

Introduction

These are the items which are used in most general purpose applications. These switches cannot be configured and are generally intended for stock and sell.

As such, many of them are picked from all the above categories, and can be ordered by part numbers. These will generally have minimum order quantities, and would be available off the shelf.

APPLICATIONS

- Power Generation
- Burners and Furnaces
- Glass and Metal Industries
- Chemical Industries
- Steel Industry
- Hydraulic, Steam and Gas Turbines
- Boilers & Compressors
- Machine tools
- Water treatment
- Sugar and Paper Mills
- Fire protection
- Surgical gas, Breweries, Milk industries
- Tyre Industry

PRODUCT SPECIFICATIONS:

- Storage temperature : Atmospheric temperature
- Operating ambient temperature : - 20° C to + 60° C
- Media temperature : for rubber diaphragms 80° C max
- Can be offered for higher temperatures with other capsule combinations
- Setpoint repeatability : $\pm 1\%$ of FSR
- Enclosure : IP rating varies as per model selected
- Switch output : SPDT
- Process connection : $\frac{1}{4}$ " BSP standard,
- Approximate weight : 1 kg

FEATURES

- Low cost
- Easily available
- Reliable accurate microswitches for long life switching
- Customized arrangements for switching values on request
- Easy safe wiring options
- Accuracy +/- 1 % FSR
- Warranty : 2 years

*Accuracy changes with switch configuration

OEM SWITCHES

SPECIFIER'S GUIDE FOR

PRESSURE SWITCHES

PRESSURE DIFFERENCE SWITCHES



Using the section

This section on “How to use this catalogue “ helps you make a logical choice in selecting the best product for a particular application. It allows a user familiar with our product line to locate the exact page the product is listed on. For those not familiar with our products, a logical sequence is given to help the user pick the best product for their need.

By taking a few minutes to familiarise yourself with the catalogue organization, you will find it very easy to locate the product / information you need.

1. The contents page lists the broad outline in which the catalogue is organized, and will help the user familiar with products to select the page on which the product or other useful information is listed.

2. Need Product Selection help ?

Product selection help will start with the “Pictorial Index” on Page 291, where the products are broadly classified. A brief description of each product group , a typical photo of the product within the group and the page number on which it is listed are given.

If the user is not familiar with the products, a product selection guide is provided on pages 294 through 298, where photos for each product and important specifications are given to help determine and select the best product for the application.

By evaluating and comparing these parameters, a logical selection can be made. Turn to the page on which the product information for the selected product is listed, for :

Capsule Construction details

Physical sizes

Special features

Ranges, hysteresis, electrical ratings etc.

Ordering information

The organisation of each of these pages is demonstrated on pages 292 and 293, of this section “How to use this catalogue”.

In many cases, more than one product may work. For the most cost effective solution, compare prices and consider alternatives. Remember, the end cost includes initial product price, plus the installation, plus the service.

3. Need the terminology explained? (see page 330)

Turn to page 330 for the definitions and terminology. This will help you familiarize with the terms used throughout the catalogue.

4. Need information on Accessories? (see page 322)

Turn to page 322 for information on important accessories. These will give information on only important accessories, and information needed, when these are to be supplied with our products.

5. Need selection guidance? (see page 331)

A logical procedure on page 331 will help you to consider most of the important factors when selecting a pressure switch.

6. Need other products ? (see page 332)

Products other than those listed in this catalogue are referenced on these pages. Separate catalogues for these products are available.

Pictorial Index

SC SUBMINIATURE



Page No. 300

SM



Page No. 302

SA



Page No. 304

EZ/EX



Page No. 306

EZ_A/EX_A



Page No. 308

MZ/MX



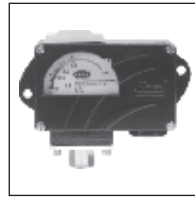
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MZ_A



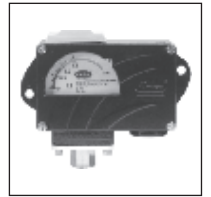
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MD



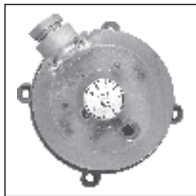
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MD_A



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CF



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CS12



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OTHER PRODUCTS

TR



Page No. 332

HOW TO USE this section

Due to the variety in product types and their salient features, catalogue page formats may vary. But generally the following formats are adhered to.


Elements appearing on each page will be:

1. Product family / series - A product family / series will appear on the outside page corner, depending on the left / right hand page, and will be in large bold type.
2. Product section - will appear immediately following the product family / series at top of the page and will be in bold type.
3. Features - will appear next to product description & will enlist only the major attributes.
4. Pressure capsule details - will show the construction of the pressure capsule and all its internal parts. If the process / working medium is variable, the wetted parts will be mentioned in italics. If the wetted parts are unique, the material of construction (MOC) will be mentioned


alongside in brackets. Where the material of construction is not specified, it will vary and the options are to be selected by the user considering the compatibility of the process / working medium. Modifications can be made to suit any particular medium, if the answer for your needs is not in the standard MOC listed. Products for which process / working medium is predefined, pressure capsule details are not provided (e.g as in case of comparison test pump). Pressure capsule details of accessories are not given.

5. Installation drawing - will show the typical installation dimensions of products as they exist in their standard forms. The dimensions are mentioned in millimetres and also in inches to facilitate the user. The dimensions of accessories will have to be added to these to arrive at any particular general arrangement (GA) drawings. The dimensions are approximate and for precise dimensions, where mounting space is restricted, the user may contact the nearest sales office. Installation drawings of only fast moving accessories are given.

1 ● **SM OEM HIGH RANGE PRESSURE SWITCHES**



6 ●



2 ●

7 ●

4 ●

3 ●

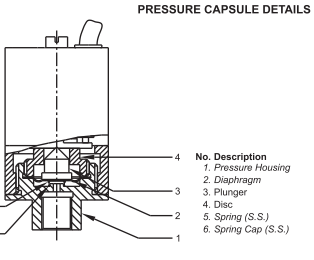
4 ●

4 ●

5 ●

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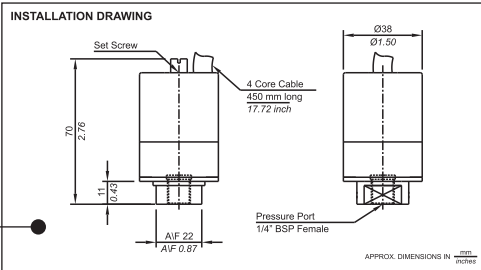
Pressure Capsule Details



No. Description
 1. Pressure Housing
 2. Diaphragm
 3. Plunger
 4. Disc
 5. Spring (S.S.)
 6. Spring Cap (S.S.)

Note: wetted parts are mentioned in italics.

INSTALLATION DRAWING



Bulletin No. KA121024

OEM HIGH RANGE PRESSURE SWITCHES SM

3 ●

8 ●

9 ●

303

General information:
 SM series pressure switches have a cast aluminium enclosure, intended for in-house use. These are generally used where size is a constraint. The repeat accuracy is better than ± 2% FSR. A core cable 450 mm long with CNCING contacts is provided for wiring. Pressure port is 1/4" BSPF standard.

Features:

- Compact
- Lightweight
- Electrical rating : 5A, 250VAC; 0.2A, 250 VDC(res.)
- Choice of wetted parts to suit working media
- Proof pressure available can be 4 times MWP (optional)
- Pressure port : 1/4" BSPF

Range Selection Table

Range Code	Range (rising pressure) bar (psi)	*Approximate Maximum Differential (fixed) bar (psi)	Maximum Working Pressure bar (psi)
H01	0.2 - 1.0 (2.90 - 14.50)	0.2 (2.90)	12 (174.05)
H03	0.2 - 2.4 (2.90 - 37.71)	0.3 (4.35)	12 (174.05)
H04	0.2 - 3.6 (2.90 - 52.52)	0.3 (4.35)	12 (174.05)
H07	0.5 - 7.0 (7.25 - 101.53)	0.5 (7.25)	12 (174.05)
H10	0.5 - 10.0 (7.25 - 145.04)	1.0 (14.50)	25 (362.6)
H15	1.0 - 15.0 (14.50 - 217.56)	1.5 (21.75)	25 (362.6)
H30	5.0 - 25.0 (72.52 - 362.6)	2.50 (36.26)	25 (362.6)

*Minimum differential increases with setpoint (Graphs available on request)

How to order SM Series High Range Pressure Switches

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
Model	Range Code	Range Scale	Pressure Housing	Diaphragm	Enclosure
SM - Fixed Differential Pressure switch	H - High range pressure switch	U - Uncalibrated	A - Aluminium B - Brass S - SS316	0 - Neoprene 1 - Teflon	0 - IP 54 as per IS 2147

eg. A single pressure switch, high pressure range from 0.1-1.0 bar in uncalibrated style with brass pressure housing & a teflon diaphragm in a standard enclosure shall be specified by

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
SM	H01	U	B	1	0

Please specify full model number to avoid ambiguity. If only the first two groups are specified while ordering, switches with standard wetted parts will be supplied.

Bulletin No. KA121024

HOW TO USE this section

6. Photos - will appear on the relevant top of the page for products. If there are mounting variations / styles, all the styles for standard products will appear for easy identification. Options, if included in the photograph, are for demonstration only, and are not a part of the standard equipment. For accessories, the photos are not given due to the sheer variety and range available.

7. Logo - will appear on right hand top of page to identify the manufacturer.

8. Characteristics - Range tables and their relevant data, e.g the range covered, the differentials and maximum working pressures will generally appear on the right hand page. Additional technical details will also be mentioned, wherever required, on the right hand side of the page.

9. Ordering guide - A guide as to how to order the particular series' variations will appear on right hand bottom of the page. Only the variations available within a particular product family / series will appear here. Any additional accessories or modifications required for the product need to be mentioned in text by the user.

10. Installation and Operating Instructions - will appear on the right hand page. This provides instructions for installation and operation of that switch.

11. Numerous combinations are possible when pressure switches are provided with accessories like chemical seals, snubbers, remote seals, pipe mounting brackets, combination of switches mounted in a panel etc. Users are requested to provide the details of accessories required in text / drawings, as separate identification codes are provided for pressure switches fitted and supplied with accessories.

1 ● **CF ULTRA LOW RANGE PRESSURE DIFFERENCE SWITCHES**

3 ● **Salient Features**

Easy to See, Easy to Use!
Set Point easily user adjustable with visible scale in Pascal. (no need of pressure gauge).
Differential easily adjustable with just a screwdriver.

Light Weight!
150 gms

Flexible!
Direction of PG 11 cable entry can be rotated in steps of 120°

Long Lasting!
10⁷ switching operations

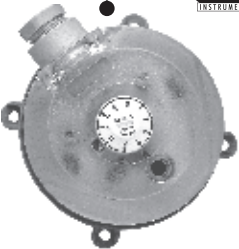
More Options!
Available in a wide range

Trusted all over!
Tested and proven

Technical Specifications

- Media - Air, non-flammable gases and non-aggressive gases.
- Housing Material - Body of PA 6.6 and Cover of PS
- Protection category - IP54 with cover.
- Maximum working pressure - 10 Kpa / 1019.74 mm wg.
- Electrical Rating - Maximum 1.0A (4 A) / 250 VAC.
- Electrical Connection - AMP flat plug 6.3 mm x 0.8 mm in accordance with DIN 46224.
- Cable Entry - PG11
- Mounting Lugs - integrated in bottom Housing.
- High Pressure and Low Pressure port of Outer Diameter 6 mm.

