

# INDUSTRIAL SWITCHES

## SPECIFIER'S GUIDE FOR

PRESSURE SWITCHES

PRESSURE DIFFERENCE SWITCHES

VACUUM SWITCHES

TEMPERATURE SWITCHES



# MD Sıcaklık Serisi

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, hysteresis, 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)

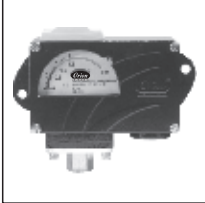
Products other than those listed in this catalogue are referenced on these pages. Separate catalogues for these products are available.

# Pictorial Index

## PRESSURE SWITCHES

### HIGH RANGE

**HIGH RANGE**



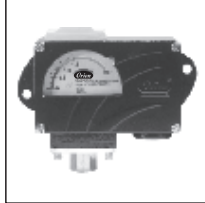
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**HIGH PROOF  
HIGH RANGE**



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**BELLOWS**



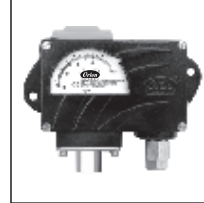
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**LARGE BORE  
HIGH RANGE**



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**AIR RELAY  
RANGE**



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**FLANGED  
RANGE**



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### LOW RANGE

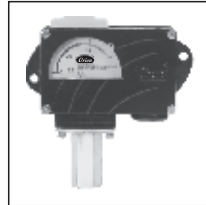
**LOW  
RANGE**



Page No. 120

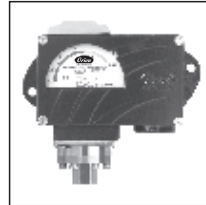
### HYDRAULIC RANGE\*

**HYDRAULIC  
RANGE**



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**HYDRAULIC  
DIAPHRAGM RANGE**



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## DUAL SWITCHES



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## PRESSURE DIFFERENCE SWITCHES

### HIGH RANGE

**HIGH RANGE**



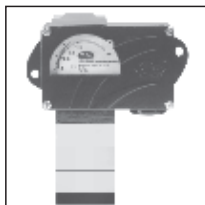
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**HIGH PROOF  
HIGH RANGE**



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**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**



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\*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

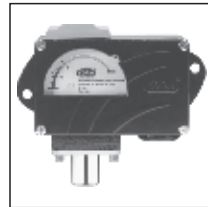


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## COMPOUND SWITCHES

### HIGH RANGE

#### HIGH RANGE



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### LOW RANGE

#### LOW RANGE



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## TEMPERATURE SWITCHES



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\*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:

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

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

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

**1 MD HIGH RANGE PRESSURE SWITCHES**

**2**

**3**

Approximate Weight : 0.700 Kg.  
**Some Applications :** Used in non-hazardous areas.  
 For any type of corrosive and non-corrosive gases and fluids.

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Electrical Connection :   
 Bulletin No. KA121024 **96**

**HIGH RANGE PRESSURE SWITCHES MD**

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**6**

**4**

No. Description  
 1. Pressure Housing  
 2. Diaphragm (Teflon)  
 3. Plunger  
 4. Seal Ring (SS316)  
 5. O-Ring (Teflon)  
 6. Disc

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**INSTALLATION DRAWING**

APPROX. DIMENSIONS IN MILLIMETRES  
 Bulletin No. KA121024 **97**

**1 MD HIGH RANGE PRESSURE SWITCHES**

**2 RANGE SELECTION TABLE**

**3**

Range Code	Range bar (psig)	Differential bar (psig)	Approximate Maximum for "M" microswitch	Maximum Working Pressure bar (psig)
LP	0.007 - 0.213 (0.097 - 3.20)	0.02 (0.29)	5	(72.52)
LP6	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 - 21.75)	0.12 (1.74)	12	(174.05)
H03	0.2 - 2.0 (2.90 - 29.71)	0.20 (2.90)	12	(174.05)
H04	0.2 - 3.0 (2.90 - 50.21)	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 - 145.30)	0.40 (5.80)	25	(362.6)
H15	0.5 - 15.0 (7.25 - 217.50)	0.80 (11.60)	25	(362.6)
H30	0.5 - 25.0 (7.25 - 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.

