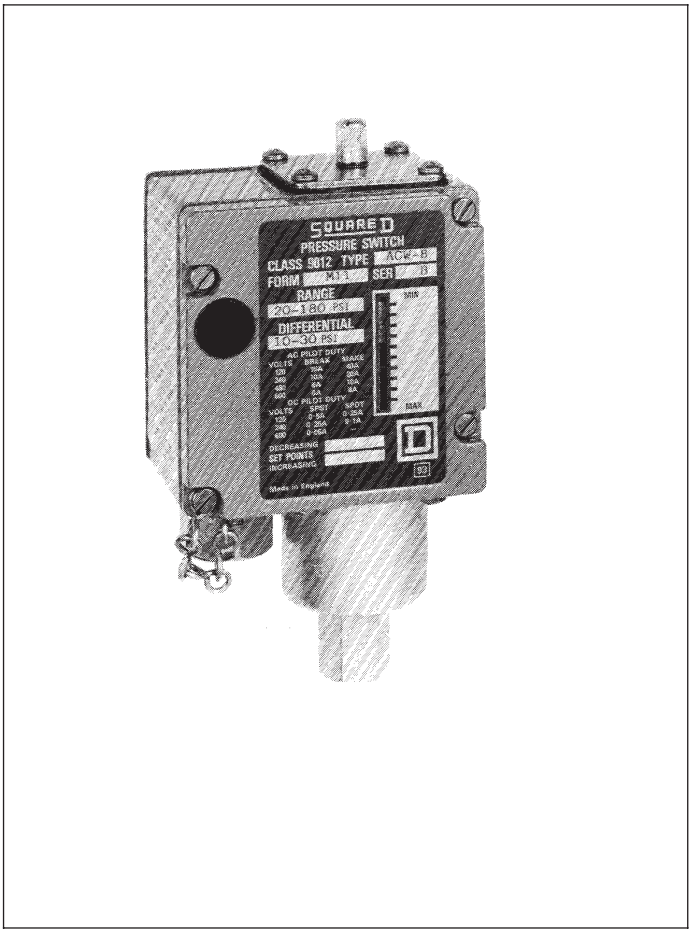


INDUSTRIAL PRESSURE SWITCHES
Type A

- Heavy duty switch for virtually any industrial application involving air, water, steam or oil
- Bellows, piston and diaphragm actuated types
- Settings externally adjustable by screwdriver or accessory plastic knob
- Gasketed die cast enclosure – oil, coolant and moisture tight to IP65
- Mechanism incorporates hardened parts and short travel characteristics for long mechanical life under severe conditions
- Double break snap switch with silver contacts, single or double pole
- Fully user serviceable

Bellows Actuated Pressure Switches

For use on Air, Oil, Water, other liquids and Gases. Ingress Protection IP65 □ (IEC 144)

Type ACW Bellows actuated pressure switches

Single pole – double throw contacts (1NO+1NC)

Range setting Switch can be adjusted to operate on Falling pressure within this range		Adjustable Differential Add to range setting to obtain operating point on Rising pressure		Maximum allowable pressure		Order Class 9012
Bars	PSI	Bars	PSI	Bars	PSI	Type...
0.1– 0.7	1–10	0.04– 0.3	½–5	2	30	ACW-3
0.1– 1.3	1–20	0.07– 0.4	1–6	2	30	ACW-4
0.1– 5.1	1–75	0.3 – 1	4–15	7	100	#ACW-5
0.1– 7.5	1–110	0.5 – 2	7–30	17	255	●ACW-1
1.4– 12	20–180	0.7 – 2	10–30	17	255	●ACW-8
0.7– 18	10–265	1.1 – 1.7	15–25	20	300	ACW-9
0.7– 20	10–300	1.7 – 8.6	25–125	41	600	ACW-2
5.2– 34	75–500	3.5 – 8	50–120	137	2000	ACW-6
10.4– 69	150–1000	5.9 –10	85–145	137	2000	ACW-7
24.1–131	350–1900	11 –20	150–300	172	2500	ACW-10

Replacement Snap Switch assembly – Class 9007 Type AO-1

Double pole – double throw contacts (2NO+2NC)

