Introduction

MD series pressure switches have been designed for applications that require robust, long lasting switches, coupled with a high accuracy and repeatability, in adverse conditions. By using appropriate capsules and wetted parts, MD series pressure switches can be used for thousands of applications. A wide choice of electrical elements including SPDT, DPDT, gold plated contacts make these switches ideal for a variety of critical applications. A wide scale, when opted for, offers ease of setting, given the smaller least counts.

APPLICATIONS

- Power Generation
- Burners and Furnaces
- Glass and Metal Industries
- Chemical Industries
- Steel Industry
- Hydraulic, Steam and GasTurbines
- Boilers & Compressors
- Machine tools
- Railway braking systems
- Water treatment
- Sugar and Paper Mills
- Fire protection
- Surgical gas, Breweries, Milk industries
- Tyre Industry
- Natural Gas, LPG storage and transportation

PRODUCT SPECIFICATIONS:

- Storage temperature : Atmospheric temperature
- Operating ambient temperature : - 20° C to + 60° C
- Media Temp.:- for rubber diaphragms 80 degree C max., higher with metal diaphragms
- Can be offered for higher temperatures with other capsule combinations
- Setpoint repeatability : ± 1 % of FSR
- Enclosure : Die cast aluminium to IP 66
- Switch output : SPDT, DPDT, hermetically sealed, gold plated contacts
- Process connection : ¼ "BSP standard, other options like flanges, triclover clamps, diaphragm seals available.

FEATURES

- Robust
- Wide scale for easier setpoint (optional)
- Enclosure protection : IP 66 standard
- Reliable accurate microswitches for long life switching
- Customized arrangements for switching values on request
- Easy safe wiring options
- Filed adjustable
- Accuracy +/- 1 % FSR
- Warranty : 2 years

*Accuracy changes with switch configuration

INDUSTRIAL SWITCHES

SPECIFIER'S GUIDE FOR

- PRESSURE SWITCHES
- PRESSURE DIFFERENCE SWITCHES
- VACUUM SWITCHES
- TEMPERATURE SWITCHES

Orion® INSTRUMENTS

CE

Using the section

This section 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 organisation, 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 organised, 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 82 & 83, 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 88 through 94, 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, hysterisis, electrical ratings etc.

   Ordering information

   Some applications

   The organisation of each of these pages is demonstrated on pages 84 and 85, 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)

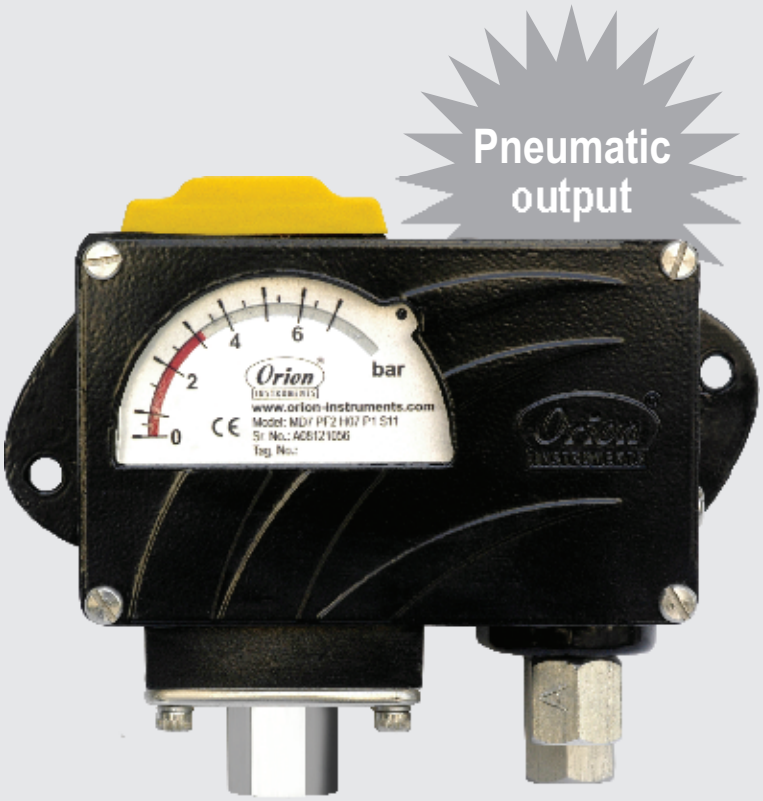
   A logical procedure on page 331 will help you to consider most of the important factors when selecting a pressure switch.

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.

Air Relay Switches

CE



Pressure, ΔP, Vacuum Ranges from 1.5 mbar to 200 bar

Please refer page no. 112 for Air Relay Switch details

Pictorial Index

PRESSURE SWITCHES

HIGH RANGE

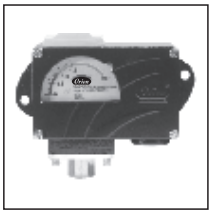
HIGH RANGE

Page No. 96

HIGH PROOF HIGH RANGE

Page No. 100

BELLOWS



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LARGE BORE HIGH RANGE

Page No. 108

AIR RELAY RANGE

Page No. 112

FLANGED RANGE

Page No. 116

LOW RANGE

LOW RANGE

Page No. 120

HYDRAULIC RANGE*

HYDRAULIC RANGE

Page No. 124

HYDRAULIC DIAPHRAGM RANGE

Page No. 128

DUAL SWITCHES

Page No. 132

PRESSURE DIFFERENCE SWITCHES

HIGH RANGE

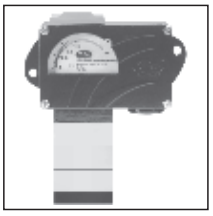
HIGH RANGE

Page No. 136

HIGH PROOF HIGH RANGE

Page No. 140

HIGH RANGE DP



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LOW RANGE

ULTRA LOW RANGE

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LOW RANGE

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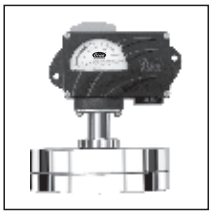
LOW ΔP HIGH PROOF RANGE



Page No. 154

*Hydraulic ranges are ranges typically from 2 bar to 600 bar, used in oil applications.
However, these switches can be used for other media depending on wetted parts compatibility.

Pictorial Index

VACUUM SWITCHES

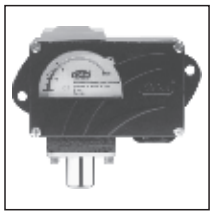
VACUUM

Page No. 158

COMPOUND SWITCHES

HIGH RANGE

HIGH RANGE



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LOW RANGE

LOW RANGE

Page No. 166

TEMPERATURE SWITCHES

Page No. 170

*Hydraulic ranges are ranges typically from 2 bar to 600 bar, used in oil applications.
However, these switches can be used for other media depending on wetted parts compatibility.

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 format is adhered to.

Elements appearing on each page will be:

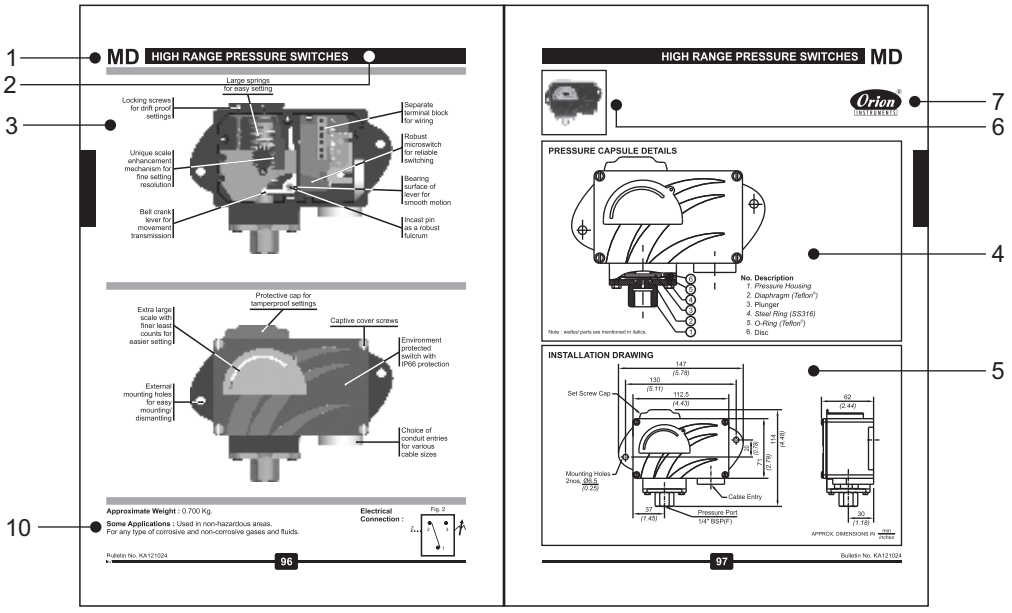
1. Product family / series - A product family / series will appear on the outside page corner, depending on the left / right hand page, and will be in large bold type.

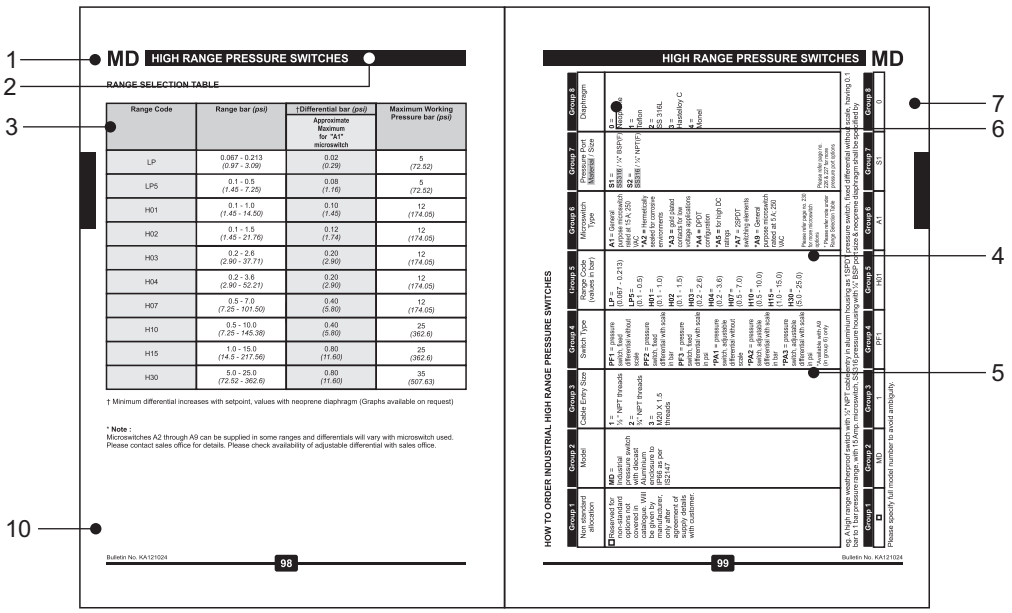
2. Product section - will appear immediately following the product family / series at top of the page and will be in bold type.

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 it's 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.





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.

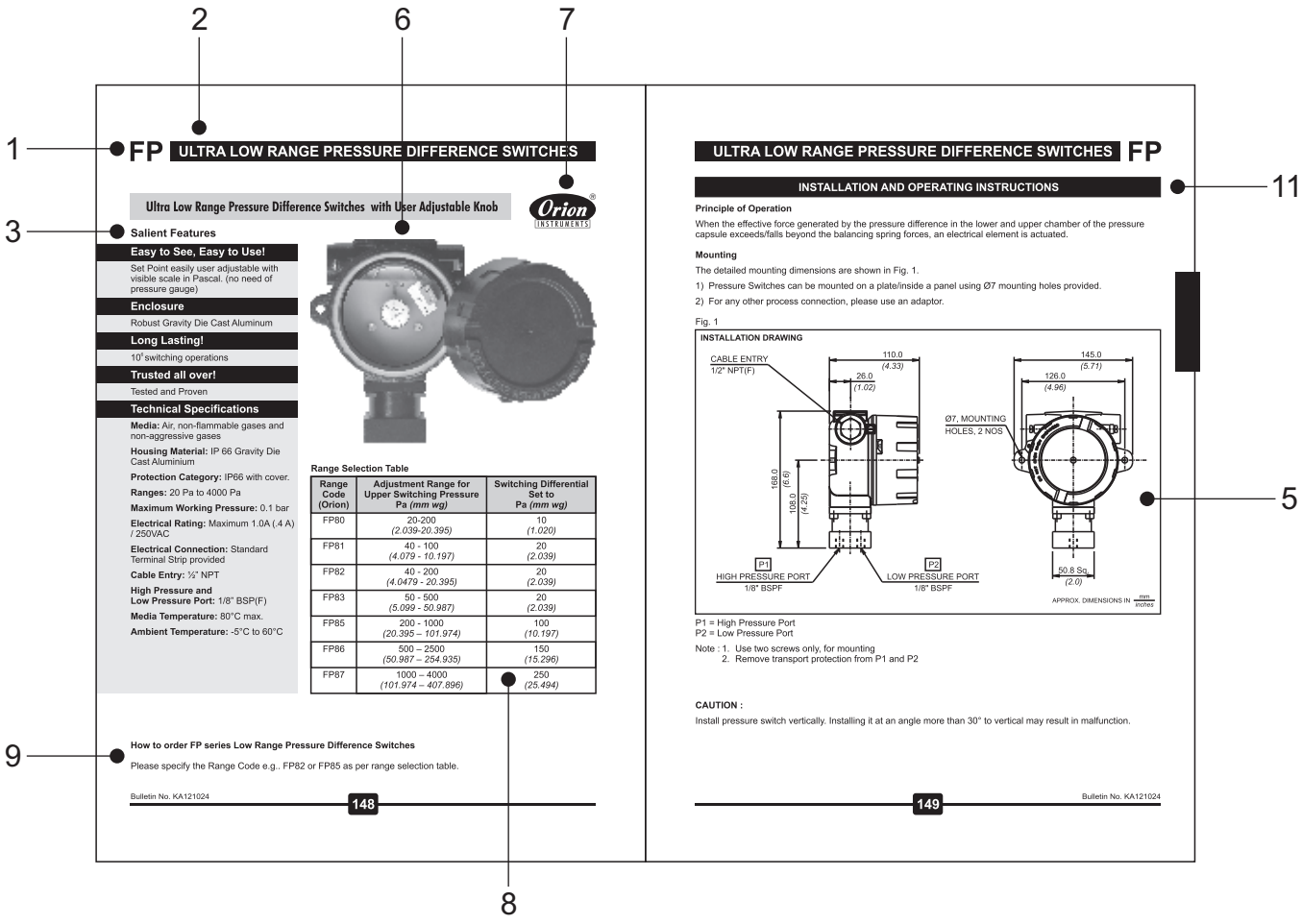
8. Characteristics - Range tables and their relevant data, e.g the range covered, the differentials and maximum working pressures will generally appear on the right hand page. Additional technical details will also be mentioned, wherever required, on the right hand side of the page.

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.

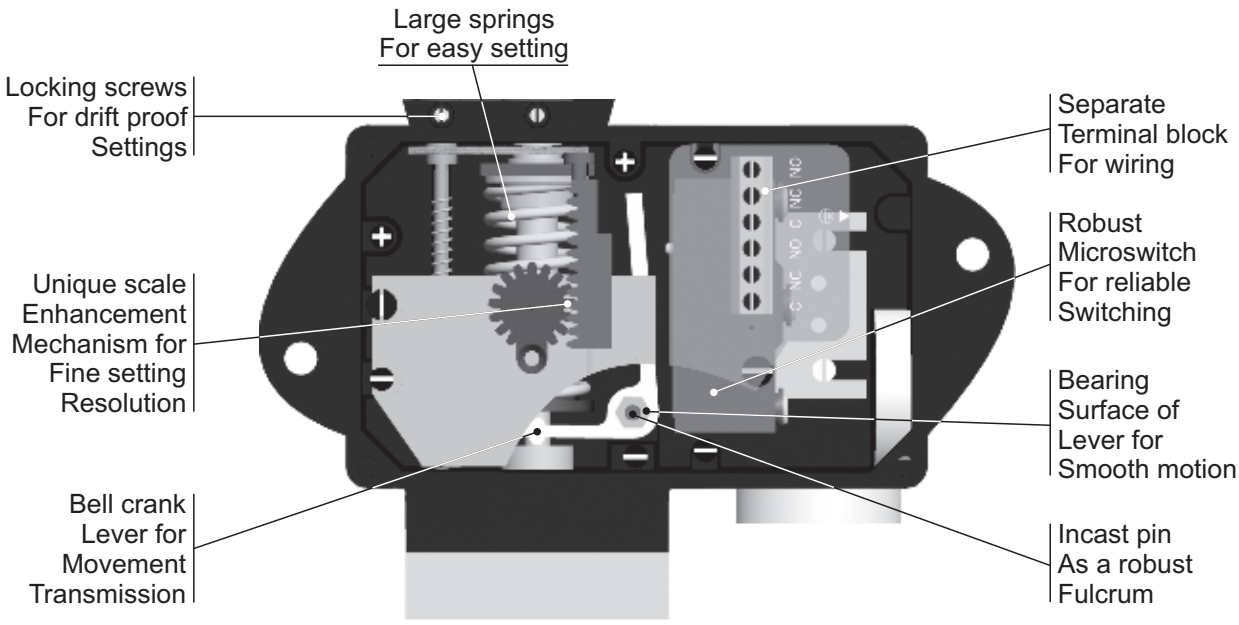
10. Some applications - will appear at the bottom left of the page. This is for easy understanding of the specific use of the switch.

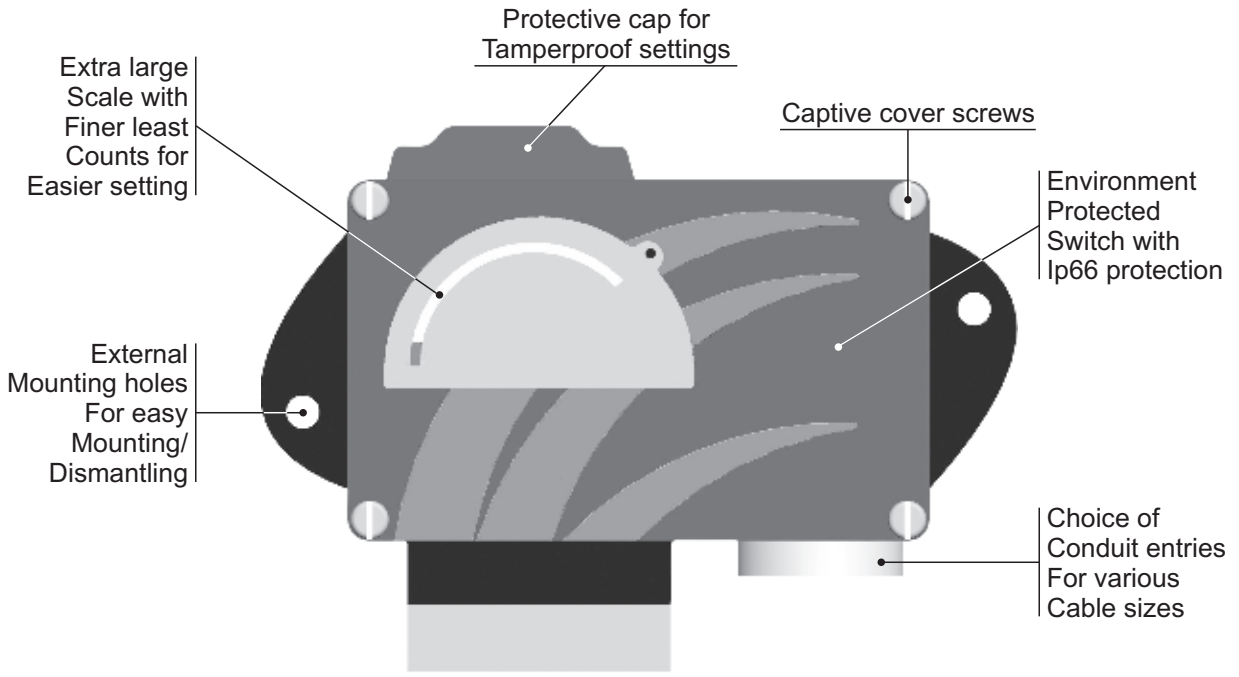
11. Installation and operating instructions - This will include the principle of operation and mounting instructions and will appear on the right hand page

12. 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.



Switch Construction





Switch Construction

The versatile construction of MD switches allows configuration by selecting the following main subassemblies / components :

a) Main body casing :

This is aluminium pressure die cast, and has an IP 66 protection factor. This houses a lever mechanism , as also a scale enhancement mechanism, which is displayed on the page alongside. The cover has captive screws, and the scale, when provided, is clearly visible through a transparent window.

The cable entries in this casing can be of the following types :
- ½ " NPT
- ¾ "NPT
- M20 X 1.5

Other cable glands to MIL standards can be fitted optionally on request.

b) The electrical element (s) :

Choice of electrical elements to suit end use are offered, like :

A1 : General purpose applications

A2 : Hermetically sealed for corrosive environments

A3 : gold plated contacts for low voltage applications

A4 : DPDT configuration

A5 : for high DC ratings

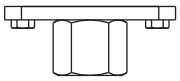
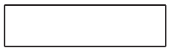
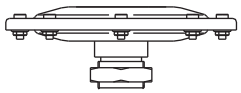
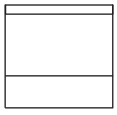
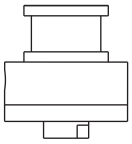
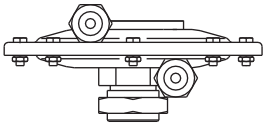
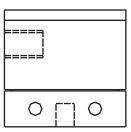
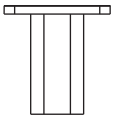
A7 : 2SPDT switching elements

It is possible to have more options of electrical elements not published here, to suit individual end use.

The deadband (or hysterisis / on-off differential) of the switches will change with the change of the electrical element (s). The approximate values for each range (for standard microswitches offered) are published in this catalogue

c) The pressure capsule :

To suit the setpoints , the working media and the function of the switch in the application:

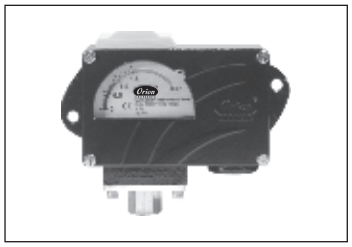
High Pressure Ranges (typically from 0.067 barg to 25 barg) 	**High Proof High Pressure Ranges** (typically from 0.067 barg to 25 barg, Pmax = 70 bar) 	**Low Pressure Ranges** (typically from 1.5 mbarg to 350 mbarg) 	**High Range Pressure Difference Switches** (typically from 0.1 barg to 25 barg) 
High Proof High Range PD Switches (typically from 0.1 barg to 25 barg, Pmax = 200 bar) 	**Low Range Pressure* Difference Switches** (typically from 1.5 mbarg to 350 mbarg) 	**Vacuum Switches** (typically from 760 mm Hg to atmospheric pressure) 	**Hydraulic Pressure Ranges** (typically from 0.5 barg to 400 barg) 

*The pressure capsule can be modified to take high proof pressures [typically 100 bar for high and low pressure switches, or pressure difference switches (from high pressure side)].

Several accessories like chemical seals, pipe mounting brackets etc can be supplied with these switches to suit the media to be sensed. All of these are not listed, though most popular ones can be found on pages 322 through 328.

Please do get in touch with us for any of your applications, not addressed in this catalogue. We would be glad to offer you a solution.

Product Selection Guide



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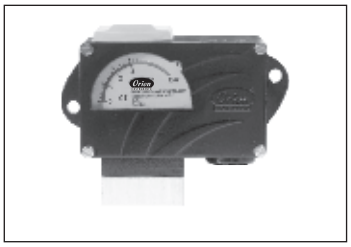

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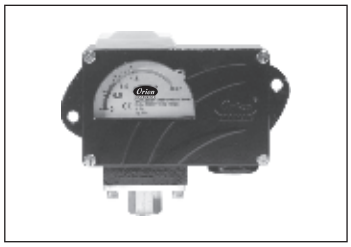

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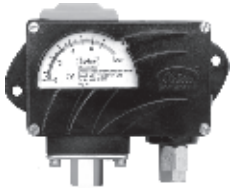
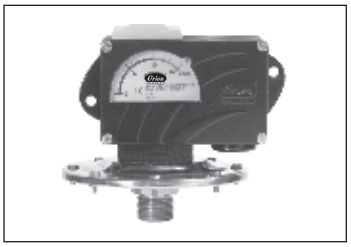
	Switch type	High Pressure Ranges	High Proof High Pressure Ranges	High Range Bellows
	Repeatability (% FSR)	± 1	± 2	± 2
	Range covered	0.067 bar to 25 bar	0.067 bar to 25 bar	0.1 bar to 25 bar
	Enclosure Protection	IP 66		
	Enclosure Material	Pressure die-cast aluminium		
WETTED PARTS	Sensing element	Diaphragm		Bellows
	Standard	Nylon reinforced neoprene diaphragm protected by Teflon		SS 316
	Optional	Teflon, SS316L, Hastelloy C, Monel	SS 316L / Teflon	
	Pressure housing Standard Optional	SS 316 Hastelloy C, Monel		SS 316
	Other Wetted Parts	SS316, Teflon		
	Optional wetted parts through chem. seal	SS316, Hastelloy, Inconel Alloy, Monel, Nickel, Platinum, Tantalum, Titanium, Zirconium, Silver, PTFE		
	Temp. of working medium	For non-metallic diaphragm: 80°C maximum. For metallic diaphragm: 150°C maximum For higher temperature, please use impulse tubing/chemical seals.		
	Switching element	SPDT Snap action switch A1 : General purpose rated at 15A, 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.

			
Page No. 108	Page No. 112	Page No. 116	
Large Bore High Range	Air Relay	Flanged	Switch type
± 2	± 2	± 2	Repeatability (% FSR)
0.1 bar to 25 bar	0.067 bar to 25 bar	0.1 bar to 200 bar	Range covered
IP66			Enclosure Protection
Pressure die-cast aluminium			Enclosure Material
Diaphragm Nylon reinforced neoprene diaphragm protected by Teflon SS316L, Teflon, Monel	Diaphragm Nylon reinforced neoprene diaphragm protected by Teflon Teflon, SS316L	Diaphragm Nylon reinforced neoprene diaphragm protected by Teflon SS316L, Hastelloy C, Titanium, Monel, Tantalum	Sensing element Standard Optional
SS316 Monel	SS 316	Flange SS316L Hastelloy C, Titanium, Monel, Tantalum	Pressure housing Standard Optional
Teflon, SS316		Teflon	Other Wetted Parts
			Optional wetted parts through chem. seal
For non-metallic diaphragm: 80°C maximum. For metallic diaphragm: 150°C maximum For higher temperature, please use impulse tubing/chemical seals.			Temp. of working medium
SPDT Snap action switch A1 : General purpose rated at 15A, 250 VAC, 0.2 A, 250 VDC resistive. For other switching elements please contact sales office.			Switching element

WETTED PARTS

Product Selection Guide



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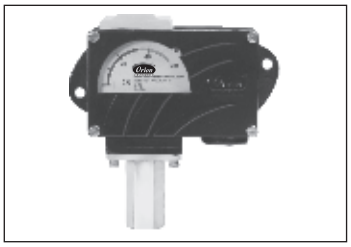

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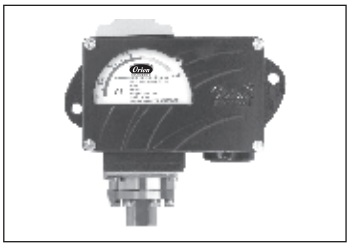

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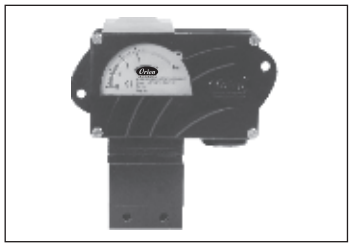
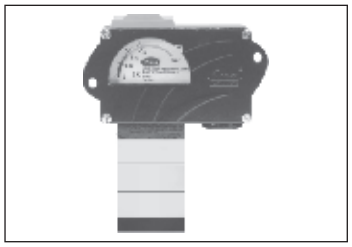
	Switch type	Low Pressure Ranges	Hydraulic Ranges	Hydraulic Diaphragm
	Repeatability (% FSR)	± 2	± 1	± 2
	Range covered	1.5 mbar to 350 mbar	5 bar to 400 bar	0.5 bar to 400 bar
	Enclosure Protection	IP 66		
	Enclosure Material	Pressure die-cast aluminium		
WETTED PARTS	Sensing element Standard Optional	Diaphragm Nylon reinforced neoprene diaphragm protected by Teflon Teflon	Piston SS SS 316L / Teflon	Diaphragm SS316L
WETTED PARTS	Pressure housing Standard Optional	SS 316 M.S.	SS 316	SS 316
WETTED PARTS	Other Wetted Parts	M.S., SS, Nitrile, Al., Neoprene	Viton, Teflon, SS	Teflon
WETTED PARTS	Optional wetted parts through chem. seal			
	Temp. of working medium	For non-metallic diaphragm: 80°C maximum. For metallic diaphragm: 150°C maximum For higher temperature, please use impulse tubing/chemical seals.		
	Switching element	SPDT Snap action switch A1 : General purpose rated at 15A, 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.
* Higher ranges available on request

			
Page No. 132	Page No. 136	Page No. 140	
Dual High Range	High Range Pressure Difference Switches	High Proof High Range Pressure Difference Switches	Switch type
± 2	± 1	± 2	Repeatability (% FSR)
0.067 bar to 200 bar	0.1 bar to 3.6 bar*	0.1 bar to 3.6 bar*	Range covered
IP 66			Enclosure Protection
Pressure die-cast aluminium			Enclosure Material
Diaphragm Nylon reinforced neoprene Teflon, SS316L	Diaphragm Nylon reinforced neoprene Teflon		Sensing element Standard Optional
SS 316	Aluminium SS 316, Hastelloy C, Monel	SS 316 Hastelloy C, Monel	Pressure housing Standard Optional
Teflon	Teflon, SS316		Other Wetted Parts
			Optional wetted parts through chem. seal
For non-metallic diaphragm: 80°C maximum. For metallic diaphragm: 150°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,	SPDT Snap action switch A1 : General purpose rated at 15A, 250 VAC, 0.2 A, 250 VDC resistive. For other switching elements please contact sales office.		Switching element

WETTED PARTS

Product Selection Guide



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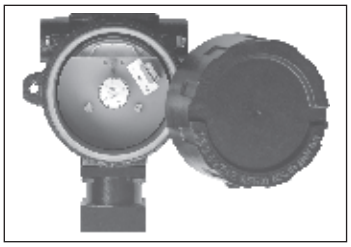

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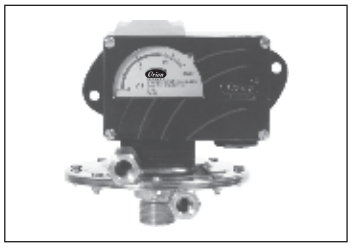

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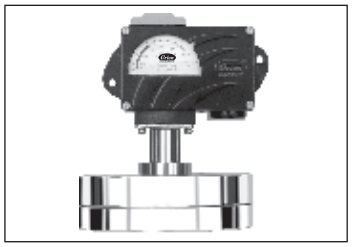
Switch type	High Range DP	Ultra Low Range	Low Range Pressure Difference Switches
Repeatability (% FSR)	± 1	± 1	± 2
Range covered	0.1 bar to 25 bar	20 Pa to 4000 Pa	1.5 mbar to 350 mbar
Enclosure Protection	IP 66		
Enclosure Material	Pressure die-cast aluminium	Gravity die-cast aluminium	Pressure die-cast aluminium
WETTED PARTS Sensing element Standard Optional	Diaphragm Nylon reinforced neoprene diaphragm protected by Teflon Teflon, SS316L	Diaphragm Silicone	Diaphragm Nylon reinforced neoprene Teflon
Pressure housing Standard Optional	SS 316 Aluminium	Aluminium	M.S. SS 316
Other Wetted Parts	Teflon, SS316		M.S., SS, Nitrile, Al., Neoprene
Optional wetted parts through chem. seal			
Temp. of working medium	For non-metallic diaphragm: 80°C maximum. For metallic diaphragm: 150°C maximum For higher temperature, please use impulse tubing/chemical seals.		
Switching element	SPDT Snap action switch A1 : General purpose rated at 15A, 250 VAC, 0.2 A, 250 VDC resistive. For other switching elements please contact sales office.	Maximum 1 A(0.4A)/250VAC	SPDT Snap action switch A1 : General purpose rated at 15A, 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.
* Higher ranges available on request



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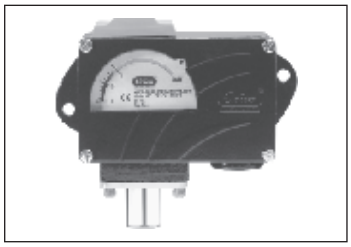
Page No. 158



Page No. 162

Low ΔP High Proof Pressure Difference Switches	Vacuum Switches	High Range Compound Switches	Switch type
± 2	± 1	± 2	Repeatability (% FSR)
5 mbar to 350 mbar	760 mmHg to 100 mmHg	-1 bar to 3.6 bar	Range covered
IP 66			Enclosure Protection
Pressure die-cast aluminium			Enclosure Material
Diaphragm Nylon reinforced neoprene Teflon			Sensing element Standard Optional
SS 316	Aluminium SS 316	SS 316	Pressure housing Standard Optional
Teflon, SS	Teflon, SS316		Other Wetted Parts
			Optional wetted parts through chem. seal
For non-metallic diaphragm: 80°C maximum. For metallic diaphragm: 150°C maximum For higher temperature, please use impulse tubing/chemical seals.			Temp. of working medium
SPDT Snap action switch A1 : General purpose rated at 15A, 250 VAC, 0.2 A, 250 VDC resistive. For other switching elements please contact sales office.			Switching element

WETTED PARTS

Product Selection Guide

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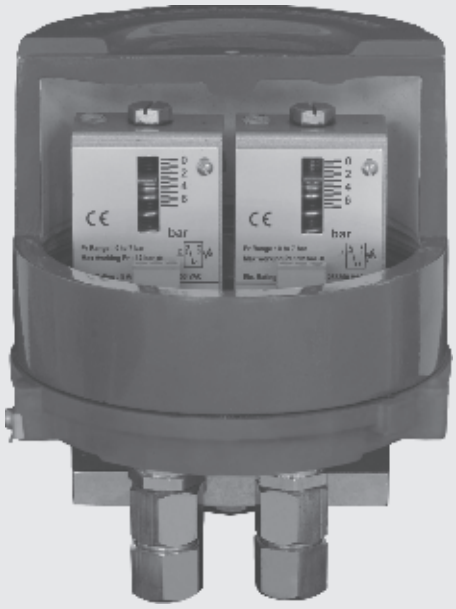
Page No. 170

Switch type	Low Range Compound Switches	Temperature Switches
Repeatability (% FSR)	± 2	± 1
Range covered	-150 mm wc to 250 mm wc	25 °C to 215 °C
Enclosure Protection	IP 66	
Enclosure Material	Pressure die-cast aluminium	
WETTED PARTS Sensing element Standard	Diaphragm Nylon reinforced neoprene diaphragm protected by Teflon	Bulb/Probe Brass
Optional	Teflon	
Pressure housing Standard Optional	SS 316	
Other Wetted Parts	SS, Nitrile, Al., M.S.	
Optional wetted parts through chem. seal		
Temp. of working medium	For non-metallic diaphragm: 80°C maximum. For metallic diaphragm: 150°C maximum For higher temperature, please use impulse tubing/chemical seals.	
Switching element	SPDT Snap action switch A1 : General purpose rated at 15A, 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.
* Higher ranges available on request

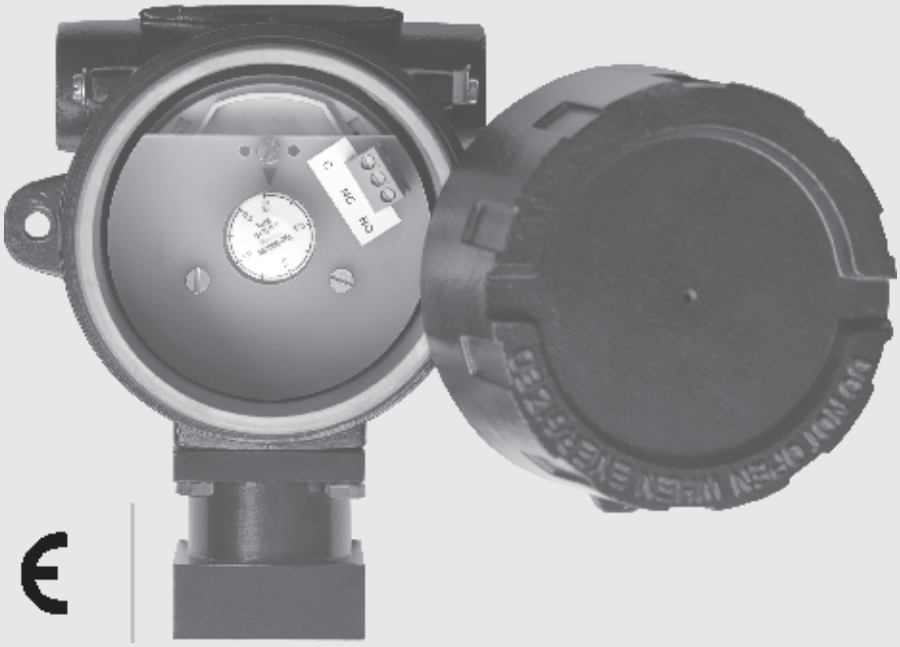
Dual Switch



Pressure Ranges from 0.067 bar to 200 bar

Please refer page no. 132 for Dual Switch details

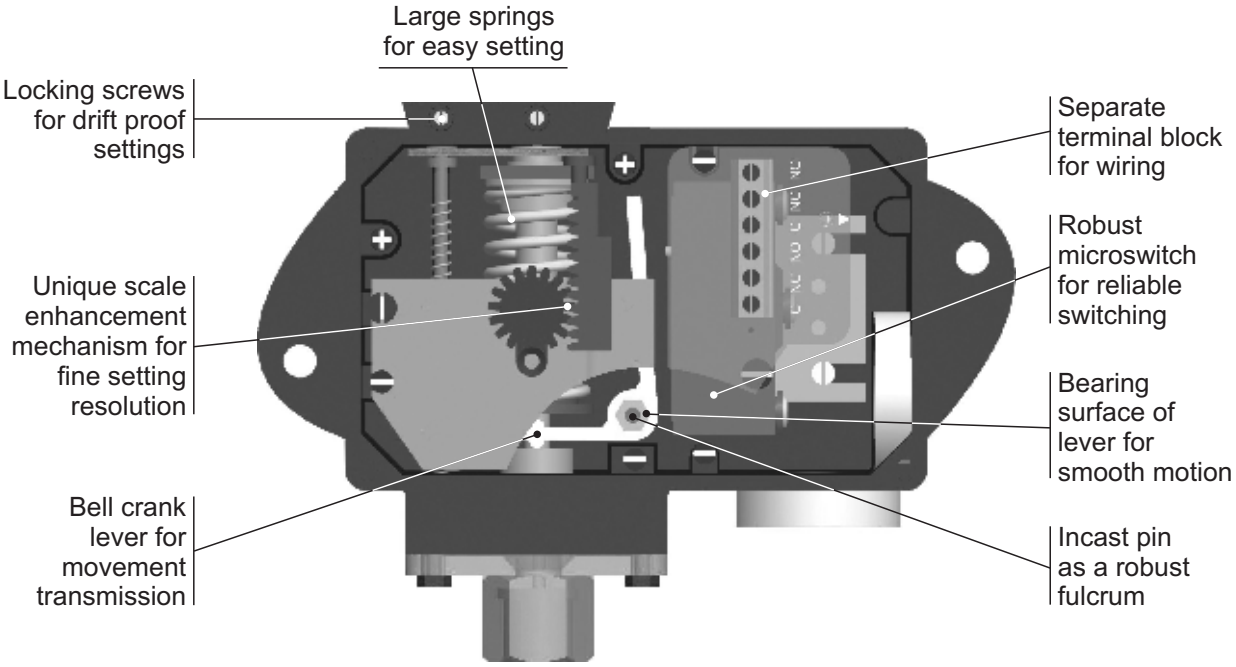
FP Ultra Low Range

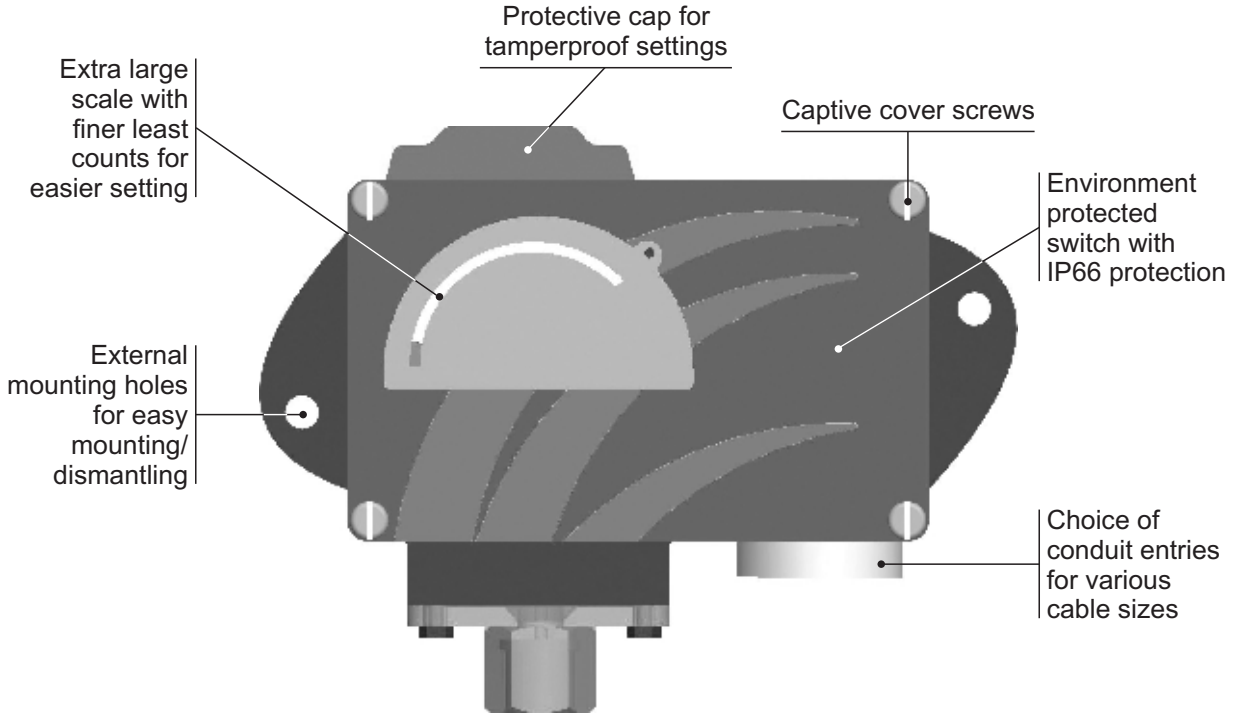


ΔP Ranges from 20 KPa to 400 KPa

Please refer page no. 148 for FP Switch details

MD HIGH RANGE PRESSURE SWITCHES



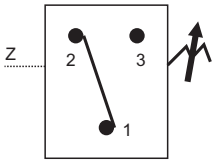


Approximate Weight : 0.700 Kg.