2 ● **Ultra Low Range Pressure Difference Switches with User Adjustable Knob**



6 ● **Range Selection Table**

Range Code (Orion)	Adjustment range for upper switching pressure Pa (mm wg)	Switching differential set to Pa (mm wg)
CF80	20 ~ 200 (2.039 ~ 20.395)	10 (1.020)
CF81	40 ~ 100 (4.079 ~ 10.197)	20 (2.039)
CF82	40 ~ 200 (4.079 ~ 20.395)	20 (2.039)
CF83	50 ~ 500 (5.099 ~ 50.987)	20 (2.039)
CF85	200 ~ 1000 (20.395 ~ 101.974)	100 (10.197)
CF86	500 ~ 2500 (50.987 ~ 254.935)	150 (15.296)
CF87	1000 ~ 4000 (101.974 ~ 407.896)	250 (25.494)

7 ● **Orion INSTRUMENTS**

9 ● **How to order CF series Low Range Pressure Difference Switches**
Please specify the Range Code eg. CF82 or CF85

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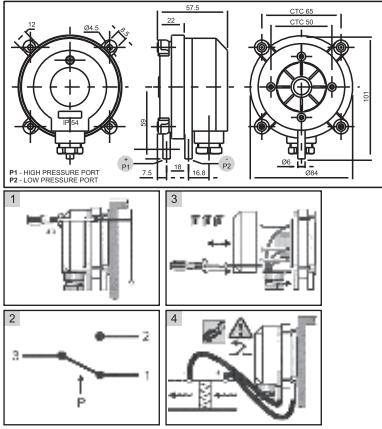
ULTRA LOW RANGE PRESSURE DIFFERENCE SWITCHES ● **CF**

INSTALLATION AND OPERATING INSTRUCTIONS

10 ● **Principle of Operation**
When the effective force generated by the pressure difference in the lower and upper chamber of the pressure capsule exceeds/falls beyond the balancing spring forces, an electrical element is actuated.

Mounting
The detail mounting dimensions are shown in Fig. 1

5 ● **Fig. 1**



1 ● **P1 = higher pressure**
2 ● **P2 = lower pressure**
*Use two screws only, for mounting
**Remove transport protection from P2
Note : Do not install upside down with trip pressure of less than 50 Pa.

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Product Selection Guide



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Model	SC	SM	SA
Switch type	Subminiature	OEM (High Pr.)	OEM (High Pr.)
Differential type	Fixed	Fixed	Fixed
Repeatability (% FSR)	± 2	± 2	± 2
Range covered	0.1 bar to 25 bar	0.2 bar to 25 bar	0.2 bar to 25 bar
Enclosure Protection			
Enclosure Standard Optional	Cast aluminium	Cast aluminium to IP 54 as per IS 2147	
WETTED PARTS	sensing element Standard Optional	Diaphragm nylon reinforced neoprene diaphragm teflon, SS316L teflon	
	Pressure housing Standard Optional	SS 316 mild steel	Aluminium Brass/SS316
	Other Wetted Parts		
	Optional wetted parts through chem. seal		
Temp. of working medium	80°C maximum. For higher temperature, please use impulse tubing/chemical seals.		
Switching element	SPDT Snap action switch A8 : General purpose rated at 5A, 250 VAC, 0.2 A, 250 VDC resistive. For other switching elements please contact sales office		

Accessories can be supplied with most of the switches. Please consult sales office.

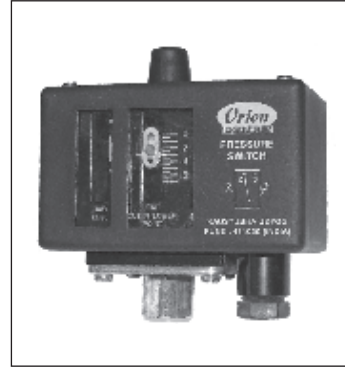
Product Selection Guide



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EZ	EX	EZ_A	Model
OEM (High Pr.)	OEM (High Pr.)	OEM (High Pr.)	Switch type
Fixed	Adjustable	Fixed	Differential type
± 1.5	± 1.5	± 1.5	Repeatability (% FSR)
0.2 bar to 25 bar	0.5 bar to 25 bar	3 psi to 350 psi	Range covered
			Enclosure Protection
Pressed steel enclosures IP 40 as per IS 2147			Enclosure Standard Optional
Diaphragm Teflon			sensing element Standard Optional
SS316			Pressure housing Standard Optional
			Other Wetted Parts
			Optional wetted parts through chem. seal
80°C maximum. For higher temperature, please use impulse tubing/chemical seals.			Temp. of working medium
SPDT Snap action switch A8 : General purpose rated at 5A, 250 VAC, 0.2 A, 250 VDC resistive. For other switching elements please contact sales office			Switching element

WETTED PARTS

Accessories can be supplied with most of the switches. Please consult sales office.

Product Selection Guide



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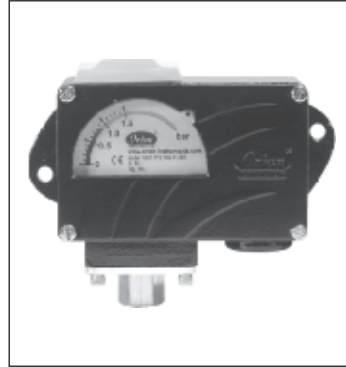
Model	EX_A	MZ	MX
Switch type	OEM (High Pr.)	OEM (High Pr.)	OEM (High Pr.)
Differential type	Adjustable	Fixed	Adjustable
Repeatability (% FSR)	± 1.5	Various	
Range covered	7 psi to 350 psi	0.1 bar to 25 bar	0.5 bar to 25 bar
Enclosure Protection		IP 66	
Enclosure Standard Optional	Pressed steel enclosures IP 40 as per IS 2147	Tough transparent polycarbonate	
sensing element Standard Optional	Teflon	Various	
Pressure housing Standard Optional	SS 316		
Other Wetted Parts		Teflon, SS 316	
Optional wetted parts through chem. seal			
Temp. of working medium	80°C maximum. For higher temperature, please use impulse tubing/chemical seals.		
Switching element	SPDT Snap action switch A8 : General purpose rated at 5A, 250 VAC, 0.2 A, 250 VDC resistive. For other switching elements please contact sales office		

Accessories can be supplied with most of the switches. Please consult sales office.

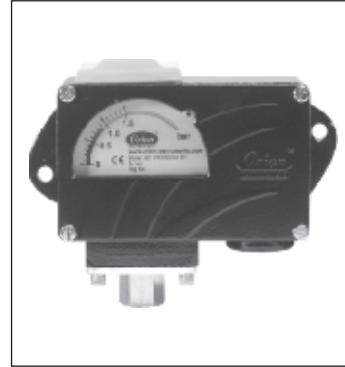
Product Selection Guide



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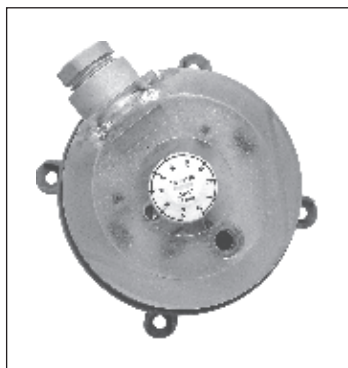
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MZ__A	MD	MD__A	Model
OEM (High Pr.)	OEM (High Pr.)	OEM (High Pr.)	Switch type
Fixed	Fixed		Differential type
Various	± 2		Repeatability (% FSR)
1.5 psi to 350 psi	0.1 bar to 25.0 bar	1.5 psi to 350 psi	Range covered
IP 66			Enclosure Protection
Tough transparent polycarbonate	Die-cast aluminium		Enclosure Standard Optional
Diaphragm nylon reinforced neoprene diaphragm teflon			sensing element Standard Optional
SS 316			Pressure housing Standard Optional
Teflon, SS316			Other Wetted Parts
			Optional wetted parts through chem. seal
80°C maximum. For higher temperature, please use impulse tubing/chemical seals.			Temp. of working medium
SPDT Snap action switch A8 : General purpose rated at 5A, 250 VAC, 0.2 A, 250 VDC resistive. For other switching elements please contact sales office		Maximum 1.0 A (.4A) / 250 VAC	Switching element

WETTED PARTS

Accessories can be supplied with most of the switches. Please consult sales office.

Product Selection Guide



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Model	CF	CS12
Switch type	OEM (Ultra-low Range)	OEM
Differential type	Adjustable	Adjustable
Repeatability (% FSR)		
Range covered	20 Pa to 4000 Pa	2 bar to 12 bar
Enclosure Protection	IP 54	IP44
Enclosure Standard Optional	Body of PA 6.6 and Cover of PS	Non-metallic cover
sensing element Standard Optional		Nitrile rubber
Pressure housing Standard Optional	Industrial Plastic	Mild Steel
Other Wetted Parts		
Optional wetted parts through chem. seal		
Temp. of working medium	80°C maximum	
Switching element	Maximum 1.0 A (.4A) / 250 VAC	16 Amp, 500 VAC

WETTED PARTS

Accessories can be supplied with most of the switches. Please consult sales office.

Subminiature Switches



Pressure Ranges from 0.1 bar to 25 bar

Please refer page no. 300 for Subminiature Switch details

SC SUBMINIATURE SWITCHES



General information:

SC series subminiature pressure switches are low cost options. They are generally used where size is a constraint. Typical applications are to sense oil pressure in power packs. Can also be used for several automation applications.

Features:

- Compact
- Lightweight (Approx. 0.13 Kg.)
- Normally closed (NC) or normally open (NO)
- Electrical rating: 5A, 250VAC; 0.2A, 250 VDC (res.)
- Switching point easy to adjust
- Body material : Aluminium
- Wetted parts : MS/SS, Neoprene, SS316L, Teflon
- Pressure port : 1/4" BSP(M), other sizes available

Range Selection Table

Range Code	Range bar (psi)	Differential bar (psi)	Maximum Working Pressure bar (psi)
H01	0.1 - 1.0 (1.45 - 14.50)	0.2 (2.9)	35 (507.6)
H10	0.5 - 10.0 (7.14 - 142.86)	0.5 (7.25)	35 (507.6)
H30	2.0 - 25.0 (29.00 - 362.6)	1.5 (21.76)	35 (507.6)

How to order SC Series Subminiature Switches

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
Non Standard Allocation	Model	Terminal Type	Switch Type	Range Code	Operating Type	Pressure Port Material / Size	Diaphragm
<input type="checkbox"/> Reserved for non-standard options not mentioned in catalogue. Will be given by manufacturer, only after agreement of supply details with customer.	SC = Subminiature Type	1 = Plug Type	PFO = Pressure Switch Fixed Differential	H01 = (0.1 - 1.0) H10 = (0.5 - 10.0) H30 = (2.0 - 25.0)	A1 = With Silver Contact NC A2 = With Silver Contact NO A3 = With Silver Contact SPDT	M3 = Mild Steel / 1/4" BSPM S3 = SS316L / 1/4" BSPM	0 = Neoprene 1 = Teflon

e.g.: A single subminiature switch, high pressure range from 0.1 - 1.0 bar in uncalibrated style with mild steel pressure port & a neoprene diaphragm shall be specified by

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
<input type="checkbox"/>	SC	1	PFO	H01	A1	M3	0

Please specify full model number to avoid ambiguity. If only the first two groups are specified while ordering, switches with standard wetted parts will be supplied.