Range setting Range setting Switch can be adjusted to operate on Falling pressure within this range		Adjustable Differential Add to range setting to obtain operating point on Rising pressure		Maximum allowable pressure		Order Class 9012
Bars	PSI	Bars	PSI	Bars	PSI	Type...
0.1– 0.7	1–10	0.06– 0.4	¾–7	2	30	ACW-23
0.1– 1.3	1–20	0.14– 0.7	2–10	2	30	ACW-24
0.1– 5.1	1–75	0.5 – 1.3	6–20	7	100	ACW-25
0.1– 7.5	1–110	0.9 – 2.7	13–40	17	255	ACW-21
1.4– 12	20–180	1.1 – 2.7	15–40	17	255	ACW-28
0.7– 17	10–250	1.6 – 2.4	23–35	20	300	ACW-29
0.7– 20	10–300	2.5 –10.3	35–150	41	600	ACW-22
5.2– 34	75–500	5.9 –11	85–160	137	2000	ACW-26
10.4– 69	150–1000	9.3 –13	135–200	137	2000	ACW-27
24.1–131	350–1900	16.6 –24	240–350	172	2500	ACW-20

Replacement Snap Switch assembly – Class 9007 Type CO-3

Connection data
Pressure connection: G¼″ to BS2779
Conduit (Electrical) entry: Form M11 (standard), 20mm Iso metric
Form M12, PG13.5 DIN 40430
Note: NPT Threads available to special order

On Form H3 devices, the minimum adjustable differential is 1½ times that quoted, except on types ACW 6, 7 & 10 where minimum differential is twice the quoted figure.

Spare Parts . . . . . Page 3a6
Accessories. . . . . Page 3a6
Technical Data . . . . . Pages 3a7 and 3a8
Dimensions . . . . . Page 3a9

Ordering Instructions
State... **Class, Type** and **Form No.**
(where applicable, see page 3a6)
Eg: Class **9012** Type **ACW-3** Form **P2**

□ When fitted with suitable cable gland or adequately sealed conduit entry
Tested to BS 6134 1981
● Registered with the Loss Prevention Council as suitable for use in sprinkler systems.

High Pressure Hydraulic Switches

For use on Oil or Hydraulic Fluids only. Ingress Protection IP65 □ (IEC 144)

Type ADW High Pressure Piston Actuated Pressure Switches

Single pole – double throw contacts (1NO+1NC)

Range setting: Limits of Pressure between which switch can be adjusted to operate on Rising pressure		Adjustable Differential: Subtract from range setting to obtain operating point on Falling pressure		Maximum allowable pressure		Order Class 9012
Bars	PSI	Bars	PSI	Bars	PSI	Type...
9.3– 68.9	135–1000	2.4– 9.3	35–135	689	10,000	ADW-3
27.6–206.7	400-3000	6.9–27.6	100–400	689	10,000	ADW-4
37.9–344.5	550–5000	8.6–27.6	150–400	689	10,000	ADW-7

With piston seal *

Bars	PSI		Bars	PSI	Type...
9.3– 68.9	135–1000	Increases with range	689	10,000	#ADW-5
27.6–206.7	400–3000	See Table below	689	10,000	ADW-6

Double pole – double throw contacts (2NO+2NC)

Range setting: Limits of Pressure between which switch can be adjusted to operate on Rising pressure		Adjustable Differential: Subtract from range setting to obtain operating point on Falling pressure		Maximum allowable pressure		Order Class 9012
Bars	PSI	Bars	PSI	Bars	PSI	Type...
9.3– 68.9	135–1000	3.1–13.8	45–200	689	10,000	ADW-23
27.6–206.7	400-3000	8.6–34.5	125–500	689	10,000	ADW-24
37.9–344.5	550–5000	13.8–41.3	200–600	689	10,000	ADW-27

With piston seal *

Bars	PSI		Bars	PSI	Type...
9.3– 68.9	135–1000	Increases with range	689	10,000	ADW-25
27.6–206.7	400–3000	See Table below	689	10,000	ADW-26