Some Applications : Used in non-hazardous areas.
For any type of corrosive and non-corrosive gases and fluids.

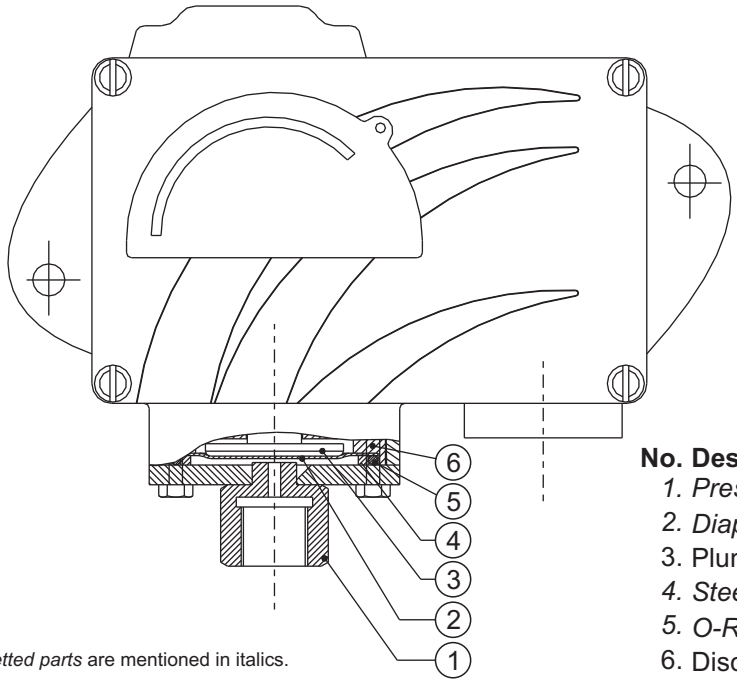
Electrical Connection :

Fig. 2



Orion® INSTRUMENTS

PRESSURE CAPSULE DETAILS

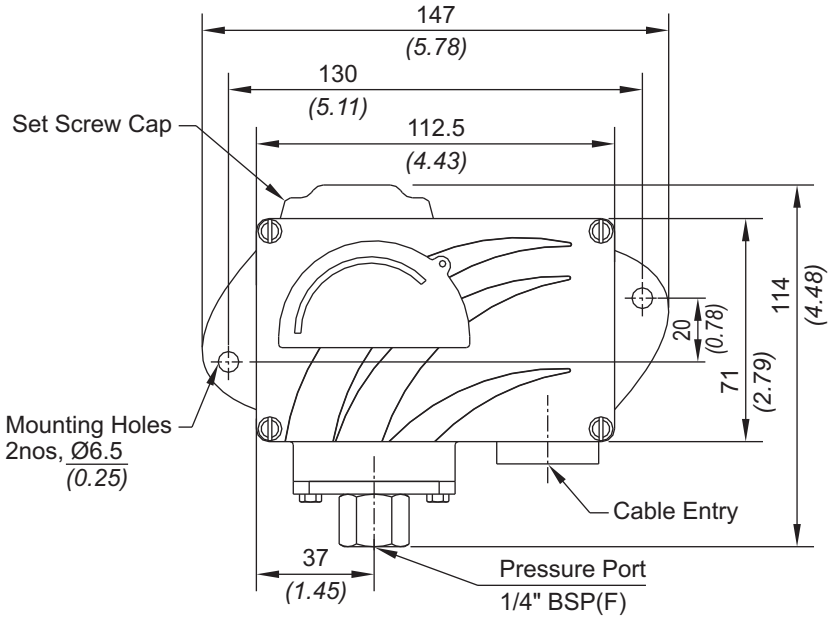


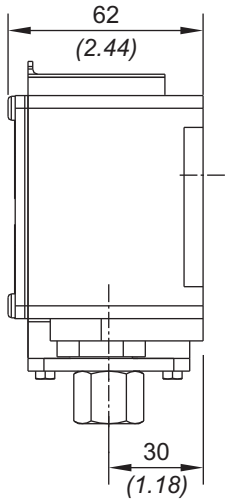
Note : *wetted parts* are mentioned in italics.

No. Description

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

INSTALLATION DRAWING





APPROX. DIMENSIONS IN mm / *inches*

MD HIGH RANGE PRESSURE SWITCHES

RANGE SELECTION TABLE

Range Code	Range bar *(psi)*	†Differential bar *(psi)*	Maximum Working Pressure bar *(psi)*
		Approximate Maximum for "A1" microswitch	
LP	0.067 - 0.213 *(0.97 - 3.09)*	0.02 *(0.29)*	5 *(72.52)*
LP5	0.1 - 0.5 *(1.45 - 7.25)*	0.08 *(1.16)*	5 *(72.52)*
H01	0.1 - 1.0 *(1.45 - 14.50)*	0.10 *(1.45)*	12 *(174.05)*
H02	0.1 - 1.5 *(1.45 - 21.76)*	0.12 *(1.74)*	12 *(174.05)*
H03	0.2 - 2.6 *(2.90 - 37.71)*	0.20 *(2.90)*	12 *(174.05)*
H04	0.2 - 3.6 *(2.90 - 52.21)*	0.20 *(2.90)*	12 *(174.05)*
H07	0.5 - 7.0 *(7.25 - 101.50)*	0.40 *(5.80)*	12 *(174.05)*
H10	0.5 - 10.0 *(7.25 - 145.38)*	0.40 *(5.80)*	25 *(362.6)*
H15	1.0 - 15.0 *(14.5 - 217.56)*	0.80 *(11.60)*	25 *(362.6)*
H30	5.0 - 25.0 *(72.52 - 362.6)*	0.80 *(11.60)*	35 *(507.63)*

† Minimum differential increases with setpoint, values with neoprene diaphragm (Graphs available on request)

* **Note :**
Microswitches A2 through A9 can be supplied in some ranges and differentials will vary with microswitch used. Please contact sales office for details. Please check availability of adjustable differential with sales office.

HOW TO ORDER INDUSTRIAL HIGH RANGE PRESSURE SWITCHES

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
Non standard allocation	Model	Cable Entry Size	Switch Type	Range Code (values in bar)	Microswitch Type	Pressure Port Material / Size	Diaphragm
☐ Reserved for non-standard options not covered in catalogue. Will be given by manufacturer, only after agreement of supply details with customer.	**MD** = Industrial pressure switch with diecast Aluminium enclosure to IP66 as per IS2147	**1** = ½ " NPT threads **2** = ¾" NPT threads **3** = M20 X 1.5 threads	**PF1** = pressure switch, fixed differential without scale **PF2** = pressure switch, fixed differential with scale in bar **PF3** = pressure switch, fixed differential with scale in psi ***PA1** = pressure switch, adjustable differential without scale ***PA2** = pressure switch, adjustable differential with scale in bar ***PA3** = pressure switch, adjustable differential with scale in psi *Available with A9 (in group 6) only	**LP** = (0.067 - 0.213) **LP5** = (0.1 - 0.5) **H01** = (0.1 - 1.0) **H02** (0.1 - 1.5) **H03** = (0.2 - 2.6) **H04** = (0.2 - 3.6) **H07** = (0.5 - 7.0) **H10** = (0.5 - 10.0) **H15** = (1.0 - 15.0) **H30** = (5.0 - 25.0)	**A1** = General purpose microswitch rated at 15 A; 250 VAC ***A2** = Hermetically sealed for corrosive environments ***A3** = gold plated contacts for low voltage applications ***A4** = DPDT configuration ***A5** = for high DC ratings ***A7** = 2SPDT switching elements ***A9** = General purpose microswitch rated at 5 A; 250 VAC Please refer page no. 230 for more microswitch options * Please refer note under Range Selection Table	**S1** = SS316 / ¼" BSP(F) **S2** = SS316 / ¼" NPT(F) Please refer page no. 226 & 227 for more pressure port options	**0** = Neoprene **1** = Teflon **2** = SS 316L **3** = Hastelloy C **4** = Monel

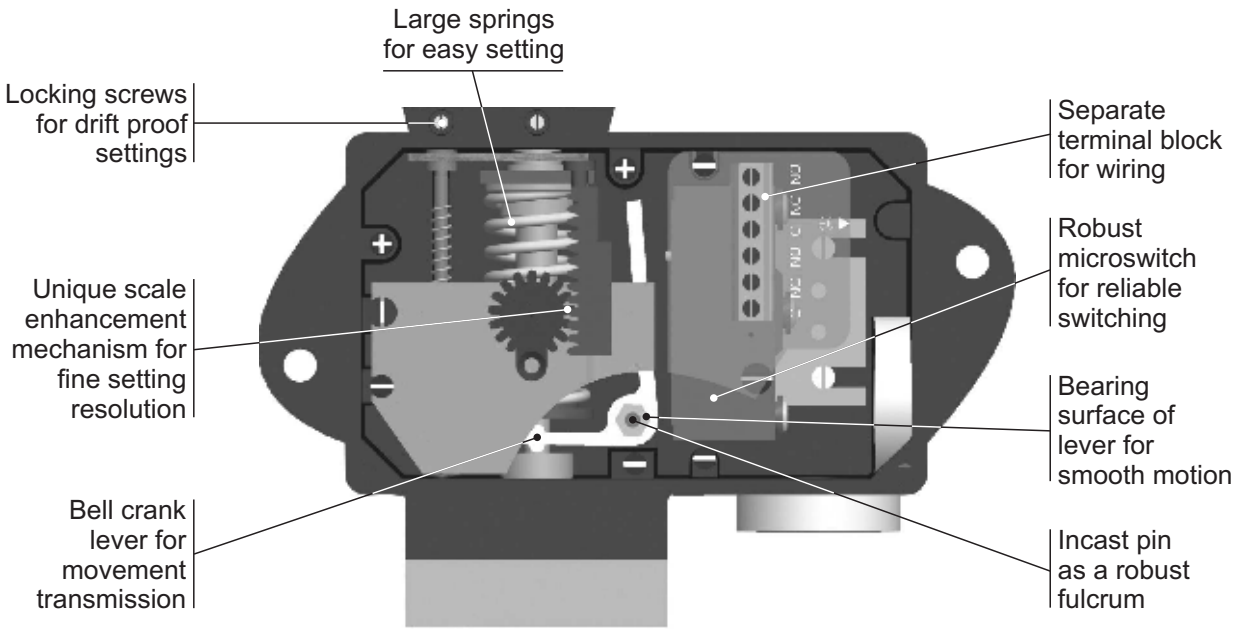
eg. A high range weatherproof switch with ½" NPT cable entry in aluminium housing as 1SPDT pressure switch, fixed differential without scale, having 0.1 bar to 1 bar pressure range, with 15 Amp. microswitch, SS316 pressure housing with ¼" BSP port size & neoprene diaphragm shall be specified by

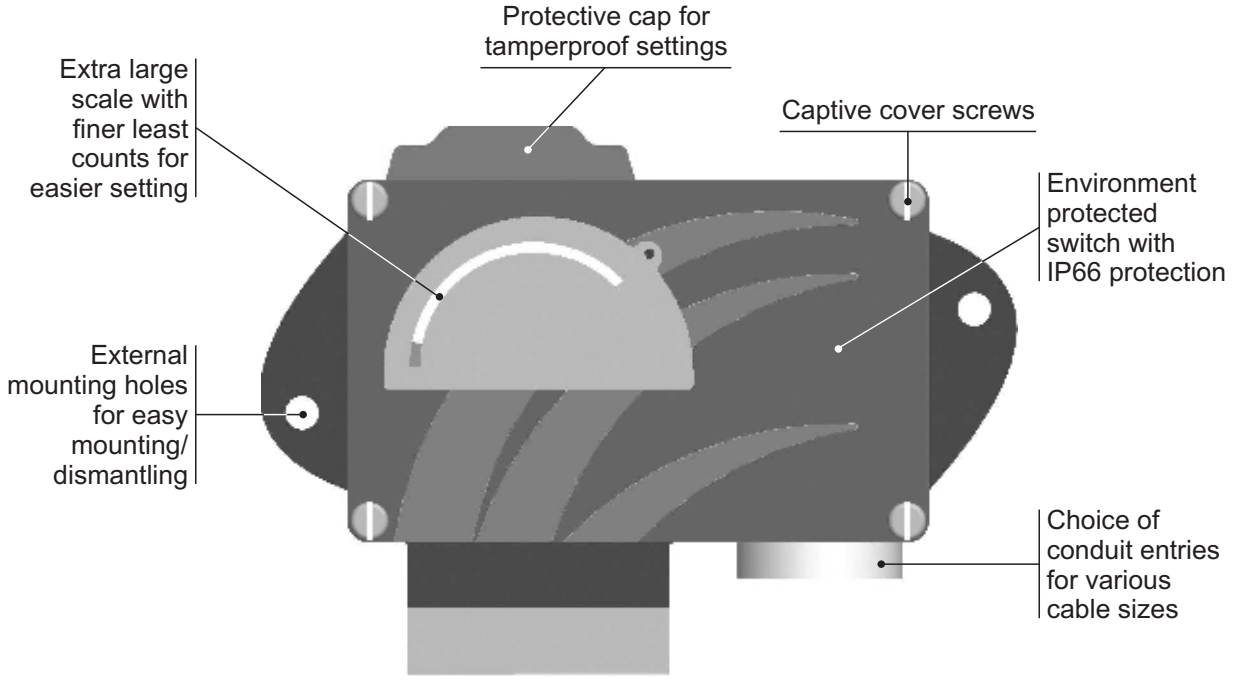
Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
☐	MD	1	PF1	H01	A1	S1	0

Please specify full model number to avoid ambiguity.

Bulletin No. KA121024

MD HIGH PROOF HIGH RANGE PRESSURE SWITCHES



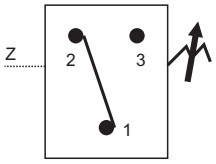


Approximate Weight : 1.200 Kg.

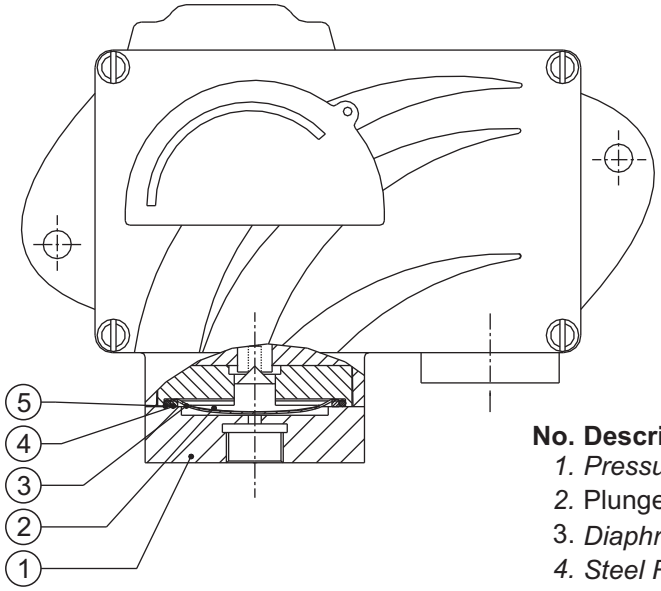
Some Applications : High pressure gas handling systems, in non-hazardous areas where the maximum pressure is high and tripping value is low.

Electrical Connection :

Fig. 2



PRESSURE CAPSULE DETAILS

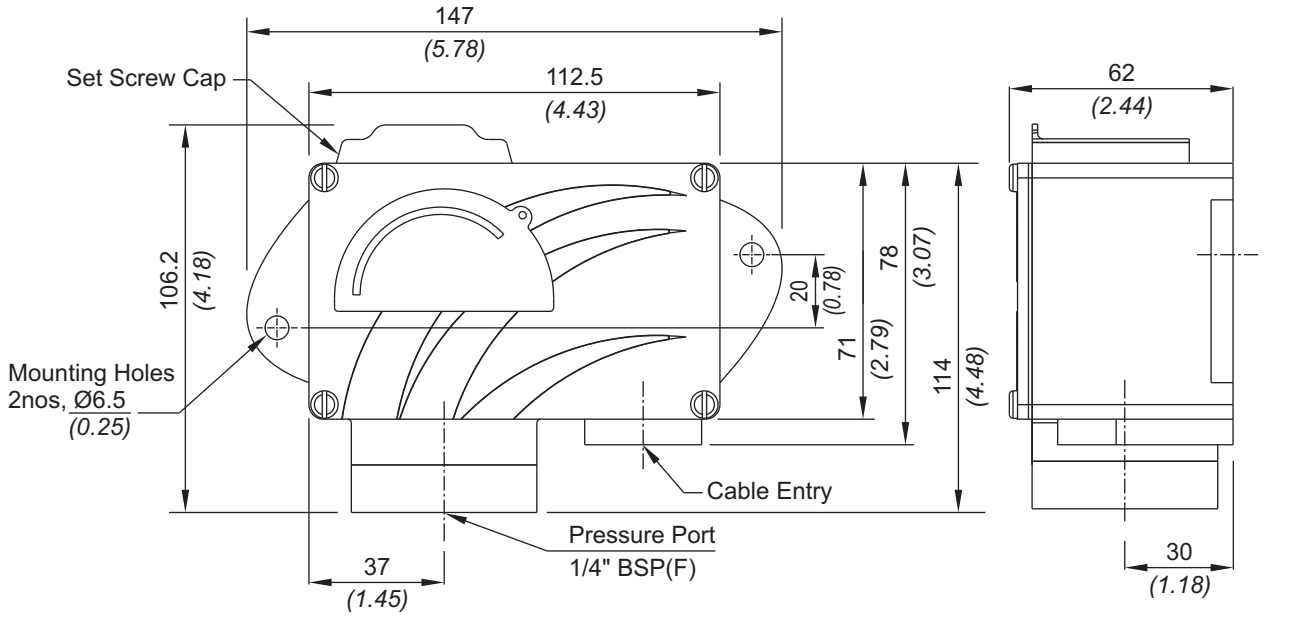


No. Description

1. *Pressure Housing*
2. Plunger
3. *Diaphragm (Teflon®)*
4. *Steel Ring (SS316 as per pr. hsg. material)*
5. *O-Ring (Teflon®)*

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING



APPROX. DIMENSIONS IN mm / *inches*

MD HIGH PROOF HIGH RANGE PRESSURE SWITCHES

RANGE SELECTION TABLE

Range Code	Range bar *(psi)*	Differential* bar *(psi)*	Maximum Working Pressure bar *(psi)*
		Approximate Maximum for "A1" microswitch	
PP	0.067 - 0.213 *(0.97 - 3.09)*	0.04 *(0.58)*	70 *(1015.27)*
PP5	0.1 - 0.5 *(1.45 - 7.25)*	0.15 *(2.176)*	70 *(1015.27)*
P01	0.1 - 1.0 *(1.45 - 14.50)*	0.20 *(2.90)*	70 *(1015.27)*
P02	0.1 - 1.5 *(1.45 - 21.76)*	0.20 *(2.90)*	70 *(1015.27)*
P03	0.2 - 2.6 *(2.90 - 37.71)*	0.30 *(4.35)*	70 *(1015.27)*
P04	0.2 - 3.6 *(2.90 - 52.21)*	0.40 *(5.80)*	70 *(1015.27)*
P07	0.5 - 7.0 *(7.25 - 101.50)*	0.60 *(8.70)*	70 *(1015.27)*
P10	0.5 - 10.0 *(7.25 - 145.04)*	0.80 *(11.60)*	70 *(1015.27)*
P15	1.0 - 15.0 *(14.5 - 217.6)*	1.50 *(23.21)*	70 *(1015.27)*
P30	5.0 - 25.0 *(72.52 - 362.5)*	2.00 *(29.00)*	70 *(1015.27)*

*Minimum differential increases with setpoint, values with neoprene diaphragm (Graphs available on request)

* **Note :**
Microswitches A2 through A9 can be supplied in some ranges and differentials will vary with microswitch used. Please contact sales office for details. Please check availability of adjustable differential with sales office.

HOW TO ORDER INDUSTRIAL HIGH PROOF HIGH RANGE PRESSURE SWITCHES

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
Non standard allocation	Model	Cable Entry Size	Switch Type	Range Code (values in bar)	Microswitch Type	Pressure Port Material / Size	Diaphragm
☐ Reserved for non-standard options not covered in catalogue. Will be given by manufacturer, only after agreement of supply details with customer.	**MD** = Industrial pressure switch with diecast Aluminium enclosure to IP66 as per IS2147	**1** = ½ " NPT threads **2** = ¾" NPT threads **3** = M20 X 1.5 threads	**PF1** = pressure switch, fixed differential without scale **PF2** = pressure switch, fixed differential with scale in bar **PF3** = pressure switch, fixed differential with scale in psi ***PA1** = pressure switch, adjustable differential without scale ***PA2** = pressure switch, adjustable differential with scale in bar ***PA3** = pressure switch, adjustable differential with scale in psi *Available with A9 (in group 6) only	**PP** = (0.067 - 0.213) **PP5**= (0.1 - 0.5) **P01** = (0.1 - 1.0) **P02** (0.1 - 1.5) **P03** = (0.2 - 2.6) **P04** = (0.2 - 3.6) **P07** = (0.5 - 7.0) **P10** = (0.5 - 10.0) **P15** = (1.0 - 15.0) **P30** = (5.0 - 25.0)	**A1** = General purpose microswitch rated at 15 A; 250 VAC ***A2 =** Hermetically sealed for corrosive environments ***A3 =** gold plated contacts for low voltage applications ***A4 =** DPDT configuration ***A5 =** for high DC ratings ***A7** = 2SPDT switching elements ***A9** = General purpose microswitch rated at 5 A; 250 VAC Please refer page no. 230 for more microswitch options * Please refer note under Range Selection Table	**S1** = SS316 / ¼" BSP(F) **S2** = SS316 / ¼" NPT(F) Please refer page no. 226 & 227 for more pressure port options	**0** = Neoprene **1** = Teflon **2** = SS 316L

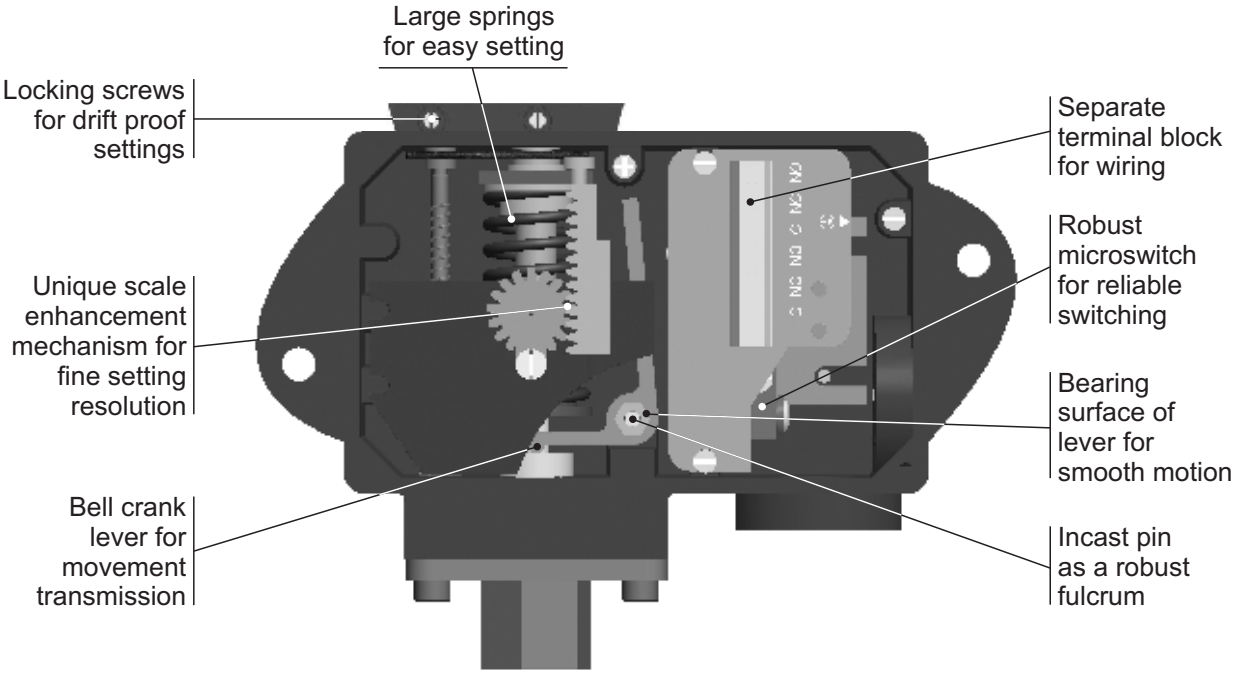
eg. A high proof high range weatherproof switch with ½" NPT cable entry in aluminium housing as 1SPDT pressure switch, fixed differential without scale, having 0.1 bar to 1 bar pressure range, with 15Amp. microswitch, SS316 pressure housing with ¼" BSP port size & neoprene diaphragm shall be specified by

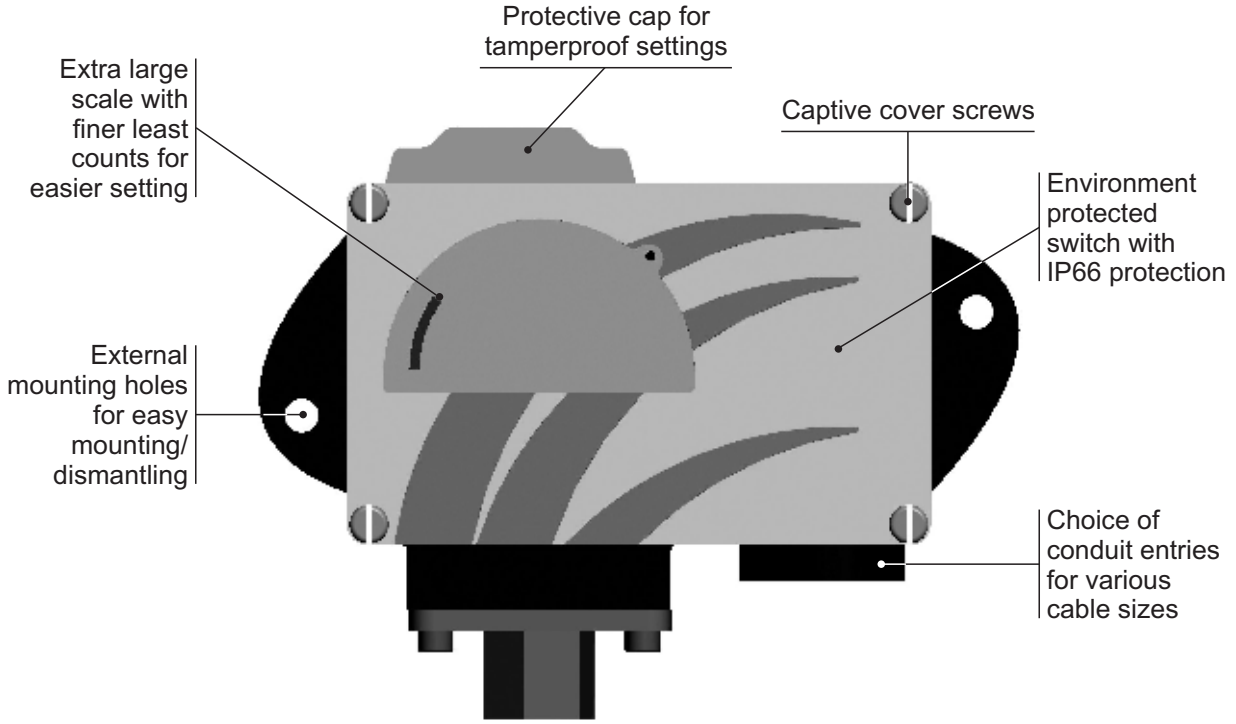
Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
☐	MD	1	PF1	P01	A1	S1	0

Please specify full model number to avoid ambiguity.

Bulletin No. KA121024

MD HIGH RANGE BELLOWS SWITCHES



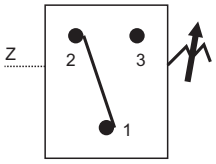


Approximate Weight : 0.700 Kg.

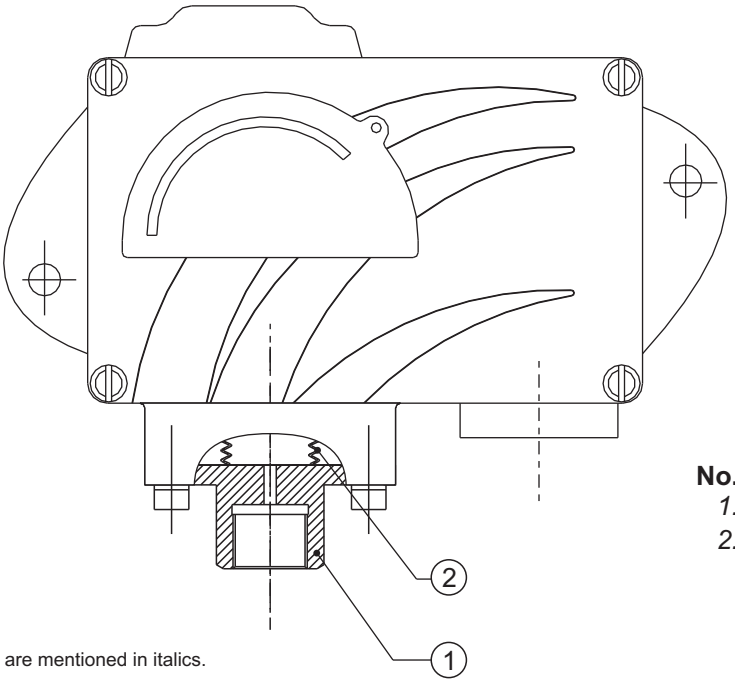
Some Applications : For cryogenic applications.

Electrical Connection :

Fig. 2



PRESSURE CAPSULE DETAILS

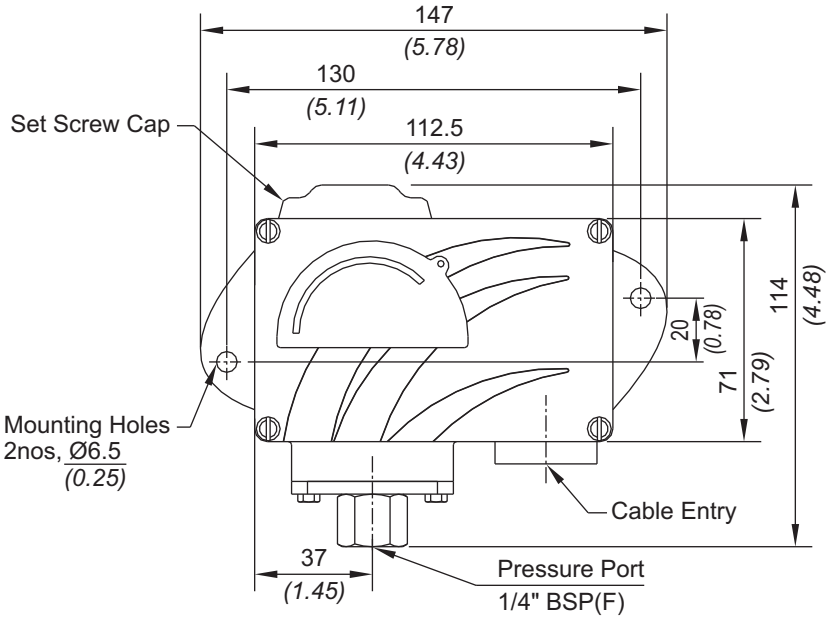


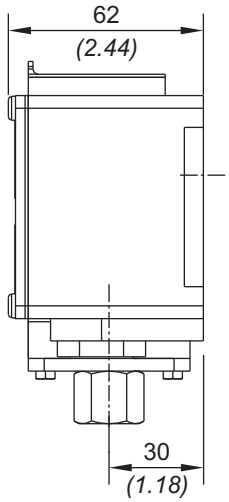
No. Description

1. *Pressure Port*
2. *Metallic Bellow*

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING





APPROX. DIMENSIONS IN mm / *inches*

MD HIGH RANGE BELLOWS SWITCHES

RANGE SELECTION TABLE

Range Code	Range bar *(psi)*	†Differential bar *(psi)*	Maximum Working Pressure bar *(psi)*
		Approximate Maximum for "A1" microswitch	
H01	0.1 - 1.0 *(1.45 - 14.50)*	0.10 *(1.45)*	12 *(174.05)*
H02	0.1 - 1.5 *(1.45 - 21.76)*	0.12 *(1.74)*	12 *(174.05)*
H03	0.2 - 2.6 *(2.90 - 37.71)*	0.17 *(2.46)*	12 *(174.05)*
H04	0.2 - 3.6 *(2.90 - 52.21)*	0.20 *(2.90)*	12 *(174.05)*
H07	0.5 - 7.0 *(7.25 - 101.50)*	0.40 *(5.80)*	12 *(174.05)*
H10	0.5 - 10.0 *(7.25 - 145.03)*	0.40 *(5.80)*	25 *(362.6)*
H15	1.0 - 15.0 *(14.50 - 217.56)*	0.80 *(11.60)*	25 *(362.6)*
H30	5.0 - 25.0 *(72.52 - 362.59)*	0.80 *(11.60)*	35 *(507.63)*
H4T	5.0 - 40.0 *(72.52 - 580.15)*	5.0 *(72.52)*	100 *(1450.37)*
H1H	10.0 - 100.0 *(145.03 - 1450.37)*	*12 (174.05)*	200 *(2900.76)*

† Minimum differential increases with setpoint, (Graphs available on request)

* **Note :**
Microswitches A2 through A9 can be supplied in some ranges and differentials will vary with microswitch used. Please contact sales office for details. Please check availability of adjustable differential with sales office.