Construction :

The pressure switch is housed in a diecast aluminium enclosure. The pressure capsule, at the bottom of the switch, comprises a pressure housing (either M.S. Or S.S.), a disc, a diaphragm (Neoprene, Teflon or SS316L) and a plunger. This is a plug type switch with NO (Normally Open) or NC (Normally Closed) contacts. The electrical terminations are standard Push On type. Figure 1.

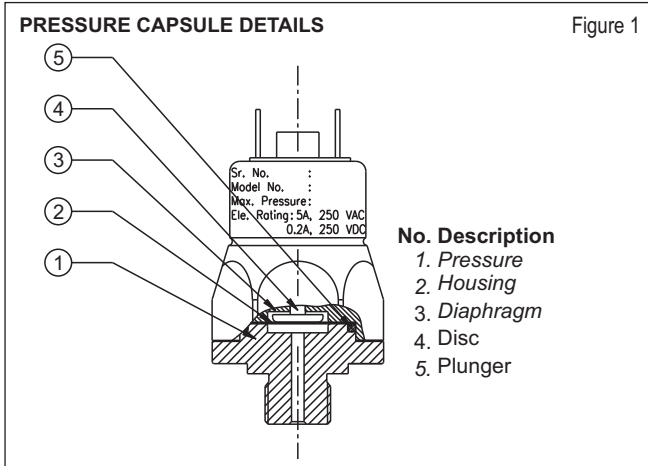


Figure 1

Principle of Operation :

The pressure in the pressure capsule is converted into force by means of a diaphragm and a calibrated piston, which is balanced by a compression spring from above. When the force generated by the pressure in the pressure capsule exceeds/falls beyond the balancing spring force, an electrical element is actuated/deactuated.

Materials of Construction :

Housing : Die-Cast Aluminium
Diaphragm : Neoprene / Teflon / SS316L

Mounting :

- 1) The SC series subminiature switches have stem type mounting and can be mounted in any direction.
- 2) The pressure port size is generally 1/4" BSP(M), unless specifically ordered otherwise. Other sizes can be obtained via adaptors for small quantities. For larger quantities, customized thread ends can be provided.

CAUTION : Tightening torque should not exceed by 4kg-m.

Electrical Connections :

These pressure switches will generally have NO (Normally Open) or NC (Normally Closed) contact terminals. Figure. 2.

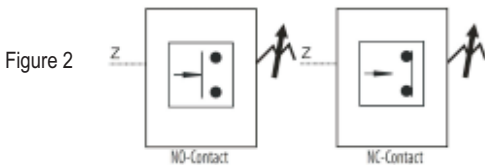


Figure 2

Wiring :

Connect the wires to the contact terminals as per your wiring diagram.

Set Point Adjustment :

- 1) The switching point can be easily adjusted by turning the setting screw located in between the contacts. Figure. 3.
- 2) Apply the desired cutin (lower) / cutout (higher) pressure to the pressure switch.
- 3) Increase the pressure setting by turning the setting screw till contacts changeover.
- 4) Some minor adjustment will be required to achieve the exact cutin (lower) / cutout (higher) point, which can be checked with the help of a proper pressure measurement device.

Tip : The pressure switches are factory set at half the set point range (unless otherwise specified in a Purchase Order).

Trouble Shooting Tips

Generally no problems are observed if the pressure switch selection, wiring and the setpoint is proper. For a pressure switch selection procedure please consult our sales office.

For properly selected pressure switches, if following symptoms are observed, the likely causes and remedies are as stated below:

Symptom 1: Switch does not operate

- 1) Check if the NO and NC contacts operate properly.
- 2) Pressure does not reach the pressure port.

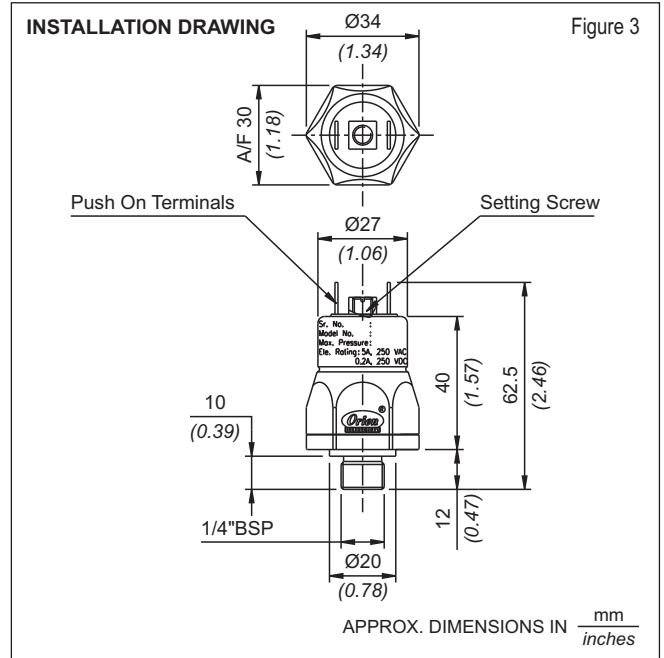


Figure 3

- a) Check if the entry to the pressure capsule is not blocked by frozen process or scales or impurities in the process.
 - i) If this is the case, try freeing the blocked path by a blunt tool in case of scales or impurities in the process.

DO NOT OPEN THE PRESSURE CAPSULE IN ANY EVENT

If the cause is none of the above mentioned probabilities, proceed as per the following steps.

- b) Check the system pressure and set point of pressure switch. For use of pressure switch for falling setpoints, system pressure has to be greater than cutin point. For use of pressure switch for rising setpoints, the system pressure may not be reaching or exceeding the cutout point.
 - i) Use 'T' connection and connect calibrated pressure gauge to the 'T' connection as shown in Figure 4.
 - ii) Adjust the setpoint such that the system pressure is greater than the cut-out point of the pressure switch.

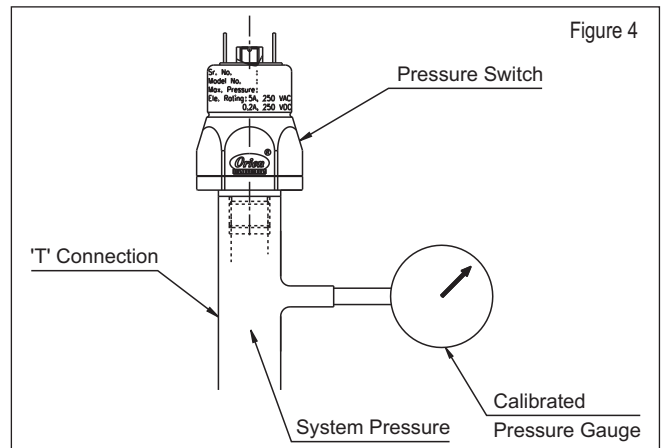


Figure 4

Symptom 2: Leakage

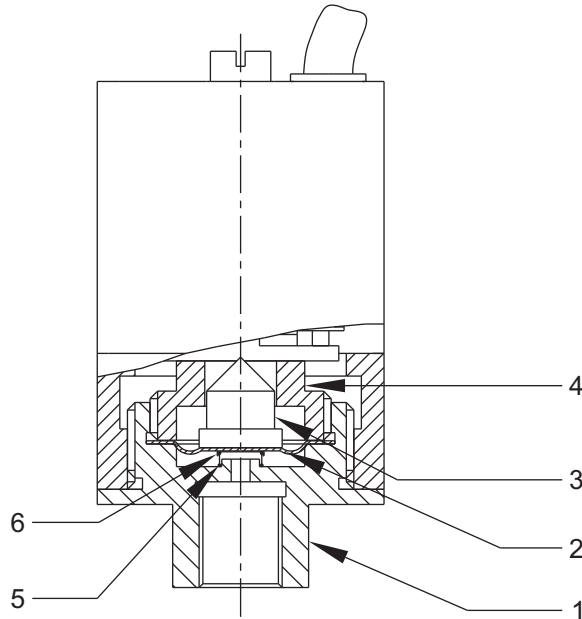
In case leakage is observed, pictures of pressure switch with wetted parts clearly visible, be mailed to service@orion-instruments.com. Please ensure to include a picture showing model no. and serial no. of the switch. Check for the following likely causes and use a new switch taking proper precautions.

- a) System pressure is greater than working pressure : Use an overrange protector or a switch with greater maximum working pressure.
- b) Incompatible wetted parts : The working medium may not be compatible with wetted parts, which damages the sealing of the process from working parts. Please choose proper compatible wetted parts.
- c) Excessive process temperature : Process temperature may exceed maximum allowable temperature, which in turn damages the diaphragms. Use an impulse tube to cool down process temperature.

SM OEM HIGH RANGE PRESSURE SWITCHES



PRESSURE CAPSULE DETAILS

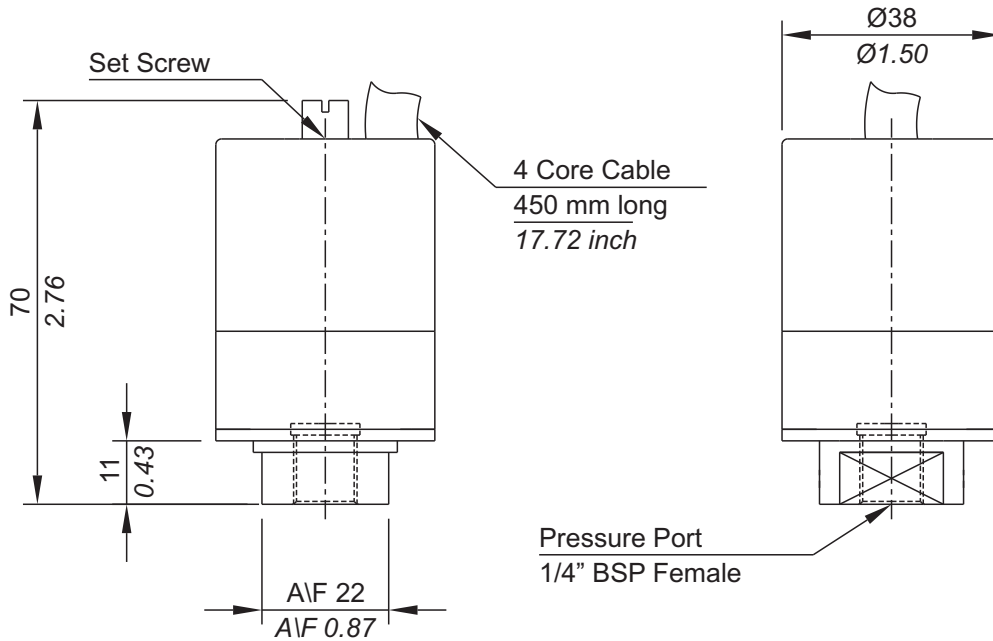


No. Description

1. Pressure Housing
2. Diaphragm
3. Plunger
4. Disc
5. Spring (S.S.)
6. Spring Cap (S.S.)

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING



APPROX. DIMENSIONS IN $\frac{\text{mm}}{\text{inches}}$

OEM HIGH RANGE PRESSURE SWITCHES

SM

General information:

SM series pressure switches have a cast aluminium enclosure, intended for inhouse use. These are generally used where size is a constraint. The repeat accuracy is better than $\pm 2\%$ FSR. A core cable 450 mm long with C/NO/NC contacts is provided for wiring. Pressure port is $\frac{1}{4}$ " BSPF standard.