Approximate differentials for types ADW-5, 6, 25, 26

Bars Type		ADW-5 Min	ADW-5 Max	ADW-25 Min	ADW-25 Max	**PSI** Type		ADW-5 Min	ADW-5 Max	ADW-25 Min	ADW-25 Max
Overall Range	9.3–68.9					Overall Range	135–1000				
Lower End	9.3–29.3	4.8	6.9	6.2	7.9	Lower End	135– 425	70	100	90	115
Middle	29.3–49.3	6.5	9.3	8.3	11.0	Middle	425– 715	95	135	120	160
Upper End	49.3–68.9	8.6	10.3	10.3	12.4	Upper End	715–1000	125	150	150	180
Type		ADW-6 Min	ADW-6 Max	ADW-26 Min	ADW-26 Max	Type		ADW-6 Min	ADW-6 Max	ADW-26 Min	ADW-26 Max
Overall Range	27.6–206.7					Overall Range	400–3000				
Lower End	27.6– 87.2	14.5	20.7	17.2	24.1	Lower End	400–1265	210	300	250	350
Middle	87.2–146.8	21.4	28.2	25.5	33.8	Middle	1265–2130	310	410	370	490
Upper End	146.8–206.7	27.6	34.5	34.5	38.6	Upper End	2130–3000	400	500	500	560

Connection data
Pressure connection: G⅜″ to BS2779
Conduit (Electrical) entry: Form M11 (standard) 20mm Iso Metric
Form M12 PG13.5 DIN 40430
Note: NPT Threads available to special order.

Spare Parts ..... Page 3a6
Accessories ..... Page 3a6
Technical Data ..... Pages 3a7 and 3a8
Dimensions ..... Page 3a9

Standard controls should not be used with phosphate base synthetic hydraulic fluids. Refer to Technical Data.

Ordering Instructions
State... **Class Type** and **Form No.**
(where applicable, see page 3a6)
Eg: Class **9012** Type **ADW-5**

* Prevents oil leakage – refer to Technical Data
# Tested to BS 6134 1981
□ When fitted with suitable Cable Gland or adequately sealed conduit entry

Differential Pressure Switches

Ingress Protection IP65 □ (IEC 144)

Type AEW Bellows actuated differential pressure switches

Single pole – double throw contacts (1NO+1NC)

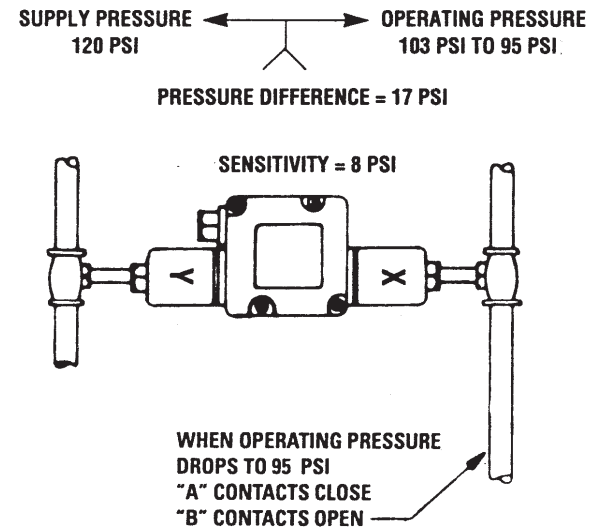
Working Pressure Range ('Y' must always be greater than 'X')		Maximum Allowable Pressure		* Sensitivity Between Opening and Closing of Contacts		Adjustable Pressure Differential ●		Order Class 9012
Bars	PSI	Bars	PSI	Bars	PSI	Bars	PSI	Type...
For use on Air, Water or Oil (Bellows Actuated)								
0–6.89 0–13.78	0–100 0–200	6.89 17.57	100 255	0.28–0.96 0.55–1.38	4–14 8–20	0.03–1.38 0.2–2.76	0.5–20 3–40	AEW-5 ●AEW-1
760 mm Hg Vac to 1.38	20	2.07	30	25–406 mm Hg or 0.03-0.55	½– 8	0–406 mm Hg or 0.02–0.55	0.25– 8	AEW-3