HOW TO ORDER INDUSTRIAL HIGH RANGE BELLOWS PRESSURE SWITCHES

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
Non standard allocation	Model	Cable Entry Size	Switch Type	Range Code (values in bar)	Microswitch Type	Pressure Port Material / Size	Bellows
☐ Reserved for non-standard options not covered in catalogue. Will be given by manufacturer, only after agreement of supply details with customer.	**MD** = Industrial pressure switch with diecast Aluminium enclosure to IP66 as per IS2147	**1** = ½ " NPT threads **2** = ¾" NPT threads **3** = M20 X 1.5 threads	**PF1** = pressure switch, fixed differential without scale **PF2** = pressure switch, fixed differential with scale in bar **PF3** = pressure switch, fixed differential with scale in psi ***PA1** = pressure switch, adjustable differential without scale ***PA2** = pressure switch, adjustable differential with scale in bar ***PA3** = pressure switch, adjustable differential with scale in psi *Available with A9 (in group 6) only	**H01** = (0.1 - 1.0) **H02** (0.1 - 1.5) **H03** = (0.2 - 2.6) **H04** = (0.2 - 3.6) **H07** = (0.5 - 7.0) **H10** = (0.5 - 10.0) **H15** = (1.0 - 15.0) **H30** = (5.0 - 25.0) **H4T** = (5.0 - 40.0) **H1H** = (10.0 - 100.0)	**A1** = General purpose microswitch rated at 15 A; 250 VAC ***A2** = Hermetically sealed for corrosive environments ***A3** = gold plated contacts for low voltage applications ***A4** = DPDT configuration ***A5** = for high DC ratings ***A7** = 2SPDT switching elements ***A9** = General purpose microswitch rated at 5 A; 250 VAC Please refer page no. 230 for more microswitch options * Please refer note under Range Selection Table	**B1** = Bellows / ¼" BSP(F) **B2** = Bellows / ¼" NPT(F)	**2** = SS 316L

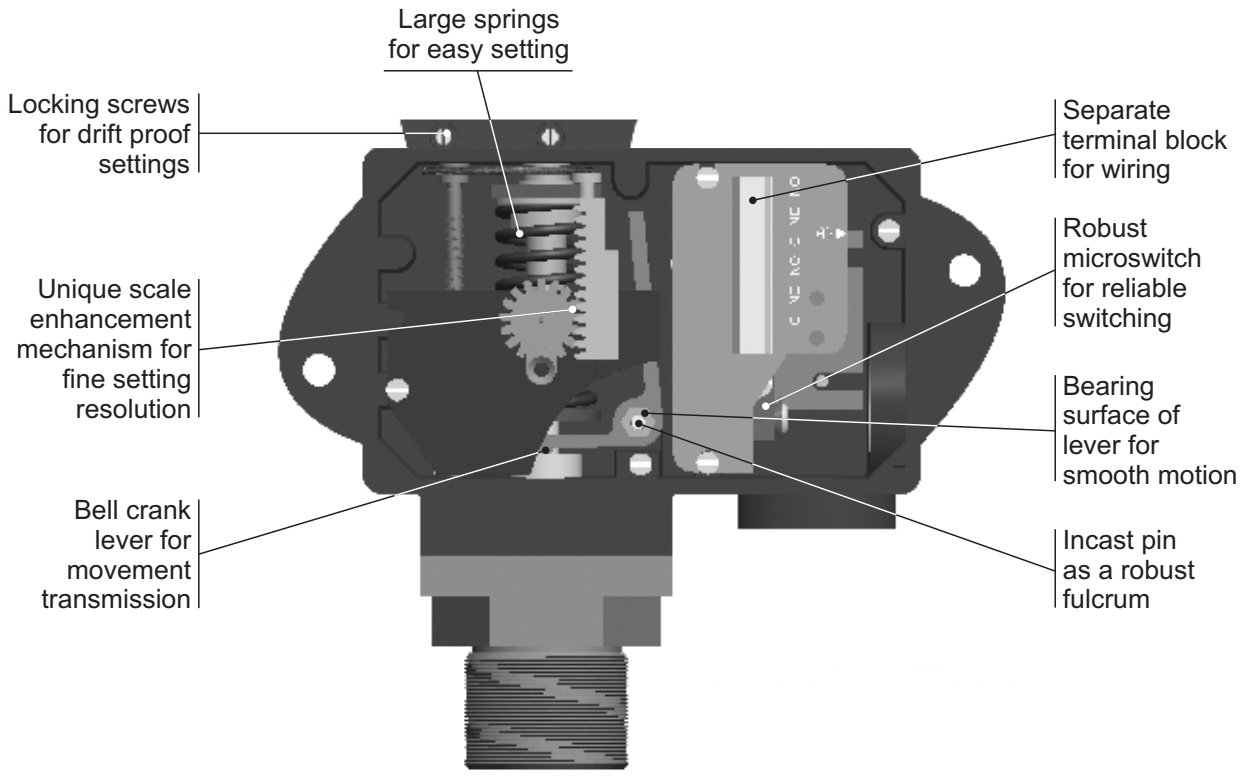
eg. A high range weatherproof bellows switch with ½" NPT cable entry in aluminium housing as 1SPDT pressure switch, fixed differential without scale, having 0.1 bar to 1 bar pressure range, with 15 Amp. microswitch, SS316 pressure housing with ¼" BSP port size & SS316L bellows shall be specified by

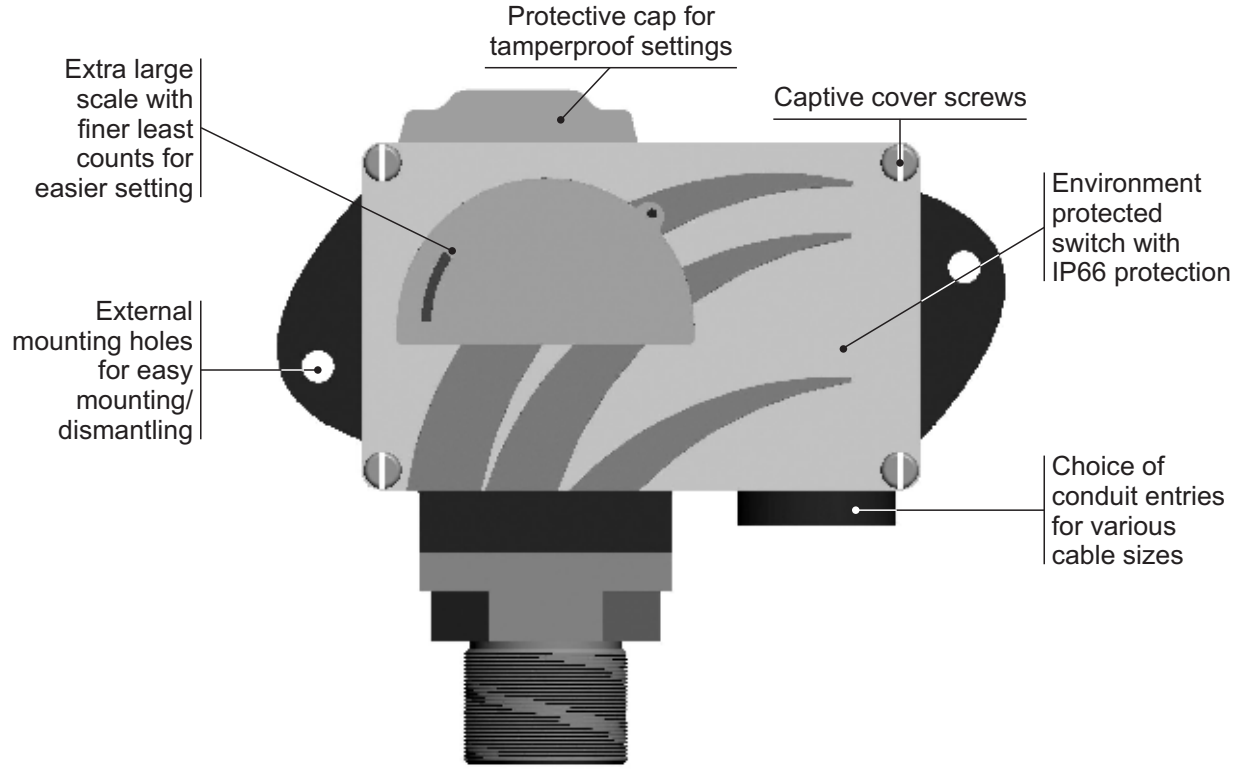
Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
☐	MD	1	PF1	H01	A1	B1	2

Please specify full model number to avoid ambiguity.

Bulletin No. KA121024

MD LARGE BORE HIGH RANGE PRESSURE SWITCHES



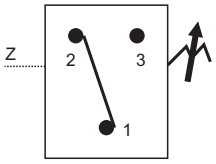


Approximate Weight : 1.500 Kg.

Some Applications : Water treatment plants, reverse osmosis plants, etc.

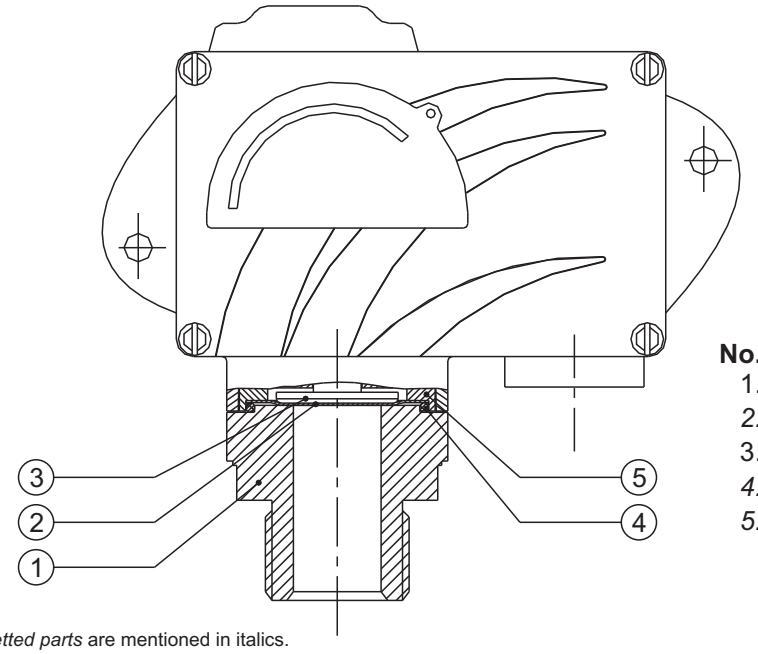
Electrical Connection :

Fig. 2



LARGE BORE HIGH RANGE PRESSURE SWITCHES MD

PRESSURE CAPSULE DETAILS

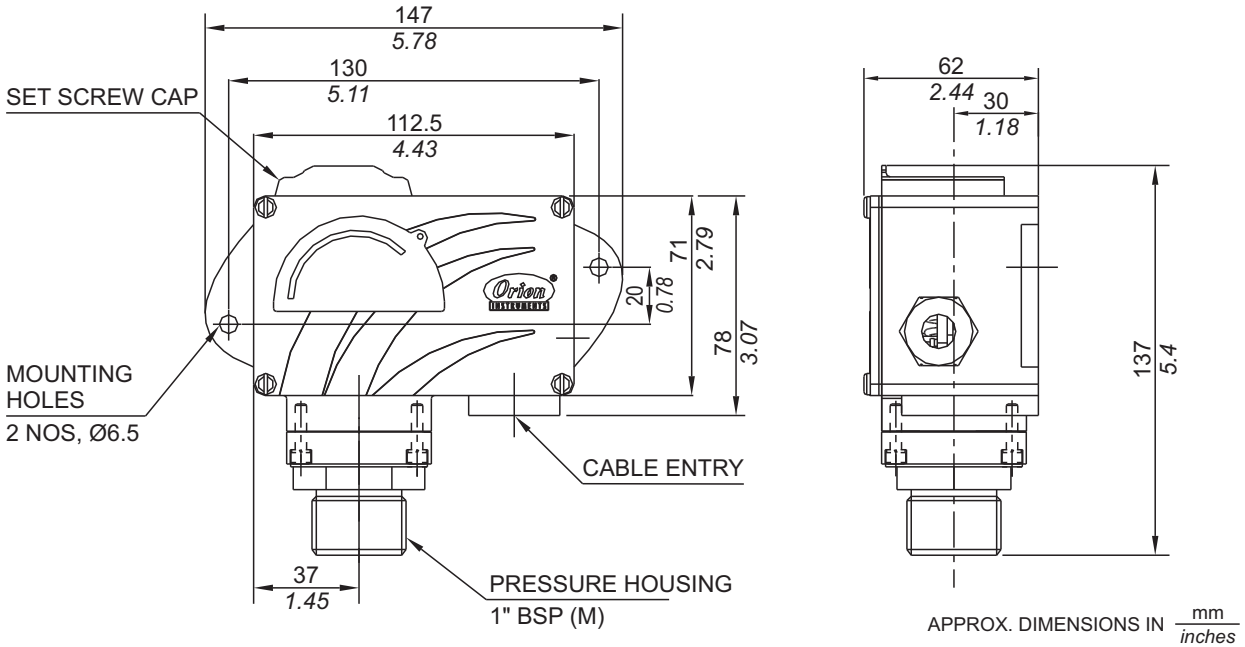


No. Description

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

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING



MD LARGE BORE HIGH RANGE PRESSURE SWITCHES

RANGE SELECTION TABLE

Range Code	Range bar *(psi)*	Differential* bar *(psi)*	Maximum Working Pressure bar *(psi)*
		Approximate Maximum for "A8" microswitch	
H01	0.1 - 1.0 *(1.45 - 14.50)*	0.10 *(1.45)*	12 *(174.05)*
H02	0.1 - 1.5 *(1.45 - 21.76)*	0.20 *(2.90)*	12 *(174.05)*
H03	0.2 - 2.6 *(2.90 - 37.71)*	0.20 *(2.90)*	12 *(174.05)*
H04	0.2 - 3.6 *(2.90 - 52.21)*	0.20 *(2.90)*	12 *(174.05)*
H07	0.5 - 7.0 *(7.25 - 101.50)*	0.40 *(5.80)*	12 *(174.05)*
H10	0.5 - 10.0 *(7.25 - 145.03)*	0.60 *(8.70)*	25 *(362.6)*
H15	1.0 - 15.0 *(14.50 - 217.56)*	0.60 *(8.70)*	25 *(362.6)*
H30	5.0 - 25.0 *(72.52 - 362.6)*	0.80 *(11.60)*	35 *(507.63)*

*Minimum differential increases with setpoint (Graphs available on request), results for neoprene diaphragm.

Note: Welded diaphragm also available as shown

HOW TO ORDER INDUSTRIAL LARGE BORE HIGH RANGE PRESSURE SWITCHES

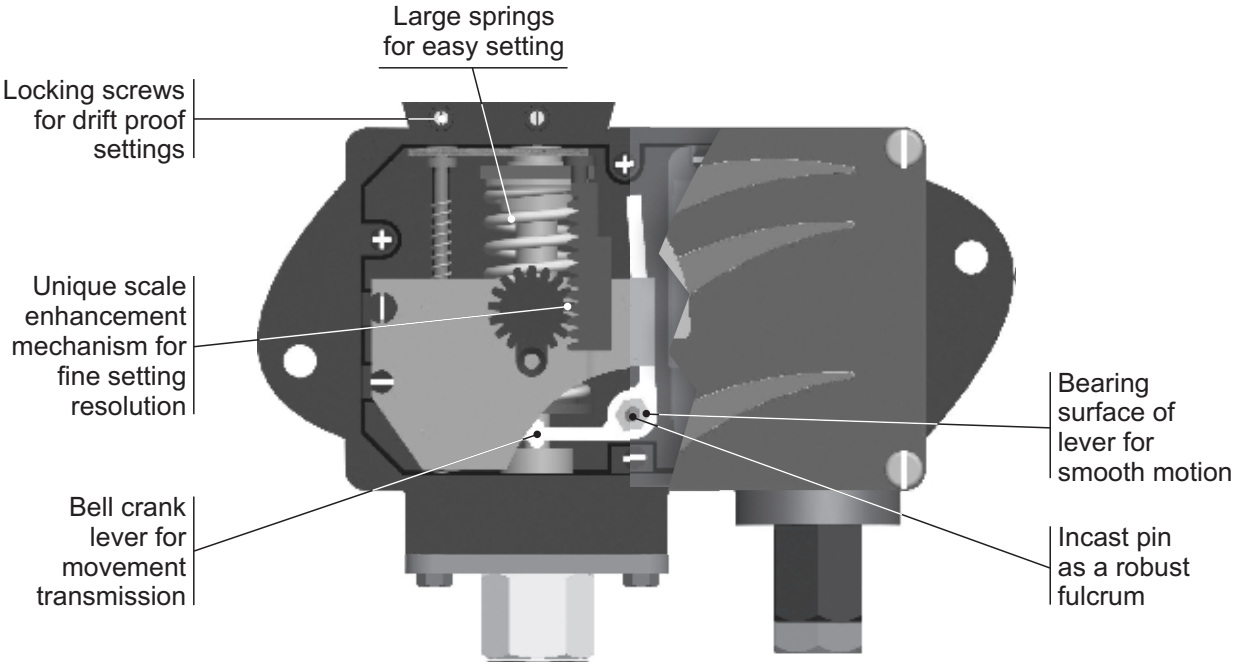
Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
Non standard allocation	Model	Cable Entry Size	Switch Type	Range Code (values in bar)	Microswitch Type	Pressure Port Material / Size	Diaphragm
☐ Reserved for non-standard options not covered in catalogue. Will be given by manufacturer, only after agreement of supply details with customer.	**MD** = Industrial pressure switch with diecast Aluminium enclosure to IP66 as per IS2147	**1** = ½ " NPT threads **2** = ¾" NPT threads **3** = M20 X 1.5 threads	**PF1** = pressure switch, fixed differential without scale **PF2** = pressure switch, fixed differential with scale in bar **PF3** = pressure switch, fixed differential with scale in psi ***PA1** = pressure switch, adjustable differential without scale ***PA2** = pressure switch, adjustable differential with scale in bar ***PA3** = pressure switch, adjustable differential with scale in psi *Available with A9 (in group 6) only	**H01** = (0.1 - 1.0) **H02** (0.1 - 1.5) **H03** = (0.2 - 2.6) **H04** = (0.2 - 3.6) **H07** = (0.5 - 7.0) **H10** = (0.5 - 10.0) **H15** = (1.0 - 15.0) **H30** = (5.0 - 25.0)	**A1** = General purpose microswitch rated at 15 A; 250 VAC ***A2** = Hermetically sealed for corrosive environments ***A3** = gold plated contacts for low voltage applications ***A4** = DPDT configuration ***A5** = for high DC ratings ***A7** = 2SPDT switching elements **A8** = General purpose microswitch rated at 5 A; 250 VAC ***A9** = General purpose microswitch rated at 5 A; 250 VAC Please refer page no. 230 for more microswitch options * Please refer note under Range Selection Table	**S3** = SS316 / 1" BSP(M) **N3** = Monel / 1" BSP(M) Note: Welded diaphragm also available	**0** = Neoprene **1** = Teflon **2** = SS 316L **4** = Monel

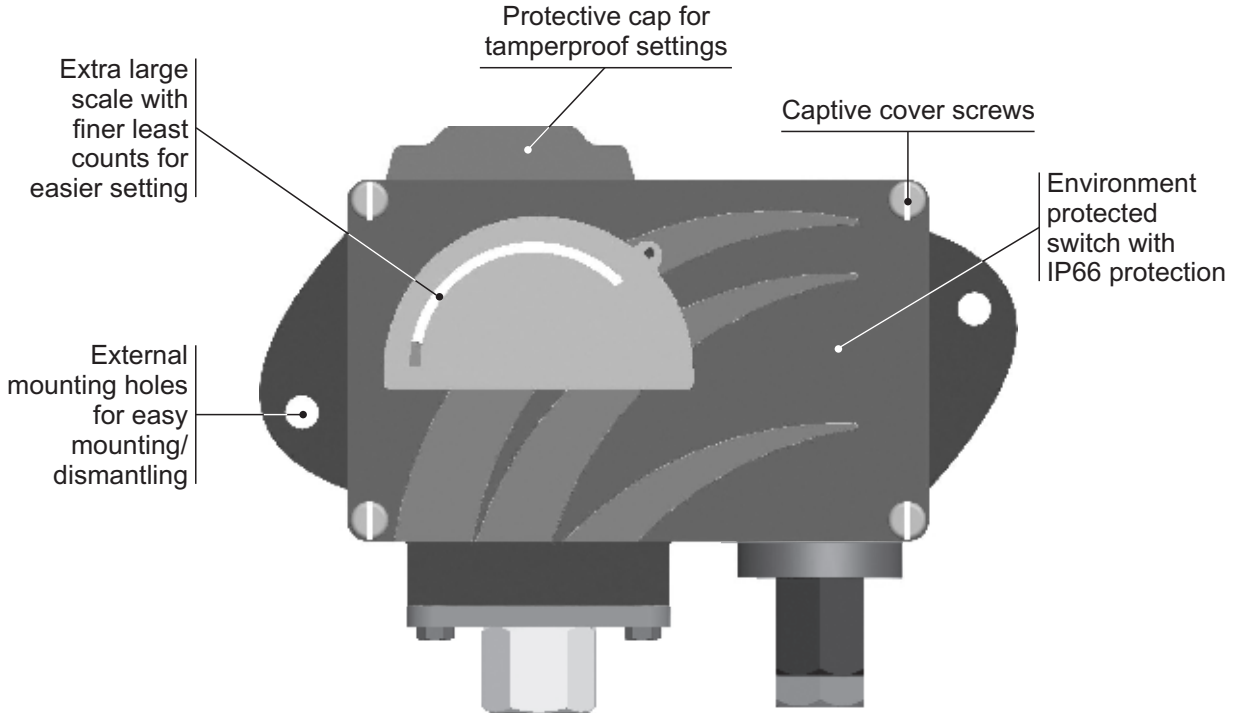
eg. An Industrial large bore pressure switch with fixed differential having 0.1 bar to 1 bar pressure range, with 5 Amp. microswitch, SS316 pressure housing with 1" BSPM port size & neoprene diaphragm shall be specified by

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
☐	MD	3	PF2	H01	A8	S3	0

Please specify full model number to avoid ambiguity.

Bulletin No. KA121024

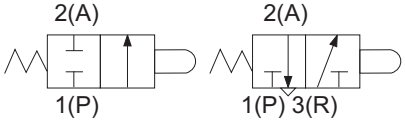


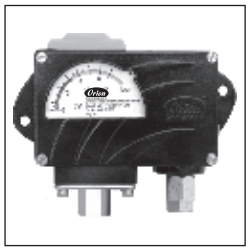


Approximate Weight :
Varies with capsule size. Please consult sales office.

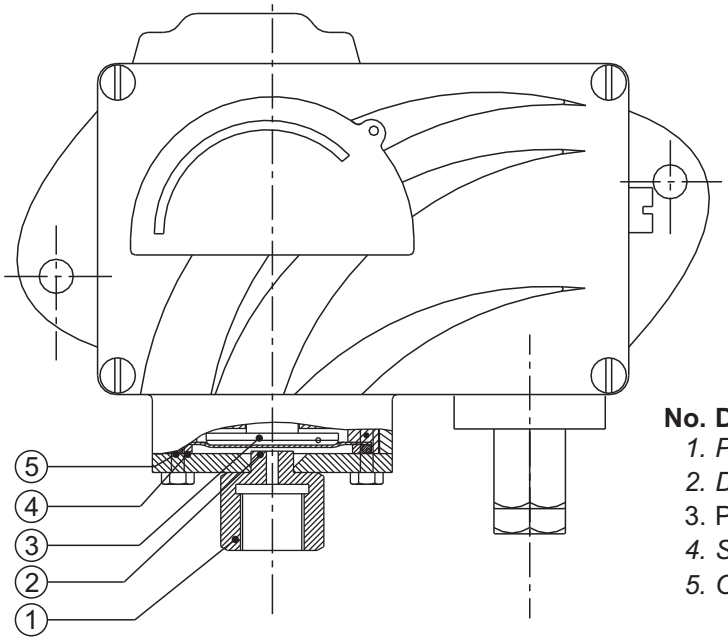
Some Applications : For operating pneumatic circuits in coal mines, oil mines & pneumatic systems.

Valve Schematic :





PRESSURE CAPSULE DETAILS

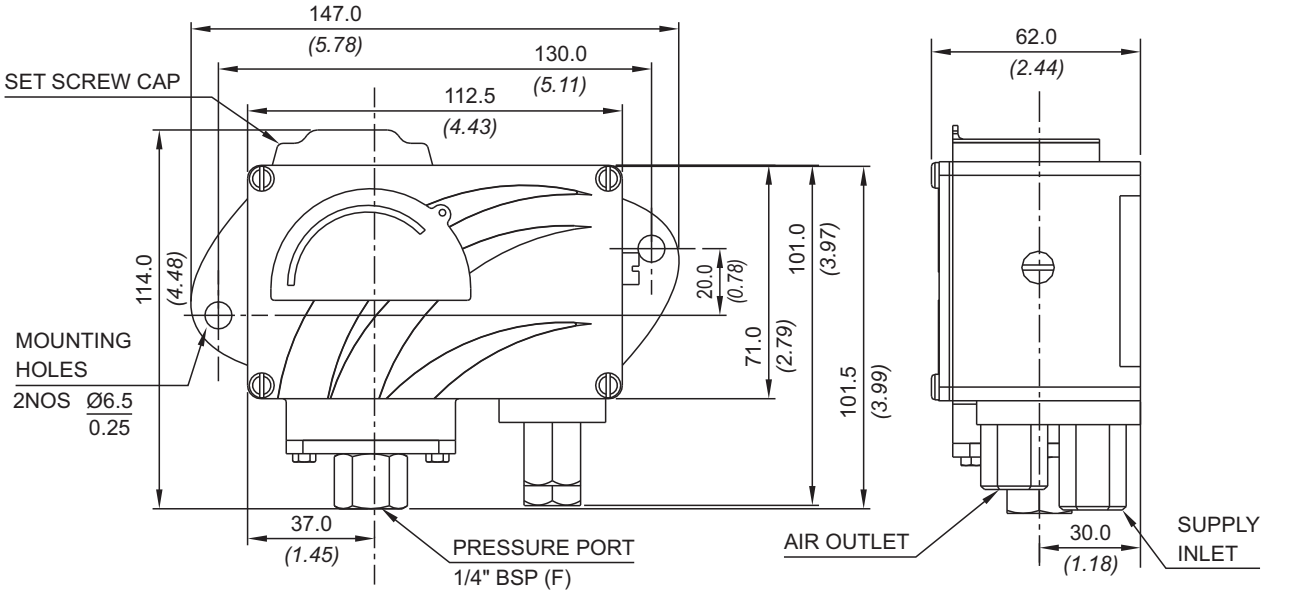


No. Description

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

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING



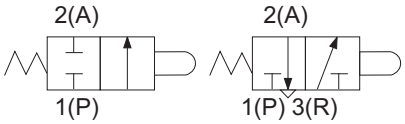
APPROX. DIMENSIONS IN mm / *inches*

MD AIR RELAY SWITCHES

RANGE SELECTION TABLE

Range Code	Range bar *(psi)*	†Differential bar *(psi)*	Maximum Working Pressure bar *(psi)*
		Approximate Maximum for "A1" microswitch	
LP	0.067 - 0.213 *(0.97 - 3.09)*	0.02 *(0.29)*	5 *(72.52)*
LP5	0.1 - 0.5 *(1.45 - 7.25)*	0.08 *(1.16)*	5 *(72.52)*
H01	0.1 - 1.0 *(1.45 - 14.50)*	0.10 *(1.45)*	12 *(174.05)*
H02	0.1 - 1.5 *(1.45 - 21.76)*	0.12 *(1.74)*	12 *(174.05)*
H03	0.2 - 2.6 *(2.90 - 37.71)*	0.17 *(2.46)*	12 *(174.05)*
H04	0.2 - 3.6 *(2.90 - 52.21)*	0.20 *(2.90)*	12 *(174.05)*
H07	0.5 - 7.0 *(7.25 - 101.50)*	0.40 *(5.80)*	12 *(174.05)*
H10	0.5 - 10.0 *(7.25 - 145.04)*	0.40 *(5.80)*	25 *(362.6)*
H15	1.0 - 15.0 *(14.5 - 217.56)*	0.80 *(11.60)*	25 *(362.6)*
H30	5.0 - 25.0 *(72.52 - 362.6)*	0.80 *(11.60)*	35 *(507.63)*

Pneumatic valve specifications



NO valve (P2) = air flows when process pressure < set point
NC valve (P1) = air flows when process pressure > set point

Supply pressure of air/inert gas = 7 bar max

*Other ranges from 1.5 mbar upto 400 bar too available. Also various pressure capsules for vacuum, pressure difference in a variety of wetted parts too can be supplied. Please contact sales office.

HOW TO ORDER INDUSTRIAL AIR RELAY PRESSURE SWITCHES

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
Non standard allocation	Model	Cable Entry Size	Switch Type	Range Code (values in bar)	Microswitch Type	Pressure Port Material / Size	Diaphragm
☐ Reserved for non-standard options not covered in catalogue. Will be given by manufacturer, only after agreement of supply details with customer.	**MD** = Industrial pressure switch with diecast Aluminium enclosure to IP66 as per IS2147	**7** = 1/8“ BSPF air inlet & outlet pressure supply = 7 bar max	**PF1** = pressure switch, fixed differential without scale **PF2** = pressure switch, fixed differential with scale in bar **PF3** = pressure switch, fixed differential with scale in psi ***PA1** = pressure switch, adjustable differential without scale ***PA2** = pressure switch, adjustable differential with scale in bar ***PA3** = pressure switch, adjustable differential with scale in psi *Available with A9 (in group 6) only	**LP** = (0.067 - 0.213) **LP5** = (0.1 - 0.5) **H01** = (0.1 - 1.0) **H02** (0.1 - 1.5) **H03** = (0.2 - 2.6) **H04** = (0.2 - 3.6) **H07** = (0.5 - 7.0) **H10** = (0.5 - 10.0) **H15** = (1.0 - 15.0) **H30** = (5.0 - 25.0)	**P1** = NC valve **P2** = NO valve * Please refer note under Range Selection Table	**S1** = SS316 / ¼" BSP(F) **S2** = SS316 / ¼” NPT(F)	**0** = Neoprene **1** = Teflon **2** = SS 316L

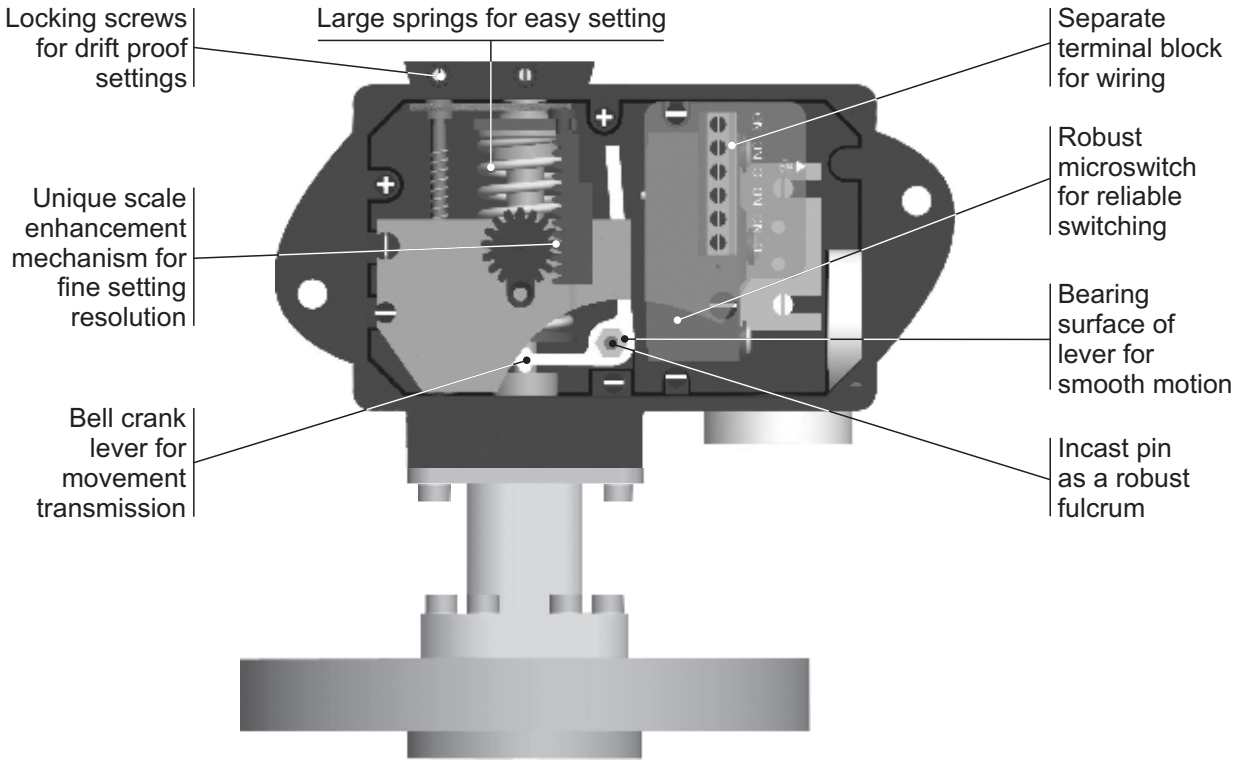
eg. A high range weatherproof switch with 1/8" BSPF air inlet & outlet parts in aluminium housing as a pressure switch, fixed differential without scale, having 0.1 bar to 1 bar pressure range, NC valve, SS316 pressure housing with ¼” BSP port size & neoprene diaphragm shall be specified by

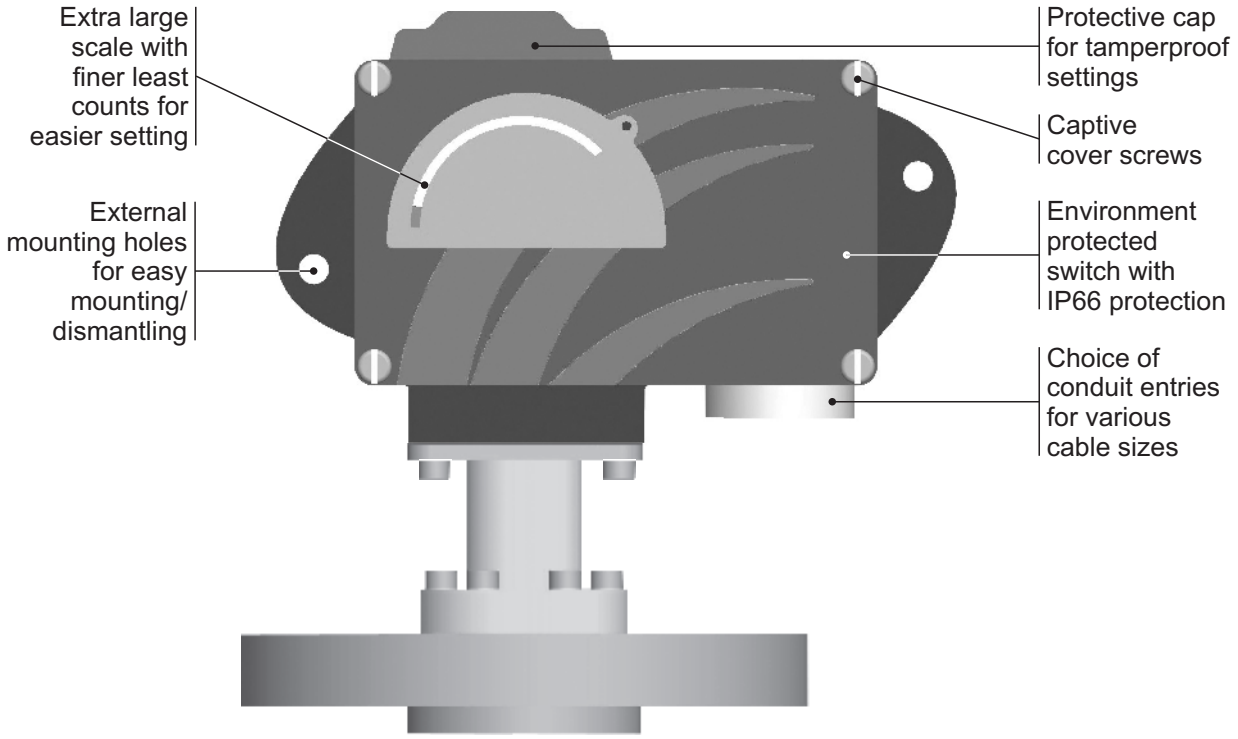
Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
☐	MD	7	PF1	H01	P1	S1	0

Please specify full model number to avoid ambiguity.

Bulletin No. KA121024

MD FLANGED PRESSURE SWITCHES



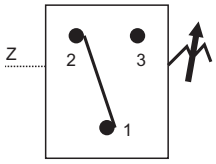


Approximate Weight : Varies with flange size. Please consult sales office.