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**HIGH RANGE PRESSURE SWITCHES MD**

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**HOW TO ORDER INDUSTRIAL HIGH RANGE PRESSURE SWITCHES**

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
Material	Diaphragm	Microswitch	Switch Type	Range Code (psig)	Pressure Port Material	Terminal Size	Diaphragm Material
MD - Aluminum Aluminum Hastelloy C	0 1 2	MD - General purpose M2 - High pressure M3 - High pressure M4 - High pressure M5 - High pressure M6 - High pressure M7 - High pressure M8 - High pressure M9 - High pressure	1 - 1000 psi 2 - 1000 psi 3 - 1000 psi 4 - 1000 psi 5 - 1000 psi 6 - 1000 psi 7 - 1000 psi 8 - 1000 psi 9 - 1000 psi 10 - 1000 psi	LP (0.007 - 0.213) LP6 (0.1 - 0.5) H01 (0.1 - 1.0) H02 (0.1 - 1.5) H03 (0.2 - 2.0) H04 (0.2 - 3.0) H07 (0.5 - 7.0) H10 (0.5 - 10.0) H15 (0.5 - 15.0) H30 (0.5 - 25.0)	B1 - 1/8" (3.18) B2 - 1/4" (6.35) B3 - 1/2" (12.7)	1 - 1/16" (1.58) 2 - 1/8" (3.18) 3 - 1/4" (6.35) 4 - 3/8" (9.52) 5 - 1/2" (12.7) 6 - 5/8" (15.88) 7 - 3/4" (19.05) 8 - 1" (25.4) 9 - 1 1/8" (29.17) 10 - 1 1/4" (31.75)	0 - Teflon 1 - Neoprene 2 - Nitrile 3 - Viton 4 - Hastelloy C 5 - Inconel 6 - Titanium 7 - Monel 8 - 316L 9 - 304 10 - 304

Please specify full correct number to avoid ambiguity.

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# HOW TO USE this section

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

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

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

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

10. 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.

2

6

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

3 ● **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 Aluminium
- Long Lasting!**  
10<sup>7</sup> 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 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.