Replacement snap switch assembly – Class 9007 Type AO-1

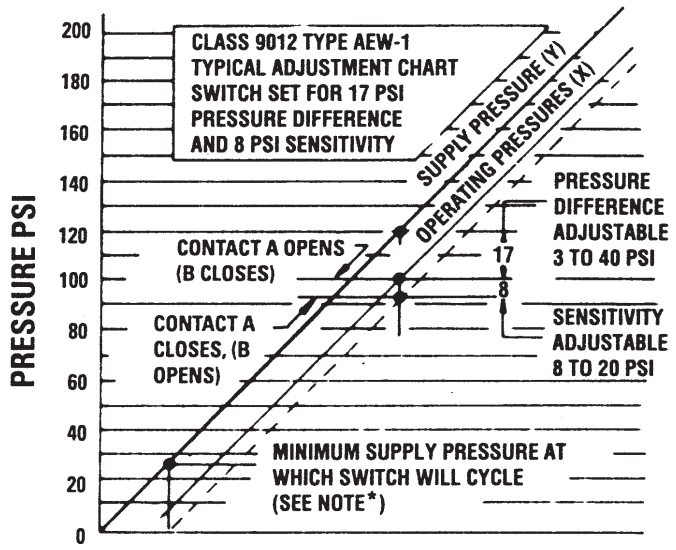
Application

Differential pressure switches are used to control, or respond to a change in, the difference between two pressures. On these devices the top bellows, identified as the ''X'' or lower pressure side, works in opposition to the bottom bellows, identified as the ''Y'' or higher pressure side. These devices can control lower pressure X to maintain a constant difference from variable pressure Y or can control higher pressure Y to maintain a constant difference from variable pressure X or can initiate an alarm circuit to indicate that a predetermined pressure difference has widened beyond or narrowed below the desired value or can be made to operate when a predetermined pressure difference has been reached as a result of either a widening or a narrowing difference between pressures.

Application Example for Differential Pressure Switch using AEW-1



NOTE - THE LOWEST SUPPLY PRESSURE AT WHICH THE SWITCH WILL CYCLE IS EQUAL TO THE SUM OF THE PRESSURE DIFFERENCE AND THE SENSITIVITY FOR WHICH THE DEVICE IS ADJUSTED. IN THIS EXAMPLE, THIS EQUALS 25 PSI. BELOW THIS VALUE, CONTACT "A" REMAINS OPEN, "B" REMAINS CLOSED.



PRESSURE/CONTACT STATE RELATIONSHIP

Connection data
Pressure connection: G¼" BS2779. ×2.
Conduit (Electrical) entry: Form M11 standard 20mm Iso Metric.

Technical Data ..... Pages 3a7 and 3a8
Dimensions ..... Page 3a10

● Registered with the Loss Prevention Council as suitable for use in sprinkler systems.

Ordering Instructions
State... **Class** and **Type**
Eg: Class **9012** Type **AEW-1**

* Adds to adjustable pressure differential to obtain operating point on a widening pressure difference.
□ When fitted with suitable cable gland or adequately sealed conduit entry
● Switch can be adjusted to operate on a narrowing pressure difference withing this range.

Pressure Switch Selection Criteria

PRESSURE SWITCH SELECTION GUIDE

The selection of a Pressure Switch for a particular application is straightforward with Square D products.

Selection criteria are typically as follows:

ENVIRONMENT – This will affect the degree of ingress protection needed, and possibly the temperature characteristics. All Square D Type A devices meet IP65 and may be used in ambient temperatures from −56°C to +85°C, with a maximum media temperature of 125°C.

THE PRESSURE MEDIA – This may be crucial as certain media used over a long term may damage parts of the mechanism with which they come into contact. Square D Pressure Switches are suitable for use on a wide variety of media. Contact Telemecanique for further information.

DIMENSIONS – Square D Type A devices are compact two point switching types.

MAXIMUM NORMAL SYSTEM PRESSURE – This will determine the range of the device selected. Square D switches are available for system pressures up to 9000 psi.

MAXIMUM SURGE PRESSURE EXPECTED – This will affect selection as a device must be capable of accepting the maximum surge expected. Square D Pressure switches are highly tolerant of system surges.