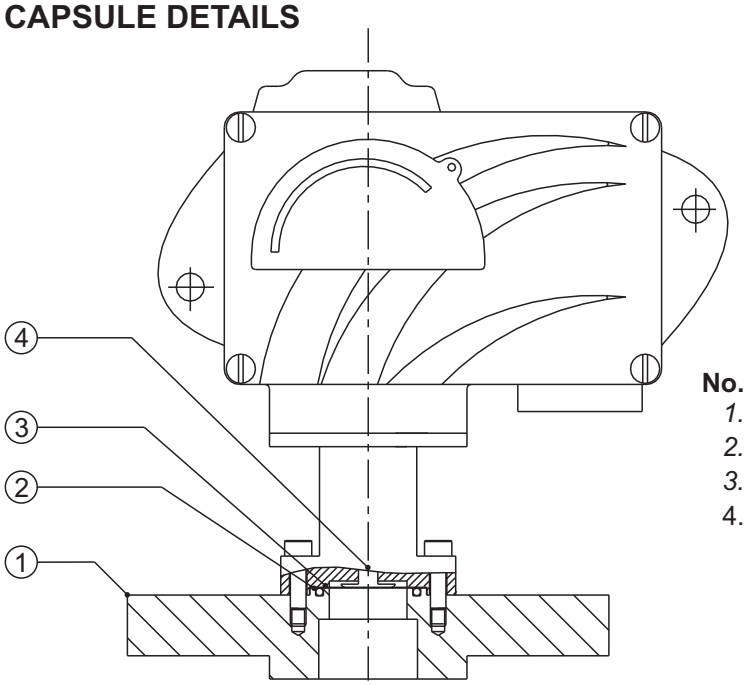
Some Applications :
In non-hazardous areas for slurry, colloidal solutions, corrosive & non-corrosive working media (unclean working media), etc.

Electrical Connection :

Fig. 2



PRESSURE CAPSULE DETAILS

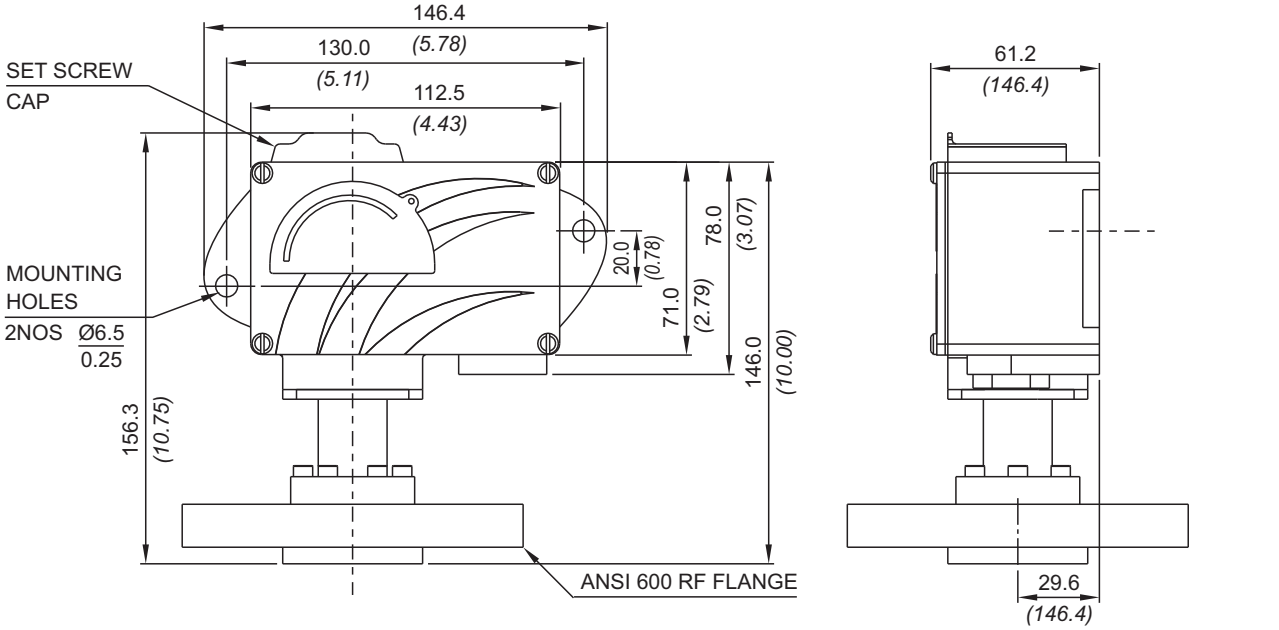


No. Description

1. *ANSI 600 Flange*
2. *Teflon® O-Ring*
3. *Diaphragm*
4. Conical Plunger

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING



APPROX. DIMENSIONS IN mm / *inches*

MD FLANGED PRESSURE SWITCHES

RANGE SELECTION TABLE

Range Code	Range bar *(psi)*	Differential* bar *(psi)* Approximate Maximum for "A1" microswitch	Maximum Working Pressure bar *(psi)*
H01	0.1 - 1.0 *(1.45 - 14.50)*	0.10 *(1.45)*	As per the class of flange
H02	0.1 - 1.5 *(1.45 - 21.76)*	0.12 *(1.74)*	
H03	0.2 - 2.6 *(2.90 - 37.71)*	0.15 *(2.17)*	
H04	0.2 - 3.6 *(2.90 - 52.21)*	0.20 *(2.90)*	Please consult Sales Office in case you need clarification on availability of maximum working pressure for a particular range.
H07	0.5 - 7.0 *(7.25 - 101.50)*	0.40 *(5.80)*	
H10	0.5 - 10.0 *(7.25 - 145.04)*	0.40 *(5.80)*	
H15	1.0 - 15.0 *(14.50 - 217.56)*	0.80 *(11.60)*	
H30	5.0 - 25.0 *(72.52 - 362.6)*	0.80 *(11.60)*	
H4T	5 - 40 *(72.52 - 580.15)*	5 *(72.52)*	
H1H	10 - 100 *(145.04 - 1450.38)*	12 *(174.05)*	
H2H	7 - 200 *(101.53 - 2900.76)*	24 *(348.09)*	

* Minimum differential increases with setpoint (Graphs available on request)
* Differentials of miroswitches A2 through A9 will vary. Differentials for A7 are typically twice that for A1 microswitch.
Please indicate specifically the differential value in enquiry/order, when it is critical in your application.

FLANGE CODE TABLE (Please refer page no. 228 & 229 for more options)

	SS316L		Hastelloy C276		Monel		Titanium		Tantalum	
	RF*	FF*	RF*	FF*	RF*	FF*	RF*	FF*	RF*	FF*
150 #										
1" NB	AC	BS	DI	EY	GO	IE	JU	LK	NA	OQ
2" NB	AF	BV	DL	FB	GR	IH	JX	LN	ND	OT
300#										
1" NB	AI	BY	DO	FE	GU	IK	KA	LQ	NG	OW
2" NB	AL	CB	DR	FH	GX	IN	KD	LT	NJ	OZ
2500#										
1" NB	BM	DC	ES	GI	HY	JO	LE	MU	OK	QA
2" NB	BP	DF	EV	GL	IB	JR	LH	MX	ON	QD

*RF = Raised Face
*FF = Flat Face

RANGE AVAILABILITY AS PER BORE SIZES

	H01 to H04	H07	H10	H15	H30	H2T to H2H
1" NB	NA	Yes	Yes	Yes	Yes	Yes
2" NB	Yes	Yes	Yes	Yes	Yes	Yes

HOW TO ORDER INDUSTRIAL FLANGED PRESSURE SWITCHES

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
Non standard allocation	Model	Cable Entry Size	Switch Type ANSI flanged	Range Code (values in bar)	Microswitch Type	Flange Size and Material	Diaphragm
☐ Reserved for non-standard options not covered in catalogue. Will be given by manufacturer, only after agreement of supply details with customer.	**MD** = Industrial pressure switch with diecast Aluminium enclosure to IP66 as per IS2147	**1** = ½ " NPT threads **2** = ¾" NPT threads **3** = M20 X 1.5 threads	**AF1** = pressure switch, fixed differential without scale **AF2** = pressure switch, fixed differential with scale in bar **AF3** = pressure switch, fixed differential with scale in psi ***AA1** = pressure switch, adjustable differential without scale ***AA2** = pressure switch, adjustable differential with scale in bar ***AA3** = pressure switch, adjustable differential with scale in psi *Available with A9 (in group 6) only	**H01** = 0.1 - 1.0 **H02** = 0.1 - 1.5 **H03** = 0.2 - 2.6 **H04** = 0.2 - 3.6 **H07** = 0.5 - 7.0 **H10** = 0.5 - 10.0 **H15** = 1.0 - 15.0 **H30** = 5.0 - 25.0 **H4T** = 5 - 40 **H1H** = 10 - 100 **H2H** = 7 - 200	**A1** = General purpose microswitch rated at 15 A; 250 VAC ***A2 =** Hermetically sealed for corrosive environments ***A3 =** gold plated contacts for low voltage applications ***A4 =** DPDT configuration ***A5 =** for high DC ratings ***A7** = 2SPDT switching elements ***A9** = General purpose microswitch rated at 5 A; 250 VAC Please refer page no. 230 for more microswitch options * Please refer note under Range Selection Table	Please select as per Flange Code Table For other classes and sizes please refer page no. 228 & 229	**0** = Neoprene **1** = Teflon **2** = SS316L **3** = Hastelloy C **4** = Monel 400 **5** = Titanium **6** = Tantalum

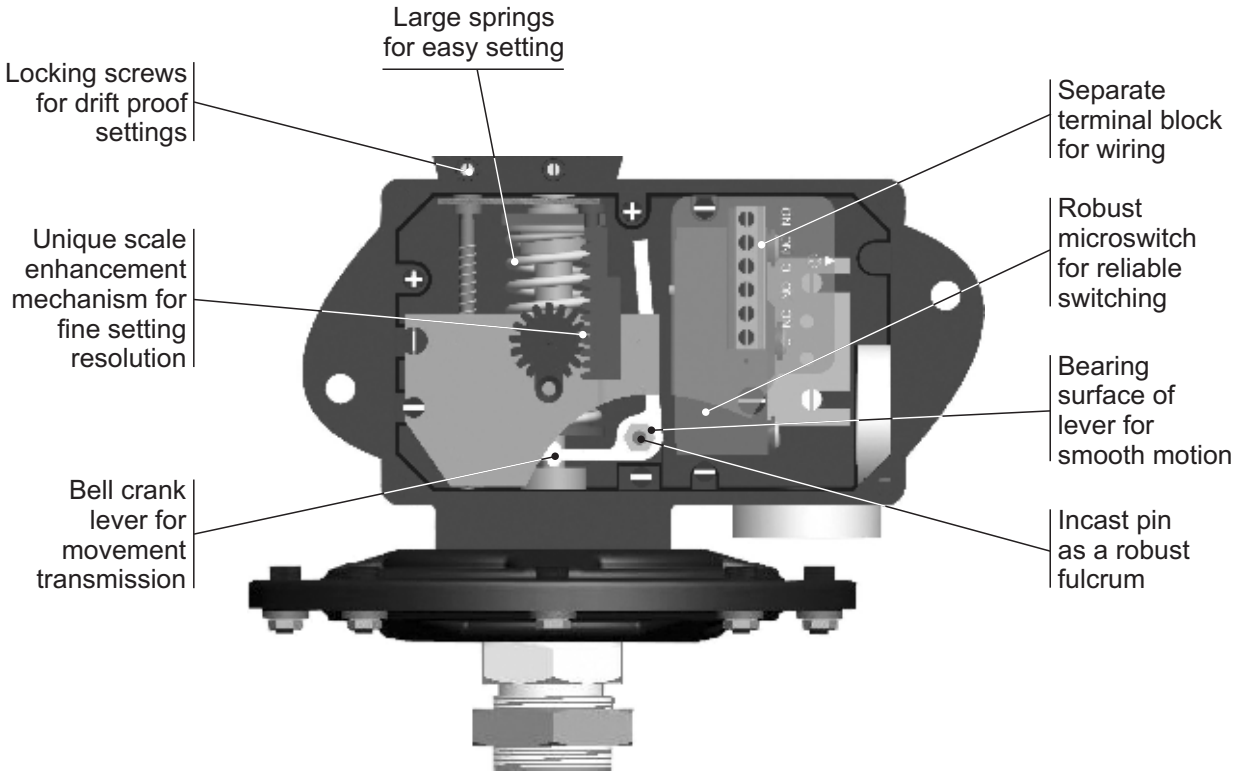
eg. A high range Industrial ANSI flanged pressure switch with ½" NPT cable entry with fixed differential without scale, having 0.1 bar to 1 bar pressure range, with 15 Amp. microswitch, and 2" 150# RF SS316L flange & SS316L diaphragm shall be specified by

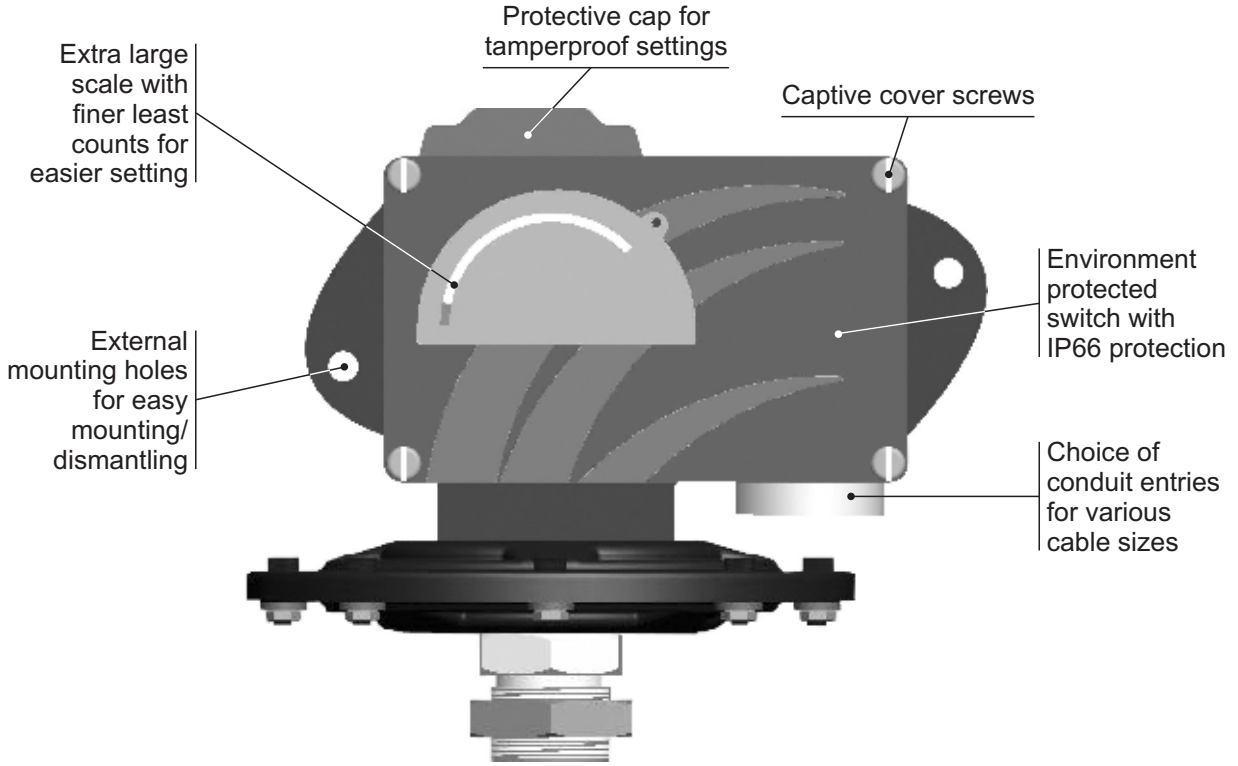
Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
☐	MD	1	AF1	H01	A1	AF	2

Please specify full model number to avoid ambiguity.

Bulletin No. KA121024

MD LOW RANGE PRESSURE SWITCHES



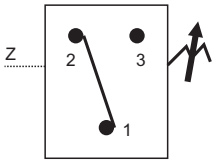


Approximate Weight : 1.500 Kg.

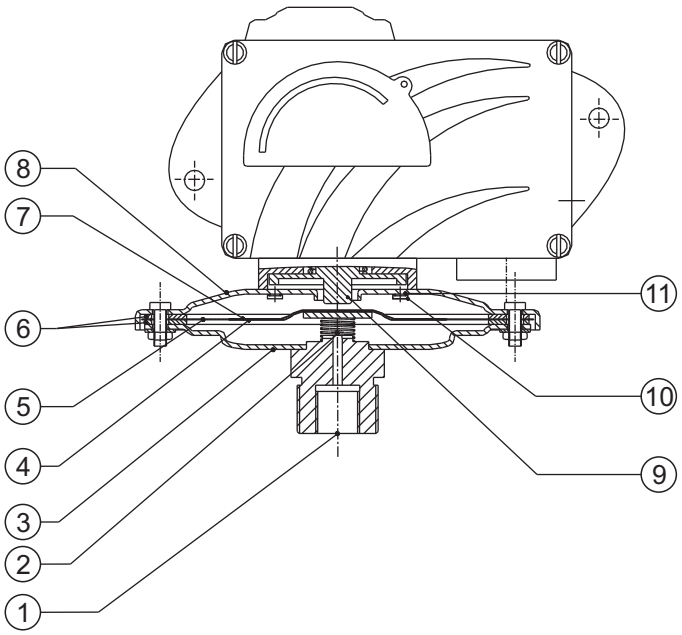
Some Applications : For clean rooms, air duct systems, ventilation systems, etc.

Electrical Connection :

Fig. 2



PRESSURE CAPSULE DETAILS



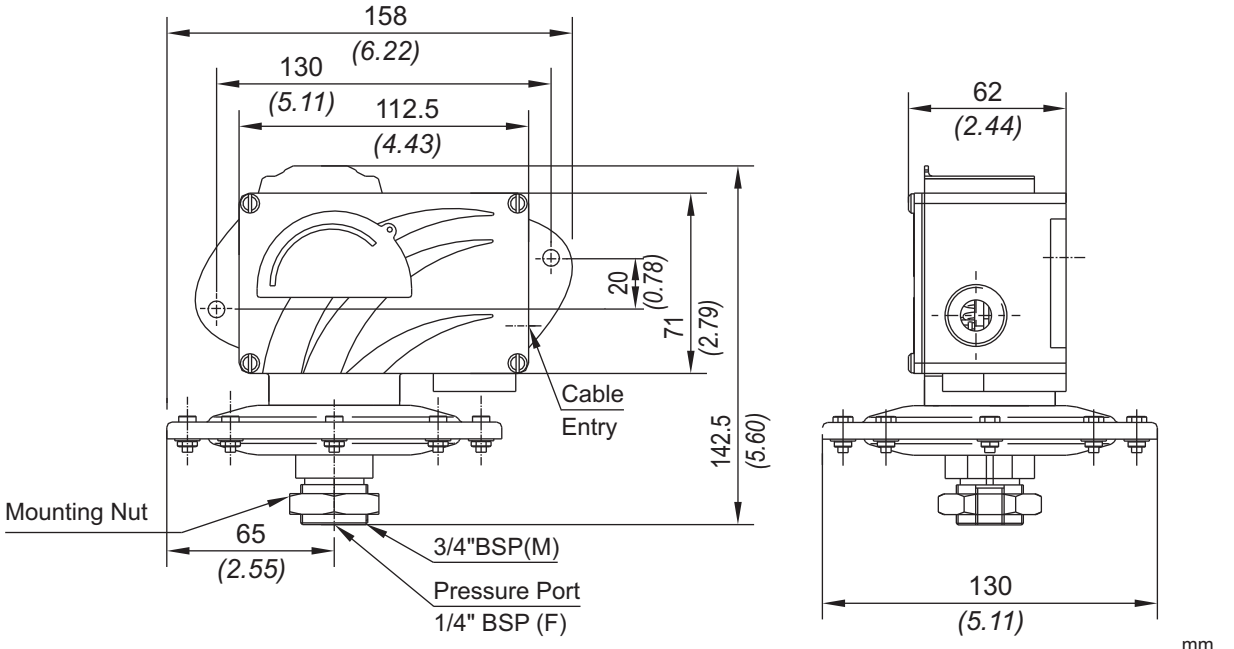
No. Description

1. *Pressure port (M.S.)**
2. *Support spring (S.S.)*
3. *Bottom flange (M.S.)*
4. *Support plate (Aluminium)*
5. *Diaphragm (Neoprene)*
6. *Gasket (Nitrile)*
7. Top plate (Aluminium)
8. Top flange (M.S.)
9. Plunger
10. Top flange screw (M.S.)
11. Sealing 'O' ring (Nitrile)

*Pressure port is brazed with flange

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING



APPROX. DIMENSIONS IN mm / *inches*

MD LOW RANGE PRESSURE SWITCHES

RANGE SELECTION TABLE

Range Code	Range mbar *("wc)*	Differential* mbar *("wc)*	Maximum Working Pressure bar *(psi)*
		Approximate Maximum for "A1" microswitch	
L02	1.5 - 15.0 *(0.602 - 6.021)*	3 *(1.204)*	2 *(29.00)*
L03	5.0 - 25.0 *(2.007 - 10.037)*	5 *(2.007)*	2 *(29.00)*
L05	10.0 - 50.0 *(4.015 - 20.073)*	5 *(2.007)*	2 *(29.00)*
L10	10.0 - 100.0 *(4.015 - 40.146)*	10 *(4.015)*	2 *(29.00)*
L15	10.0 - 150.0 *(4.015 - 60.22)*	10 *(4.015)*	2 *(29.00)*
L25	20.0 - 250.0 *(8.029 - 100.36)*	15 *(6.021)*	2 *(29.00)*
L35	50.0 - 350.0 *(20.073 - 140.52)*	25 *(10.036)*	2 *(29.00)*

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

* **Note :**
Microswitches A2 through A9 can be supplied in some ranges and differentials will vary with microswitch used. Please contact sales office for details. Please check availability of adjustable differential with sales office.

HOW TO ORDER INDUSTRIAL LOW RANGE PRESSURE SWITCHES

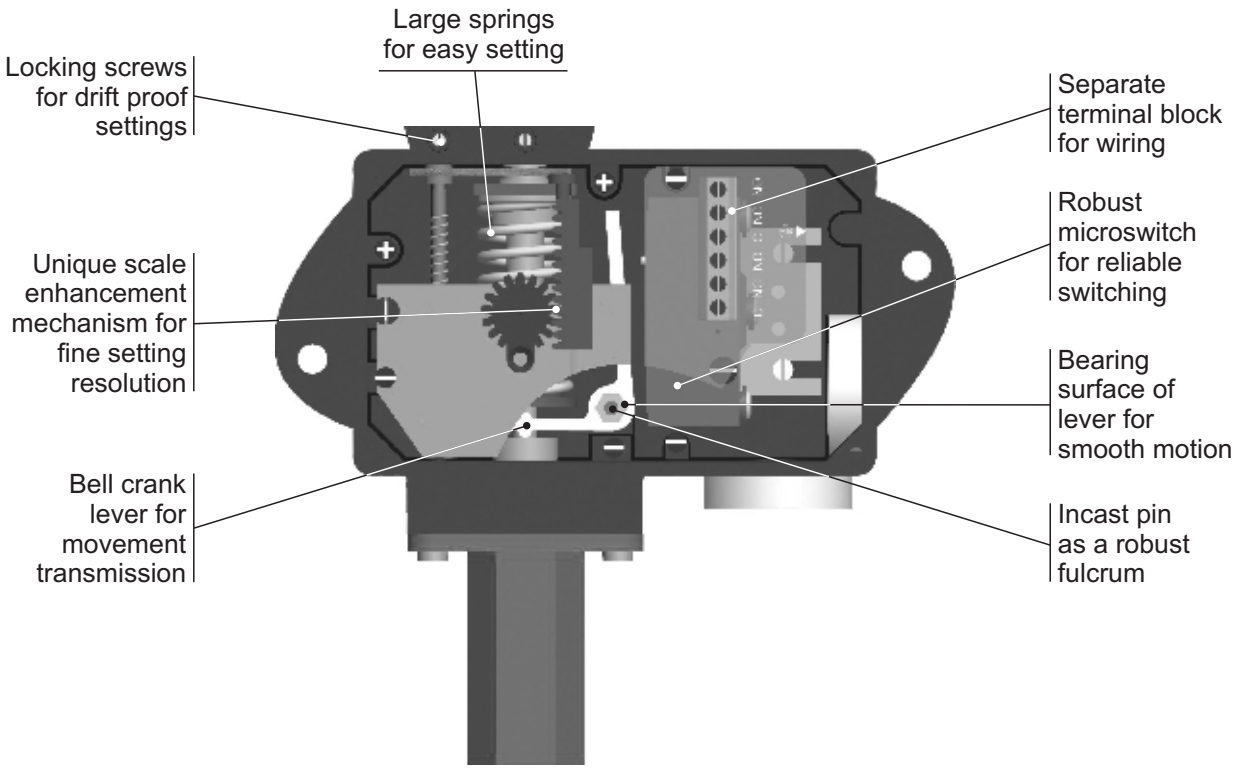
Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
Non standard allocation	Model	Cable Entry Size	Switch Type	Range Code (values in mbar)	Microswitch Type	Pressure Port Material / Size	Diaphragm
☐ Reserved for non-standard options not covered in catalogue. Will be given by manufacturer, only after agreement of supply details with customer.	**MD** = Industrial pressure switch with diecast Aluminium enclosure to IP66 as per IS2147	**1** = ½ " NPT threads **2** = ¾" NPT threads **3** = M20 X 1.5 threads	**PF1** = pressure switch, fixed differential without scale **PF2** = pressure switch, fixed differential with scale in mbar **PF3** = pressure switch, fixed differential with scale in "wc ***PA1** = pressure switch, adjustable differential without scale ***PA2** = pressure switch, adjustable differential with scale in mbar ***PA3** = pressure switch, adjustable differential with scale in "wc *Available with A9 (in group 6) only	**L02** = (1.5 - 15) **L03** = (5 - 25) **L05** = (10 - 50) **L10** = (10 - 100) **L15** = (10 - 150) **L25** = (20 - 250) **L35** = (50 - 350)	**A1** = General purpose microswitch rated at 15 A; 250 VAC ***A2 =** Hermetically sealed for corrosive environments ***A3 =** gold plated contacts for low voltage applications ***A4 =** DPDT configuration ***A5 =** for high DC ratings ***A7** = 2SPDT switching elements ***A9** = General purpose microswitch rated at 5 A; 250 VAC Please refer page no. 230 for more microswitch options * Please refer note under Range Selection Table	**M1** = M.S. powder coated / ¼" BSP(F) **M2** = M.S. powder coated / ¼" NPT(F) **S1** = SS316 / ¼" BSP(F) **S2** = SS316 / ¼" NPT(F) Please refer page no. 226 & 227 for more pressure port options	**0** = Neoprene **1** = Teflon **2** = SS316L

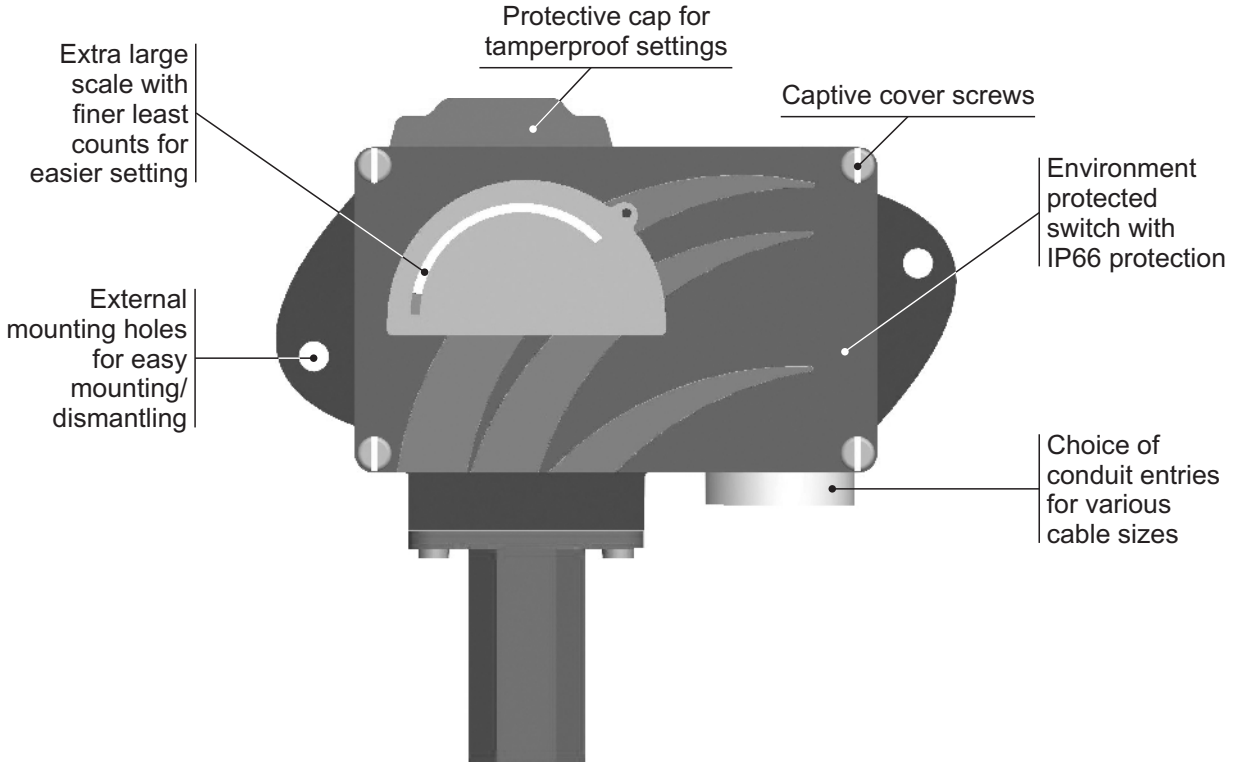
eg. A low range weatherproof switch, with ½" NPT cable entry in aluminium housing as 1SPDT pressure switch, fixed differential without scale, having 5 mbar to 25 mbar pressure range, with 15 Amp. microswitch, SS316 pressure housing with ¼" BSP port size & neoprene diaphragm shall be specified by

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
☐	MD	1	PF1	L03	A1	S1	0

Please specify full model number to avoid ambiguity.

MD HYDRAULIC RANGE PRESSURE SWITCHES



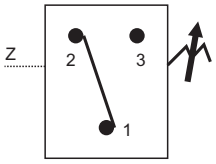


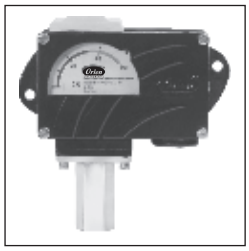
Approximate Weight : 0.850 Kg.

Some Applications : Used where oil is a working medium.

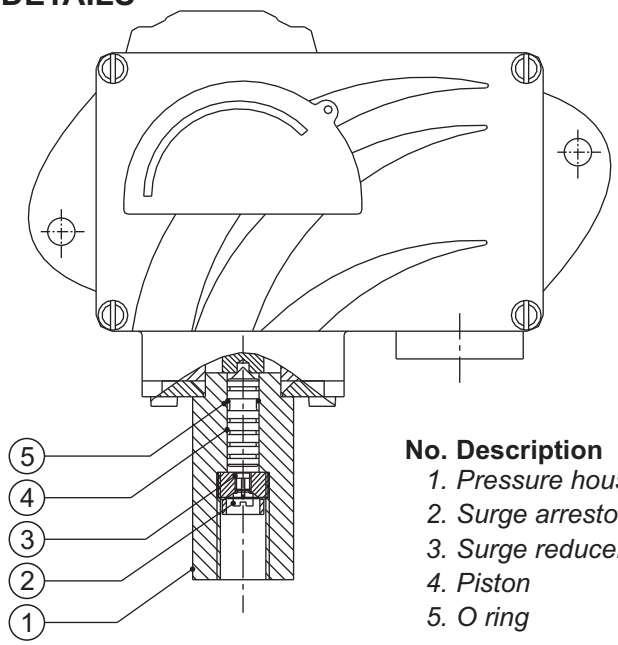
Electrical Connection :

Fig. 2





PRESSURE CAPSULE DETAILS

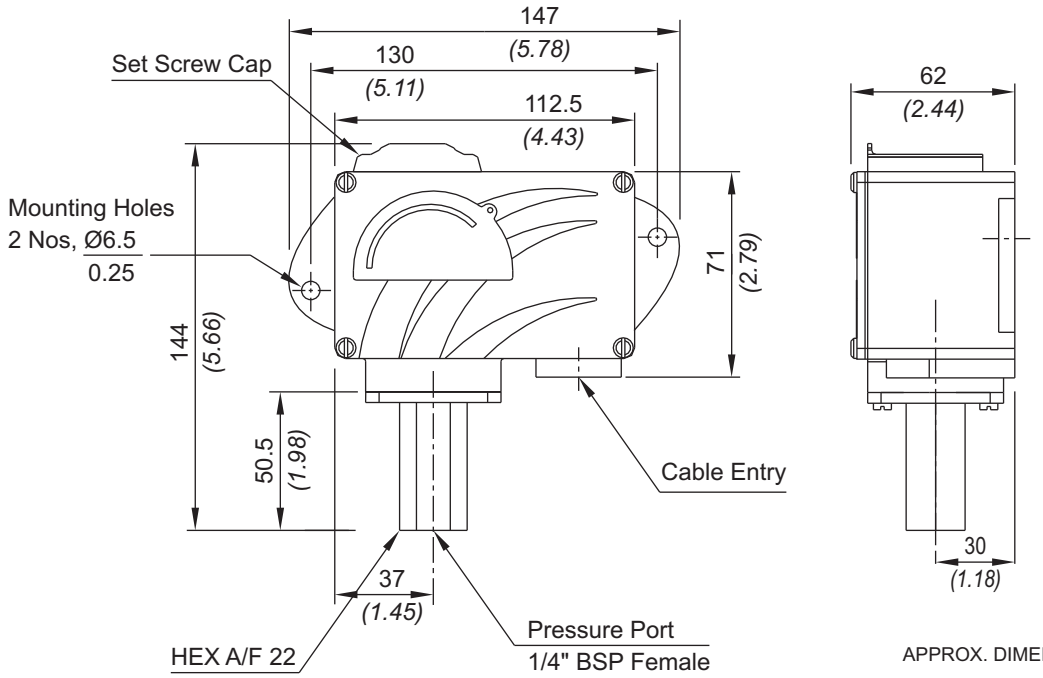


No. Description

1. *Pressure housing*
2. *Surge arrestor*
3. *Surge reducer*
4. *Piston*
5. *O ring*

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING



APPROX. DIMENSIONS IN mm / *inches*

MD HYDRAULIC RANGE PRESSURE SWITCHES

RANGE SELECTION TABLE

Range Code	Range bar *(psi)*	Differential* bar *(psi)*	Maximum Working Pressure bar *(psi)*
		Approximate Maximum for "A1" microswitch	
040	5 - 40 *(72.52 - 580.15)*	5 *(72.52)*	80 *(1160.30)*
100	10 - 100 *(145.04 - 1450.38)*	12 *(174.05)*	120 *(1740.45)*
200	7 - 200 *(101.53 - 2900.76)*	24 *(348.09)*	200 *(2900.76)*
350	35 - 350 *(507.63 - 5076.33)*	30 *(435.11)*	500 *(7251.9)*
400	100 - 400 *(1450.38 - 5801.52)*	30 *(435.11)*	400 *(5801.52)*

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

* **Note :**
Microswitches A2 through A7 can be supplied in some ranges and differentials will vary with microswitch used. Please contact sales office for details. Please check availability of adjustable differential with sales office.