Features:

- Compact
- Lightweight
- Electrical rating : 5A, 250VAC; 0.2A, 250 VDC(res.)
- Choice of wetted parts to suit working media
- Proof pressure available can be 4 times MWP (optional)
- Pressure port : $\frac{1}{4}$ " BSPF

Range Selection Table

Range Code	Range (rising pressure) bar (psi)	*Approximate Maximum Differential (fixed) bar (psi)	Maximum Working Pressure bar (psi)
H01	0.2 - 1.0 (2.90 - 14.50)	0.2 (2.90)	12 (174.05)
H03	0.2 - 2.6 (2.90 - 37.71)	0.3 (4.35)	12 (174.05)
H04	0.2 - 3.6 (2.90 - 52.52)	0.3 (4.35)	12 (174.05)
H07	0.5 - 7.0 (7.25 - 101.53)	0.5 (7.25)	12 (174.05)
H10	0.5 - 10.0 (7.25 - 145.04)	1.0 (14.50)	25 (362.6)
H15	1.0 - 15.0 (14.50 - 217.56)	1.5 (21.76)	25 (362.6)
H30	5.0 - 25.0 (72.52 - 362.6)	2.50 (36.26)	35 (507.63)

*Minimum differential increases with setpoint (Graphs available on request)

How to order SM Series High Range Pressure Switches

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
Model	Range Code	Range Scale	Pressure Housing	Diaphragm	Enclosure
SM - Fixed Differential Pressure switch	H - High range pressure switch	U - Uncalibrated	A - Aluminium B - Brass S - SS316	0 - Neoprene 1 - Teflon	0 - IP 54 as per IS 2147

eg. A single pressure switch, high pressure range from 0.1-1.0 bar in uncalibrated style with brass pressure housing & a teflon diaphragm in a standard enclosure shall be specified by

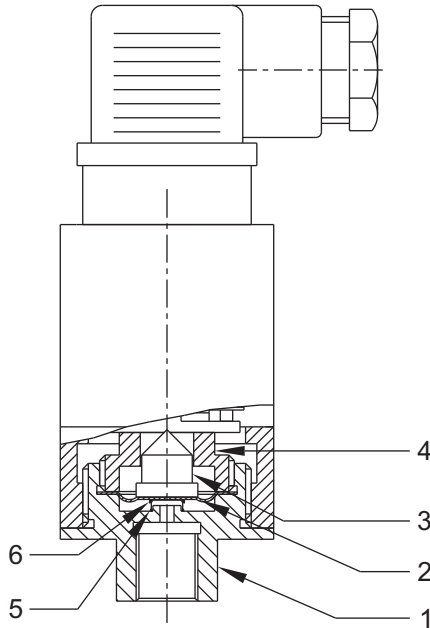
Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
SM	H01	U	B	1	0

Please specify full model number to avoid ambiguity. If only the first two groups are specified while ordering, switches with standard wetted parts will be supplied.

SA OEM HIGH RANGE PRESSURE SWITCHES



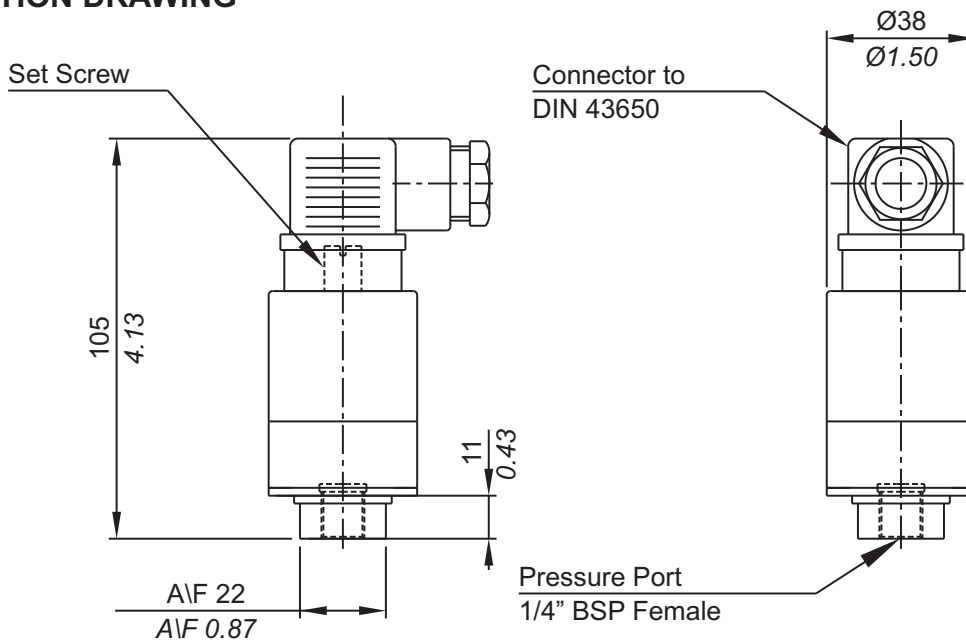
PRESSURE CAPSULE DETAILS



- | No. | Description |
|-----|-------------------|
| 1. | Pressure Housing |
| 2. | Diaphragm |
| 3. | Plunger |
| 4. | Disc |
| 5. | Spring (S.S.) |
| 6. | Spring Cap (S.S.) |

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING



APPROX. DIMENSIONS IN $\frac{\text{mm}}{\text{inches}}$

OEM HIGH RANGE PRESSURE SWITCHES SA

General information:

SA series (a variant of SM series) pressure switches have a cast aluminium enclosure, intended for inhouse use. These are generally used where size is a constraint. The repeat accuracy is better than $\pm 2\%$ FSR. A connector to DIN 43650 is provided for wiring. Pressure port is 1/4" BSPF standard.

Features:

- Compact
- Lightweight
- Electrical rating : 5A, 250 VAC; 0.2A, 250 VDC (res.)
- Choice of wetted parts to suit working media
- Proof pressure available can be 4 times MWP (optional)
- Pressure port: 1/4" BSPF

Range Selection Table

Range Code	Range (rising pressure) bar (psi)	*Approximate Maximum Differential (fixed) bar (psi)	Maximum Working Pressure bar (psi)
H01	0.2 - 1.0 (2.90 - 14.50)	0.2 (2.90)	12 (174.05)
H03	0.2 - 2.6 (2.90 - 37.71)	0.3 (4.35)	12 (174.05)
H04	0.2 - 3.6 (2.90 - 52.21)	0.3 (4.35)	12 (174.05)
H07	0.5 - 7.0 (7.25 - 101.53)	0.5 (7.25)	12 (174.05)
H10	0.5 - 10.0 (7.25 - 145.04)	1.0 (14.50)	25 (362.6)
H15	1.0 - 15.0 (14.50 - 217.76)	1.5 (21.76)	25 (362.6)
H30	5.0 - 25.0 (72.52 - 362.6)	2.50 (36.26)	35 (507.63)

*Minimum differential increases with setpoint (Graphs available on request)

How to order SA high range pressure switches

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
Model	Range Code	Range Scale	Pressure Housing	Diaphragm	Enclosure
SA - Fixed Differential Pressure switch	H - High range pressure Switch	U - Uncalibrated	A - Aluminium B - Brass S - SS316	0 - Neoprene 1 - Teflon	0 - IP 65 as per IS 2147

eg. A single pressure switch, high pressure range from 0.2 - 2.6 bar in uncalibrated style with brass pressure housing & a teflon diaphragm in a standard enclosure shall be specified by

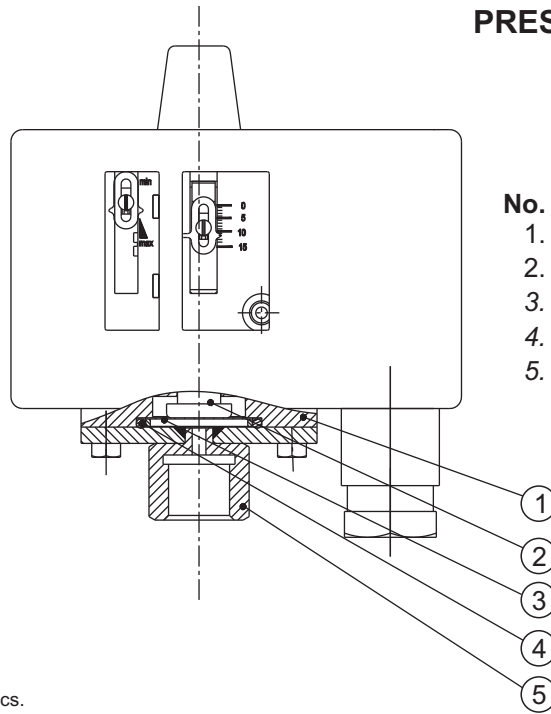
Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
SA	H03	U	B	1	0

Please specify full model number to avoid ambiguity. If only the first two groups are specified while ordering, switches with standard wetted parts will be supplied.

EZ / EX OEM HIGH RANGE PRESSURE SWITCHES



PRESSURE CAPSULE DETAILS

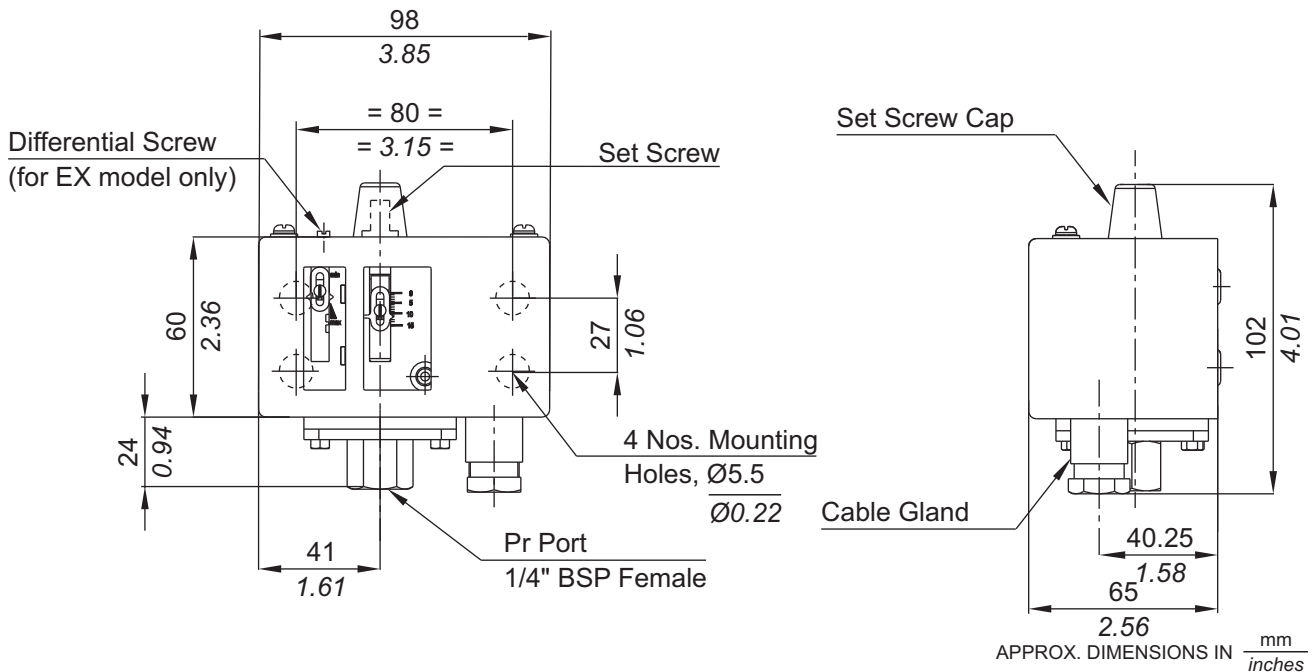


No. Description

1. Disc
2. Plunger
3. Diaphragm (Teflon)
4. O ring (Teflon)
5. Pressure Housing (SS 316)

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING



OEM HIGH RANGE PRESSURE SWITCHES **EZ / EX**

General information:

EZ /EX series pressure switches are housed in pressed steel powder coated enclosure and are recommended for panel mounting or indoor service. The repeat accuracy is better than $\pm 1.5\%$ FSR. A 3/8" cable entry is provided for cables and a terminal strip suitable for wired ends is provided inside the enclosure. Pressure port is 1/4" BSPF standard.