SWITCHING POINTS REQUIRED – On both rising and falling pressure.

DIFFERENTIAL REQUIRED – The difference between the rising and falling pressure switching points

CONNECTION – All Square D devices have standard G Pressure connections to BS2779 and 20mm Iso Metric conduit entries. (PG and NPT entries available to order).

MECHANICAL LIFE – Crucial in fast cycling applications. Square D Type A devices are built for long mechanical life and all parts subject to wear are serviceable.

ELECTRICAL CHARACTERISTICS – Rating and number of contacts – Square D Type A devices are available with single or double pole changeover contacts.

Accessories, Replacement Parts and Modifications

For use with	Description	Class	Order Type...
Replacement Parts Kits for Types ACW & ADW Pressure Switches			
ACW Series B	Bellows kit for Types ACW1, 21, 8 and 28	9998	PCM-25
ACW Series B	Bellows kit for Types ACW2 and 22	9998	PCM-26
ACW Series B	Bellows kit for Types ACW3, 23, 4 and 24	9998	PCM-27
ACW Series B	Bellows kit for Types ACW5 and 25	9998	PCM-28
ACW Series B	Bellows kit for Types ACW9 and 29	9998	PCM-29
ACW Series A	Bellows kit for Types ACW6, 7, 10, 26, 27 and 20	9998	PCM-50
ACW and ADW all	Gasket kit	9998	E1538-S959-G1
ACW and ADW all	Snap switch single pole double throw	9007	AO-1
ACW and ADW all	Snap switch double pole double throw	9007	CO-3
ADW	Piston and cylinder kit for Types ADW3 and 23	9998	E1538-S968-G1
ADW	Piston and cylinder kit for Types ADW4, 24, 7 and 27	9998	E1538-S969-G1
ADW	Piston and cylinder kit for Types ADW5 and 25	9998	E1538-S970-G1
ADW	Piston and cylinder kit for Types ADW6 and 26	9998	E1538-S971-G1
ADW	Diaphragm assembly kit	9998	E1538-S965-G1
ACW and ADW	Replacement lamp unit 24V/125V/250V (specify voltage)	9998	PC 185
Accessories			
ACW and ADW	Range adjustment knob	9049	A-11
ACW and ADW	Sealing cap (to prevent tampering with range adjustment)	9049	A-17
ACW and ADW	Pilot light kit 24V	9998	PC276
ACW and ADW	Pilot light kit 125V	9998	PC278
ACW and ADW	Pilot light kit 250V	9998	PC279
Factory Modifications			
ACW	Range adjustment locking nut (prevents tampering with range adjustment)		#Form Z4
ACW	Substitution of A0-2 snap-switch, with higher DC rating, replacing A0-1 (see note below)		● #Form H3
ACW single pole changeover devices	Hirschmann plug and socket electrical connector		#Form H18

Factory modification only specify form no. after Class and Type.
● Note that differential range of devices fitted with this modification will be as shown for double pole devices.

Ordering Instructions
State... **Class** and **Type**
Eg: Class **9049** Type **A-17**

Technical Data

Type ACW and AEW

Steam – Switches should not be applied directly on steam exceeding 15 p.s.i. However, with the installation of a steam capillary tubing kit, between the pressure system and the pressure switch, steam pressure up to 250 psi may be applied, providing this does not exceed the maximum allowable pressure rating of the switch, or the maximum temperature at the bellows.

Adjustments – The range setting is made by turning the stem on top of the device with a screwdriver. Removal of the front cover reveals the screwdriver differential adjustment in the upper right-hand corner of the device.

Surge and Pulsation Dampening – ACW switches are furnished with .060 pulsation plugs to prevent false operation of the switch on minor pressure surges. For surges of greater magnitude a surge reducer can be used.

Actuators – The materials in contact with the pressure medium on standard switches are as follows:
Housing and Connector – Cadmium or Zinc Plated Steel
Bellows – Phosphor Bronze
Pulse Plug – Brass
Joints – Soft Solder

Life Expectancy – Normally, the life of the ACW switching mechanism, excluding the bellows, is about 10 million operations. Bellows life can vary from a few thousand to millions of operations depending on operating pressure, bellows stroke, frequency of operation, presence of corrosive elements and pressure surges. Complete data on this subject is available from the factory. High speed cycling, or rapid pressure drop to zero on each cycle can drastically reduce the life of a bellows actuated switch.