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**ULTRA LOW RANGE PRESSURE DIFFERENCE SWITCHES FP**

**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**

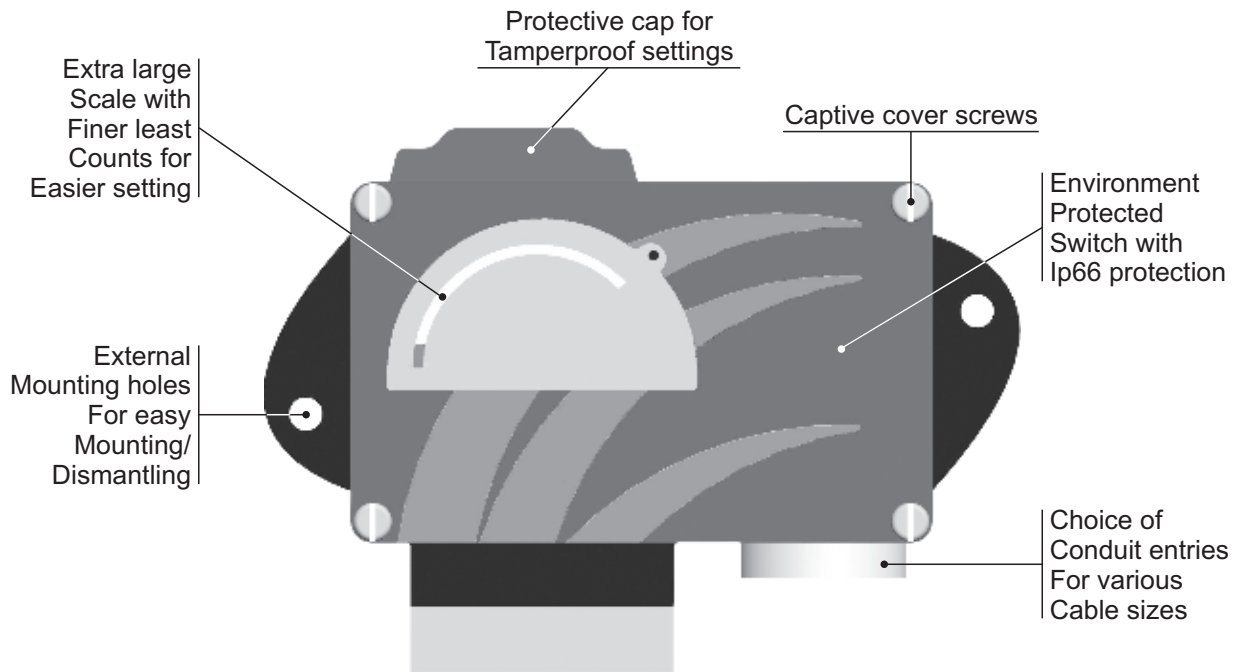
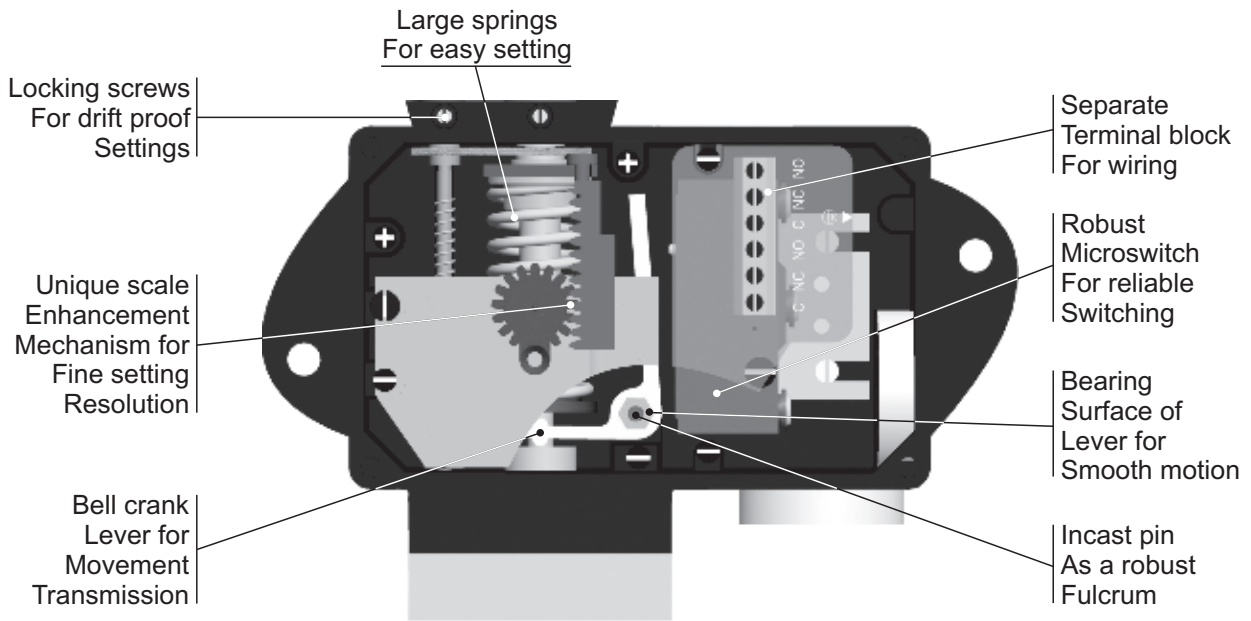
P1 = High Pressure Port  
P2 = Low Pressure Port  
Note : 1. Use two screws only, for mounting  
2. Remove transport protection from P1 and P2

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

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# 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 :

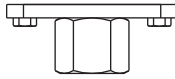

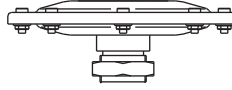

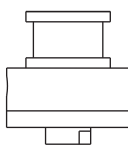
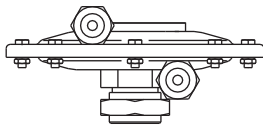
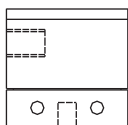
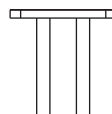
- A1 : General purpose applications
- A2 : Hermetically sealed for corrosive environments
- A3 : gold plated contacts for low voltage applications
- A4 : DPDT configuration
- A5 : for high DC ratings
- A7 : 2SPDT switching elements

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

The deadband (or hysteresis / 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:

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

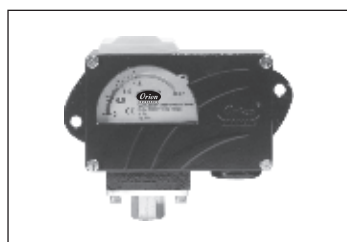
\*The pressure capsule can be modified to take high proof pressures [typically 100 bar for high and low pressure switches, or pressure difference switches (from high pressure side)].

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.