Features:

- Compact
- SS316 & Teflon as standard wetted parts
- Electrical rating : 5A, 250 VAC; 0.2A, 250VDC (res.)
- Pressure port: 1/4" BSPF

Range Selection Table

Model Code	† Range bar (psi)	*Approximate Maximum Differential bar (psi)	* Adjustable Differential bar (psi)	Maximum Working Pressure bar (psi)
EZ4	0.2 - 3.6 (2.90 - 52.21)	0.20 (2.90)	-	12 (174.05)
EZ7	0.5 - 7.0 (7.25 - 101.52)	0.40 (5.80)	-	12 (174.05)
EZ15	1.0 - 15.0 (14.50 - 217.71)	0.60 (8.70)	-	25 (362.6)
EZ30	5.0 - 25.0 (72.52 - 362.6)	1.00 (14.50)	-	35 (507.63)
EX7	0.5 - 7.0 (7.25 - 101.52)	-	0.8 - 6.0 (11.60 - 87.02)	12 (174.05)
EX15	1.0 - 15.0 (14.50 - 217.71)	-	1.5 - 10.0 (21.76 - 145.04)	25 (362.6)
EX30	5.0 - 25.0 (72.52 - 362.6)	-	2.5 - 10.0 (36.26 - 145.04)	35 (507.63)

*Minimum differential increases with setpoint (Graphs available on request)

† rising pressure for EZ series; falling pressure for EX series

HOW TO ORDER EZ/EX OEM HIGH RANGE PRESSURE SWITCHES

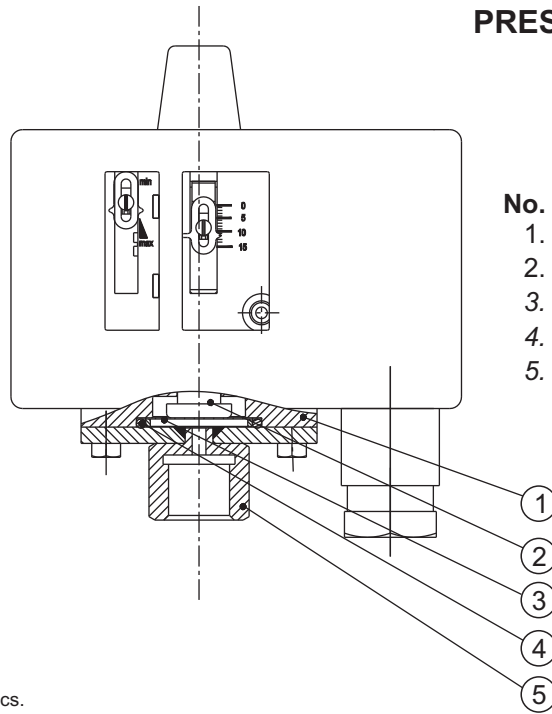
Please specify model code as per range selection table above.

EZ__A / EX__A

OEM HIGH RANGE PRESSURE SWITCHES



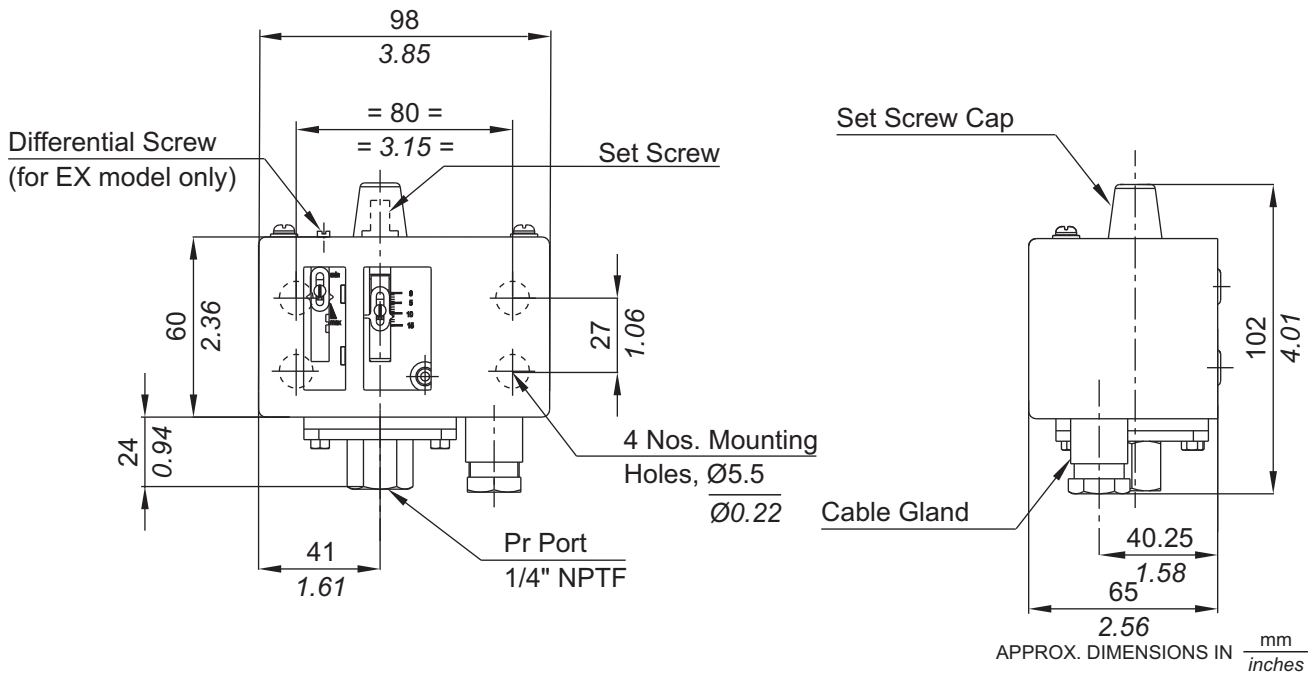
PRESSURE CAPSULE DETAILS



- | No. | Description |
|-----|---------------------------|
| 1. | Disc |
| 2. | Plunger |
| 3. | Diaphragm (Teflon) |
| 4. | O ring (Teflon) |
| 5. | Pressure Housing (SS 316) |

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING



OEM HIGH RANGE PRESSURE SWITCHES

EZ__A / EX__A

General information:

EZ /EX series pressure switches are housed in pressed steel powder coated enclosure and are recommended for panel mounting or indoor service. The repeat accuracy is better than $\pm 1.5\%$ FSR. A 3/8" BSP cable entry is provided for cables and a terminal strip suitable for wired ends is provided inside the enclosure. Pressure port is 1/4" NPTF standard.

Features:

- Compact
- SS316 & Teflon as standard wetted parts
- Electrical rating : 5A, 250 VAC; 0.2A, 250VDC (res.)
- Pressure port: 1/4" NPTF

Range Selection Table

Model Code	† Range psi	*Approximate Maximum Differential psi	* Adjustable Differential psi	Maximum Working Pressure psi
EZ4A	3.0 - 50.0	3.0	-	200.0
EZ7A	7.0 - 100.0	6.0	-	200.0
EZ15A	15.0 - 200.0	6.0	-	350.0
EZ30A	70.0 - 350.0	6.0	-	500.0
EX7A	7.0 - 100.0	-	10.0 - 90.0	200.0
EX15A	15.0 - 200.0	-	20.0 - 150.0	350.0
EX30A	70.0 - 350.0	-	40.0 - 150.0	500.0

*Minimum differential increases with setpoint (Graphs available on request)

† rising pressure for EZ series; falling pressure for EX series

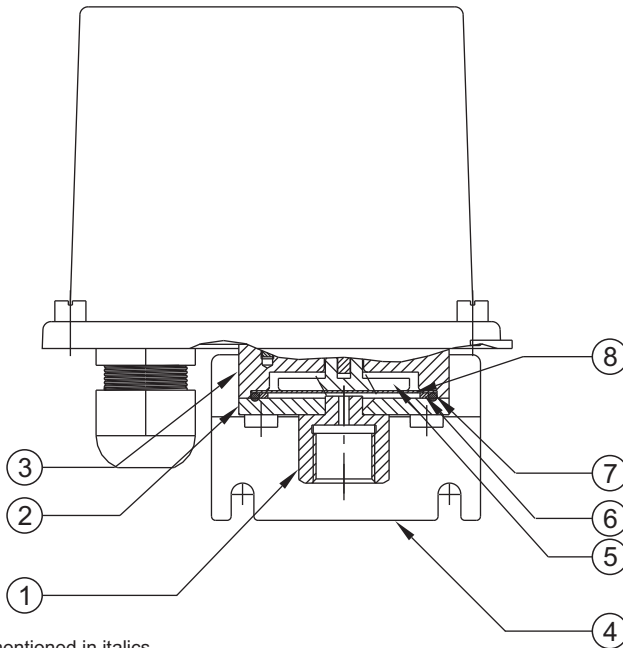
HOW TO ORDER EZ__A/EX__A OEM HIGH RANGE PRESSURE SWITCHES

Please specify model code as per range selection table above.

MZ / MX OEM HIGH RANGE PRESSURE SWITCHES



PRESSURE CAPSULE DETAILS

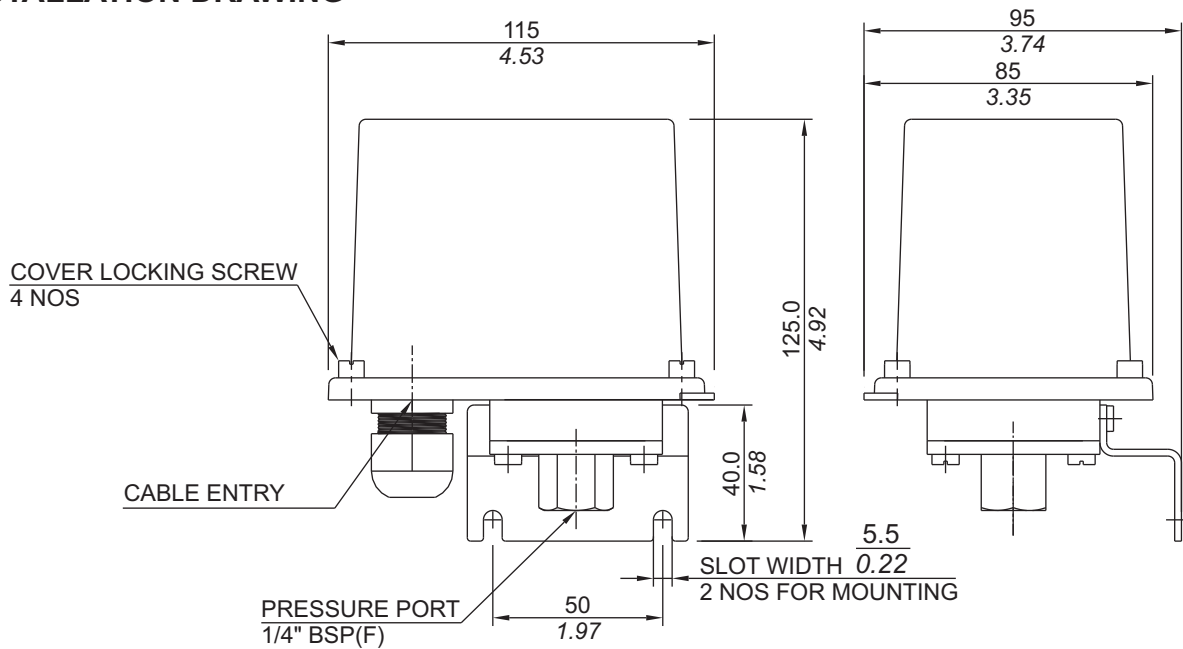


No. Description

1. *Pressure Port (SS316)*
2. *Housing Plate (SS316)*
3. *Disc*
4. *Mounting Bracket*
5. *Plunger*
6. *Ring (SS316)*
7. *O-Ring (Teflon®)*
8. *Diaphragm (Teflon®)*