Service Temperature Limitations

Ambient	Pressure Media
Minimum: −56°C (−70°F) Maximum +85°C (+185°F)	Minimum: −73°C (−100°F) Maximum +125°C (+257°F)

Mounting – Types ACW and AEW are mounted from the front. The two mounting holes are exposed by removal of the cover plate.

Type ADW

Use with High Flash Point Synthetic Hydraulic Fluids – When phosphate or phosphate ester base or other synthetic fluids which might damage the standard Buna N diaphragm are to be used, a Viton* diaphragm and piston seal is necessary. Select appropriate type GCWM pressure switch (Page 5b2) which has these fitted as standard.
*Viton is a registered trademark of Du Pont.

Oil Leakage – Slight oil leakage past the piston is normal on the devices that have no piston seal. A G⅛″ BS2779 tapped drain hole in the cylinder wall on the low pressure side of the piston permits piping of the leakage oil back to the reservoir. This hole should never be plugged nor should oil return lines be connected to a high volume discharge system because back pressure on the drain side can damage the diaphragm. Devices with piston seals have no leakage, and although an oil return line is not needed, the drain hole still should never be plugged.

Surge and Pulsation Dampening – These devices have as standard a .020 orifice pulsation plug which prevents false operation on minor pressure surges. For heavier duty surge snubbing a surge reducer can be used.

Actuators – The materials in contact with the pressure medium on standard switches are as follows:
Piston Housing – Cast Iron
Piston – Steel
Pulse Plug – Brass
Diaphragm – Nitrile Rubber (Buna N)
Seal – Nitrile Rubber (Buna N) } Piston Seal Types Only
Back up Ring – P.T.F.E.

Service Temperature Limitations

Ambient	Pressure Media
Minimum: −30°C (−22°F) Maximum +85°C (+185°F)	Minimum: −30°C (−22°F) Maximum +125°C (+257°F)

Mounting – Type ADW devices are mounted from the front. The two mounting holes are exposed by removal of the cover plate.

Technical Data

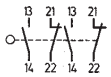
Enclosure

Gasketed, die cast, drip tight and oil resistant housing to IP65 and, NEMA Type 13

Electrical

The snap switches used in Type A devices are:–
Single Pole, Double throw – Class 9007 Type AO-1 Snap Switch
Double Pole, Double throw – Class 9007 Type CO-3 Snap Switch

Contact Ratings

Type	AC Ratings	120V	240V	415V	600V	DC Ratings	120V	240V
Single pole, double throw. One NO circuit and one NC circuit. These circuits cannot be used on opposite polarities 	Maximum making current Inductive 35% Cos θ A	40	20	10	8	Maximum making and breaking current. Pilot duty resistive and inductive A	0.25	0.1
	Maximum breaking current Inductive 35% Cos θ A	15	10	6	5			
	Maximum continous current A	15	15	15	15	Maximum continuous current A	15	15
	Maximum making, breaking and continuous current resistive 75% Cos θ A	15	15	15	15			
Double pole, double throw. Each pole electrically seperate from the other and may be used on opposite polarities. The contacts on each pole are single pole double throw and cannot be used on opposite polarities 	Maximum making current Inductive 35% Cos θ A	30	15	7.5	6	Maximum making and breaking current. Pilot duty resistive and inductive A	115V 0.2	230V 0.1
	Maximum breaking current Inductive 35% Cos θ A	3	1.5	0.75	0.6			
	Maximum continous current A	10	10	10	10	Maximum continuous current A	10	10
	Maximum making, breaking and continuous current resistive 75% Cos θ A	10	10	10	10			

Adjustment

Type ACW

RANGE – Adjustment of the operating point is made externally using the screw driver adjustment located at the top of the switch. The range scale refers to the operating point on falling pressure.