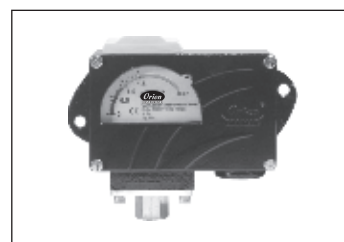
## Product Selection Guide



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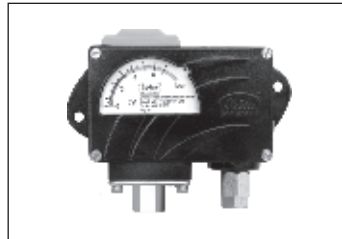
Switch type	High Pressure Ranges	High Proof High Pressure Ranges	High Range Bellows
Repeatability (% FSR)	± 1	± 2	± 2
Range covered	0.067 bar to 25 bar	0.067 bar to 25 bar	0.1 bar to 25 bar
Enclosure Protection	IP 66		
Enclosure Material	Pressure die-cast aluminium		
Sensing element	Diaphragm		Bellows
	Standard	Nylon reinforced neoprene diaphragm protected by Teflon	SS 316
Optional	Teflon, SS316L, Hastelloy C, Monel	SS 316L / Teflon	
Pressure housing	SS 316		SS 316
	Standard	Hastelloy C, Monel	
Optional			
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.

# Product Selection Guide



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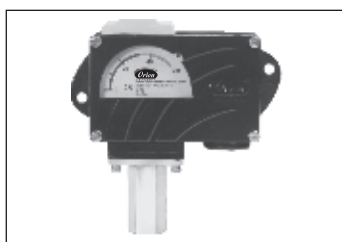
Large Bore High Range		Air Relay		Flanged		Switch type
± 2		± 2		± 2		Repeatability (% FSR)
0.1 bar to 25 bar		0.067 bar to 25 bar		0.1 bar to 200 bar		Range covered
IP66						Enclosure Protection
Pressure die-cast aluminium						Enclosure Material
Diaphragm Nylon reinforced neoprene diaphragm protected 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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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		
Sensing element	Diaphragm	Piston	Diaphragm
	Nylon reinforced neoprene diaphragm protected by Teflon	SS	SS316L
Optional	Teflon	SS 316L / Teflon	
Pressure housing	SS 316	SS 316	SS 316
	M.S.		
Other Wetted Parts	M.S., SS, Nitrile, Al., Neoprene	Viton, Teflon, SS	Teflon
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.		

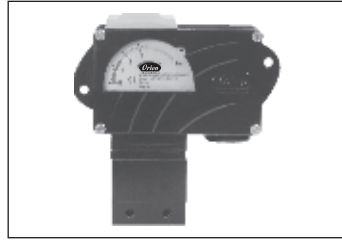
Accessories can be supplied with most of the switches. Please consult sales office.

\* Higher ranges available on request

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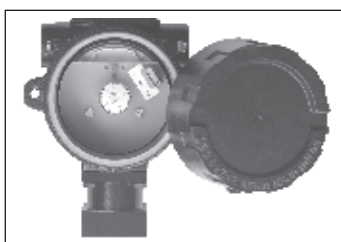
Dual High Range	High Range Pressure Difference Switches	High Proof High Range Pressure Difference Switches	Switch type
± 2	± 1	± 2	Repeatability (% FSR)
0.067 bar to 200 bar	0.1 bar to 3.6 bar*	0.1 bar to 3.6 bar*	Range covered
IP 66			Enclosure Protection
Pressure die-cast aluminium			Enclosure Material
Diaphragm Nylon reinforced neoprene Teflon, SS316L	Diaphragm Nylon reinforced neoprene Teflon	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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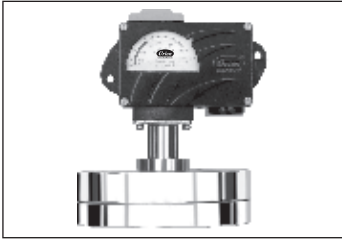
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Switch type	High Range DP	Ultra Low Range	Low Range Pressure Difference Switches
Repeatability (% FSR)	± 1	± 1	± 2
Range covered	0.1 bar to 25 bar	20 Pa to 4000 Pa	1.5 mbar to 350 mbar
Enclosure Protection	IP 66		
Enclosure Material	Pressure die-cast aluminium	Gravity die-cast aluminium	Pressure die-cast aluminium
Sensing element	Diaphragm Nylon reinforced neoprene diaphragm protected by Teflon	Diaphragm Silicone	Diaphragm Nylon reinforced neoprene
Standard			
Optional	Teflon, SS316L		Teflon
Pressure housing			
Standard	SS 316	Aluminium	M.S.
Optional	Aluminium		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