HOW TO ORDER INDUSTRIAL HYDRAULIC RANGE PRESSURE SWITCHES

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
Non standard allocation	Model	Cable Entry Size	Switch Type	Range Code (values in bar)	Microswitch Type	Pressure Port Material / Size	Piston
☐ Reserved for non-standard options not covered in catalogue. Will be given by manufacturer, only after agreement of supply details with customer.	**MD** = Industrial pressure switch with diecast Aluminium enclosure to IP66 as per IS2147	**1** = ½ " NPT threads **2** = ¾" NPT threads **3** = M20 X 1.5 threads	**PF1** = pressure switch, fixed differential without scale **PF2** = pressure switch, fixed differential with scale in bar **PF3** = pressure switch, fixed differential with scale in psi ***PA1** = pressure switch, adjustable differential without scale ***PA2** = pressure switch, adjustable differential with scale in bar ***PA3** = pressure switch, adjustable differential with scale in psi *Available with A9 (in group 6) only	**040** = (5 - 40) **100** = (10 - 100) **200** = (7 - 200) **350** = (35 - 350) **400** = (100 - 400)	**A1** = General purpose microswitch rated at 15 A; 250 VAC ***A2 =** Hermetically sealed for corrosive environments ***A3 =** gold plated contacts for low voltage applications ***A4 =** DPDT configuration ***A5 =** for high DC ratings ***A7** = 2SPDT switching elements ***A9** = General purpose microswitch rated at 5 A; 250 VAC Please refer page no. 230 for more microswitch options * Please refer note under Range Selection Table	**S1** = SS316 / ¼" BSP(F) **S2** = SS316 / ¼" NPT(F) Please refer page no. 226 & 227 for more pressure port options	**2** = SS

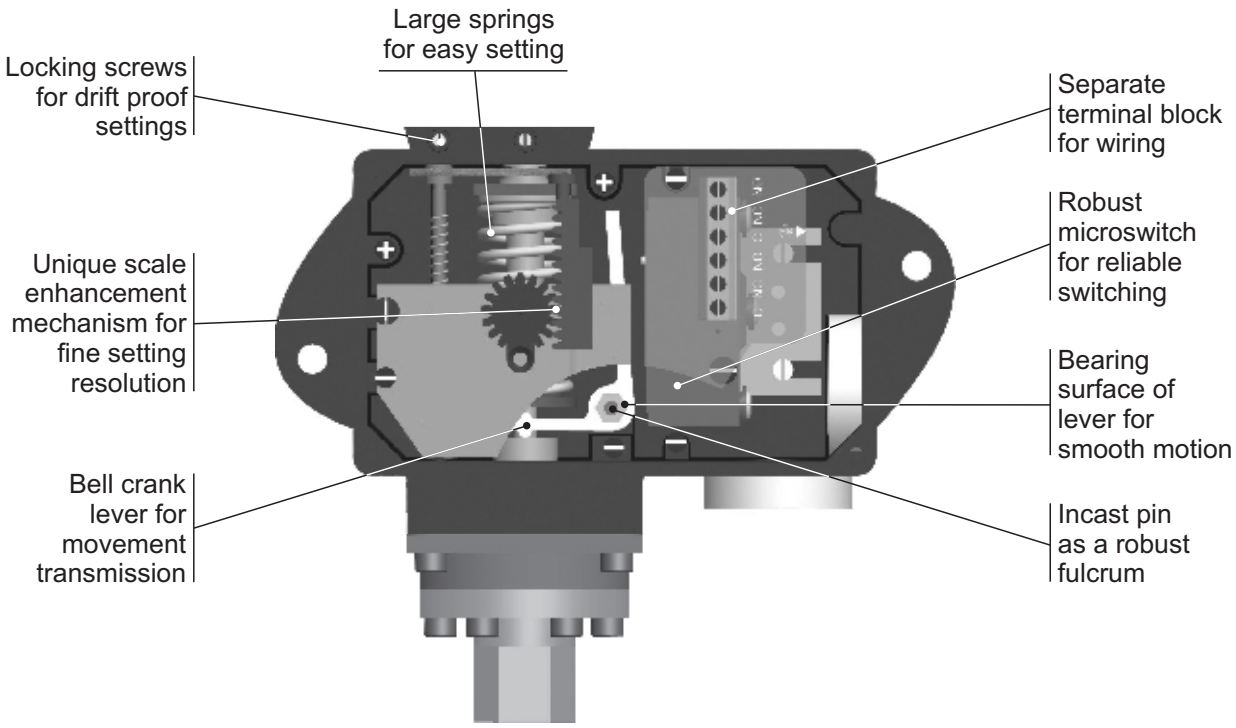
eg. A hydraulic weatherproof switch, with ½" NPT cable entry in aluminium housing as 1SPDT pressure switch, fixed differential without scale, having 5 bar to 40 bar pressure range, with 15 Amp. microswitch, SS316 pressure housing with ¼" BSP port size shall be specified by

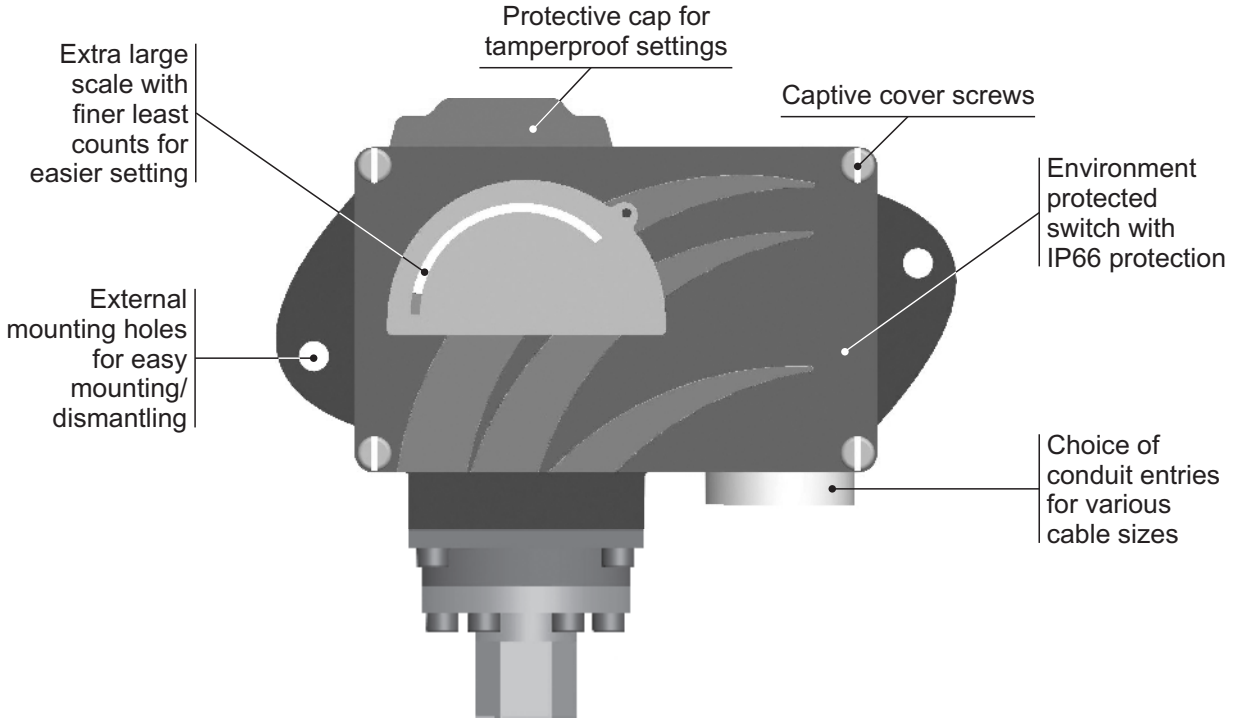
Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
☐	MD	1	PF1	040	A1	S1	-

Please specify full model number to avoid ambiguity.

Bulletin No. KA121024

MD HYDRAULIC DIAPHRAGM SWITCH



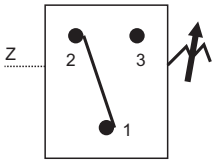


Approximate Weight : 1.2 Kg.

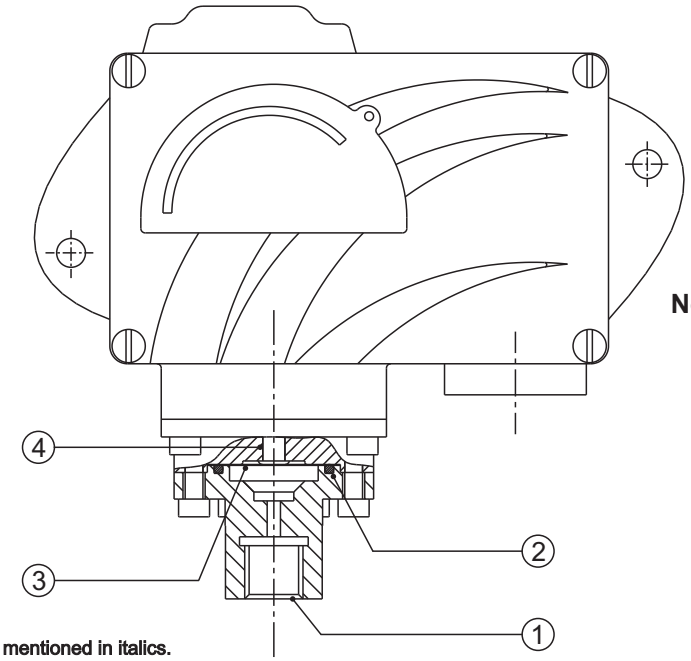
Some Applications : Used for high pressure compressor systems, mainly used for gaseous media.

Electrical Connection :

Fig. 2



PRESSURE CAPSULE DETAILS

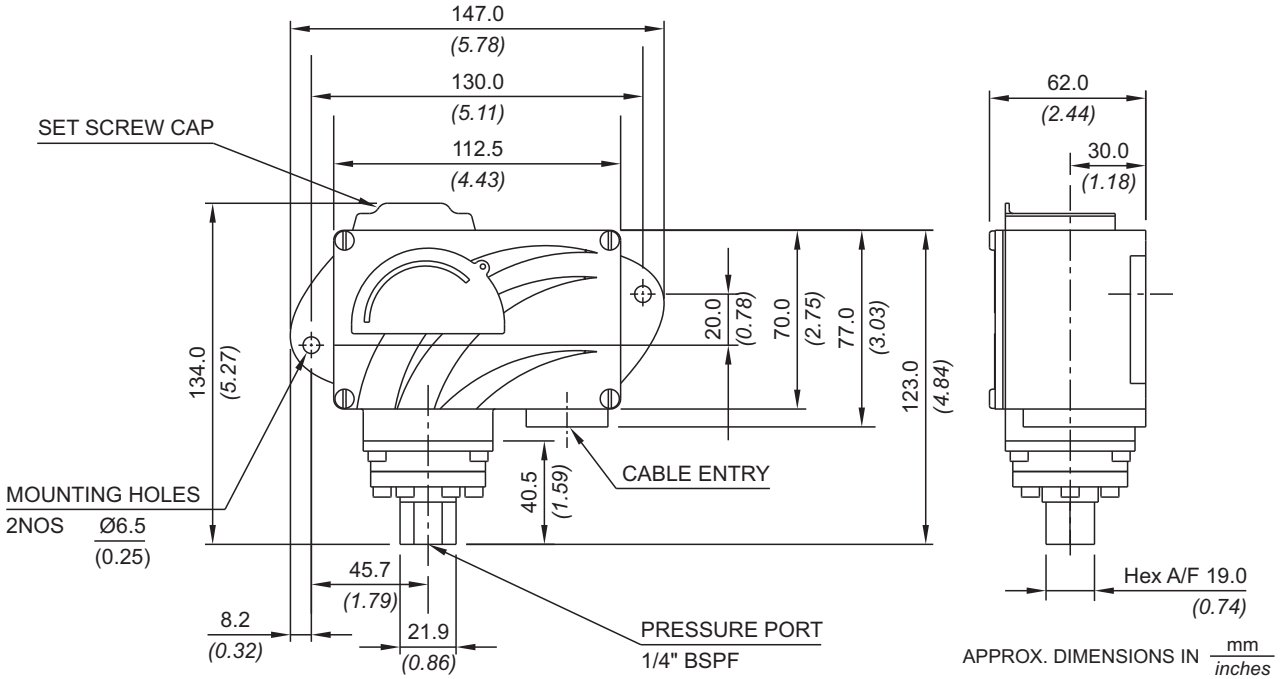


No. Description

1. *Pressure Housing*
2. *Teflon® O-Ring*
3. *Diaphragm*
4. Plunger

Note : ***wetted parts*** **are mentioned in italics.**

INSTALLATION DRAWING



APPROX. DIMENSIONS IN mm / *inches*

MD HYDRAULIC DIAPHRAGM SWITCH

RANGE SELECTION TABLE

Range Code	Range bar *(psi)*	Differential* bar *(psi)*	Maximum Working Pressure bar *(psi)*
		Approximate Maximum for "A1" microswitch	
H1T	0.5 - 10 *(7.25 - 145.04)*	0.5 *(7.25)*	150 *(2175.57)*
H2T	2 - 20 *(29.00 - 290.07)*	2 *(29.00)*	200 *(2900.76)*
H4T	5 - 40 *(72.52 - 580.15)*	5 *(72.52)*	200 *(2900.76)*
H1H	10 - 100 *(145.04 - 1450.38)*	12 *(174.05)*	200 *(2900.76)*
H2H	7 - 200 *(101.53 - 2900.76)*	24 *(348.09)*	400 *(5801.52)*
H4H	40 - 400 *(580.15 - 5801.52)*	70 *(1015.27)*	500 *(7251.9)*

* Minimum differential increases with setpoint (Graphs available on request)
* Differentials of miroswitches A2 through A9 will vary. Differentials for A7 are typically twice that for A1 microswitch. Please indicate specifically the differential value in enquiry/order, when it is critical in your application.

HOW TO ORDER INDUSTRIAL HYDRAULIC DIAPHRAGM RANGE PRESSURE SWITCHES

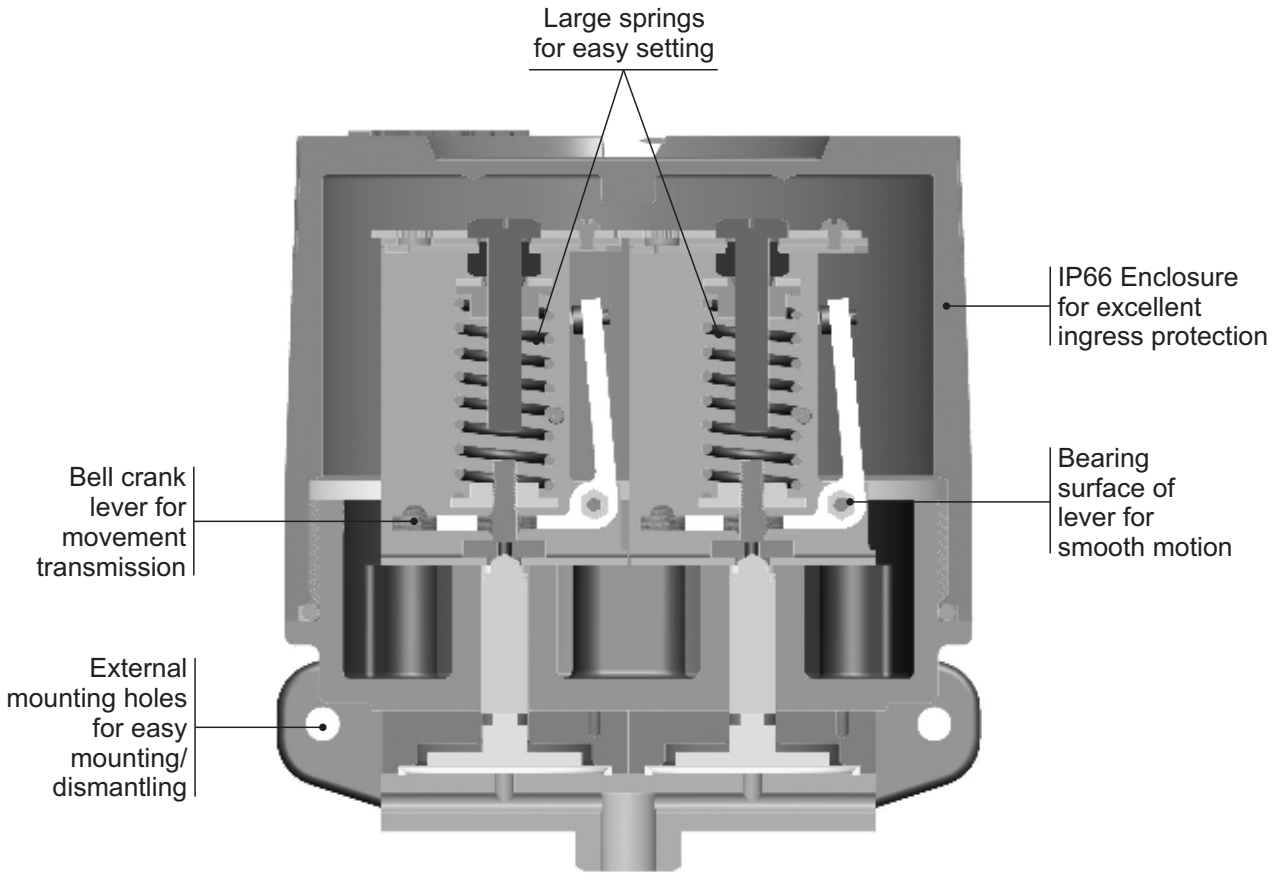
Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
Non standard allocation	Gas Group Classification	Cable Entry Size	Switch Type	Range Code (values in bar)	Microswitch Type	Pressure Port Material / Size	Diaphragm
☐ Reserved for non-standard options not covered in catalogue. Will be given by manufacturer, only after agreement of supply details with customer.	**MD** = Industrial pressure switch with diecast Aluminium enclosure to IP66 as per IS2147	**1** = ½ " NPT threads **2** = ¾" NPT threads **3** = M20 X 1.5 threads	**PF1** = pressure switch, fixed differential without scale **PF2** = pressure switch, fixed differential with scale in bar **PF3** = pressure switch, fixed differential with scale in psi ***PA1** = pressure switch, adjustable differential without scale ***PA2** = pressure switch, adjustable differential with scale in bar ***PA3** = pressure switch, adjustable differential with scale in psi *Available with A9 (in group 6) only	**H1T** = (0.5 - 10) **H2T** = (2 - 20) **H4T** = (5 - 40) **H1H** = (10 - 100) **H2H** = (7 - 200) **H4H** = (40 - 400)	**A1** = General purpose microswitch rated at 15 A; 250 VAC ***A2 =** Hermetically sealed for corrosive environments ***A3 =** gold plated contacts for low voltage applications ***A4 =** DPDT configuration ***A5 =** for high DC ratings ***A7** = 2SPDT switching elements ***A9** = General purpose microswitch rated at 5 A; 250 VAC Please refer page no. 230 for more microswitch options * Please refer note under Range Selection Table	**S1** = SS316 / ¼" BSP(F) **S2** = SS316 / ¼" NPT(F) Please refer page no. 226 & 227 for more pressure port options	**2** = SS316L

eg. A hydraulic diaphragm pressure switch, with ½" NPT cable entry in aluminium housing as 1SPDT pressure switch, fixed differential without scale, having 5 bar to 40 bar pressure range, with 15Amp. microswitch, SS316 pressure housing with ¼" BSP port size shall be specified by

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
☐	MD	1	PF1	H4T	A1	S1	2

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

Bulletin No. KA121024

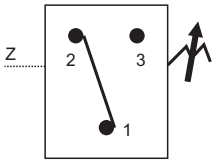


Approximate Weight : 3.5 Kg.

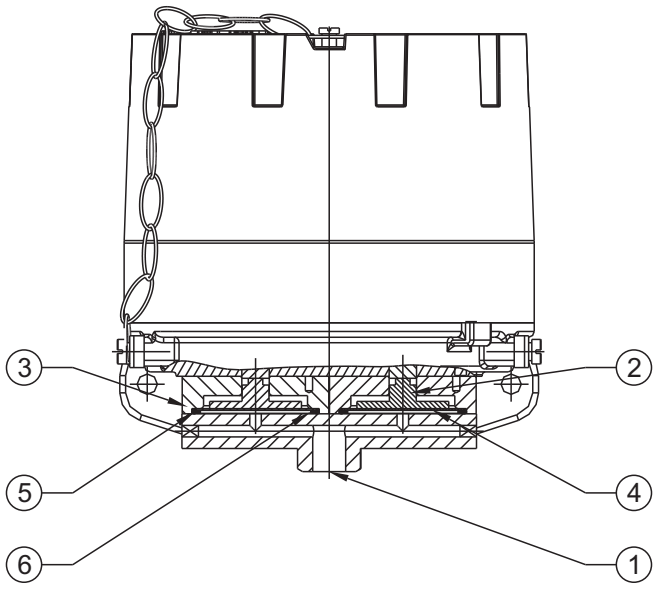
Some Applications : Used when two independent set points are required for HI-HI, LO-LO or HI-LO applications, typically alarm and trip functions.

Electrical Connection :

Fig. 2



PRESSURE CAPSULE DETAILS

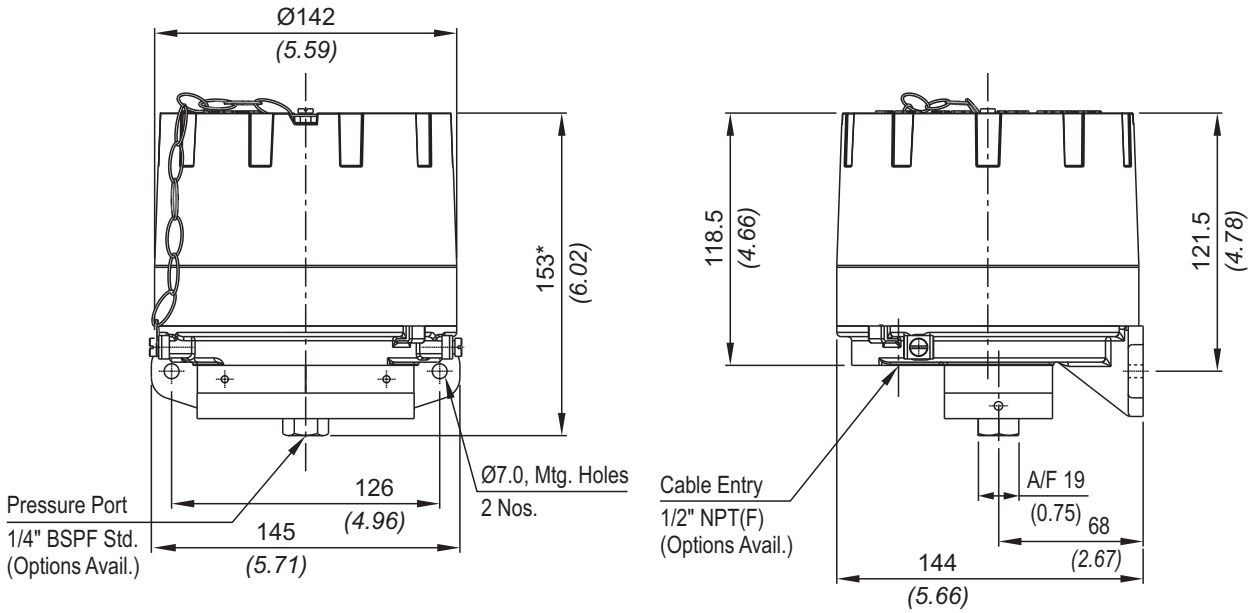


No. Description

1. *Pressure Port*
2. Plunger
3. Housing Plate
4. *Diaphragm*
5. *O-Ring*
6. *Backup Ring*

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING



*164mm (*6.45 inches*) for range codes H4T, H1H and H2H

APPROX. DIMENSIONS IN mm / *inches*

DS DUAL HIGH RANGE PRESSURE SWITCHES

RANGE SELECTION TABLE

Range Code	Range bar *(psi)*	Differential* bar *(psi)*	Maximum Working Pressure bar *(psi)*
		Approximate Maximum for "A8" microswitch	
LP†	0.067 - 0.213 *(0.97 - 3.09)*	0.05 *(0.72)*	5 *(72.52)*
LP5	0.1 - 0.5 *(1.45 - 7.25)*	0.10 *(1.45)*	5 *(72.52)*
H01	0.1 - 1.0 *(1.45 - 14.50)*	0.10 *(1.45)*	12 *(174.05)*
H02	0.1 - 1.5 *(1.45 - 21.76)*	0.20 *(2.90)*	12 *(174.05)*
H03	0.2 - 2.6 *(2.90 - 37.71)*	0.20 *(2.90)*	12 *(174.05)*
H04	0.2 - 3.6 *(2.90 - 52.21)*	0.20 *(2.90)*	12 *(174.05)*
H07	0.5 - 7.0 *(7.25 - 101.50)*	0.40 *(5.80)*	12 *(174.05)*
H10	0.5 - 10.0 *(7.25 - 145.04)*	0.60 *(8.70)*	25 *(362.6)*
H15	1.0 - 15.0 *(14.50 - 217.56)*	0.60 *(8.70)*	25 *(362.6)*
H30	5.0 - 25.0 *(72.52 - 362.6)*	0.80 *(11.60)*	35 *(507.63)*
H4T	5.0 - 40.0 *(72.52 - 580.15)*	5 *(72.52)*	200 *(2900.76)*
H1H	10.0 - 100.0 *(146.04 - 1450.38)*	12 *(174.05)*	200 *(2900.76)*
H2H	7.0 - 200.0 *(101.52 - 2900.76)*	24 *(348.09)*	400 *(5801.88)*

*Minimum differential increases with setpoint (Graphs available on request), results for neoprene diaphragm.
†Range not available in SS316 L diaphragm.

HOW TO ORDER INDUSTRIAL DUAL HIGH RANGE PRESSURE SWITCHES

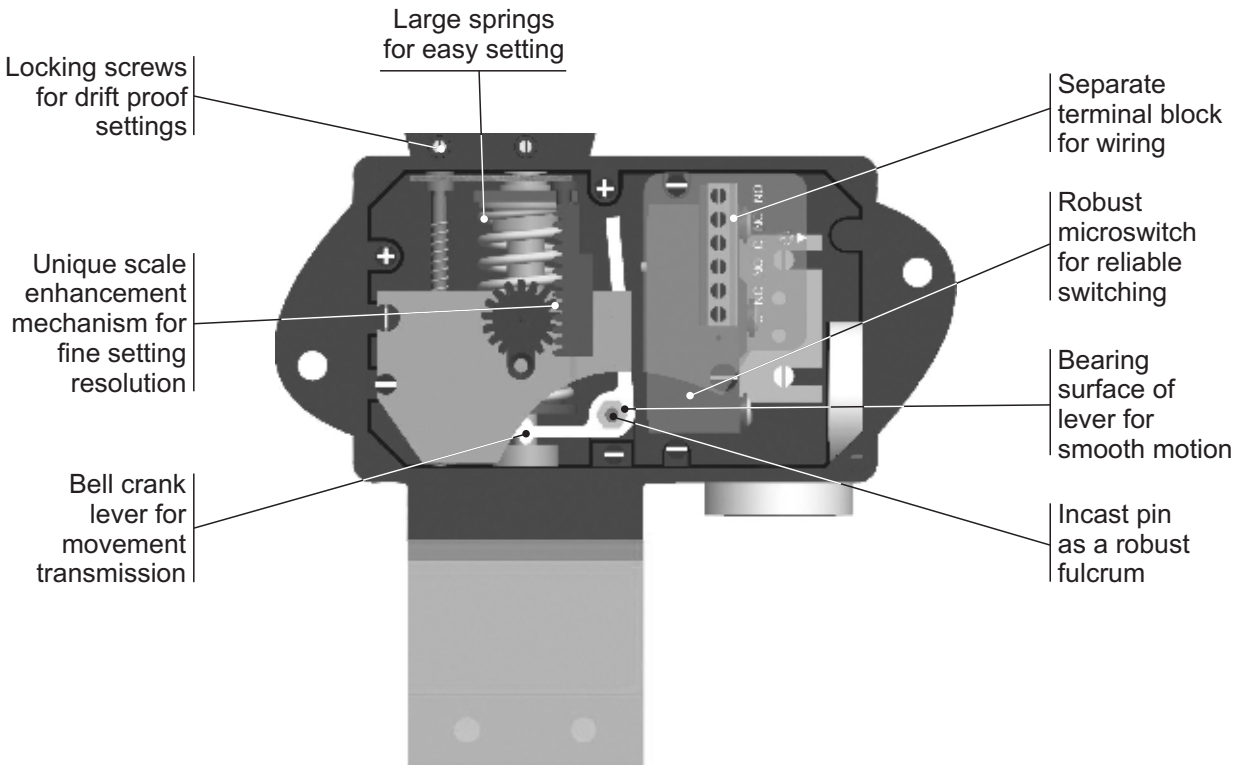
Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
Non standard allocation	Model	Cable Entry Size	Switch Type	Range Code (values in bar)	Microswitch Type	Pressure Port Material / Size	Diaphragm
☐ Reserved for non-standard options not covered in catalogue. Will be given by manufacturer, only after agreement of supply details with customer.	**DS** = Dual pressure switch with cast aluminium enclosure to IP66 as per IS2147	**1** = ½ " NPT threads **2** = ¾" NPT threads **3** = M20 X 1.5 threads	**PF2** = pressure switch, fixed differential with scale in bar **PF3** = pressure switch, fixed differential with scale in psi ***PA2** = pressure switch, adjustable differential with scale in bar ***PA3** = pressure switch, adjustable differential with scale in psi *Available with A9 (in group 6) only	**LP** = (0.067 - 0.213) **LP5** = (0.1 - 0.5) **H01** = (0.1 - 1.0) **H02** = (0.1 - 1.5) **H03** = (0.2 - 2.6) **H04** = (0.2 - 3.6) **H07** = (0.5 - 7.0) **H10** = (0.5 - 10.0) **H15** = (1.0 - 15.0) **H30** = (5.0 - 25.0) **H4T** = (5.0 - 40.0) **H1H** = (10.0 -100.0) **H2H** = (7.0 - 200.0)	**A8** = General purpose microswitch rated at 5 A; 250 VAC **A7** = 2SPDT microswitches **A9** = General purpose microswitch rated @ 5A, 250 VAC * Please refer note under Range Selection Table	**S1** = SS316 / ¼" BSP(F) **S2** = SS316 / ¼" NPT(F) Please refer page no. 226 & 227 for more pressure port options	**0** = Neoprene **1** = Teflon **2** = SS 316L

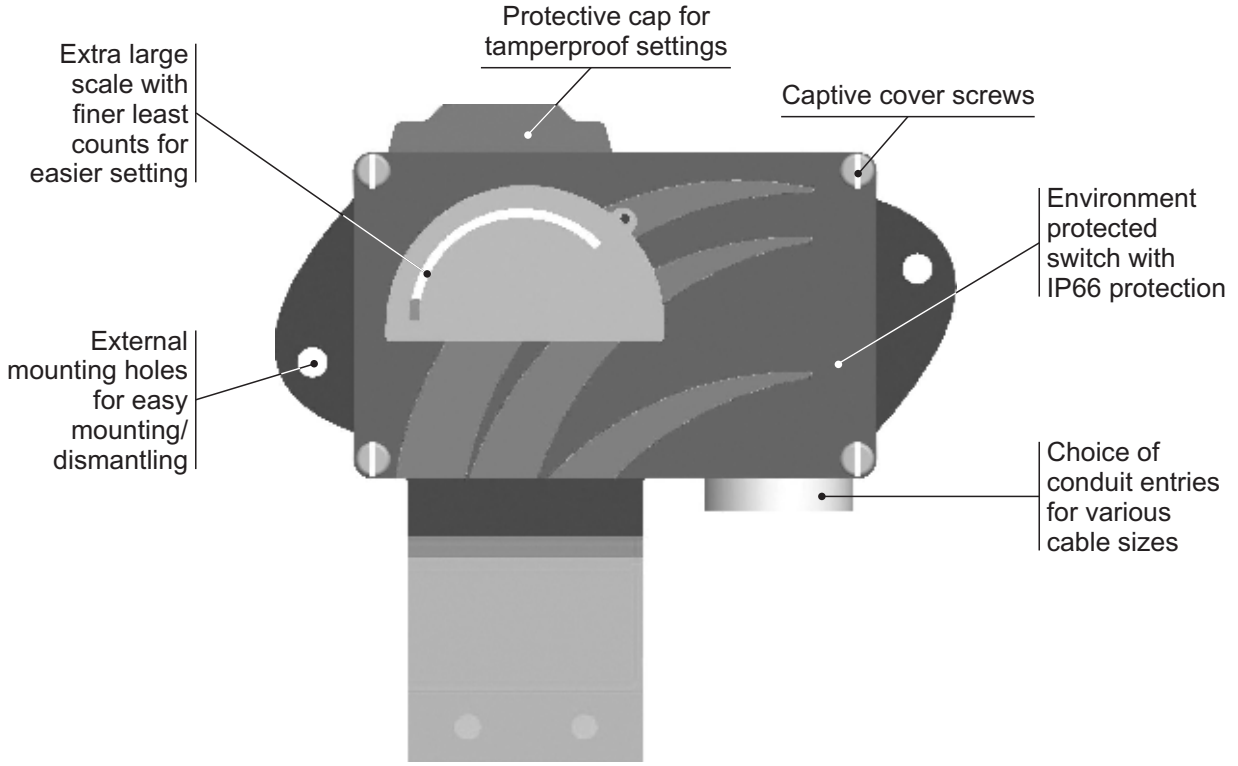
eg. A dual pressure switch with fixed differential having 0.1 bar to 1 bar pressure range, with 5 Amp. microswitch, SS316 pressure housing with ¼" BSP port size & neoprene diaphragm shall be specified by

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
☐	DS	3	PF2	H01	A8	S1	0

Please specify full model number to avoid ambiguity.

MD HIGH RANGE PRESSURE DIFFERENCE SWITCHES



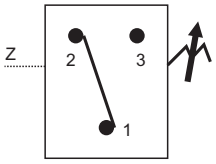


Approximate Weight : 1.500 Kg.

Some Applications : In non-hazardous areas for filters, strainers, cooling systems, etc.

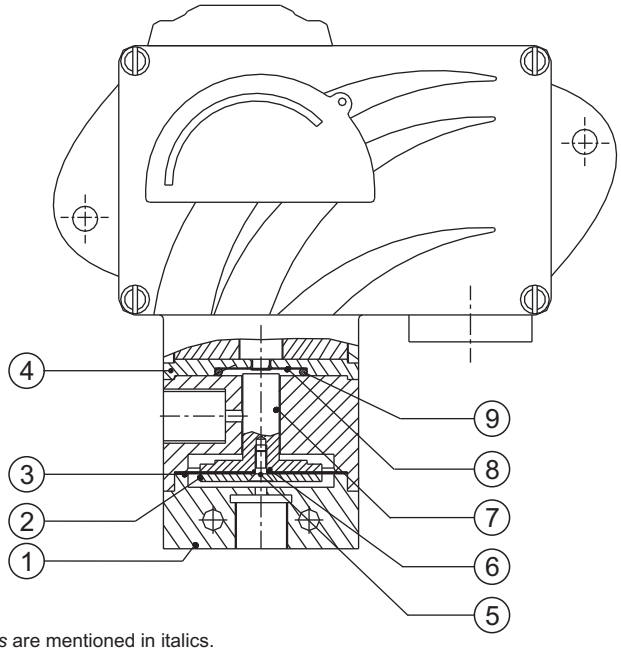
Electrical Connection :

Fig. 2



HIGH RANGE PRESSURE DIFFERENCE SWITCHES MD

PRESSURE CAPSULE DETAILS

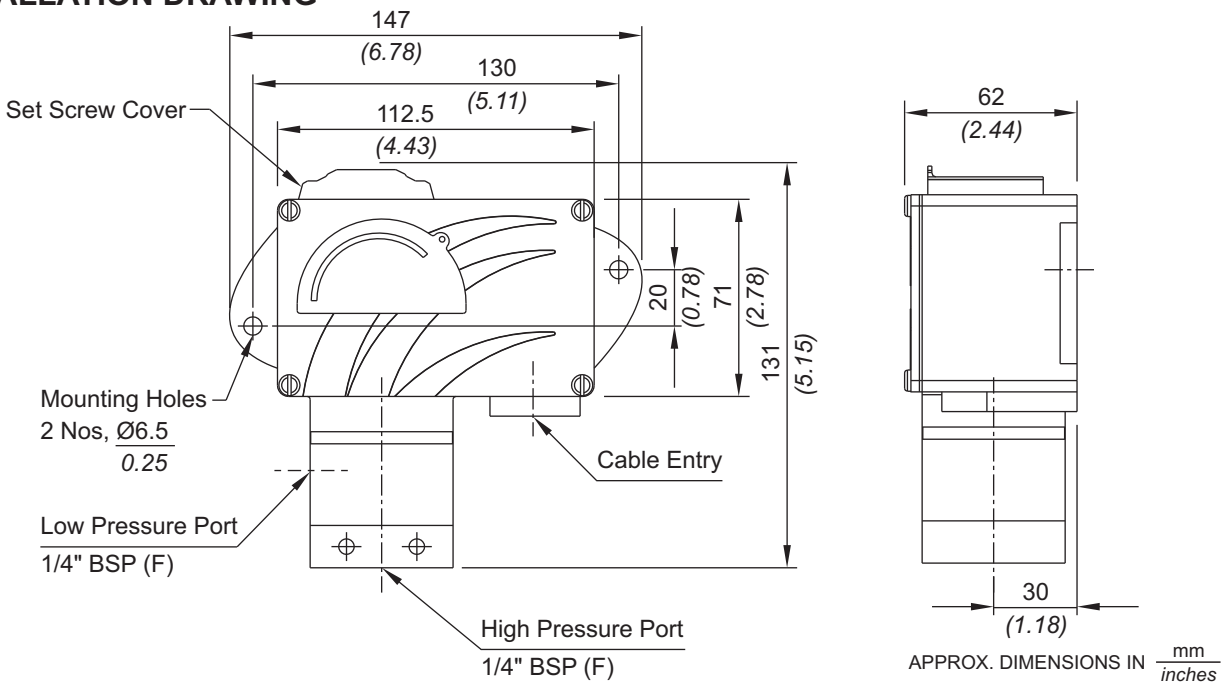


Note : *wetted parts* are mentioned in italics.

No. Description

1. *Pressure Housing*
2. *HP Plunger*
3. *Diaphragm*
4. *Disc*
5. *CSK Screw (SS)*
6. *O-Ring (Teflon®)*
7. *LP Plunger (SS316)*
8. *Sealing Diaphragm (Teflon®)*
9. *Sealing O-Ring (Teflon®)*

INSTALLATION DRAWING



APPROX. DIMENSIONS IN mm / *inches*

MD HIGH RANGE PRESSURE DIFFERENCE SWITCHES

RANGE SELECTION TABLE

Range Code	Range bar *(psi)*	Differential* bar *(psi)*	Maximum Working Pressure bar *(psi)*
		Approximate Maximum for "A1" microswitch	
H01	0.1 - 1.0 *(1.45 - 14.50)*	0.12 *(1.74)*	12 *(174.05)*
H02	0.1 - 1.5 *(1.45 - 21.76)*	0.20 *(2.90)*	12 *(174.05)*
H03	0.2 - 2.6 *(2.90 - 37.71)*	0.20 *(2.90)*	12 *(174.05)*
H04	0.2 - 3.6 *(2.90 - 52.21)*	0.30 *(4.35)*	12 *(174.05)*

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

* **Note :**
Microswitches A2 through A9 can be supplied in some ranges and differentials will vary with microswitch used. Please contact sales office for details. Please check availability of adjustable differential with sales office.