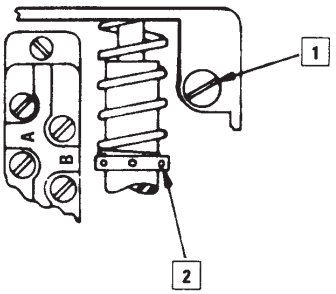
DIFFERENTIAL – The differential adjusting screw is accessible by removal of the cover assembly. Turn the screw in a clockwise direction to increase the differential. This will affect only the operating point on rising pressure.

Type ADW

RANGE – This adjustment determines the operating point on rising pressure and is made externally with a screwdriver. First, the range locking nut must be loosened. After the adjustment is made, the range locking nut should be tightened.

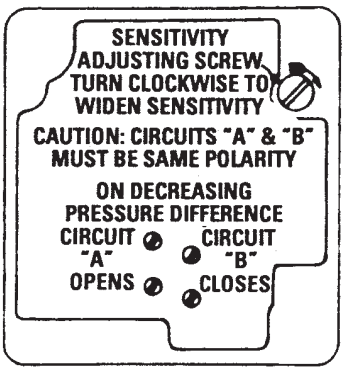
DIFFERENTIAL – The differential adjusting screw is accessible by removal of the cover. Turn the screw in a clockwise direction to increase the differential. This will affect the resetting point on falling pressure only.

Type AEW



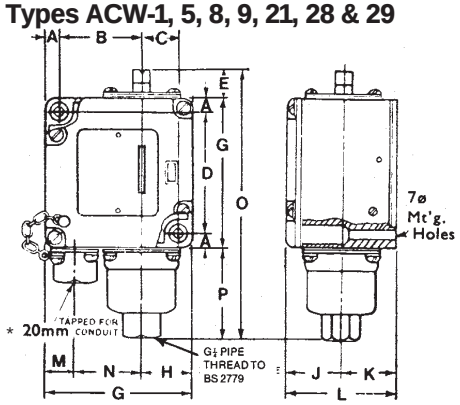
PRESSURE DIFFERENCE ADJUSTING NUT. TURN TO RIGHT TO INCREASE PRESSURE DIFFERENCE

TWO ADJUSTMENTS:
1 SENSITIVITY
2 PRESSURE DIFFERENCE



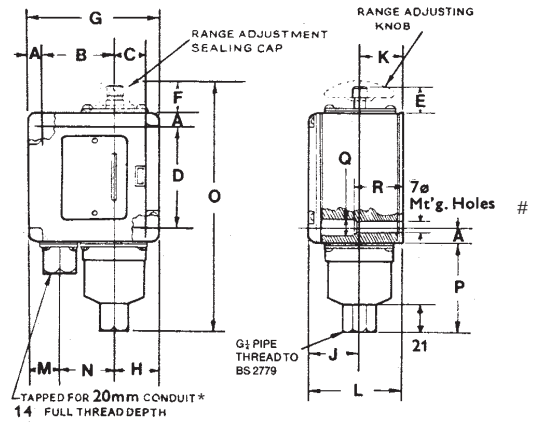
Dimensions
Type ACW and ADW

Types ACW-1, 5, 8, 9, 21, 28 & 29



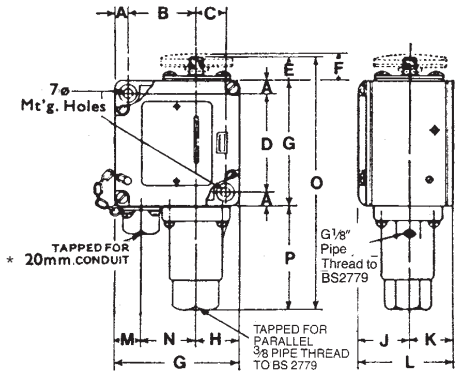
Types ACW-1, 5, 8, 9, 21, 25, 28 & 29
Net Weight – 1.55 kg

Types ACW-1, 5, 8, 9, 21, 25, 28 & 29 With Range Adjustment Sealing Cap and Range Adjusting Knob



