual to consider that the control “actuates” at the pre-set level on increasing pressure or temperature and “deactuates” on decreasing pressure or temperature. (“Deadband” is the difference between the actuation and deactuation pressures or temperatures for a given setpoint.)

When a change in pressure or temperature occurs, causing the sensing element to move and actuate the switch, some of that pressure or temperature must be removed before the switch will reset for another cycle.



The deadband is the pressure or temperature that must be removed before the switch resets for another cycle after the setpoint has been reached and the switch actuated.

A deadband is inherent in a snap switch. It results from two things. The spring rate of the range spring at the chosen setpoint and the deactuation travel of the switch lever. Thus the deadband is different at each setpoint. When the setpoint is at the lowest end of the pressure switch range, (or the highest end of the filled system temperature switch range), the deadband is minimum. Conversely, when the setpoint is at the highest end of the pressure or lowest end of the temperature switch range, deadband is maximum.

For example: A pressure switch is set to actuate when an increasing pressure reaches 100 psi (6.9 bar). The pressure then begins to drop. The switch remains actuated, however, until the pressure drops to approximately 95 psi (6.6 bar). This difference of 5 psi (.35 bar) is the “deadband.” It is the overlap or pressure difference between the setpoint at which the switch actuates and the point at which the switch resets when pressure drops.

In many applications it is desirable to be able to adjust the deadband to a value considerably greater than the minimum. Some pressure and temperature switches (such as Mercoïd’s model DA) allow this adjustment.

Most Mercoïd® controls reset the electric switch automatically upon deactuation. However, some models are available with a manual reset feature which requires that an operator reset the switch by means of a push-button before it is again ready to actuate. This feature is usually specified for alarm applications where a problem must be corrected before the system is allowed to restart.

Note that all Mercoïd® controls have a discrete range of setpoints that a particular model will cover. It is recommended that the control selected have an intended

actuation setpoint as close as possible to the middle of the total adjustment range. Also, the specifier should be sure the maximum operating or surge temperature or pressure does not exceed those ratings of the control selected.

Many Mercoïd® controls are available with either snap-action or tilt-type mercury electric switches. In general, snap-action switches offer lower cost and are well-suited to most medium load, frequent cycle applications or for operating environments where mercury is not allowed, i.e., food processing. Mercury switches are highly reliable in harsh environments and in very low cycle or “dry circuit” applications where infrequent alarm testing is the usual reason for operation or the switch is providing a “no-current” computer input contact closure and the load cannot “self-clean” the contacts. Mercury switches usually provide for narrower deadbands. A magnetically-operated mercury switch is also available which provides an even narrower deadband but has a limited electrical load rating. It should be noted that mercury switch controls are sensitive to mounting position and shock or vibration applications.

Both snap-action and mercury switches are available with a variety of circuit configurations, i.e., SPST, SPDT, DPDT, DPST, two-stage, etc. However, specifiers should consider a SPDT circuit (one common, one normally open and one normally closed terminal) as standard. The SPDT circuit is supplied on most stocked Mercoïd controls and allows the control to be used in either actuate or deactuate on increasing or decreasing pressure or temperature applications as well as accommodating changes from one to the other in the field.

How do they work?

When a change in pressure or temperature occurs, the sensing element in the control moves and transmits the resulting force to the electric switch. Sensing elements used in Mercoïd® pressure controls include bourdon tubes, metal bellows and elastomer diaphragms. Bourdon tube or bellows motion is coupled to the control “movement,” which transmits the motion to the electric switch only when the tube position corresponds to a pre-set actuation point. Actuation points are adjusted by moving pointers linked to the movement.

Diaphragm motion is resisted by a calibrated spring. This spring determines the range of pressure within which the diaphragm motion will actuate the electric switch. The actuation point is set by adjusting the compression or tension of the spring.