HOW TO ORDER INDUSTRIAL HIGH RANGE PRESSURE DIFFERENCE SWITCHES

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
Non standard allocation	Model	Cable Entry Size	Switch Type	Range Code (values in bar)	Microswitch Type	Pressure Port Material / Size	Diaphragm
☐ Reserved for non-standard options not covered in catalogue. Will be given by manufacturer, only after agreement of supply details with customer.	**MD** = Industrial pressure switch with diecast Aluminium enclosure to IP66 as per IS2147	**1** = ½ " NPT threads **2** = ¾" NPT threads **3** = M20 X 1.5 threads	**DF1** = pressure difference switch, fixed differential without scale **DF2** = pressure difference switch, fixed differential with scale in bar **DF3** = pressure difference switch, fixed differential with scale in psi ***DA1** = pressure difference switch, adjustable differential without scale ***DA2** = pressure difference switch, adjustable differential with scale in bar ***DA3** = pressure difference switch, adjustable differential with scale in psi *Available with A9 (in group 6) only	**H01** = (0.1 - 1.0) **H02** = (0.1 - 1.5) **H03** = (0.2 - 2.6) **H04** = (0.2 - 3.6)	**A1** = General purpose microswitch rated at 15 A; 250 VAC ***A2 =** Hermetically sealed for corrosive environments ***A3 =** gold plated contacts for low voltage applications ***A4 =** DPDT configuration ***A5 =** for high DC ratings ***A7** = 2SPDT switching elements Please refer page no. 230 for more microswitch options * Please refer note under Range Selection Table	**A1** = Aluminium / ¼" BSP(F) **A2** = Aluminium / ¼" NPT(F) **S1** = SS316 / ¼" BSP(F) **S2** = SS316 / ¼" NPT(F) Please refer page no. 226 & 227 for more pressure port options	**0** = Neoprene **1** = Teflon

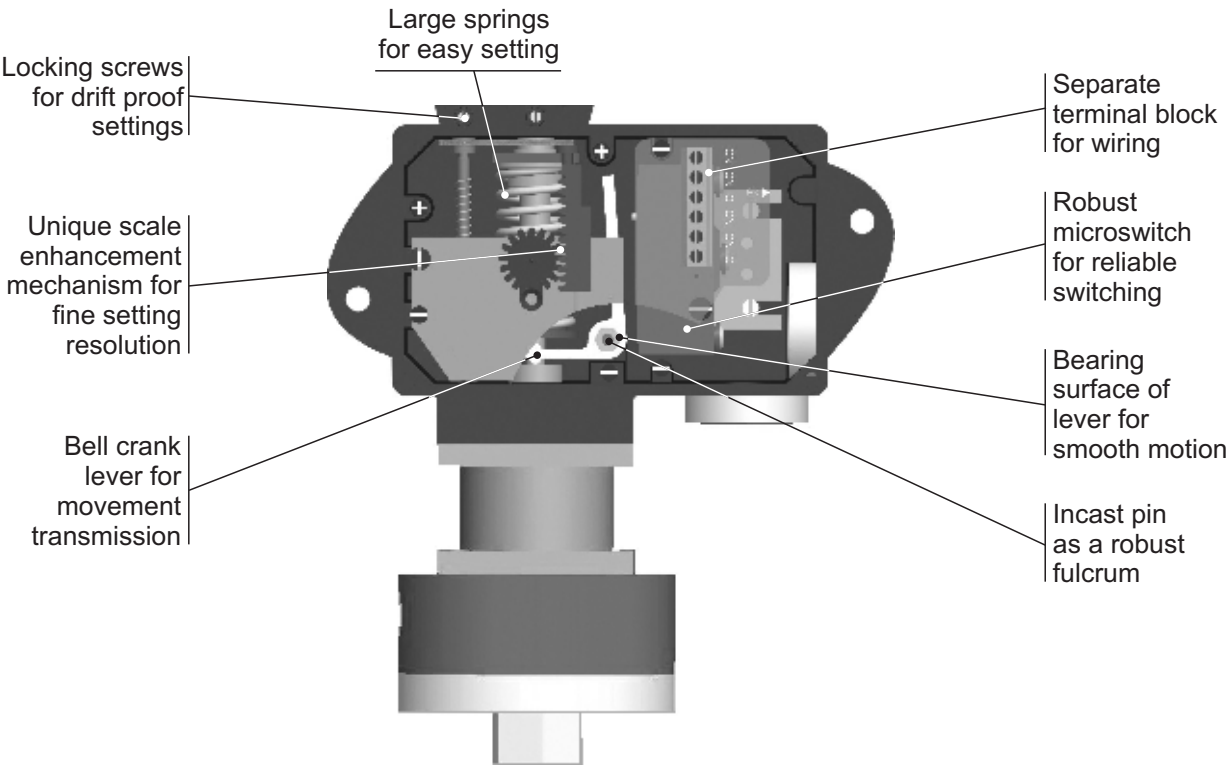
eg. A high range pressure difference weatherproof switch, with ½" NPT cable entry in aluminium housing as 1SPDT pressure switch, fixed differential without scale, having 0.1 bar to 1 bar pressure range, with 15 Amp. microswitch, SS316 pressure housing with ¼" BSP port size & neoprene diaphragm shall be specified by

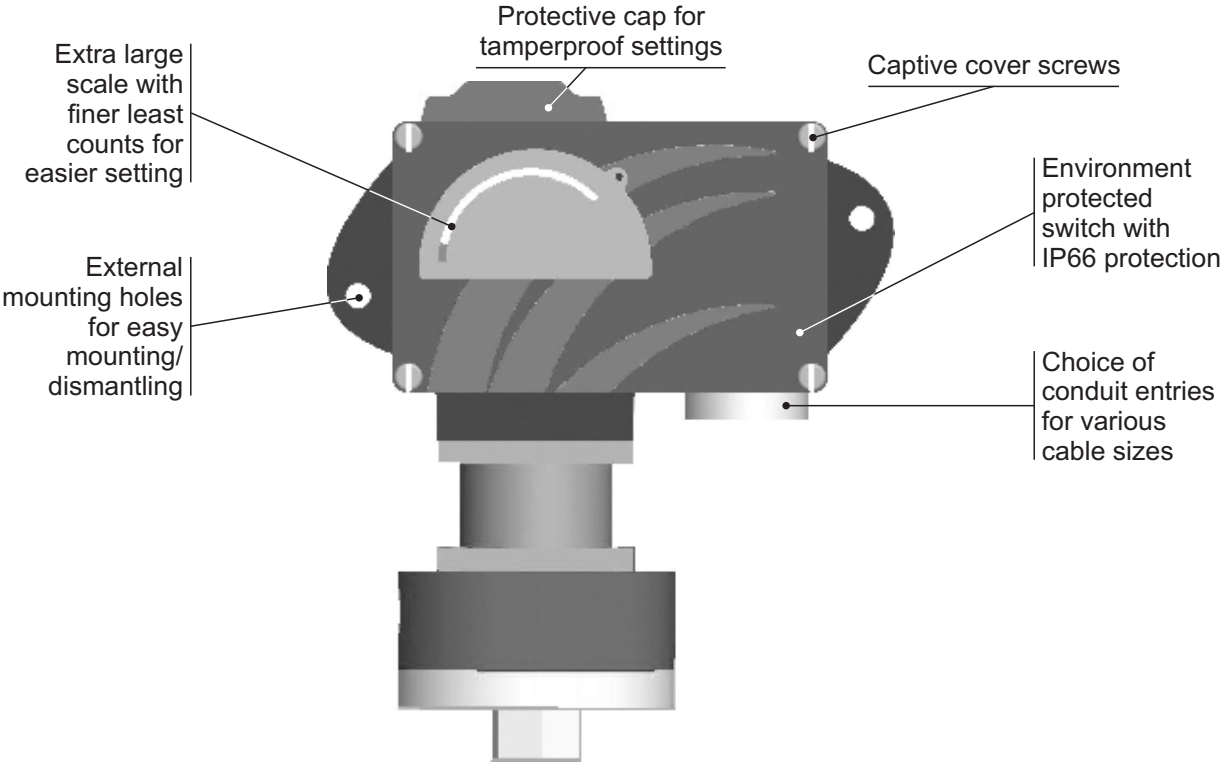
Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
☐	MD	1	DF1	H01	A1	S1	0

Please specify full model number to avoid ambiguity.

Bulletin No. KA121024

MD HIGH PROOF HIGH RANGE PRESSURE DIFFERENCE SWITCHES



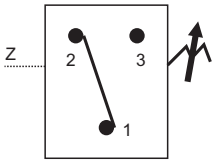


Approximate Weight : 2.000 Kg.

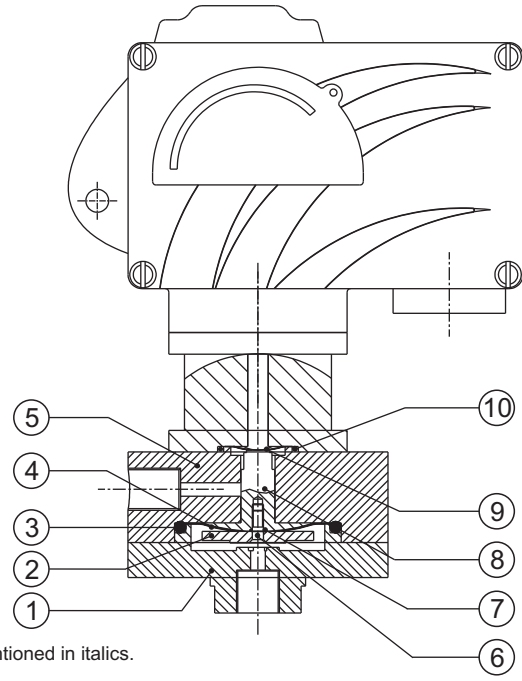
Some Applications : Applications requiring high static/system pressure but low pressure difference.

Electrical Connection :

Fig. 2



PRESSURE CAPSULE DETAILS

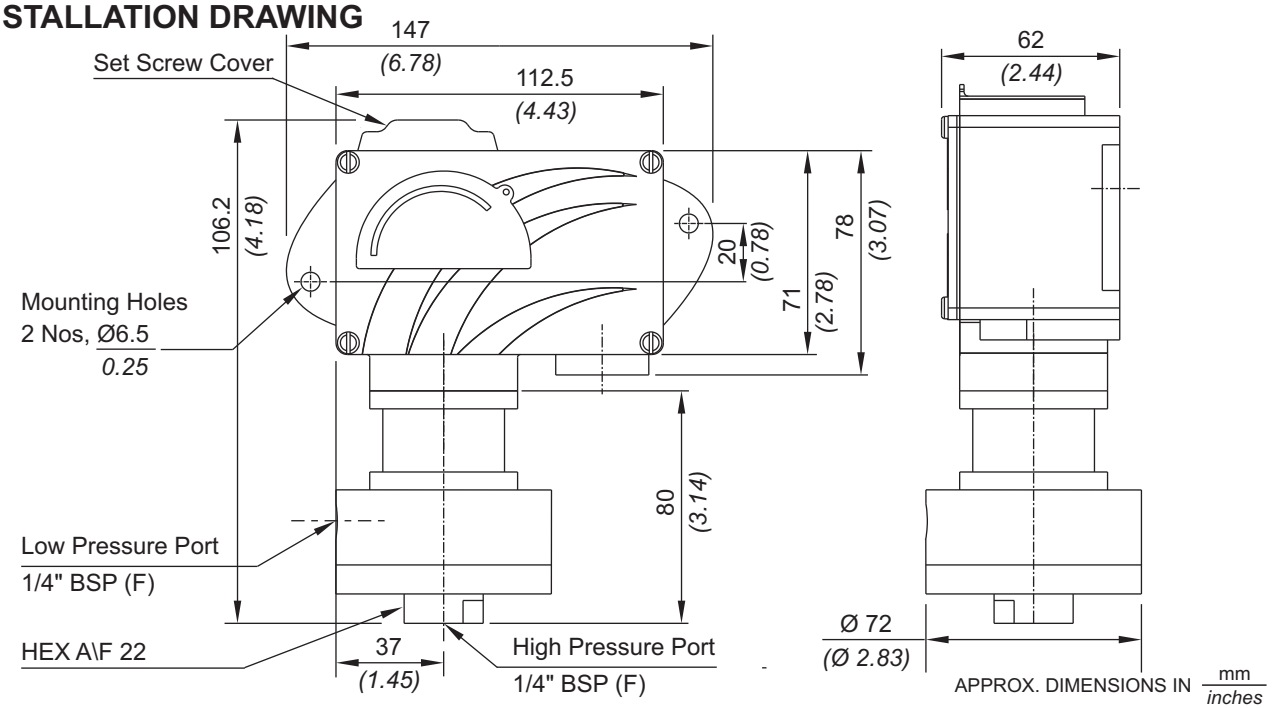


Note : *wetted parts* are mentioned in italics.

No. Description

1. *Pressure Housing*
2. *HP Plunger*
3. *Sealng O-Ring*
4. *Diaphragm*
5. *Disc*
6. *CSK Screw (SS)*
7. *O-Ring (Teflon®)*
8. *LP Plunger (SS316)*
9. *Sealing Diaphragm (Teflon®)*
10. *Sealing O-Ring (Teflon®)*

INSTALLATION DRAWING



MD HIGH PROOF HIGH RANGE PRESSURE DIFFERENCE SWITCHES

RANGE SELECTION TABLE

Range Code	Range bar *(psi)*	Differential* bar *(psi)*	Maximum Working Pressure bar *(psi)*
		Approximate Maximum for "A1" microswitch	
P01	0.1 - 1.0 *(1.45 - 14.50)*	0.24 *(3.48)*	200 *(2900.76)*
P02	0.1 - 1.5 *(1.45 - 21.76)*	0.40 *(5.80)*	200 *(2900.76)*
P03	0.2 - 2.6 *(2.90 - 37.71)*	0.40 *(5.80)*	200 *(2900.76)*
P04	0.2 - 3.6 *(2.90 - 51.21)*	0.60 *(8.71)*	200 *(2900.76)*

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

* **Note :**
Microswitches A2 through A9 can be supplied in some ranges and differentials will vary with microswitch used. Please contact sales office for details. Please check availability of adjustable differential with sales office.

HOW TO ORDER INDUSTRIAL HIGH PROOF HIGH RANGE PRESSURE DIFFERENCE SWITCHES

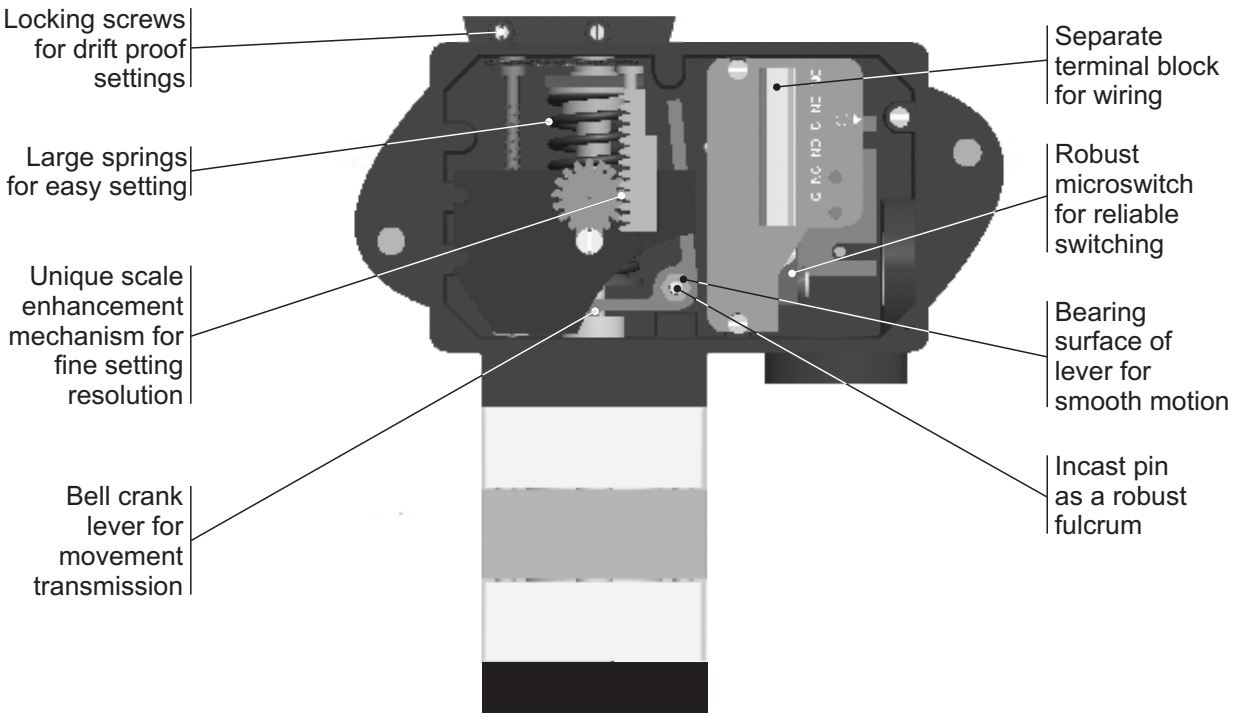
Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
Non standard allocation	Model	Cable Entry Size	Switch Type	Range Code (values in bar)	Microswitch Type	Pressure Port Material / Size	Diaphragm
☐ Reserved for non-standard options not covered in catalogue. Will be given by manufacturer, only after agreement of supply details with customer.	**MD** = Industrial pressure switch with diecast Aluminium enclosure to IP66 as per IS2147	**1** = ½ " NPT threads **2** = ¾" NPT threads **3** = M20 X 1.5 threads	**DF1** = pressure difference switch, fixed differential without scale **DF2** = pressure difference switch, fixed differential with scale in bar **DF3** = pressure difference switch, fixed differential with scale in psi ***DA1** = pressure difference switch, adjustable differential without scale ***DA2** = pressure difference switch, adjustable differential with scale in bar ***DA3** = pressure difference switch, adjustable differential with scale in psi *Available with A9 (in group 6) only	**P01** = (0.1 - 1.0) **P02** = (0.1 - 1.5) **P03** = (0.2 - 2.6) **P04** = (0.2 - 3.6)	**A1** = General purpose microswitch rated at 15 A; 250 VAC ***A2 =** Hermetically sealed for corrosive environments ***A3 =** gold plated contacts for low voltage applications ***A4 =** DPDT configuration ***A5 =** for high DC ratings ***A7** = 2SPDT switching elements ***A9** = General purpose microswitch rated at 5 A; 250 VAC Please refer page no. 230 for more microswitch options * Please refer note under Range Selection Table	**S1** = SS316 / ¼" BSP(F) **S2** = SS316 / ¼" NPT(F) Please refer page no. 226 & 227 for more pressure port options	**0** = Neoprene **1** = Teflon

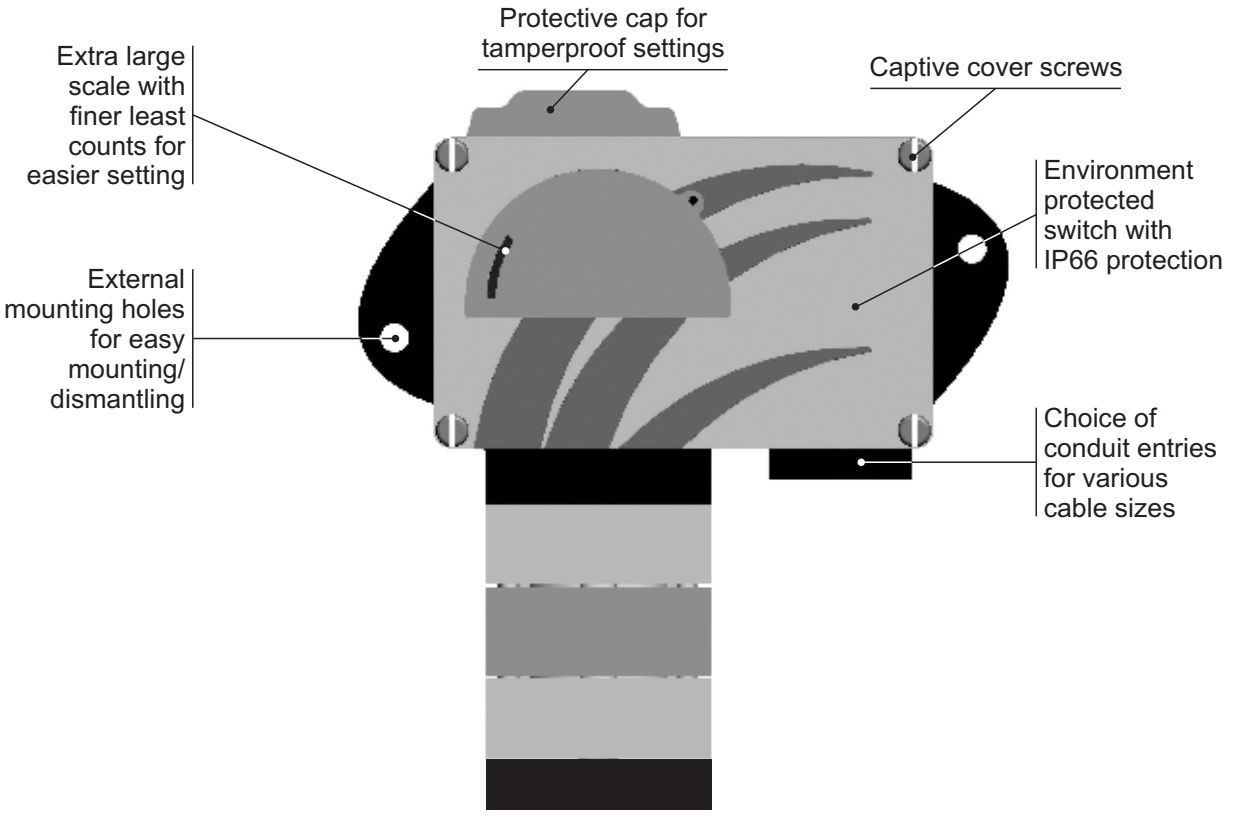
eg. A high proof high range pressure difference weatherproof switch, with ½" NPT cable entry in aluminium housing as 1SPDT pressure switch, fixed differential without scale, having 0.1 bar to 1 bar pressure range, with 15Amp. microswitch, SS316 pressure housing with ¼" BSP port size & neoprene diaphragm shall be specified by

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
☐	MD	1	DF1	P01	A1	S1	0

Please specify full model number to avoid ambiguity.

MD HIGH RANGE DP



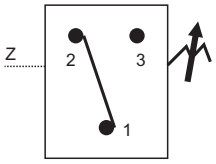


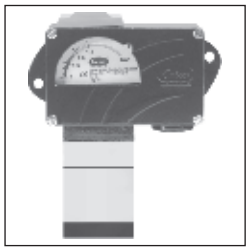
Approximate Weight : 2.500 Kg.

Some Applications : Applications requiring high static/system pressure but low pressure difference.

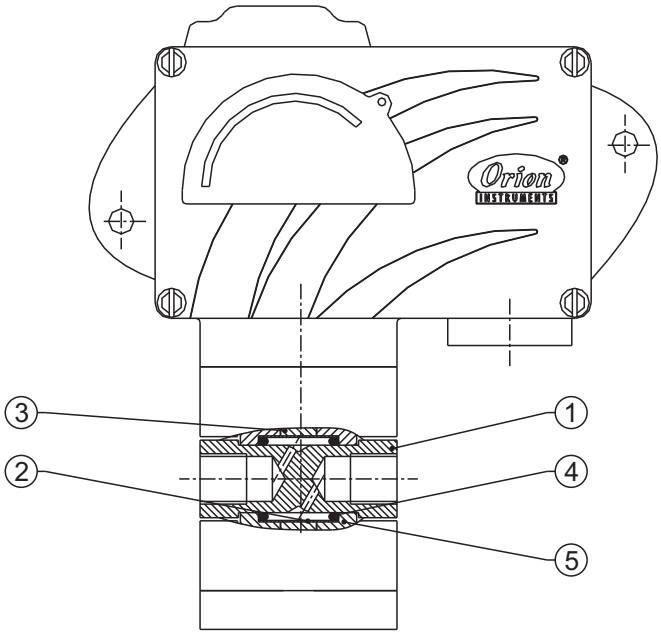
Electrical Connection :

Fig. 2





PRESSURE CAPSULE DETAILS

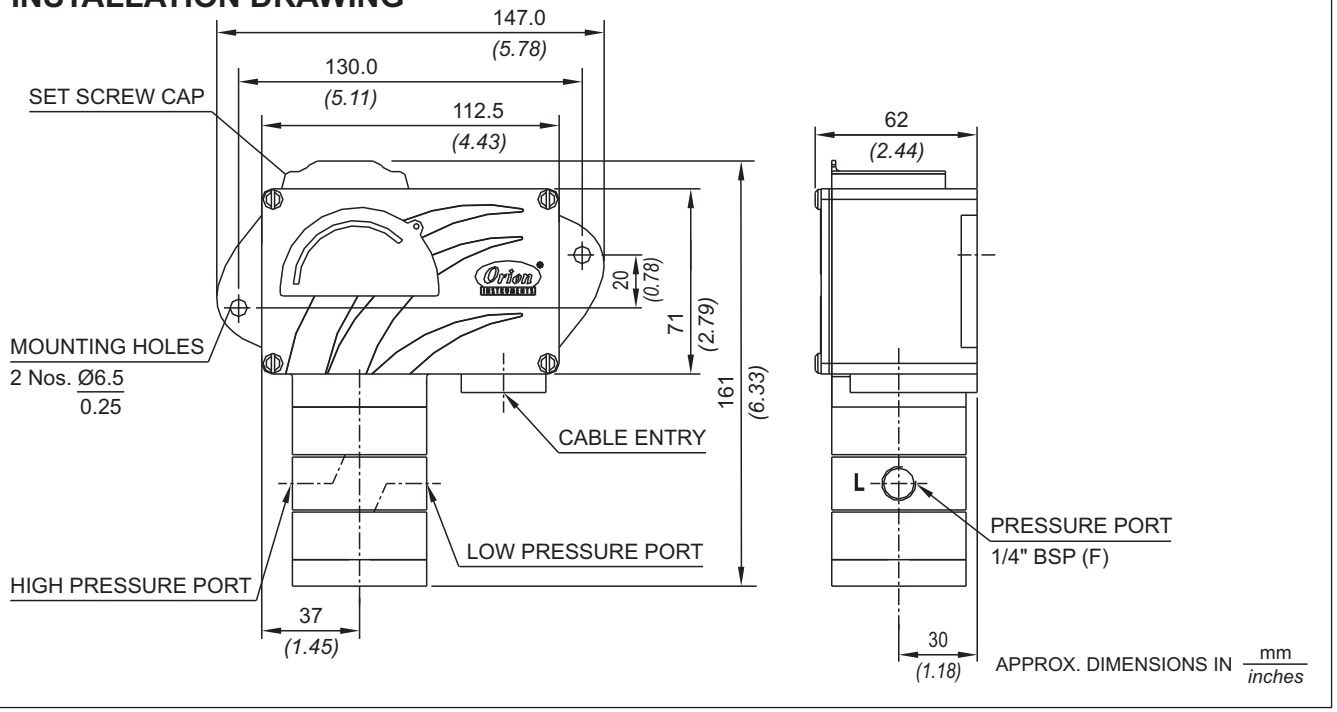


No. Description

1. *Pressure Housing*
2. *Diaphragm*
3. Plunger
4. *O-Ring*
5. Disc

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING



APPROX. DIMENSIONS IN mm / *inches*

MD HIGH RANGE DP

RANGE SELECTION TABLE

Range Code	Range bar *(psi)*	Differential* bar *(psi)*	Maximum Working Pressure bar *(psi)*
		Approximate Maximum for "A1" microswitch	
D01	0.1 - 1.0 *(1.45 - 14.50)*	0.12 *(1.74)*	70 *(1015.26)*
D02	0.1 - 1.5 *(1.45 - 21.76)*	0.20 *(2.90)*	70 *(1015.26)*
D03	0.2 - 2.6 *(2.90 - 37.71)*	0.20 *(2.90)*	70 *(1015.26)*
D04	0.2 - 3.6 *(2.90 - 52.21)*	0.30 *(4.35)*	70 *(1015.26)*
D07	0.5 - 7.0 *(7.25 - 101.50)*	0.40 *(5.80)*	70 *(1015.26)*
D10	0.5 - 10.0 *(7.25 - 145.04)*	0.50 *(7.25)*	70 *(1015.26)*
D15	1.0 - 15.0 *(14.50 - 217.71)*	0.50 *(7.25)*	70 *(1015.26)*
D30	5.0 - 25.0 *(72.52 - 362.6)*	0.80 *(11.60)*	70 *(1015.26)*

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

* **Note :**
Microswitches A2 through A9 can be supplied in some ranges and differentials will vary with microswitch used. Please contact sales office for details. Please check availability of adjustable differential with sales office.

HOW TO ORDER INDUSTRIAL HIGH RANGE DP SWITCHES

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
Non standard allocation	Model	Cable Entry Size	Switch Type	Range Code (values in bar)	Microswitch Type	Pressure Port Material / Size	Diaphragm
☐ Reserved for non-standard options not covered in catalogue. Will be given by manufacturer, only after agreement of supply details with customer.	**MD** = Industrial pressure switch with diecast Aluminium enclosure to IP66 as per IS2147	**1** = ½ " NPT threads **2** = ¾" NPT threads **3** = M20 X 1.5 threads	**DF1** = pressure difference switch, fixed differential without scale **DF2** = pressure difference switch, fixed differential with scale in bar **DF3** = pressure difference switch, fixed differential with scale in psi ***DA1** = pressure difference switch, adjustable differential without scale ***DA2** = pressure difference switch, adjustable differential with scale in bar ***DA3** = pressure difference switch, adjustable differential with scale in psi *Available with A9 (in group 6) only	**D01** = (0.1 - 1.0) **D02** (0.1 - 1.5) **D03** = (0.2 - 2.6) **D04** = (0.2 - 3.6) **D07** = (0.5 - 7.0) **D10** = (0.5 - 10.0) **D15** = (1.0 - 15.0) **D30** = (5.0 - 25.0)	**A1** = General purpose microswitch rated at 15 A; 250 VAC ***A2 =** Hermetically sealed for corrosive environments ***A3 =** gold plated contacts for low voltage applications ***A4 =** DPDT configuration ***A5 =** for high DC ratings ***A7** = 2SPDT switching elements Please refer page no. 230 for more microswitch options * Please refer note under Range Selection Table	**A1** = Aluminium / ¼" BSP(F) **A2** = Aluminium / ¼" NPT(F) **S1** = SS316 / ¼" BSP(F) **S2** = SS316 / ¼" NPT(F) Please refer page no. 226 & 227 for more pressure port options	**0** = Neoprene **1** = Teflon **2** = SS316L For additional wetted parts please refer Pressure Capsule Details on Page 145

eg. A high range pressure difference weatherproof switch, with ½" NPT cable entry in aluminium housing as 1SPDT pressure switch, fixed differential without scale, having 0.1 bar to 1 bar pressure range, with 15 Amp. microswitch, SS316 pressure housing with ¼" BSP port size & neoprene diaphragm shall be specified by

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
☐	MD	1	DF1	D01	A1	S1	0

Please specify full model number to avoid ambiguity.

FP 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)

Enclosure

Robust Gravity Die Cast Aluminum

Long Lasting!

10^6 switching operations

Trusted all over!

Tested and Proven

Technical Specifications

Media: Air, non-flammable gases and non-aggressive gases

Housing Material: IP 66 Gravity Die Cast Aluminium

Protection Category: IP66 with cover.

Ranges: 20 Pa to 4000 Pa

Maximum Working Pressure: 0.1 bar

Electrical Rating: Maximum 1.0A (.4 A) / 250VAC

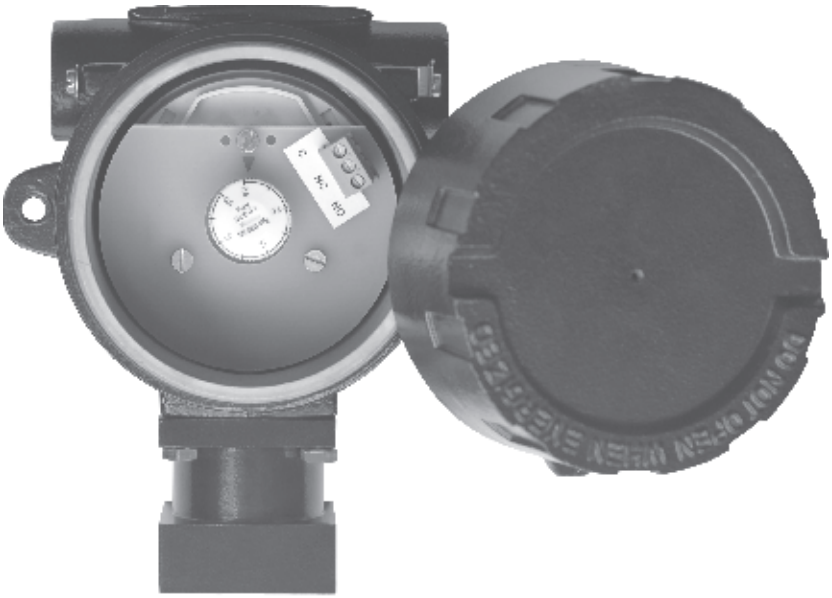
Electrical Connection: Standard Terminal Strip provided

Cable Entry: ½" NPT

High Pressure and Low Pressure Port: 1/8" BSP(F)

Media Temperature: 80°C max.

Ambient Temperature: -5°C to 60°C



Range Selection Table

Range Code (Orion)	Adjustment Range for Upper Switching Pressure Pa *(mm wg)*	Switching Differential Set to Pa *(mm wg)*
FP80	20-200 *(2.039-20.395)*	10 *(1.020)*
FP81	40 - 100 *(4.079 - 10.197)*	20 *(2.039)*
FP82	40 - 200 *(4.0479 - 20.395)*	20 *(2.039)*
FP83	50 - 500 *(5.099 - 50.987)*	20 *(2.039)*
FP85	200 - 1000 *(20.395 – 101.974)*	100 *(10.197)*
FP86	500 – 2500 *(50.987 – 254.935)*	150 *(15.296)*
FP87	1000 – 4000 *(101.974 – 407.896)*	250 *(25.494)*

How to order FP series Low Range Pressure Difference Switches

Please specify the Range Code e.g.. FP82 or FP85 as per range selection table.

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

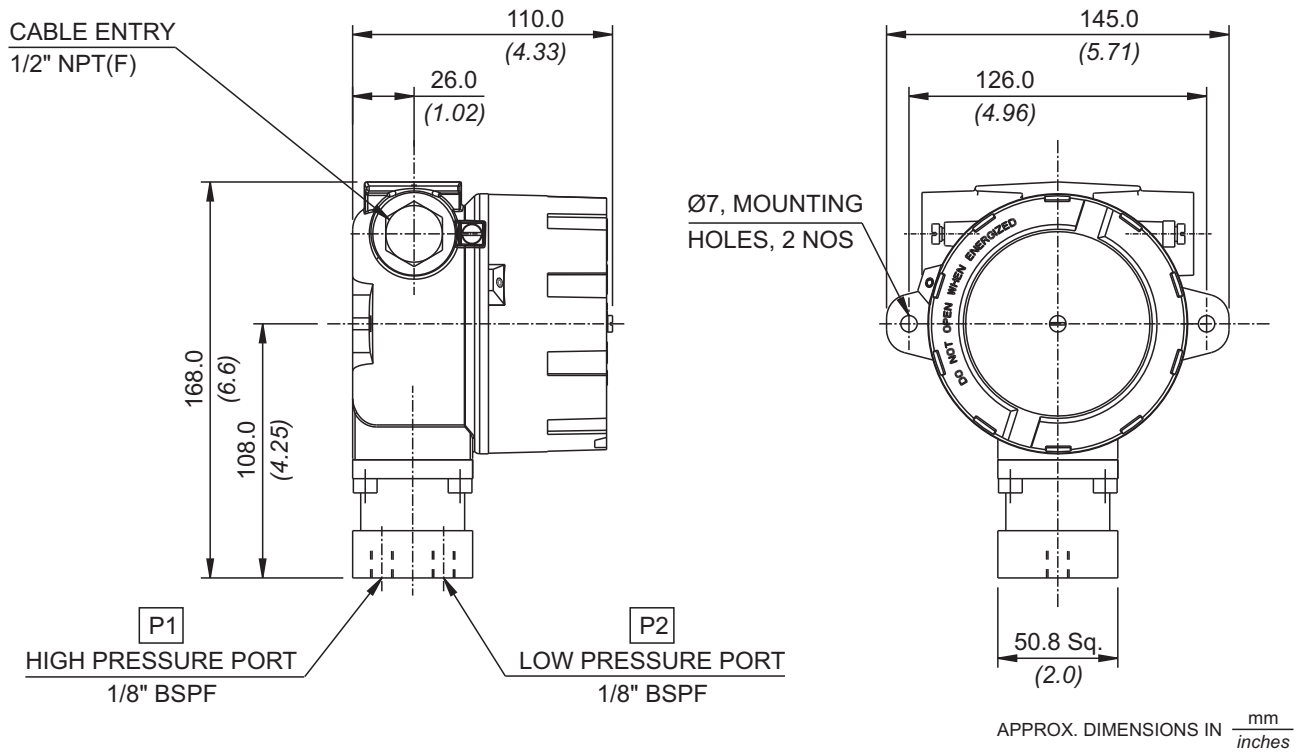
The detailed mounting dimensions are shown in Fig. 1.

1) Pressure Switches can be mounted on a plate/inside a panel using Ø7 mounting holes provided.

2) For any other process connection, please use an adaptor.