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING



Range Selection Table

Model Code	† Range bar (psi)	*Approximate Maximum Differential bar (psi)	* Adjustable Differential bar (psi)	Maximum Working Pressure bar (psi)
MZ-1	0.1 - 1.0 (1.45 - 14.50)	0.15 (2.18)	-	12 (174.05)
MZ-4	0.2 - 3.6 (2.90 - 52.21)	0.15 (2.18)	-	12 (174.05)
MZ-7	0.5 - 7.0 (7.25 - 101.52)	0.15 (2.18)	-	12 (174.05)
MZ-10	0.5 - 10.0 (7.25 - 145.04)	0.8 (11.60)	-	25 (362.6)
MZ-15	1.0 - 15.0 (14.50 - 217.71)	1.5 (21.76)	-	25 (362.6)
MZ-30	5.0 - 25.0 (72.52 - 362.6)	1.5 (21.76)	-	35 (507.63)
MX-7	0.5 - 7.0 (7.25 - 101.52)	-	0.8 - 2.0 (11.60 - 29.00)	12 (174.05)
MX-10	0.5 - 10.0 (7.25 - 145.04)	-	0.8 - 2.0 (11.60 - 29.00)	25 (362.6)
MX-15	1.0 - 15.0 (14.50 - 217.71)	-	1.0 - 2.0 (14.50 - 29.00)	25 (362.6)
MX-30	5.0 - 25.0 (72.52 - 362.6)	-	1.5 - 2.5 (21.76 - 36.26)	35 (507.63)

*Minimum differential increases with setpoint (Graphs available on request)

†Rising pressure for MZ series

‡Falling pressure for MX series

SPECIFICATIONS :

- Range** : As per model code
- Electrical rating** : 15 Amp, 250 VAC, SPDT snapaction microswitch
- Enclosure[#]** : IP66 standard, transparent tough polycarbonate cover
- Wetted parts** : SS 316 & Teflon
- Pressure port** : 1/4" BSPF standard
- Cable gland** : M20 x 1.5 standard (polyamide)
- Maximum temperature of working medium** : 80° C maximum. Please use impulse tubing for higher temperatures

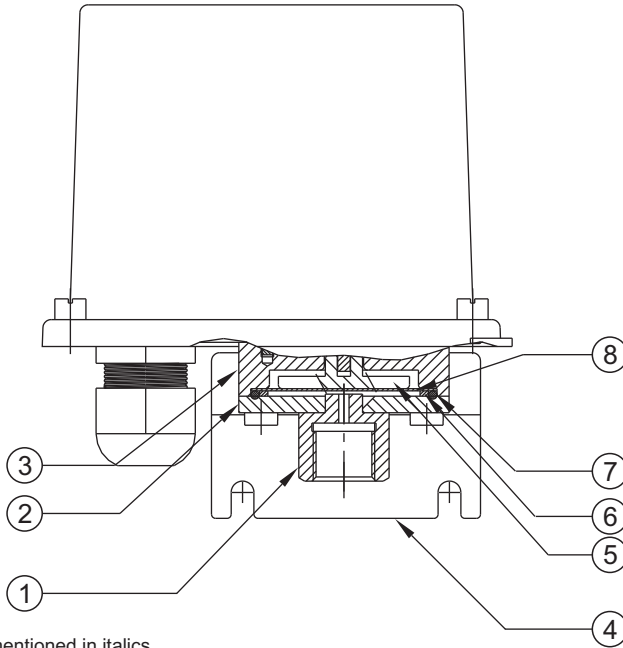
- IP66 is approximately equivalent to NEMA 4X

HOW TO ORDER MZ/MX SERIES OEM PRESSURE SWITCHES

Please select model code from Range Selection table



PRESSURE CAPSULE DETAILS

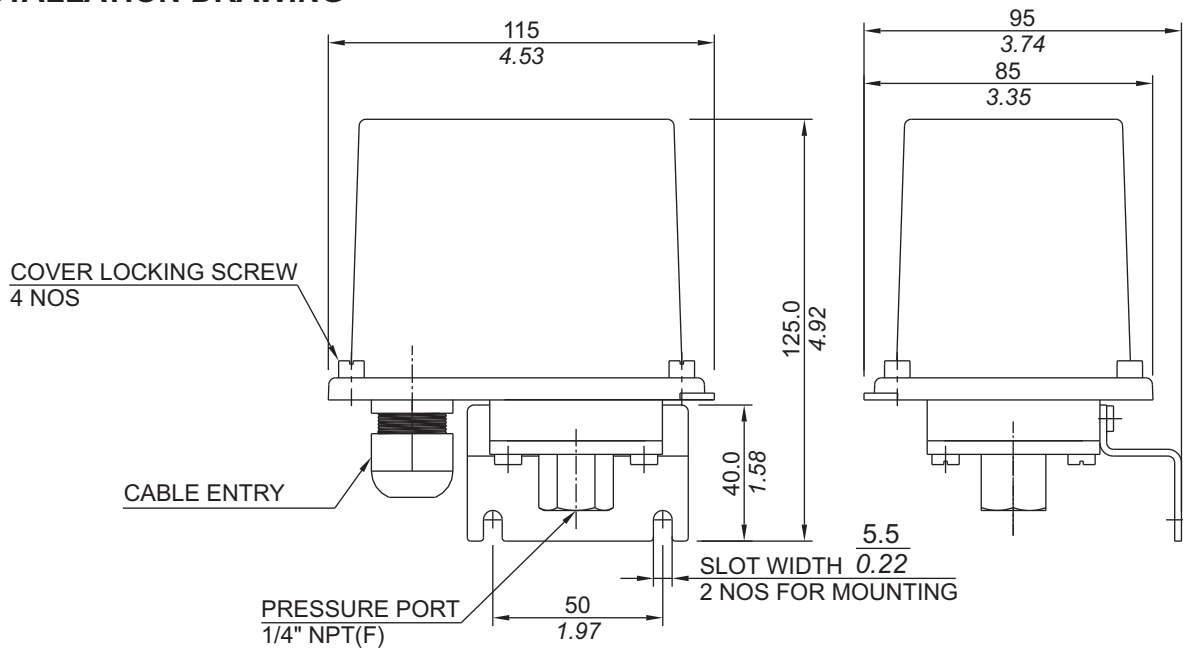


No. Description

1. *Pressure Port (SS316)*
2. *Housing Plate (SS316)*
3. Disc
4. Mounting Bracket
5. Plunger
6. *Ring (SS316)*
7. *O-Ring (Teflon®)*
8. *Diaphragm (Teflon®)*

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING



APPROX. DIMENSIONS IN $\frac{\text{mm}}{\text{inches}}$

RANGE SELECTION TABLE

Model Code	Range † psi	*Approximate Maximum Differential psi	Maximum Working Pressure psi
MZ-1A	1.5-15.0	2.0	200
MZ-4A	3.0-50.0	3.0	200
MZ-7A	7.0-100.0	6.0	200
MZ-10A	7.0-150.0	12.0	350
MZ-15A	15.0-200.0	20.0	350
MZ-30A	70.0-350.0	20.0	500

*Minimum differential increases with setpoint (Graphs available on request)

†Rising pressure for MZ series

SPECIFICATIONS :

- Range** : As per model code
- Electrical rating** : 15 Amp, 250 VAC, SPDT snapaction microswitch
- Enclosure[#]** : IP66 standard, transparent tough polycarbonate cover
- Wetted parts** : SS 316 & Teflon
- Pressure port** : 1/4" NPTF standard
- Cable gland** : M20 x 1.5 standard (polyamide)
- Maximum temperature of working medium** : 80° C maximum. Please use impulse tubing for higher temperatures

- IP66 is approximately equivalent to NEMA 4X

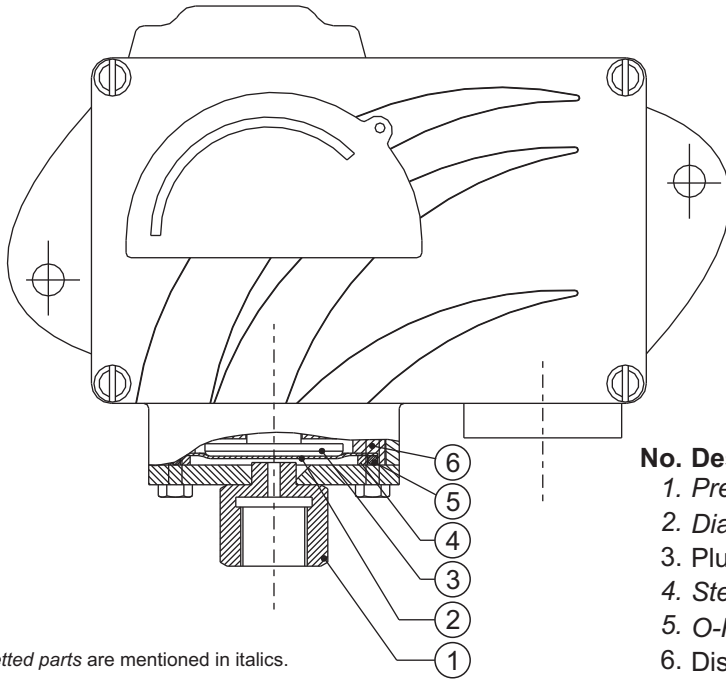
HOW TO ORDER MZ__A SERIES OEM PRESSURE SWITCHES