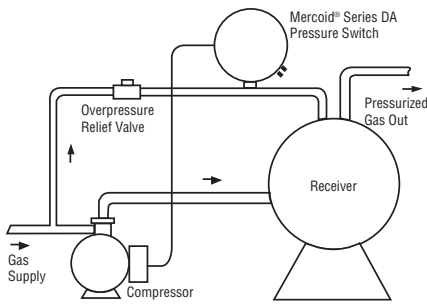
Temperature control sensing elements include filled systems and bi-metals. The filled system switches use a bulb filled with inert gas and connected by capillary tubing to a bourdon tube pressure switch. Changes in bulb temperature cause the gas inside the bulb to expand or contract. The resulting change in internal pressure is sensed by the pressure switch. Bi-metal systems use bi-metal sensors to directly actuate an electric switch. The bi-metals are usually formed into a spiral to increase the mechanical motion for small temperature changes.

Bourdon tube controls provide good sensitivity over a broad range of pressures except at the very low end. Rated operating pressures and, therefore, maximum pressure ranges are limited by the strength of the bourdon tube. However, bourdon tubes can be fabricated from various metals to offer excellent media compatibility and, in the case of stainless steel, can be welded directly to the pressure connection to reduce the possibility of a leak in case of fire.

Diaphragm controls offer both very low and very high pressure ranges as well as lower cost but are limited in operating temperature. Care must be taken to insure the diaphragm elastomer material is compatible with the media involved. Since diaphragm area can be made large, very low pressures can be sensed and different pressures introduced on each side of the diaphragm to control differential pressure. However, a large diaphragm control is sensitive to mounting position and vibration. On very high pressure range controls, the diaphragm is essentially used as a seal and is backed up by a metal piston which operates the switch mechanism. Thus, with built-in motion stops, considerable over-pressures can be tolerated. These controls are also insensitive to mounting position and vibration.

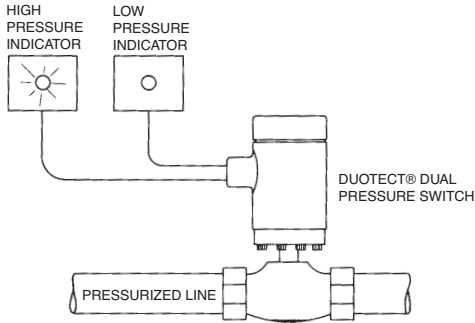
Metal bellows provide good sensitivity, resistance to vibration and moderate cost, particularly in a differential pressure control. The metal bellows may also be compatible with media which cannot be used with elastomer diaphragms.

In temperature controls, selection is very similar to pressure controls. Filled systems are available with either bourdon tube or bellows sensing elements. Bi-metal controls are usually less expensive but may not be as sensitive. Material of the sensing element and other wetted parts must be compatible with the media to be controlled. If a sensing element is to be inserted in a pipe with high velocity liquid flow, a heavy duty protective well should be used to protect the element.



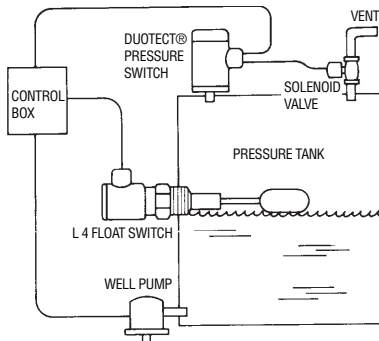
Mercoïd® Series DA pressure switch maintains desired gas pressure in tank.

Demand for compressed gas varies in this gas line. So a Mercoïd® Series DA adjustable deadband pressure switch is included to turn the compressor on at low pressure and off when the maximum pressure is reached.



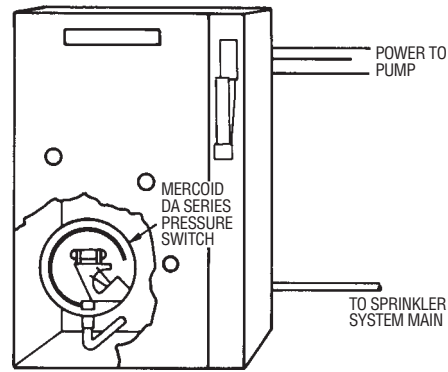
One diaphragm actuates two independent explosion-proof switches in Duotect® pressure switch to monitor pressure.