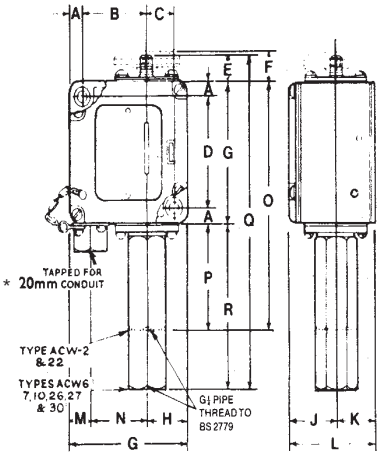
Types ACW-1, 5, 8, 9, 21 25, 28 & 29
With Range Adjustment Sealing Cap (Specify Class 9049, Type A17) and Range Adjusting Knob (Specify Class 9049, Type A11)
Net Weight – 1.55 kg

Types ADW-3, 4, 5, 6, 7, 23, 24, 25, 26 & 27



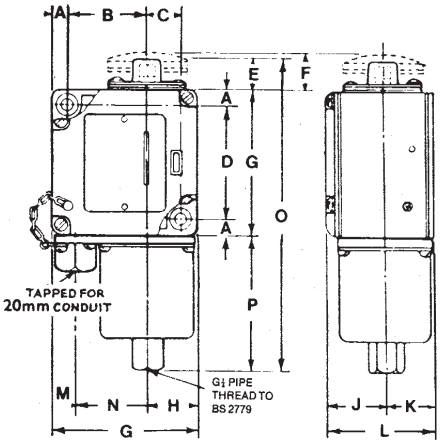
Types ADW-3, 4, 5, 6, 7, 23, 24, 25, 26 & 27
Piston Types. Net Weight – 2.0 kg

Types ACW-2, 6, 7, 10, 22, 26, 27 & 20



Types ACW-2, 6, 7, 10, 22, 26, 27 & 20
Net Weight – 2.10 kg

Types ACW-3, 4, 23 & 24



Types ACW-3, 4, 23 & 24
Net Weight – 1.75 kg

A	B	C	D	E	F	G	H	J	K
10	48	21	69	17	19	88	31	37	31

Type	L	M	N	O	P	Q	R
ACW-3, 4, 23 & 24 *	68	11	46	188	83	–	–
ACW-1, 5, 8, 9, 21, 25, 28 & 29	68	19	39	165	60	12	24
ACW-2, 6, 7, 10, 22, 26, 27 & 30	68	18	39	173	68	221	116
ADW-3, 4, 5, 6, 7, 23, 24, 25, 26 & 27	68	19	39	176	71	–	–

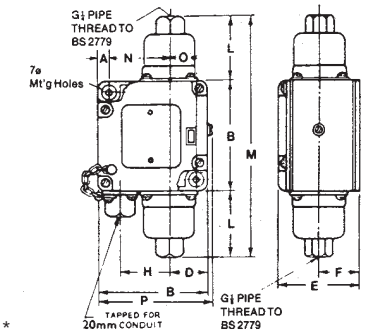
All Dimensions in mm

***NOTE:** Conduit boss now fitted to types ACW-3, ACW-4, ACW23 and ACW24 only. All other types have casings tapped 20mm ISO.
ACW-1, 5, 8, 9, 21, 25, 28 and 29 mounting hole diameter will be reduced to 6.8mm.

3a

Dimensions
Type AEW

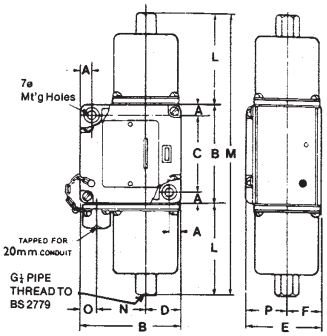
Types AEW-1 and 5



*

Types AEW-1 and 5
Net Weight 1.65 kg

Type AEW-3



Type AEW-3
Net Weight 2.15 kg

A	B	C	D	E	F	G	H	J
10	88	69	31	68	31	34	39	56

Type	K	L	M	N	O	P	Q
AEW-3 *	–	90	263	46	11	37	–
AEW-1 & 5	–	61	210	48	21	91	–

***NOTE:** Conduit boss fitted to type AEW-3 only. All other types have casings tapped 20mm ISO.