Please select model code from Range Selection table

MD OEM HIGH RANGE PRESSURE SWITCHES



PRESSURE CAPSULE DETAILS

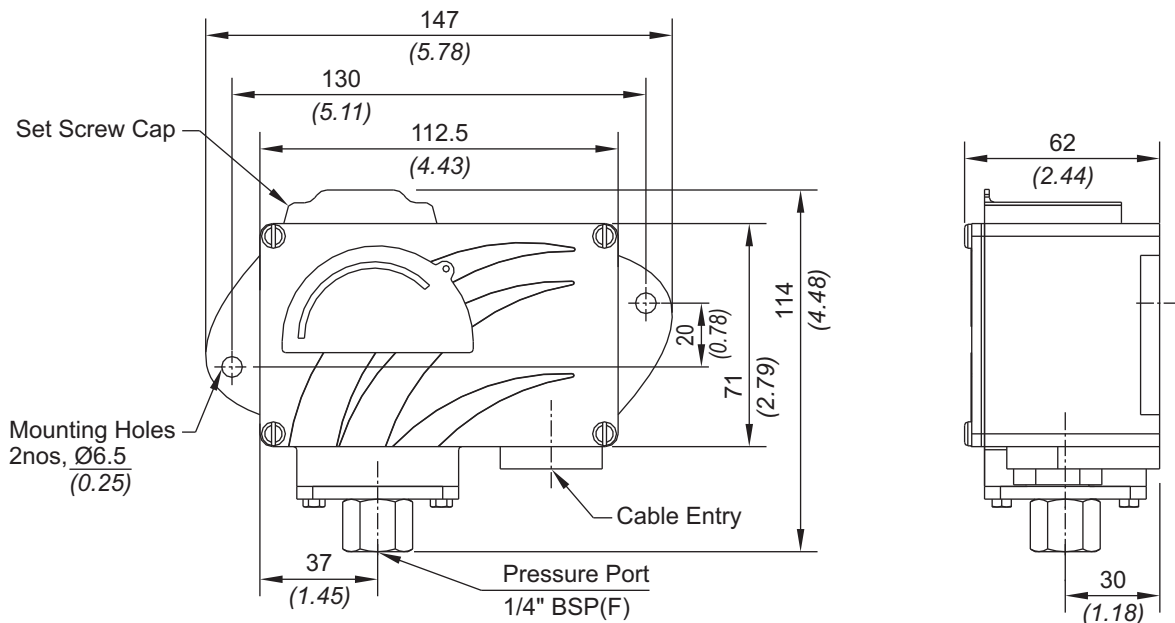


No. Description

1. Pressure Housing
2. Diaphragm (Teflon®)
3. Plunger
4. Steel Ring (SS316)
5. O-Ring (Teflon®)
6. Disc

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING



APPROX. DIMENSIONS IN $\frac{\text{mm}}{\text{inches}}$

RANGE SELECTION TABLE

Model Code	Range † bar (psi)	*Approximate Maximum Differential bar (psi)	Maximum Working Pressure bar (psi)
MD-1	0.1 - 1.0 (1.45 - 14.50)	0.10 (1.45)	12 (174.05)
MD-4	0.2 - 3.6 (2.90 - 52.21)	0.20 (2.90)	12 (174.05)
MD-7	0.5 - 7.0 (7.25 - 101.52)	0.40 (5.80)	12 (174.05)
MD-10	0.5 - 10.0 (7.25 - 145.04)	0.40 (5.80)	25 (362.6)
MD-15	1.0 - 15.0 (14.50 - 217.71)	0.80 (11.60)	25 (362.6)
MD-30	5.0 - 25.0 (72.52 - 362.6)	0.80 (11.60)	35 (507.63)

*Minimum differential increases with setpoint (Graphs available on request)

†Rising pressure for MD series

SPECIFICATIONS :

Range	: As per model code
Electrical rating	: 15 Amp, 250 VAC, SPDT snapaction microswitch
Enclosure[#]	: IP66 standard, pressure die-cast aluminium, black powder coated
Wetted parts	: SS 316 & Teflon
Pressure port	: 1/4" BSPF standard
Electrical Conduit	: 1/2" NPT standard
Maximum temperature of working medium	: 80° C maximum. Please use impulse tubing for higher temperatures

- IP66 is approximately equivalent to NEMA 4X

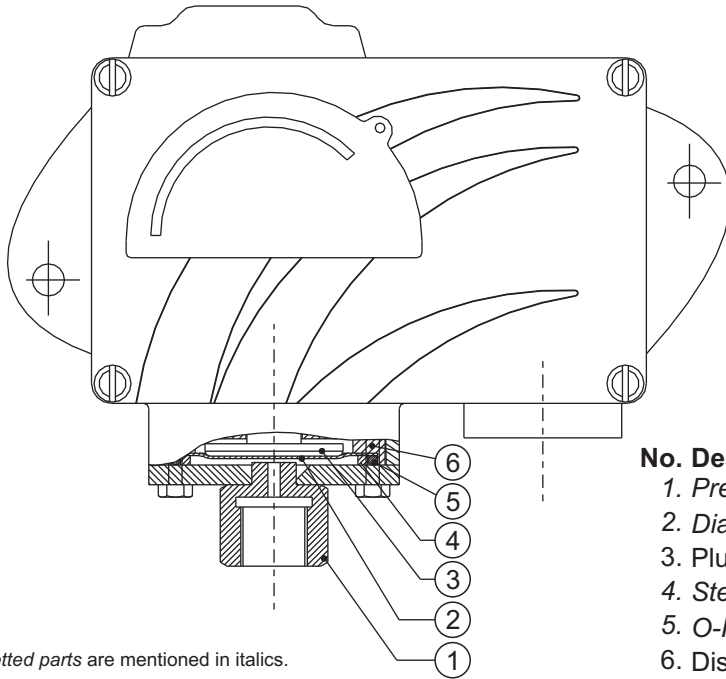
HOW TO ORDER MD SERIES OEM PRESSURE SWITCHES

Please select model code from Range Selection table

MD__A OEM HIGH RANGE PRESSURE SWITCHES



PRESSURE CAPSULE DETAILS

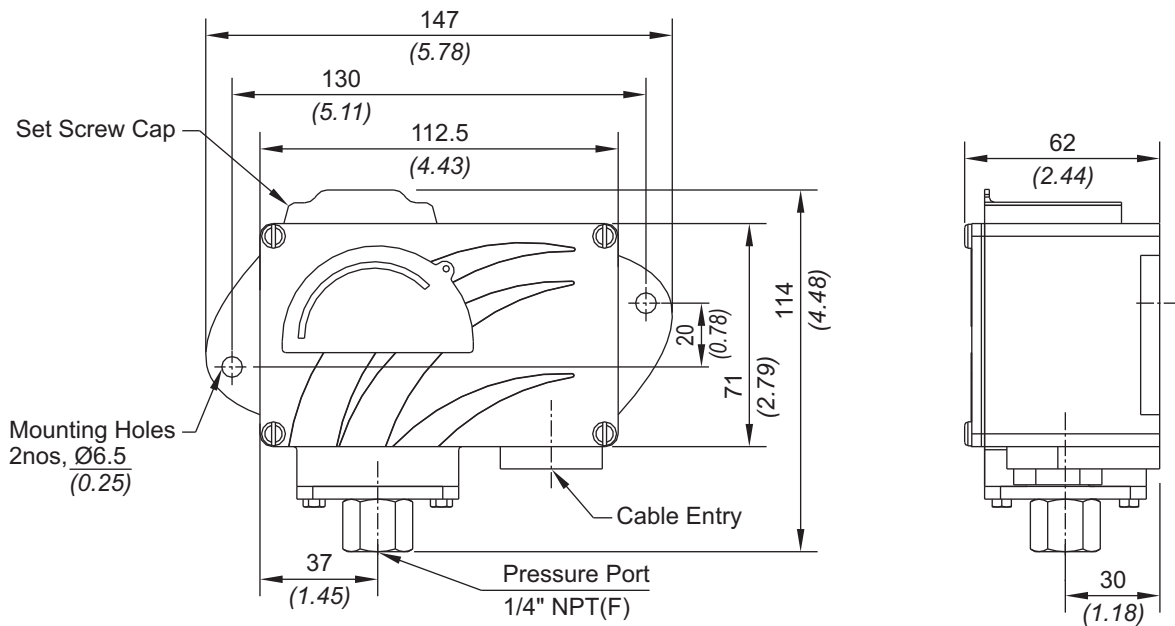


No. Description

1. Pressure Housing
2. Diaphragm (Teflon®)
3. Plunger
4. Steel Ring (SS316)
5. O-Ring (Teflon®)
6. Disc

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING



APPROX. DIMENSIONS IN $\frac{\text{mm}}{\text{inches}}$

OEM HIGH RANGE PRESSURE SWITCHES MD__A

RANGE SELECTION TABLE

Model Code	Range † psi	*Approximate Maximum Differential psi	Maximum Working Pressure psi
MD-1A	1.5 - 15	1.5	200
MD-4A	3.0 - 50.0	3.0	200
MD-7A	7.0 - 100.0	6.0	200
MD-10A	7.0 - 150.0	6.0	350
MD-15A	15.0 - 200.00	12.0	350
MD-30A	70.0 - 350.0	12.0	500

*Minimum differential increases with setpoint (Graphs available on request)

†Rising pressure for MD series

SPECIFICATIONS :

Range	: As per model code
Electrical rating	: 15 Amp, 250 VAC, SPDT snapaction microswitch
Enclosure[#]	: IP66 standard, pressure die-cast aluminium, black powder coated
Wetted parts	: SS 316 & Teflon
Pressure port	: 1/4" NPTF standard
Electrical Conduit	: 1/2" NPT standard
Maximum temperature of working medium	: 80° C maximum. Please use impulse tubing for higher temperatures

- IP66 is approximately equivalent to NEMA 4X

HOW TO ORDER MD__A SERIES OEM PRESSURE SWITCHES

Please select model code from Range Selection table

CF ULTRA LOW RANGE PRESSURE DIFFERENCE SWITCHES

Ultra Low Range Pressure Difference Switches with User Adjustable Knob

Salient Features

Easy to See, Easy to Use!

Set Point easily user adjustable with visible scale in Pascal. (no need of pressure gauge).

Differential easily adjustable with just a screwdriver

Light Weight!

150 gms

Flexible!

Direction of PG 11 cable entry can be rotated in steps of 120°

Long Lasting!

10⁶ switching operations

More Options!

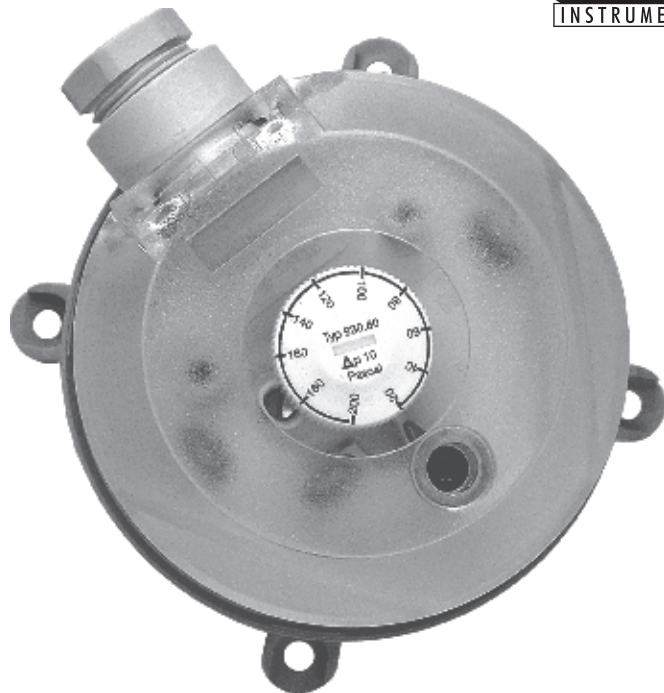
Available in a wide range

Trusted all over!

Tested and proven

Technical Specifications

- Media - Air, non-flammable gases and non-aggressiv gases.
- Housing Material - Body of PA 6.6 and Cover of PS
- Protection category - IP54 with cover.
- Maximum working pressure - 10 Kpa / 1019.74 mm wg.
- Electrical Rating - Maximum 1.0A (.4 A) / 250 VAC.
- Electrical Connection - AMP flat plug 6.3 mm x 0.8 mm in accordance with DIN 462244.
- Cable Entry - PG11
- Mounting Lugs - integrated in bottom Housing.
- High Pressure and Low Pressure port of Outer Diameter 6 mm.