Fig. 1

INSTALLATION DRAWING



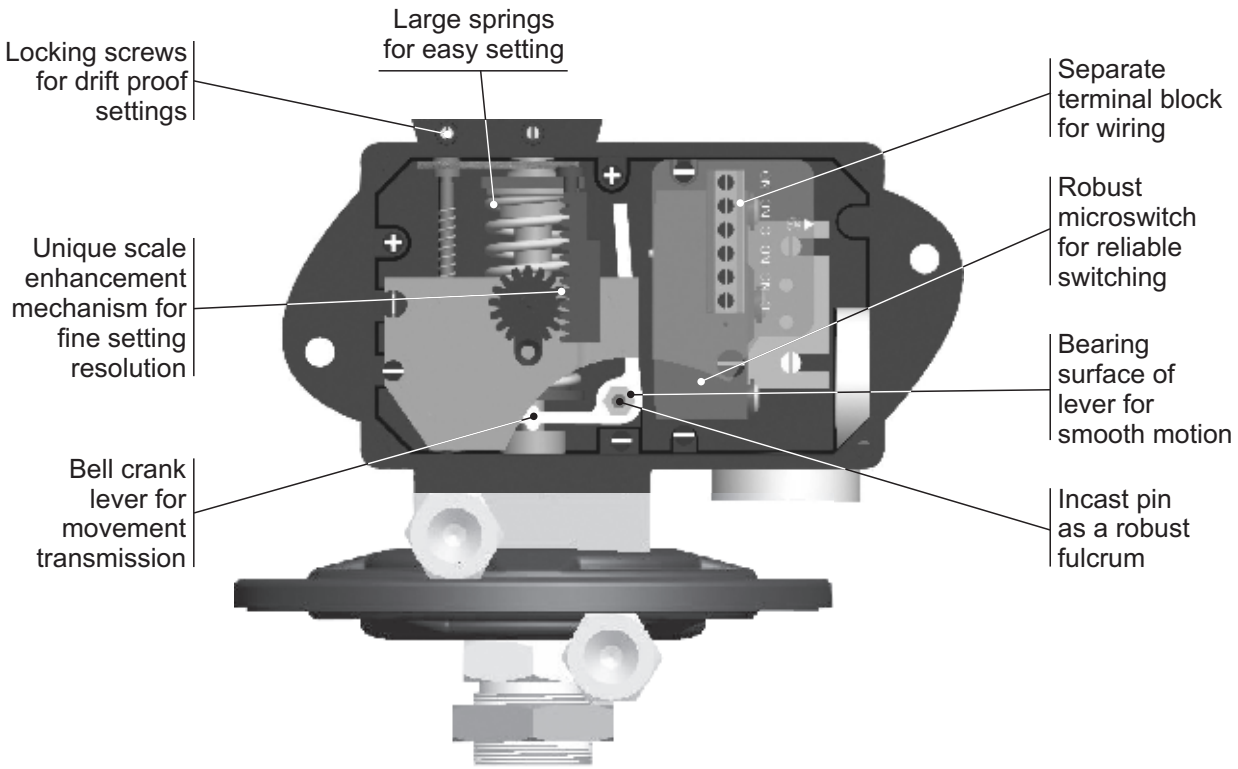
P1 = High Pressure Port
P2 = Low Pressure Port

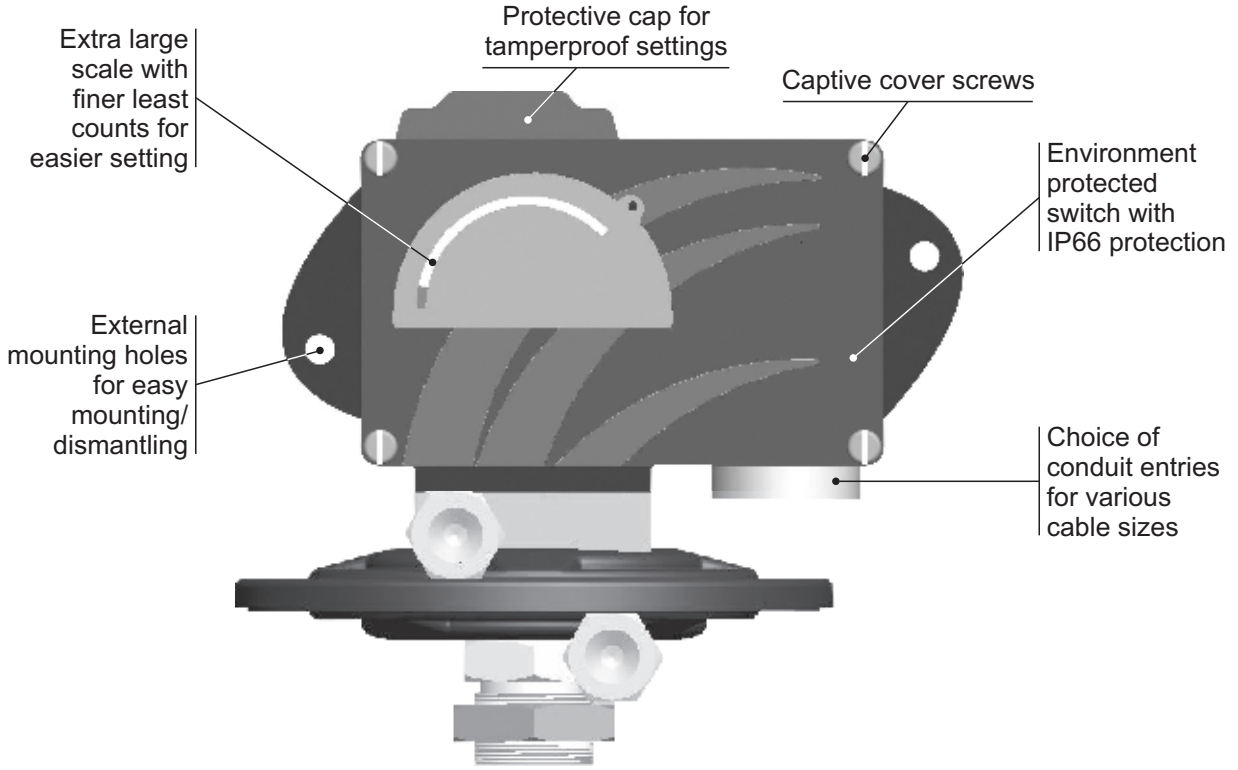
Note : 1. Use two screws only, for mounting
2. Remove transport protection from P1 and P2

CAUTION :

Install pressure switch vertically. Installing it at an angle more than 30° to vertical may result in malfunction.

MD LOW RANGE PRESSURE DIFFERENCE SWITCHES



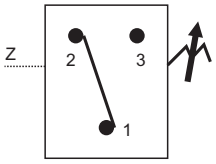


Approximate Weight : 2.000 Kg.

Some Applications : Used in ventilation systems, clean rooms, clogged filters, etc.

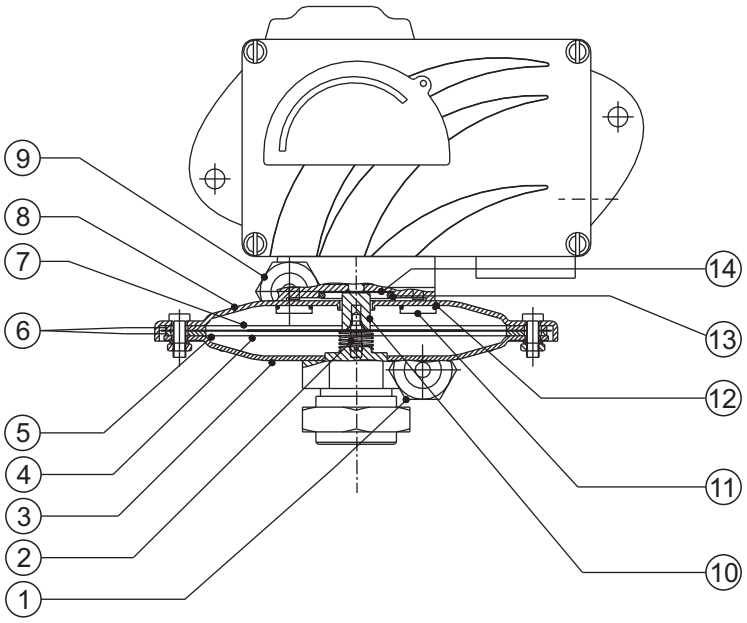
Electrical Connection :

Fig. 2



Orion INSTRUMENTS

PRESSURE CAPSULE DETAILS



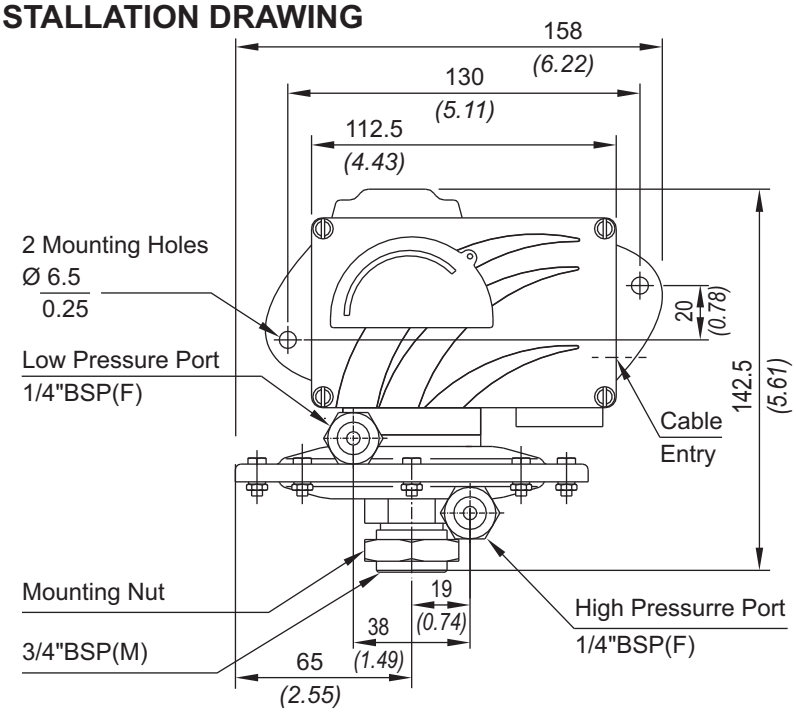
No. Description

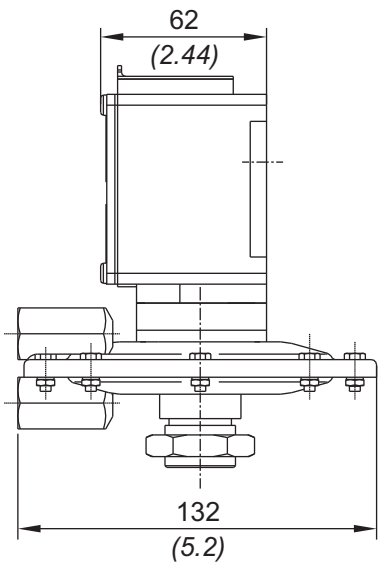
1. *High Pressure Port (M.S.)**
2. *Support Spring (S.S.)*
3. *Bottom Flange (M.S.)*
4. *Support Plate (Aluminium)*
5. *Diaphragm (Neoprene)*
6. *Gasket (Nitrile)*
7. *Top Plate (Aluminium)*
8. *Top Flange (M.S.)**
9. *Low Pressure Port (M.S.)*
10. *Transfer Pin (Al)*
11. *Top Flange Screw (M.S.)*
12. *O-Ring (Nitrile)*
13. *O-Ring (Nitrile)*
14. *Sealing Diaphragm (Nitrile)*

* Pressure ports are brazed with flange

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING





APPROX. DIMENSIONS IN mm / *inches*

MD LOW RANGE PRESSURE DIFFERENCE SWITCHES

RANGE SELECTION TABLE

Range Code	Range mbar *("wc)*	Differential* mbar *(" wc)*	Maximum Working Pressure bar *(psi)*
		Approximate Maximum for "A1" microswitch	
L02	1.5 - 15 *(0.602 - 6.02)*	3 *(1.204)*	2 *(29.00)*
L03	5 - 25 *(2.007 - 10.037)*	5 *(2.007)*	2 *(29.00)*
L05	10 - 50 *(4.015 - 20.073)*	5 *(2.007)*	2 *(29.00)*
L10	10 - 100 *(4.015 - 40.146)*	10 *(4.015)*	2 *(29.00)*
L15	10 - 150 *(4.015 - 60.22)*	10 *(4.015)*	2 *(29.00)*
L25	20 - 250 *(8.03 - 100.36)*	15 *(4.015)*	2 *(29.00)*
L35	50 - 350 *(20.073 - 140.51)*	35 *(14.05)*	2 *(29.00)*

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

* **Note :**
Microswitches A2 through A9 can be supplied in some ranges and differentials will vary with microswitch used. Please contact sales office for details. Please check availability of adjustable differential with sales office.

HOW TO ORDER INDUSTRIAL LOW RANGE PRESSURE DIFFERENCE SWITCHES

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
Non standard allocation	Model	Cable Entry Size	Switch Type	Range Code (values in mbar)	Microswitch Type	Pressure Port Material / Size	Diaphragm
☐ Reserved for non-standard options not covered in catalogue. Will be given by manufacturer, only after agreement of supply details with customer.	**MD** = Industrial pressure switch with diecast Aluminium enclosure to IP66 as per IS2147	**1** = ½ " NPT threads **2** = ¾" NPT threads **3** = M20 X 1.5 threads	**DF1** = pressure difference switch, fixed differential without scale **DF2** = pressure difference switch, fixed differential with scale in mbar **DF3** = pressure difference switch, fixed differential with scale in "wc ***DA1** = pressure difference switch, adjustable differential without scale ***DA2** = pressure difference switch, adjustable differential with scale in mbar ***DA3** = pressure difference switch, adjustable differential with scale in "wc *Available with A9 (in group 6) only	**L02** = (1.5 - 15) **L03** = (5 - 25) **L05** = (10 - 50) **L10** = (10 - 100) **L15** = (10 - 150) **L25** = (20 - 250) **L35** = (50 - 350)	**A1** = General purpose microswitch rated at 15 A; 250 VAC ***A2 =** Hermetically sealed for corrosive environments ***A3 =** gold plated contacts for low voltage applications ***A4 =** DPDT configuration ***A5 =** for high DC ratings ***A7** = 2SPDT switching elements ***A9** = General purpose microswitch rated at 5 A; 250 VAC Please refer page no. 230 for more microswitch options * Please refer note under Range Selection Table	**M1** = M.S. powder coated / ¼" BSP(F) **M2** = M.S. powder coated / ¼" NPT(F) **S1** = SS316 / ¼" BSP(F) **S2** = SS316 / ¼" NPT(F) Please refer page no. 226 & 227 for more pressure port options	**0** = Neoprene **1** = Teflon

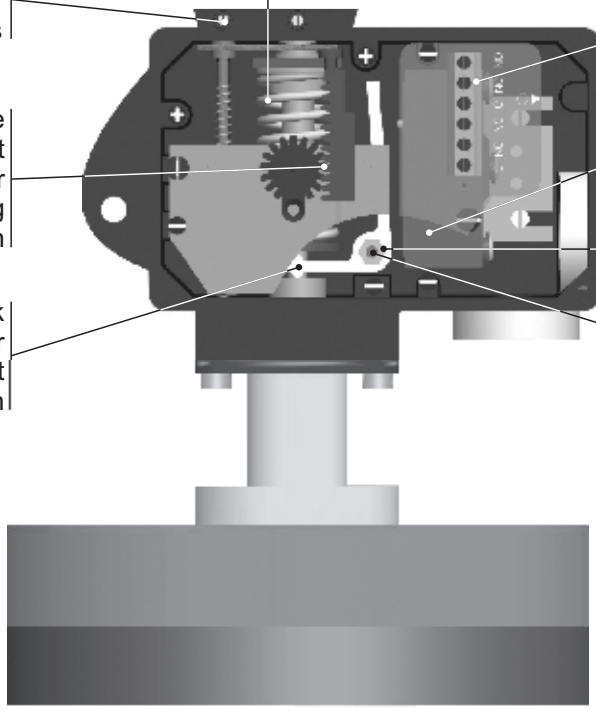
eg. A low range pressure difference weatherproof switch, with ½" NPT cable entry in aluminium housing as 1SPDT pressure switch, fixed differential without scale, having 5 mbar to 25 mbar pressure range, with 15 Amp. microswitch, SS316 pressure housing with ¼" BSP port size & neoprene diaphragm shall be specified by

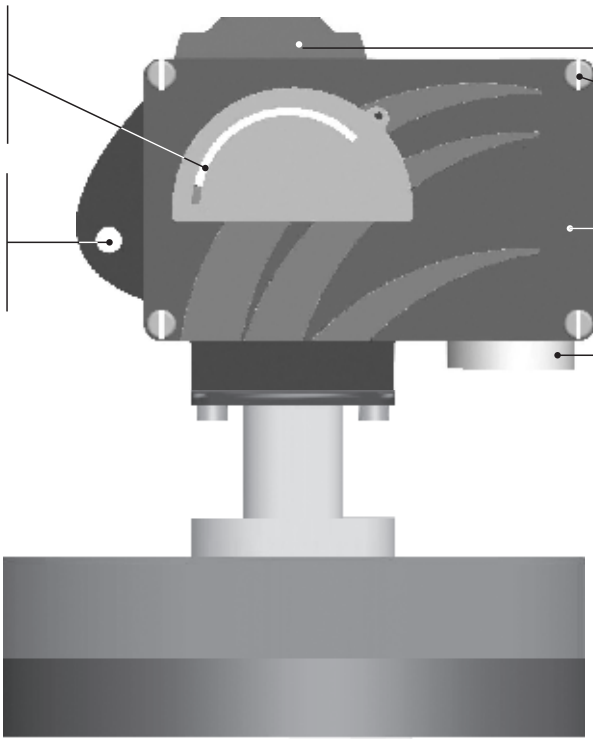
Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
☐	MD	1	DF1	L03	A1	S1	0

Please specify full model number to avoid ambiguity.

Bulletin No. KA121024

MD LOW ΔP HIGH PROOF PRESSURE DIFFERENCE SWITCHES



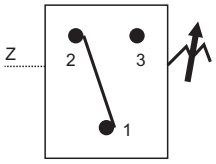


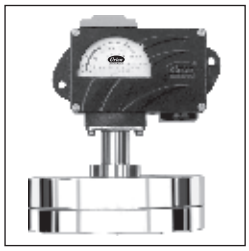
Approximate Weight : 6.70 Kg.

Some Applications : Used in gas skids, cooling systems, applications requiring very low pressure difference but high system/proof pressure like pressurization in cross country pipelines, etc.

Electrical Connection :

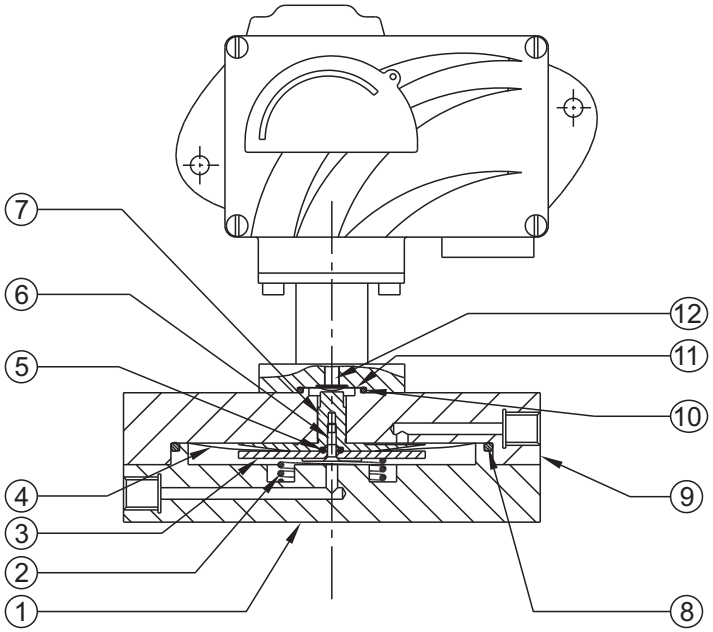
Fig. 2





Orion® INSTRUMENTS

PRESSURE CAPSULE DETAILS

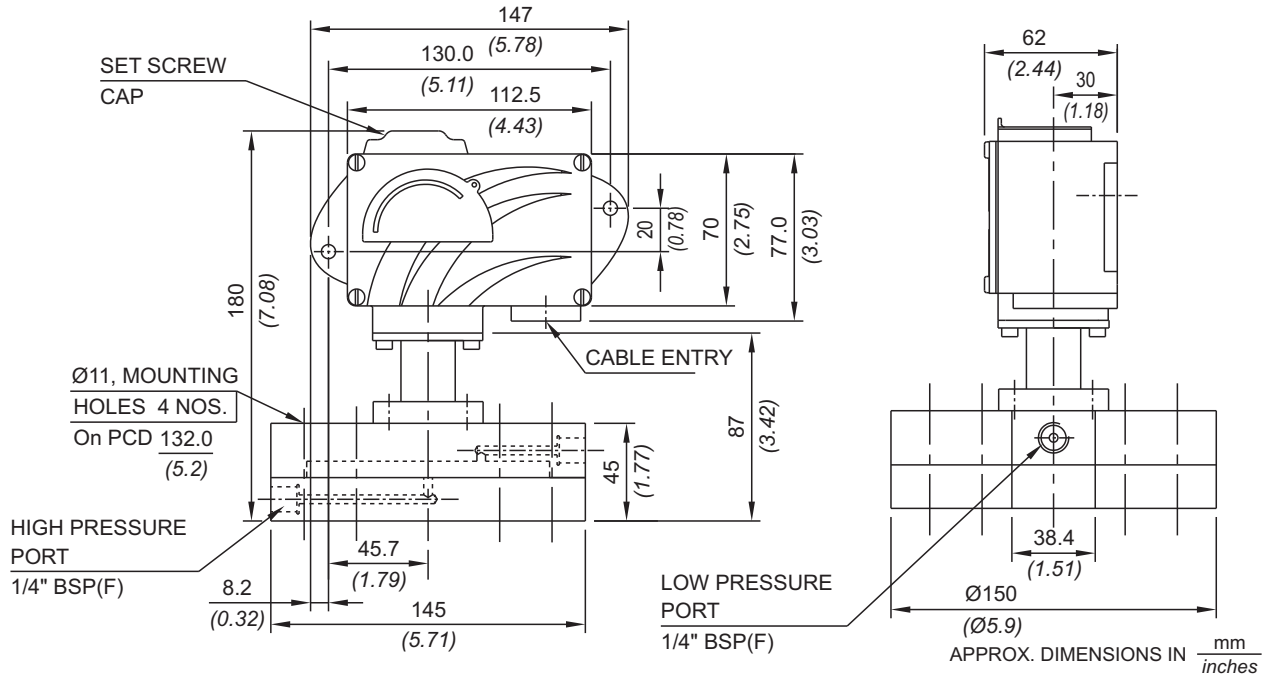


No. Description

1. *High Pressure Housing*
2. *Spring*
3. *H P Plunger*
4. *Diaphragm*
5. *Plunger 'O' ring*
6. *Plunger Screw*
7. *L P Plunger*
8. *Main Sealing 'O' ring*
9. *Low Pressure Housing*
10. *Sealing 'O' ring*
11. *Diaphragm*
12. Small Plunger

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING



MD LOW ΔP HIGH PROOF PRESSURE DIFFERENCE SWITCHES

RANGE SELECTION TABLE

Range Code	Range mbar *("wc)*	Differential* mbar *("wc)*	Maximum Working Pressure bar *(psi)*
		Approximate Maximum for "A1" microswitch	
M03	5 - 25 *(2.007 - 10.037)*	5 *(2.007)*	100 *(1450.38)*
M05	10 - 50 *(4.015 - 20.073)*	5 *(2.007)*	100 *(1450.38)*
M10	10 - 100 *(4.015 - 40.146)*	10 *(4.015)*	100 *(1450.38)*
M15	10 - 150 *(4.015 - 60.22)*	10 *(4.015)*	100 *(1450.38)*
M25	20 - 250 *(8.03 - 100.36)*	15 *(6.022)*	100 *(1450.38)*
M35	50 - 350 *(20.073 - 140.51)*	35 *(14.05)*	110 *(1595.42)*

* Minimum differential increases with setpoint (Graphs available on request)
* Differentials of miroswitches A2 through A9 will vary. Differentials for A7 are typically twice that for A1 microswitch. Please indicate specifically the differential value in enquiry/order, when it is critical in your application.

HOW TO ORDER INDUSTRIAL LOW ΔP HIGH PROOF PRESSURE DIFFERENCE SWITCHES

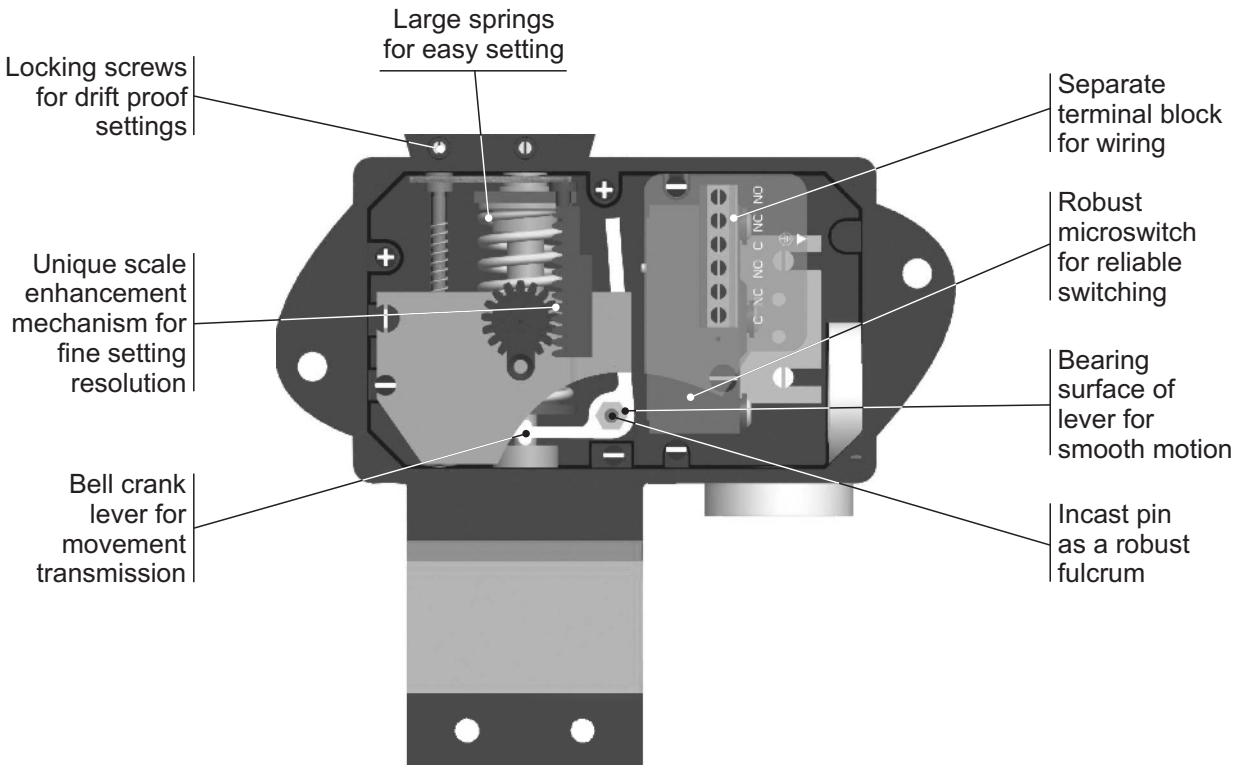
Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
Non standard allocation	Gas Group Classification	Cable Entry Size	Switch Type	Range Code (values in mbar)	Microswitch Type	Pressure Port Material / Size	Diaphragm
☐ Reserved for non-standard options not covered in catalogue. Will be given by manufacturer, only after agreement of supply details with customer.	**MD** = Industrial pressure switch with diecast Aluminium enclosure to IP66 as per IS2147	**1** = ½ " NPT threads **2** = ¾" NPT threads **3** = M20 X 1.5 threads	**DF1** = pressure difference switch, fixed differential without scale **DF2** = pressure difference switch, fixed differential with scale in mbar **DF3** = pressure difference switch, fixed differential with scale in "wc ***DA1** = pressure difference switch, adjustable differential without scale ***DA2** = pressure difference switch, adjustable differential with scale in mbar ***DA3** = pressure difference switch, adjustable differential with scale in "wc *Available with A9 (in group 6) only	**M03** = (5 - 25) **M05** = (10 - 50) **M10** = (10 - 100) **M15** = (10 - 150) **M25** = (20 - 250) **M35** = (50 - 350)	**A1** = General purpose microswitch rated at 15 A; 250 VAC ***A2 =** Hermetically sealed for corrosive environments ***A3 =** gold plated contacts for low voltage applications ***A4 =** DPDT configuration ***A5 =** for high DC ratings ***A7** = 2SPDT switching elements ***A9** = General purpose microswitch rated at 5 A; 250 VAC Please refer page no. 230 for more microswitch options * Please refer note under Range Selection Table	**S1** = SS316 / ¼" BSP(F) **S2** = SS316 / ¼" NPT(F) Please refer page no. 226 & 227 for more pressure port options	**0** = Neoprene **1** = Teflon

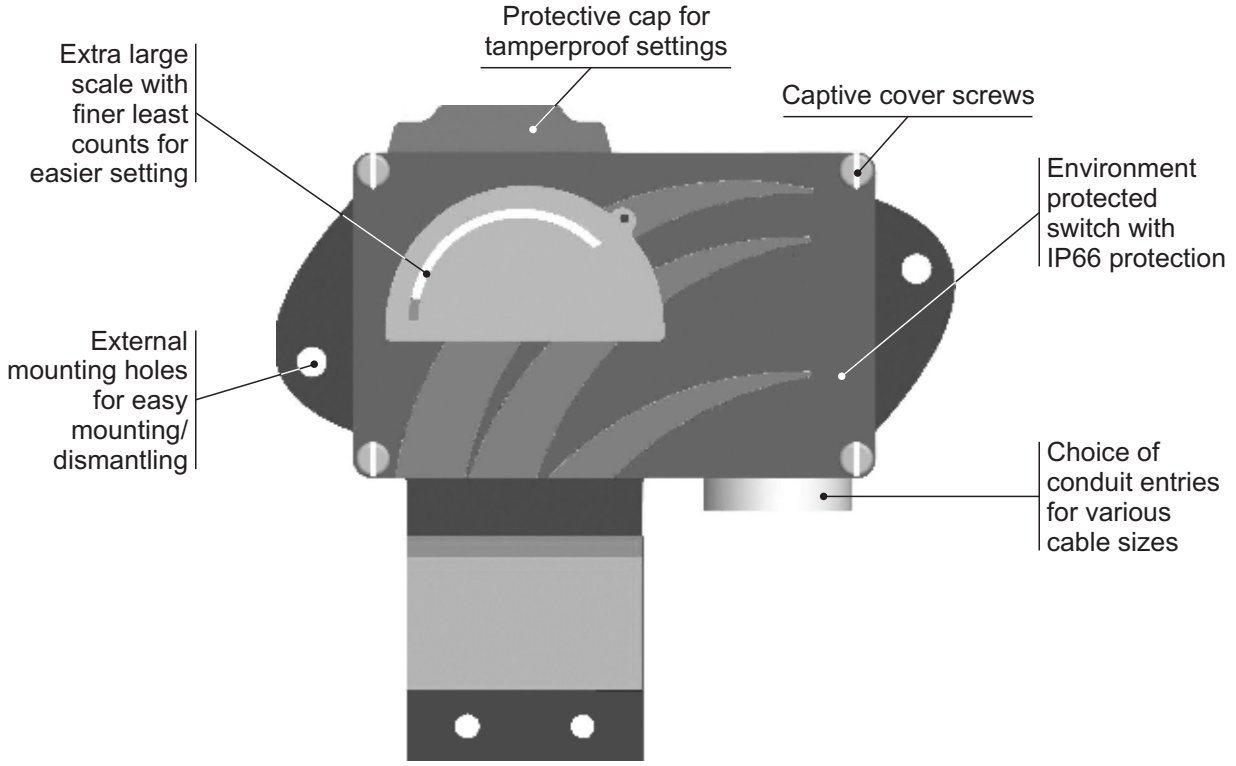
eg. A hydraulic diaphragm pressure switch, with ½" NPT cable entry in aluminium housing as 1SPDT pressure switch, fixed differential without scale, having 20 mbar to 250 mbar pressure range, with 15 Amp. microswitch, SS316 pressure housing with ¼" BSP port size shall be specified by

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
☐	MD	1	PF1	M25	A1	S1	0

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

Bulletin No. KA121024



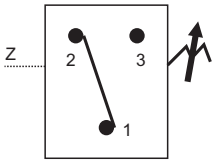


Approximate Weight : 1.500 Kg.

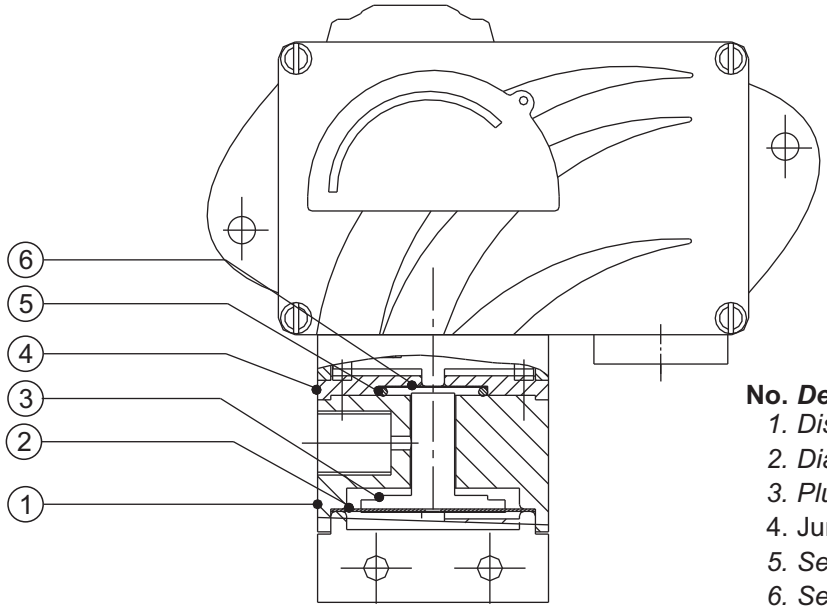
Some Applications : Used in filters, vacuum pumps, blower systems, etc.

Electrical Connection :

Fig. 2



PRESSURE CAPSULE DETAILS

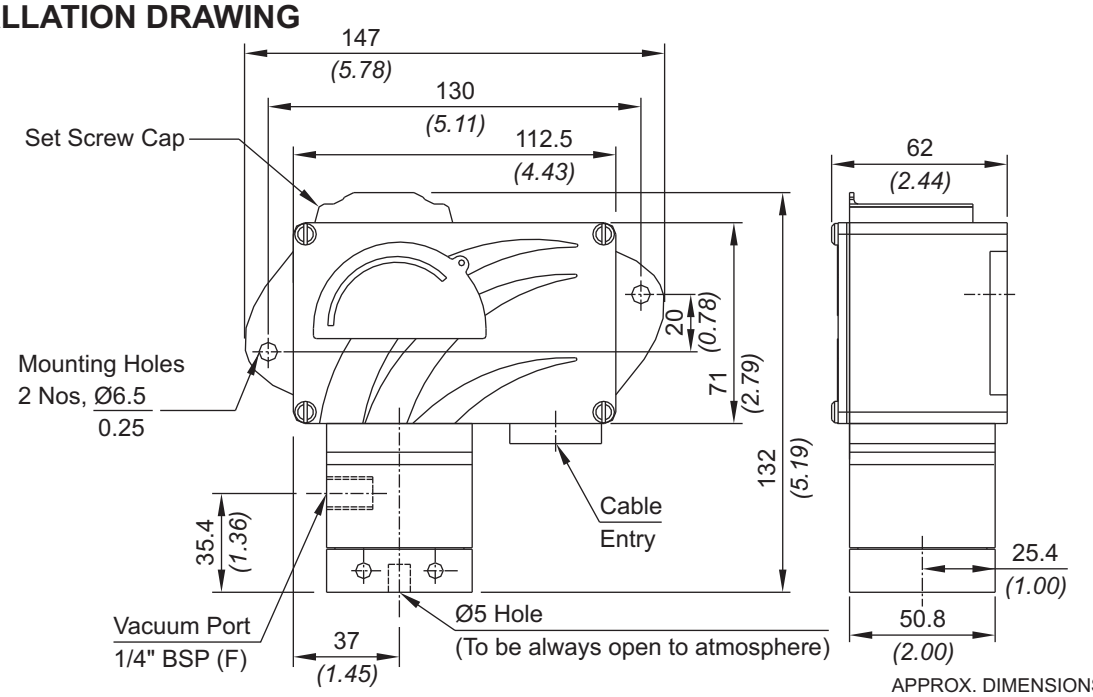


No. ***Description***

1. *Disc*
2. *Diaphragm*
3. *Plunger (SS316)*
4. Junction Plate
5. *Sealing 'O' Ring (Teflon®)*
6. *Sealing diaphragms (Teflon®)*

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING



APPROX. DIMENSIONS IN mm / *inches*

RANGE SELECTION TABLE

Range Code	Range mm Hg *(" Hg)*	Differential* mm Hg *("Hg)*	Maximum Working Pressure bar *(psi)*
		Approximate Maximum for "A1" microswitch	
V00	† 760 - 100 *(29.92 - 3.94)*	30 *(1.181)*	12 *(174.05)*

*Minimum differential increases with setpoint (Graphs available on request)
† Typical values achieved at sea level, total vacuum that can be achieved varies mainly with altitude.

* **Note :**
Microswitches A2 through A7 can be supplied in some ranges and differentials will vary with microswitch used. Please contact sales office for details. Please check availability of adjustable differential with sales office.