High pressure lines or systems for air, gases, or liquids can be monitored for proper pressure between desired limits with a Duotect® dual pressure switch. Independent low and high alarm or control points can be set from 5 to 1500 psig. With two individual switches operating from a common diaphragm, one Duotect® switch does the job. The high and low pressure indicators or alarms are activated only when the limits are exceeded; both are deactivated when the pressure is within the limits. The Duotect switch is explosion-proof and can be used with hazardous media or in explosive atmospheres.



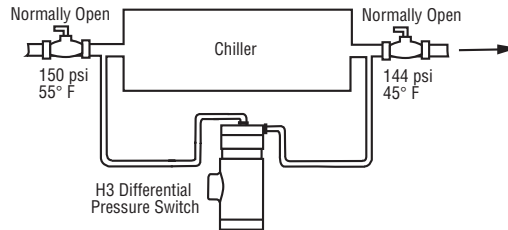
Switches control water level and tank pressure.

A hydro-pneumatic tank with a deep well pump maintains desired pressure in a water system. The pump, however, delivers entrained air along with makeup water, requiring periodic tank venting to prevent excess pressure buildup. As both water level and tank pressure must be maintained, one side of the W.E. Anderson® Duotect® pressure switch is interlocked with the Anderson L4 float switch via the control box. When tank pressure falls below the preset system pressure due to water drawdown, the Duotect® switch starts the pump and transfers control to the float switch. When the preset water level is reached, the float switch turns the pump off. If entrained air has increased the pressure beyond the limit set in the other side of the Duotect® pressure switch, after a time delay covering several normal cycles, the switch will open the solenoid valve and vent the tank down to proper pressures.



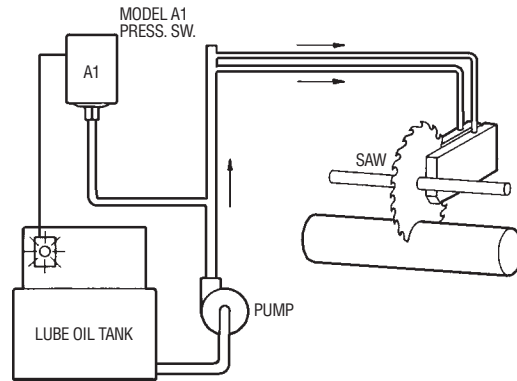
The Mercoïd® DA Series is the industry standard pressure switch for fire pump controls.

Fire pump controls operate pumps which supply water to building fire sprinkler systems, turning on the main pumps when system pressure falls due to sprinkler heads being activated and turning on smaller make-up pumps to maintain system pressure which may fluctuate due to small leaks. These controls almost always employ the Mercoïd® DA Series pressure switch due to its rugged design which provides high reliability over long periods of infrequent operation. The DA Series switch provides independent high and low setpoints over the entire pressure range of the switch to meet varying requirements from system to system. The low setpoint maintains minimum pressure required for proper system operation while the high setpoint prevents damage due to over-pressurization of the system.



W.E. Anderson® H3 explosion-proof differential pressure switch protects water chiller.

If ice builds up inside water chiller, or if tubes become restricted, differential pressure across chiller increases. Differential pressure switch Series H3 senses the increase and actuates an alarm. Switch is typically set between 10 and 20 psid.



Mercoïd® model A1 pressure switch senses loss of lubricating oil to saw blade in saw mill and actuates an alarm.

Since only a small amount of oil is used, the sawdust can be recovered and used as a fuel. The pressure switch (A1) sounds an alarm if the oil pressure is lost, preventing severe damage to the saw blade.