Range Selection Table

Range Code (Orion)	Adjustment range for upper switching pressure Pa (mm wg)	Switching differential set to Pa (mm wg)
CF80	20 ~ 200 (2.039 ~ 20.395)	10 (1.020)
CF81	40 ~ 100 (4.079 ~ 10.197)	20 (2.039)
CF82	40 ~ 200 (4.0479 ~ 20.395)	20 (2.039)
CF83	50 ~ 500 (5.099 ~ 50.987)	20 (2.039)
CF85	200 ~ 1000 (20.395 ~ 101.974)	100 (10.197)
CF86	500 ~ 2500 (50.987 ~ 254.935)	150 (15.296)
CF87	1000 ~ 4000 (101.974 ~ 407.896)	250 (25.494)

How to order CF series Low Range Pressure Difference Switches

Please specify the Range Code eg. CF82 or CF85

ULTRA LOW RANGE PRESSURE DIFFERENCE SWITCHES

CF

INSTALLATION AND OPERATING INSTRUCTIONS

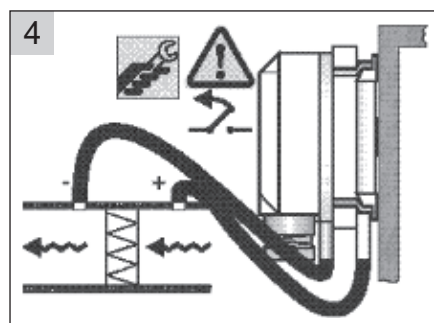
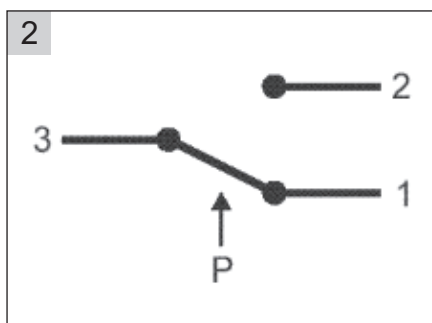
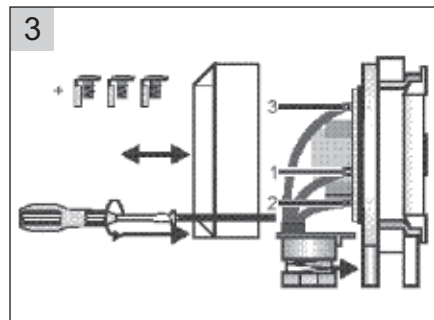
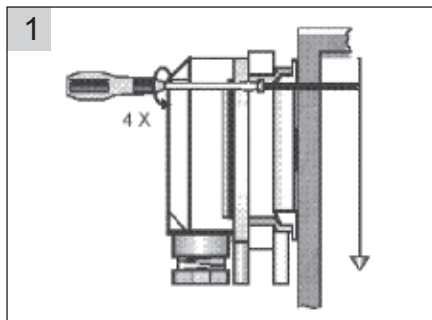
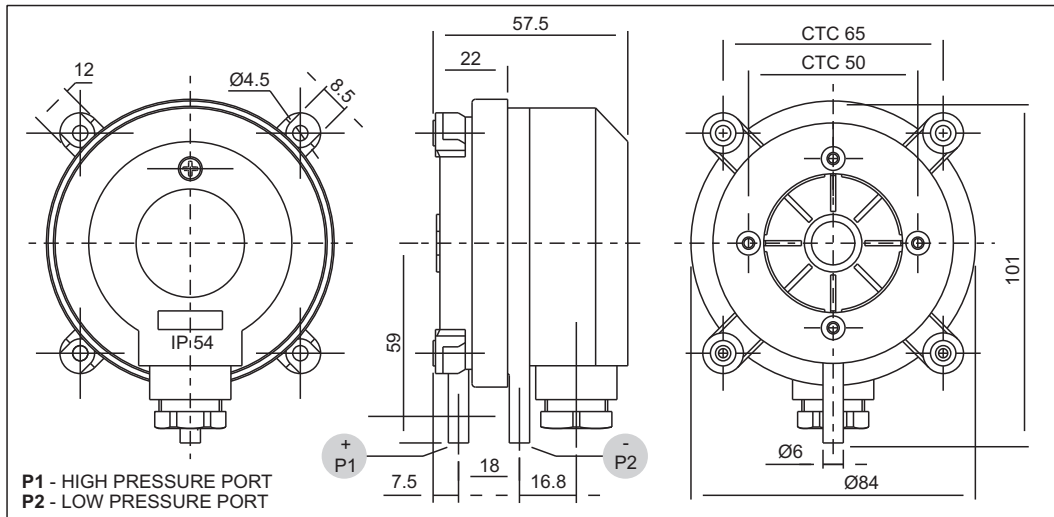
Principle of Operation

When the effective force generated by the pressure difference in the lower and upper chamber of the pressure capsule exceeds/falls beyond the balancing spring forces, an electrical element is actuated.

Mounting

The detail mounting dimensions are shown in Fig. 1

Fig. 1



P1 = higher pressure

P2 = lower pressure

*Use two screws only, for mounting

**Remove transport protection from P2

Note : Do not install upside down with trip pressure of less than 50 Pa.

CS12 COMPRESSOR PRESSURE SWITCHES

The CS12 from Orion offers you Peace of Mind and Unbeatable Features!

Salient Features

Ready to Use, Easy to Fit, No Special Mounting

2 Ground Screws enable you to
"Just Fit it, Set it and Forget it!"

Corrosion Resistant Non Metallic Cover

Protects and Lasts...

Non Additional Relays, No Extra Circuitry

Three Phase Pressure Switches can be used instead of a motor starter pressure switch combination. No need for additional relay or any other circuitry.

Manual Cut-Off

Separate an auto-off disconnect lever for manual cut off of the compressor.

Salient Feature

- Available in ready to use condition.
- Special Unloader valve is provided which prevents compressor from starting under load.
- No Special Mounting required.

Technical Specifications

- Sensing Element - Nitrile Rubber.
- Factory setting 6~ 8 bar.
- Input Pressure Port 1/2" BSP Female
- Relief valve 6 mm dia.
- Cable Leading 11.5 & 14.5 mm diameter.
- Electrical Rating 16 A, 500 V AC
- Protection - IP 44.



Range Selection Table

Range Code (Orion)	Adjustment range (bar)	Switching differential (bar)
CS12	2 - 12	1.5 ~ 4.0

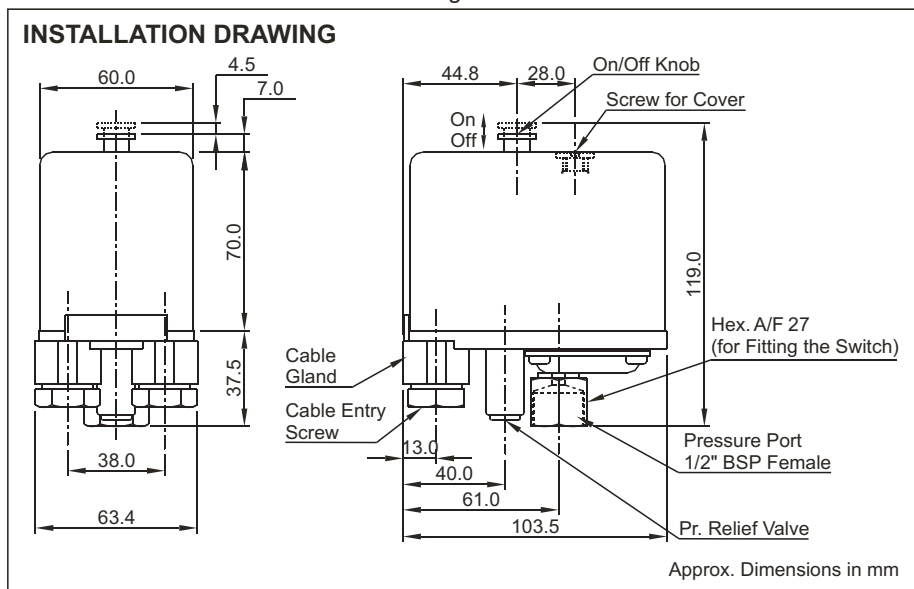
How to order CS12 Compressor Pressure Switches

Please specify the Range Code as **CS12**

COMPRESSOR PRESSURE SWITCHES CS12

INSTALLATION AND OPERATING INSTRUCTIONS

Fig. 1.1



Mounting Please refer Fig. 1.1

1. Pressure switches can be mounted directly on process connection 1/2" BSP F nut with external size of 27 mm A/F.
2. In case, any other process connection is required then the same can be achieved using adaptor.
3. Please don't tighten the switch by holding the top cover. Use appropriate spanner for turning the process connection nut.



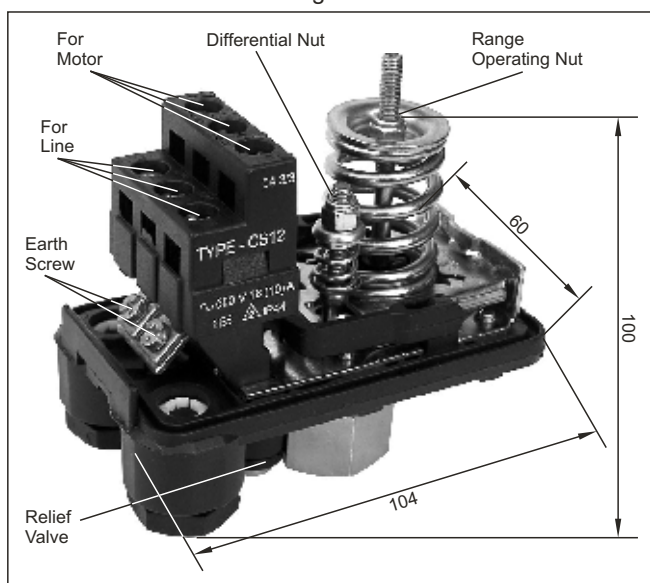
Electrical Connections & Wiring (Refer fig 1.2)

Wiring is to be carried out only when the switch is mounted and voltage free.

- (a) Remove the top cover by unscrewing the black screw.
- (b) Pass the cable through the cable gland and connect the wiring.
- (c) Basically there are two connection as shown in the figure 1.2 one for Line and another for Motor. Each has three wires for three phase. Please ensure appropriate connection of phase wires. Two earthing screws are provided to connect earthing wires from line and motor.



Fig. 1.2



Set Point Adjustment: Refer fig 1.2

Adjustment is to be carried out only when the switch is mounted,

under pressure and voltage free

- a. Remove the top cover.
- b. Decide the cut-in (lower) pressure (P1) and cut-out (upper) pressure (P2). (Pressure switch is closed when the pressure is between pressure P1 and P2.)
- c. Turn the Range nut and differential nut to extreme top position.
- d. Apply the desired cut-in pressure (P1) to pressure port.
- e. Turn the Range nut slowly till contacts changeover.
- f. Turn the differential nut to the extreme positive end (bottom position)
- g. Apply the desired cut-out (upper) pressure (P2) to pressure port.
- h. Turn the differential nut till the contacts changeover.
- i. Some minor adjustment will be required to achieve the exact cutin (lower) / output (higher) point, which can be checked with the help of proper pressure measurement device.
- j. Replace the polymer cover after the adjustment of cut-in and cut-out point is achieved.