HOW TO ORDER INDUSTRIAL VACUUM SWITCHES

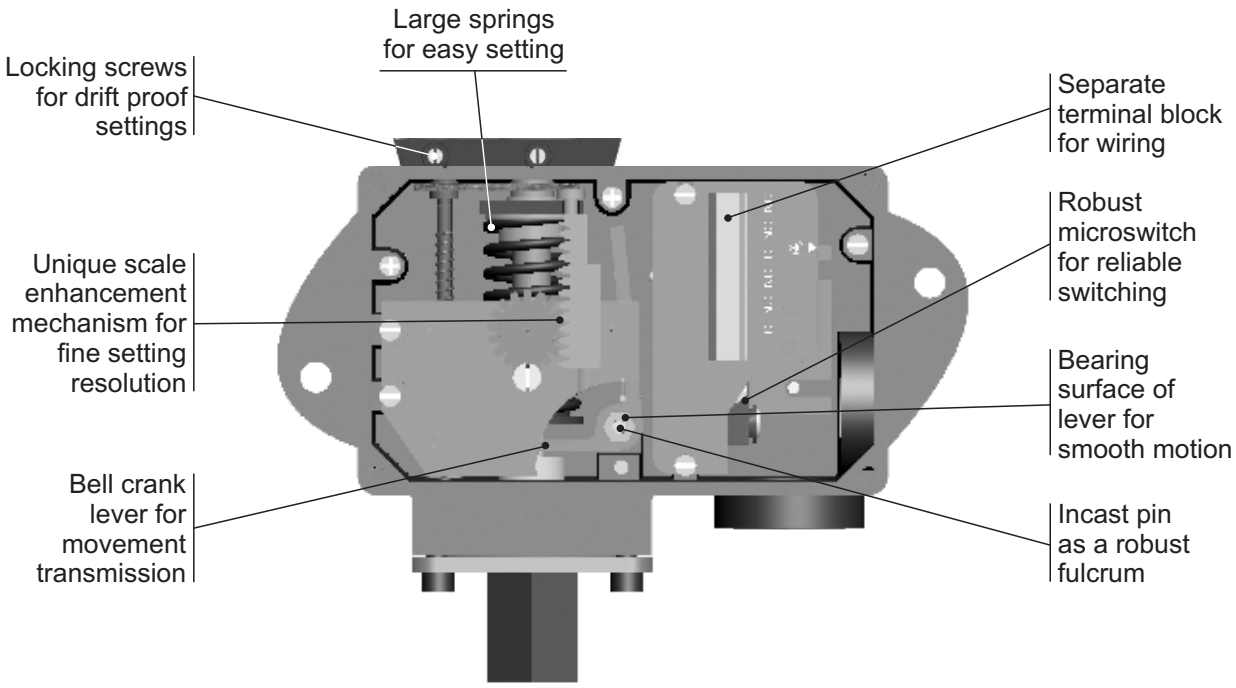
Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
Non standard allocation	Model	Cable Entry Size	Switch Type	Range Code (values in mmHg)	Microswitch Type	Pressure Port Material / Size	Diaphragm
☐ Reserved for non-standard options not covered in catalogue. Will be given by manufacturer, only after agreement of supply details with customer.	**MD** = Industrial pressure switch with diecast Aluminium enclosure to IP66 as per IS2147	**1** = ½ " NPT threads **2** = ¾" NPT threads **3** = M20 X 1.5 threads	**VF1** = vacuum switch, fixed differential without scale **VF2** = vacuum switch, fixed differential with scale in mmHg **VF3** = vacuum switch, fixed differential with scale in "Hg ***VA1** = vacuum switch, adjustable differential without scale ***VA2** = vacuum switch, adjustable differential with scale in mmHg ***VA3** = vacuum switch, adjustable differential with scale in "Hg *Available with A9 (in group 6) only	**V00** = († 760 - 100)	**A1** = General purpose microswitch rated at 15 A; 250 VAC ***A2 =** Hermetically sealed for corrosive environments ***A3 =** gold plated contacts for low voltage applications ***A4 =** DPDT configuration ***A5 =** for high DC ratings ***A7** = 2SPDT switching elements ***A9** = General purpose microswitch rated at 5 A; 250 VAC Please refer page no. 230 for more microswitch options * Please refer note under Range Selection Table	**A1** = Aluminium / ¼" BSP(F) **A2** = Aluminium / ¼" NPT(F) **S1** = SS316 / ¼" BSP(F) **S2** = SS316 / ¼" NPT(F) Please refer page no. 226 & 227 for more pressure port options	**0** = Neoprene **1** = Teflon

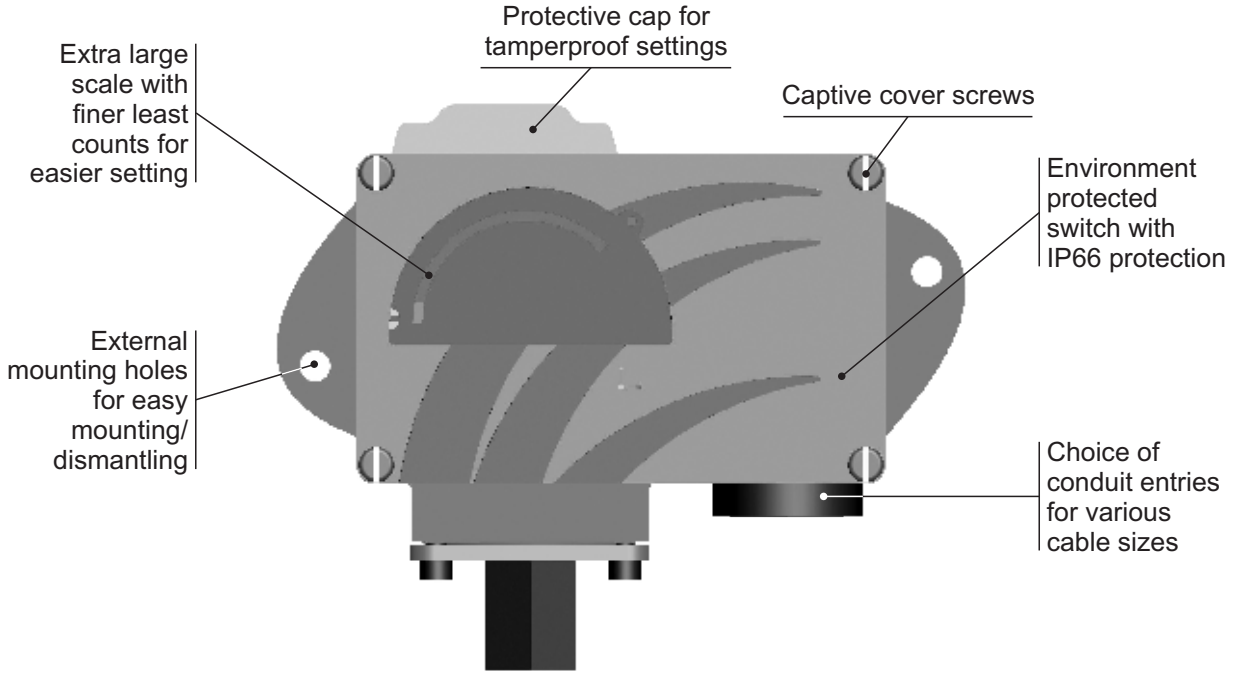
eg. A vacuum weatherproof switch, with ½" NPT cable entry in aluminium housing as 1SPDT pressure switch, fixed differential without scale, having 760 mmHg to 100 mmHg vacuum range, with 15 Amp. microswitch, SS316 pressure housing with ¼" BSP port size & neoprene diaphragm shall be specified by

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
☐	MD	1	VF1	V00	A1	S1	0

Please specify full model number to avoid ambiguity.

MD HIGH RANGE COMPOUND SWITCHES



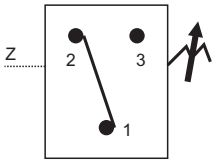


Approximate Weight : 0.900 Kg.

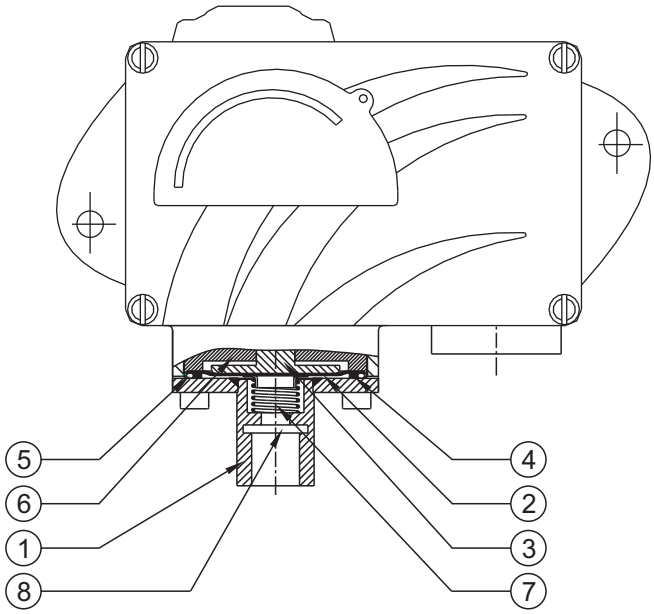
Some Applications : where the set point can vary from vacuum(-ve) pressure to +ve pressure.

Electrical Connection :

Fig. 2



PRESSURE CAPSULE DETAILS

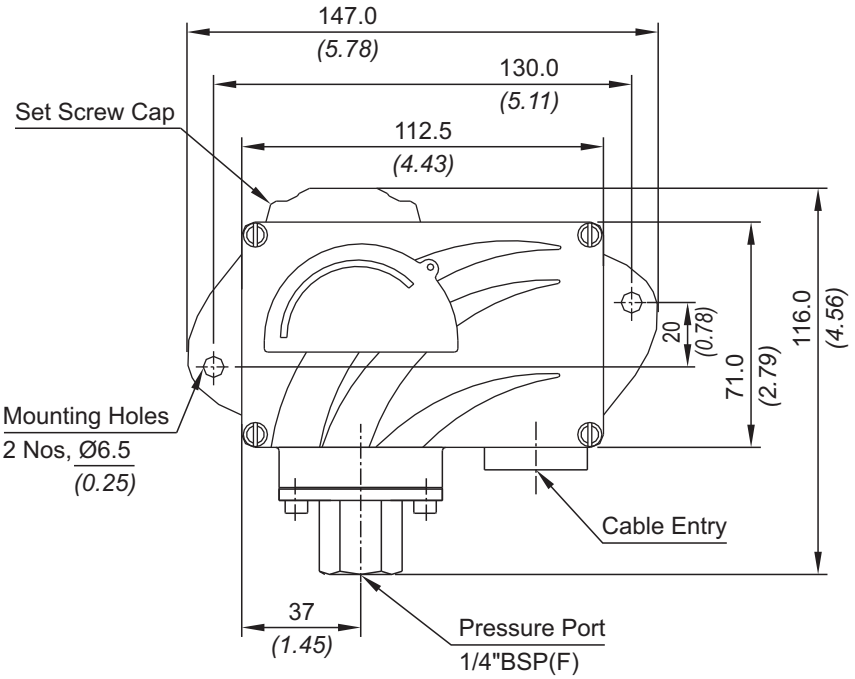


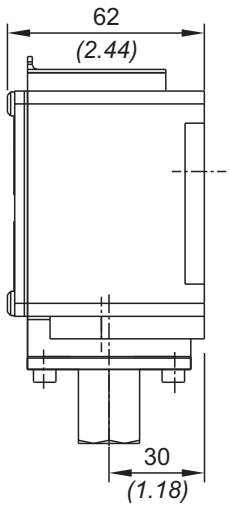
No. Description

1. *Pressure housing (SS316)*
2. *Diaphragm (Teflon®)*
3. Plunger
4. *Steel Ring (SS316)*
5. *'O' ring (Teflon®)*
6. Disc
7. *Bottom Spring*
8. *Support Plunger*

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING





APPROX. DIMENSIONS IN mm / *inches*

MD HIGH RANGE COMPOUND SWITCHES

RANGE SELECTION TABLE

Range Code	Range bar *(psi)*	Differential* bar *(psi)*	Maximum Working Pressure bar *(psi)*
		Approximate Maximum for "A1" microswitch	
C01	-1 to 1.0 *(-14.50 - 14.50)*	0.2 *(2.90)*	12 *(174.05)*
C03	-1 to 2.6 *(-14.50 - 37.71)*	0.6 *(8.70)*	12 *(174.05)*
C04	-1 to 3.6 *(-14.50 - 52.26)*	0.8 *(11.60)*	12 *(174.05)*

* Minimum differential increases with setpoint (Graphs available on request)
* Differentials of miroswitches A2 through A9 will vary. Differentials for A7 are typically twice that for A1 microswitch. Please indicate specifically the differential value in enquiry/order, when it is critical in your application.

HOW TO ORDER INDUSTRIAL HIGH RANGE COMPOUND SWITCHES

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
Non standard allocation	Gas Group Classification	Cable Entry Size	Switch Type	Range Code (values in bar)	Microswitch Type	Pressure Port Material / Size	Diaphragm
☐ Reserved for non-standard options not covered in catalogue. Will be given by manufacturer, only after agreement of supply details with customer.	**MD** = Industrial pressure switch with diecast Aluminium enclosure to IP66 as per IS2147	**1** = ½ " NPT threads **2** = ¾" NPT threads **3** = M20 X 1.5 threads	**CF1** = compound switch, fixed differential without scale	**C01** = (-1 to 1.0) **C03** = (-1 to 2.6) **C04** = (-1 to 3.6)	**A1** =General purpose microswitch rated at 15 A; 250 VAC ***A2 =** Hermetically sealed for corrosive environments ***A3 =** gold plated contacts for low voltage applications ***A4 =** DPDT configuration ***A5 =** for high DC ratings ***A6 =** elements with adjustable deadband ***A7** = 2SPDT switching elements ***A9** = General purpose microswitch rated at 5 A; 250 VAC Please refer page no. 230 for more microswitch options * Please refer note under Range Selection Table	**S1** = SS316 / ¼" BSP(F) **S2** = SS316 / ¼" NPT(F) Please refer page no. 226 & 227 for more pressure port options	**0** = Neoprene **1** = Teflon

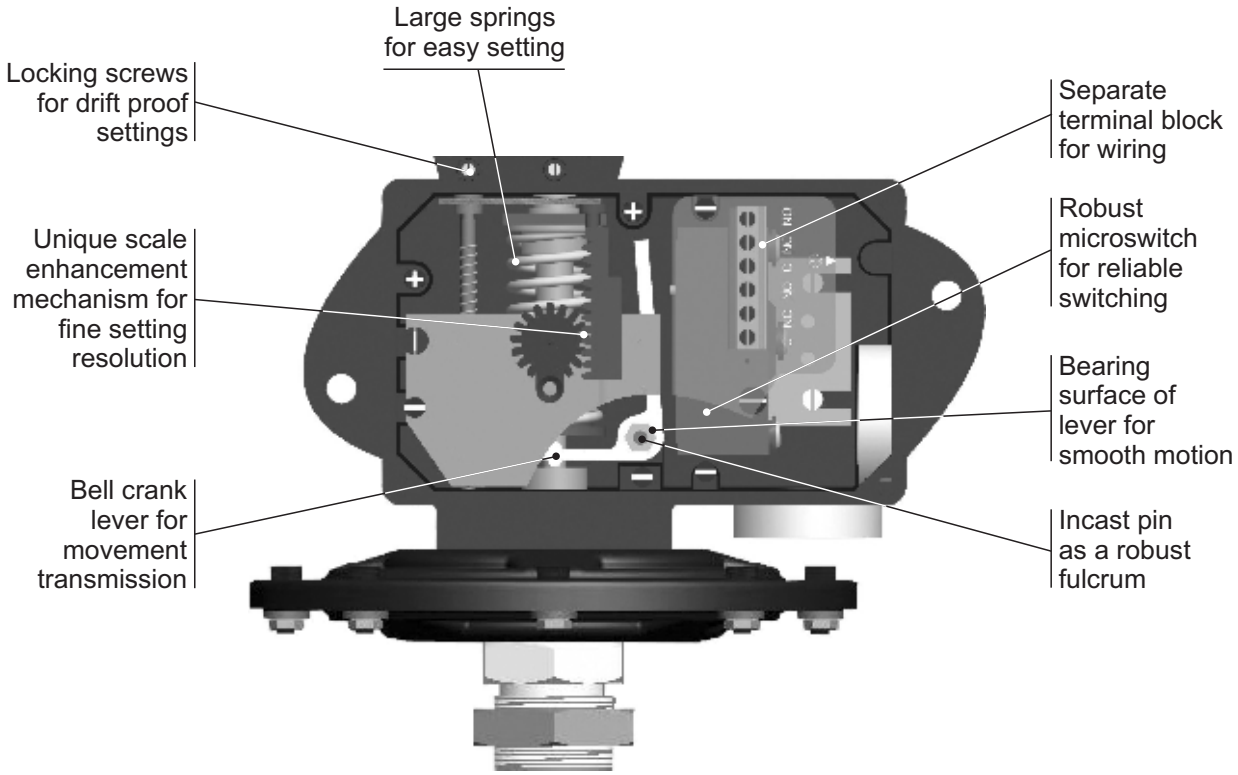
eg. A flameproof switch for gas group IIC, with ½" NPT cable entry in aluminium housing as 1SPDT pressure switch, having -1 bar to +1 bar pressure range, with 15 Amp. microswitch, SS316 pressure housing with ¼" BSP port size & Neoprene diaphragm shall be specified by

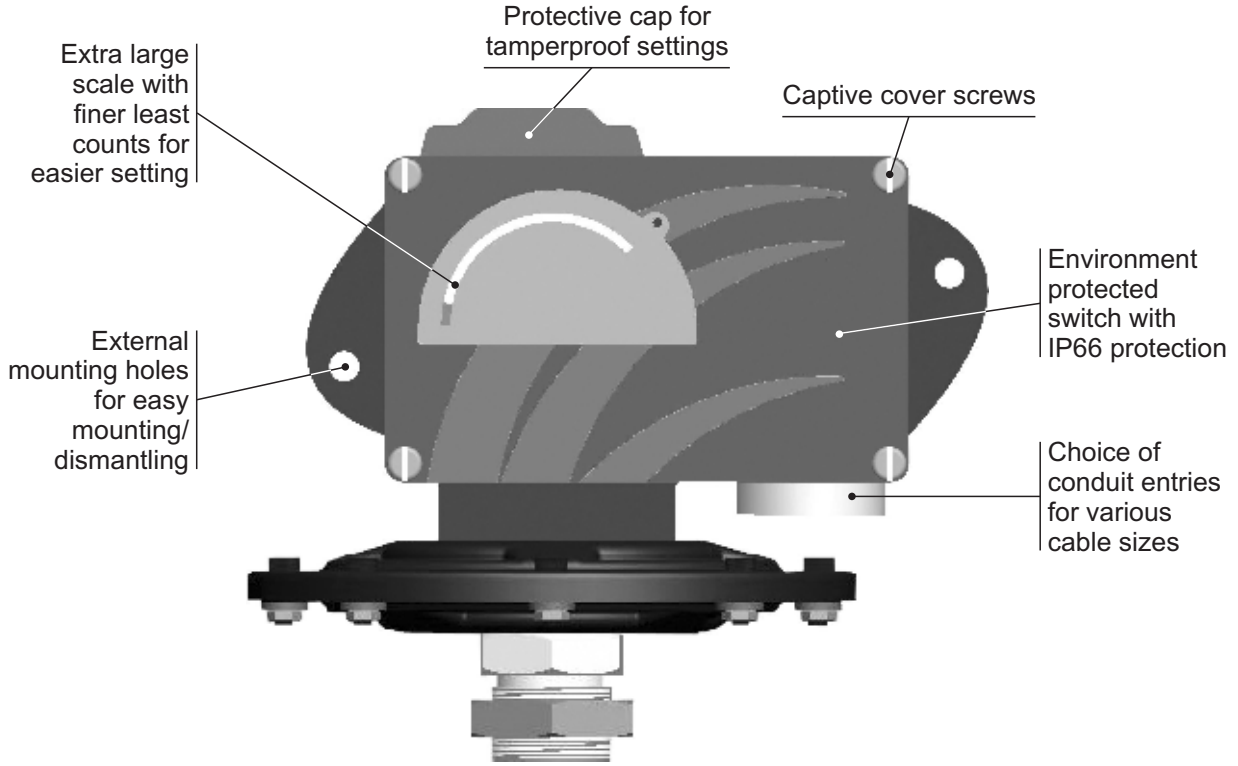
Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
☐	MD	1	CF1	C01	A1	S1	0

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

Bulletin No. KA121024

MD LOW RANGE COMPOUND SWITCHES



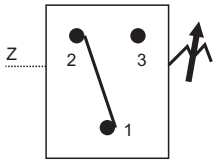


Approximate Weight : 1.500 Kg.

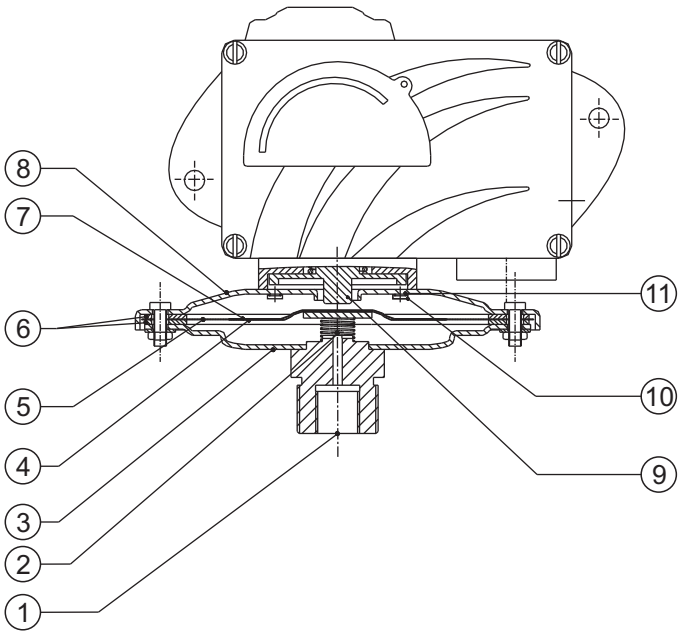
Some Applications : Used in furnaces, turbines etc.

Electrical Connection :

Fig. 2



PRESSURE CAPSULE DETAILS



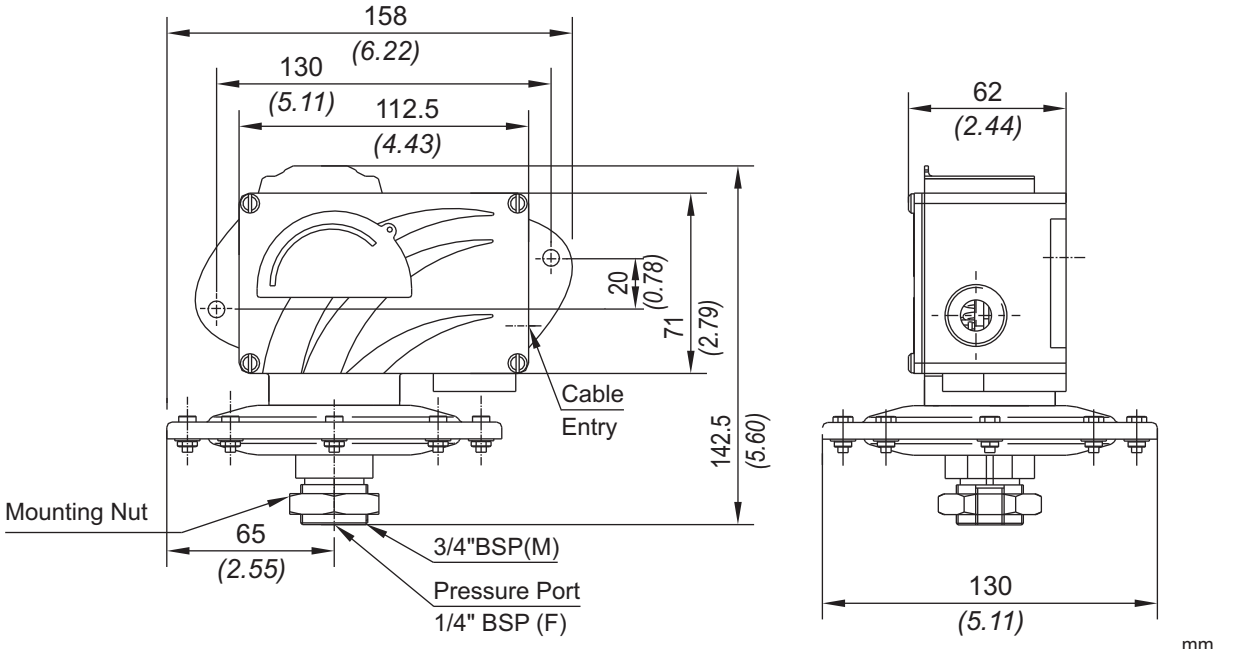
No. Description

1. *Pressure port (M.S.)**
2. *Support spring (S.S.)*
3. *Bottom flange (M.S.)*
4. *Support plate (Aluminium)*
5. *Diaphragm (Neoprene)*
6. *Gasket (Nitrile)*
7. Top plate (Aluminium)
8. Top flange (M.S.)
9. Plunger
10. Top flange screw (M.S.)
11. Sealing 'O' ring (Nitrile)

*Pressure port is brazed with flange

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING



APPROX. DIMENSIONS IN mm / *inches*

MD LOW RANGE COMPOUND SWITCHES

RANGE SELECTION TABLE

Range Code	Range mm wc *("wc)*	Differential* mm wc *("wc)*	Maximum Working Pressure bar *(psi)*
		Approximate Maximum for "A1" microswitch	
CL2	-150 to 150 *(-5.905 to 5.905)*	40 *(1.605)*	2 *(29.00)*
CL3	-250 to 250 *(-9.842 to 9.842)*	60 *(2.410)*	2 *(29.00)*

*Minimum differential increases with setpoint, values with neoprene diaphragm (Graphs available on request)

* Differentials of miroswitches A2 through A9 will vary. Differentials for A7 are typically twice that for A1 microswitch. Please indicate specifically the differential value in enquiry/order, when it is critical in your application.

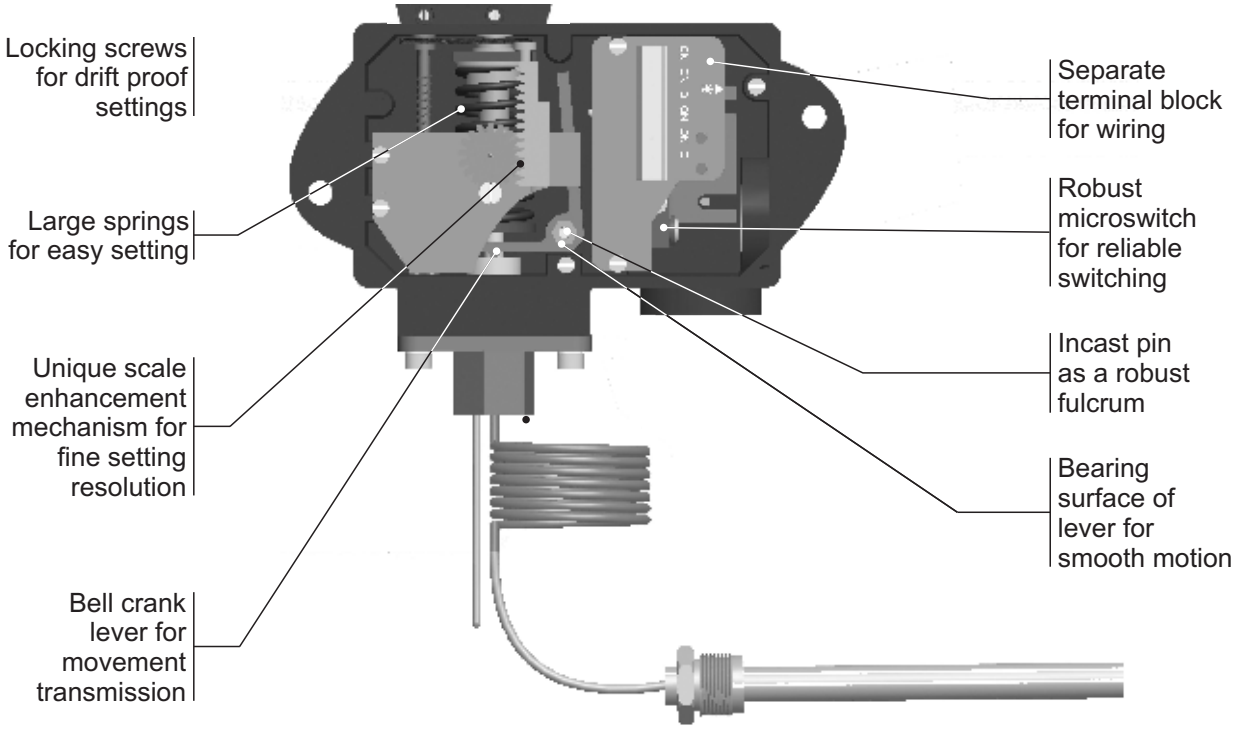
HOW TO ORDER INDUSTRIAL LOW RANGE COMPOUND SWITCHES

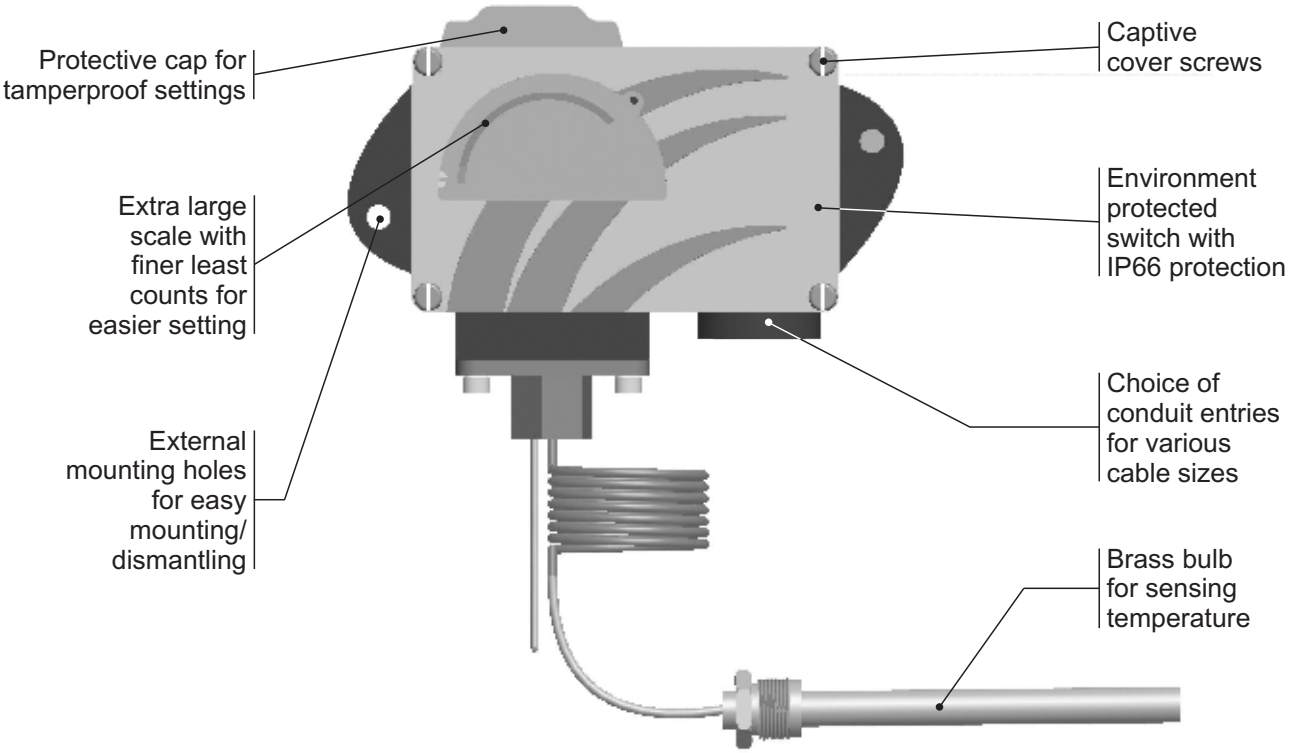
Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
Non standard allocation	Gas Group Classification	Cable Entry Size	Switch Type	Range Code (values in mm wc)	Microswitch Type	Pressure Port Material / Size	Diaphragm
☐ Reserved for non-standard options not covered in catalogue. Will be given by manufacturer, only after agreement of supply details with customer.	**MD** = Industrial pressure switch with diecast Aluminium enclosure to IP66 as per IS2147	**1** = ½ " NPT threads **2** = ¾" NPT threads **3** = M20 X 1.5 threads	**CF1** = Compound switch, fixed differential without scale	**CL2** = (-150 to 150) **CL3** = (-250 to 250)	**A1** = General purpose microswitch rated at 15 A; 250 VAC ***A2 =** Hermetically sealed for corrosive environments ***A3 =** gold plated contacts for low voltage applications ***A4 =** DPDT configuration ***A5 =** for high DC ratings ***A6 =** elements with adjustable deadband ***A7** = 2SPDT switching elements ***A9** = General purpose microswitch rated at 5 A; 250 VAC * Some microswitches may not be available for particular ranges.Please check with sales office. Please refer page no. 230 for more microswitch options	**S1** = SS316 / ¼" BSP(F) **S2** = SS316 / ¼" NPT(F) Please refer page no. 226 & 227 for more pressure port options	**0** = Neoprene **1** = Teflon
						For additional wetted parts please refer Pressure Capsule Details on Page 167	

eg. A flameproof switch for gas group IIC, with ½" NPT cable entry in aluminium housing as 1SPDT pressure switch, having -150 to 150 mm wc pressure range, with 15 Amp. microswitch, SS316 pressure housing with ¼" BSP port size & neoprene diaphragm shall be specified by

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
☐	MD	1	CF1	CL2	A1	S1	0

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



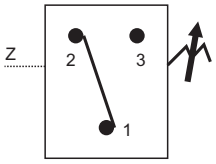


Approximate Weight : 0.950 Kg.

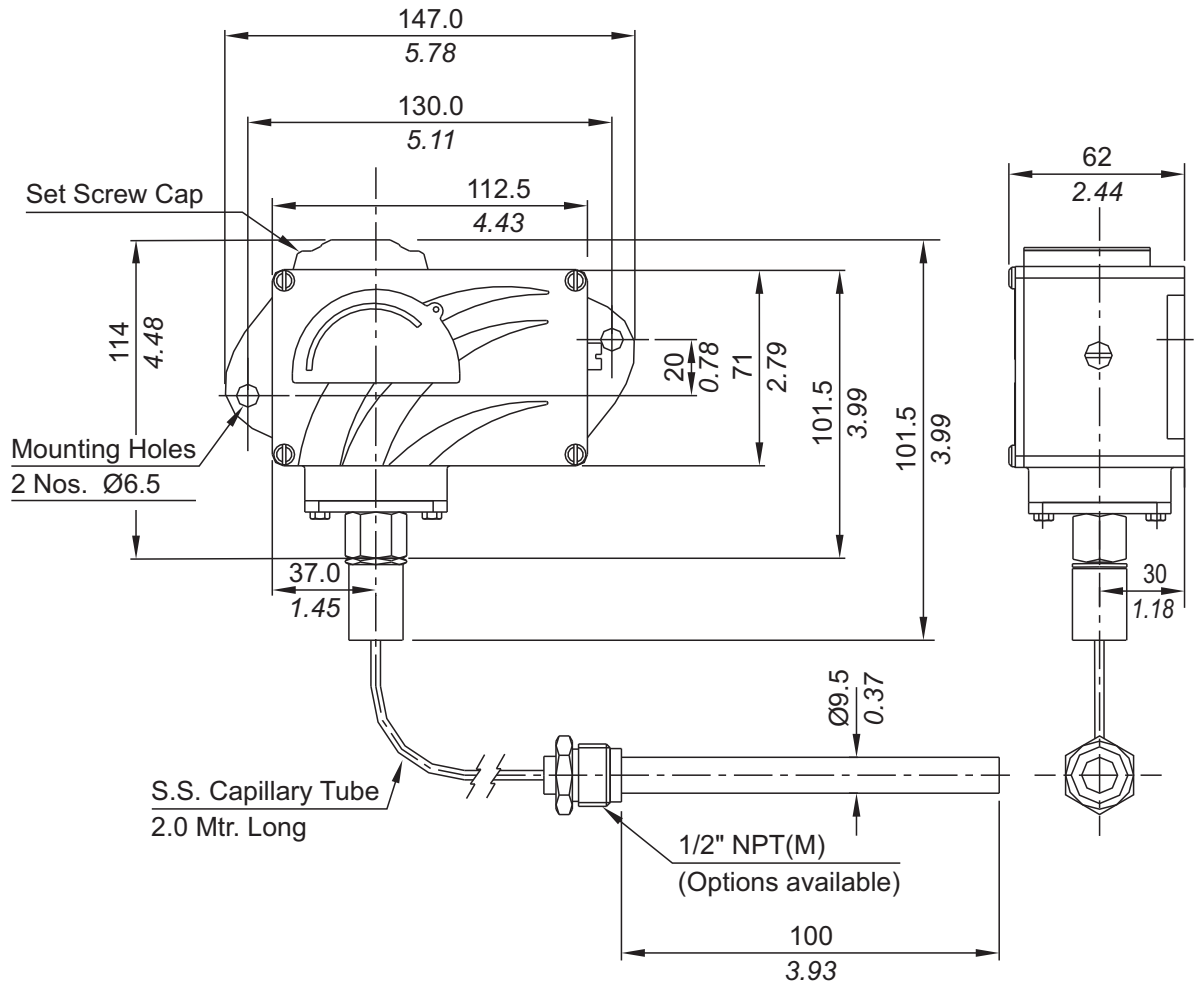
Some Applications : To detect limiting temperature levels in non-hazardous areas.

Electrical Connection :

Fig. 2



INSTALLATION DRAWING



APPROX. DIMENSIONS IN mm / inches

RANGE SELECTION TABLE

Range Code	Range ˚C *(˚F)*	Differential* ˚C *(˚F)*	Maximum Working Temperature ˚C *(˚F)*
		Approximate Maximum for "A1" microswitch	
T1H	25 - 90 *(77 - 194)*	15 *(59)*	150 *(302)*
T2H	70 - 150 *(158 - 302)*	20 *(68)*	200 *(392)*
T3H	120 - 215 *(248 - 419)*	30 *(86)*	300 *(572)*

* Approximate differential at midrange for A1 microswitch. Differentials increase with setpoint. Diffferentials vary with microswitch combinations. Please consult sales office for details

HOW TO ORDER INDUSTRIAL TEMPERATURE SWITCHES

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
Non standard allocation	Gas Group Classification	Cable Entry Size	Switch Type	Range Code (values in °C)	Microswitch Type	Temp. Bulb Material / Size	Capillary Material / Size
☐ Reserved for Non-standard Options not covered in Catalogue. Will Be given by Manufacturer, Only after Agreement of Supply details With customer.	**MD** = Industrial temp. switch with diecast Aluminum Enclosure to IP66	**1** = ½ " NPT threads **2** = ¾" NPT threads **3** = M20 X 1.5 threads	**TF1** = Temperature Switch, fixed differential without scale **TF2** = Temperature Switch, fixed differential with scale in °C	**T1H** = 25 - 90 **T2H** = 70 - 150 **T3H** = 120 - 215	**A1** = General purpose microswitch rated at 15 A; 250 VAC **A7** = 2SPDT switching elements	**B1** = Brass / Dia. 9.5 mm, 123 mm length, with 3/8" BSP (M) thermowell connection **B2** = Brass / Dia. 9.5 mm, 123 mm length, with 3/8" NPT (M) thermowell connection **B3** = Brass / Dia. 9.5 mm, 123 mm length, with 1/2" NPT (M) thermowell connection	**2** = SS316 / 2.0 meter

E.g. An Industrial Temperature Switch, with 1/2"NPT cable entry in aluminum housing as 1 SPDT, fixed differential without scale, having 25°C to 90°C temperature range, with 15 Amp. microswitch, with Brass 9.5 mm diameter bulb, having length 123 mm with 3/8"BSP(M),with 2.0 meter SS316 capillary length shall be specified by

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
☐	MD	1	TF1	T1H	A1	B1	2

Please specify full model number to avoid ambiguity.

Bulletin No. KA121024