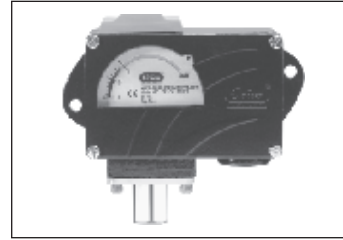
# Product Selection Guide



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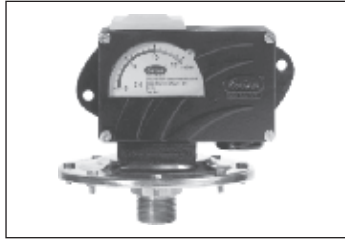


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Low ΔP High Proof Pressure Difference Switches	Vacuum Switches	High Range Compound Switches	Switch type
± 2	± 1	± 2	Repeatability (% FSR)
5 mbar to 350 mbar	760 mmHg to 100 mmHg	-1 bar to 3.6 bar	Range covered
IP 66			Enclosure Protection
Pressure 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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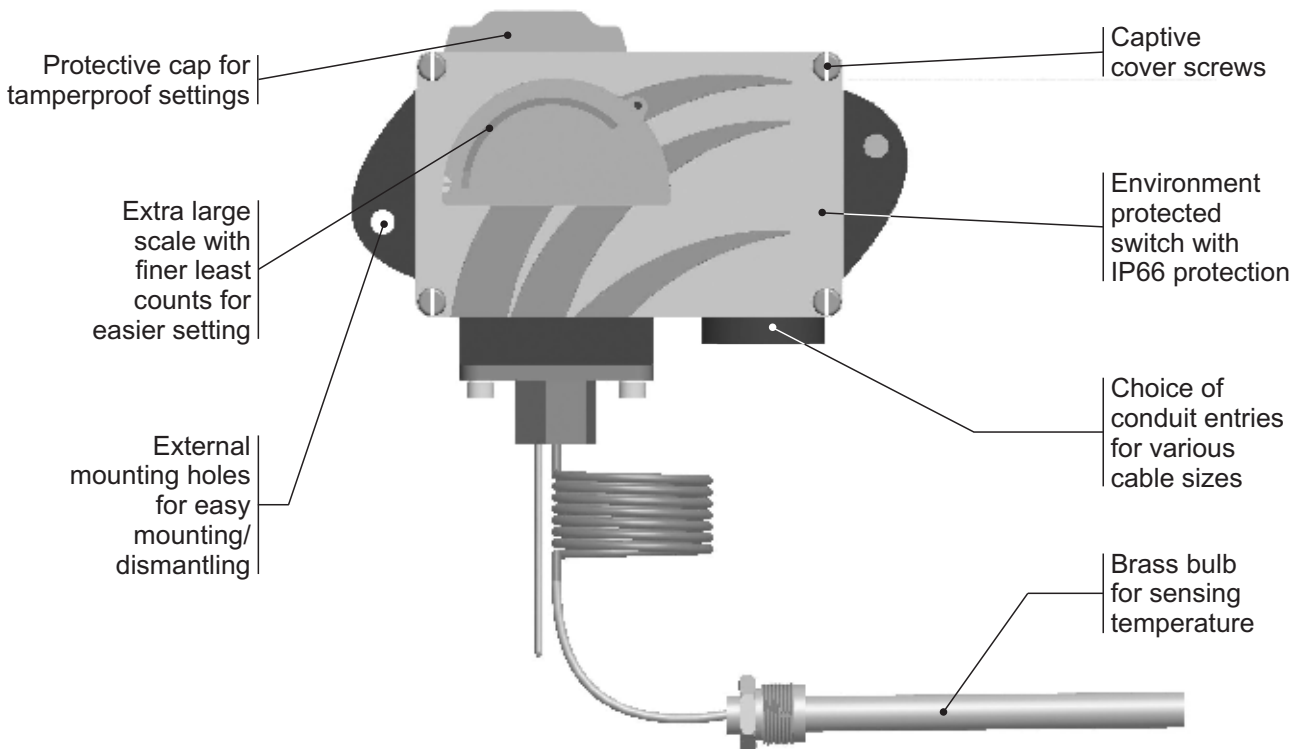
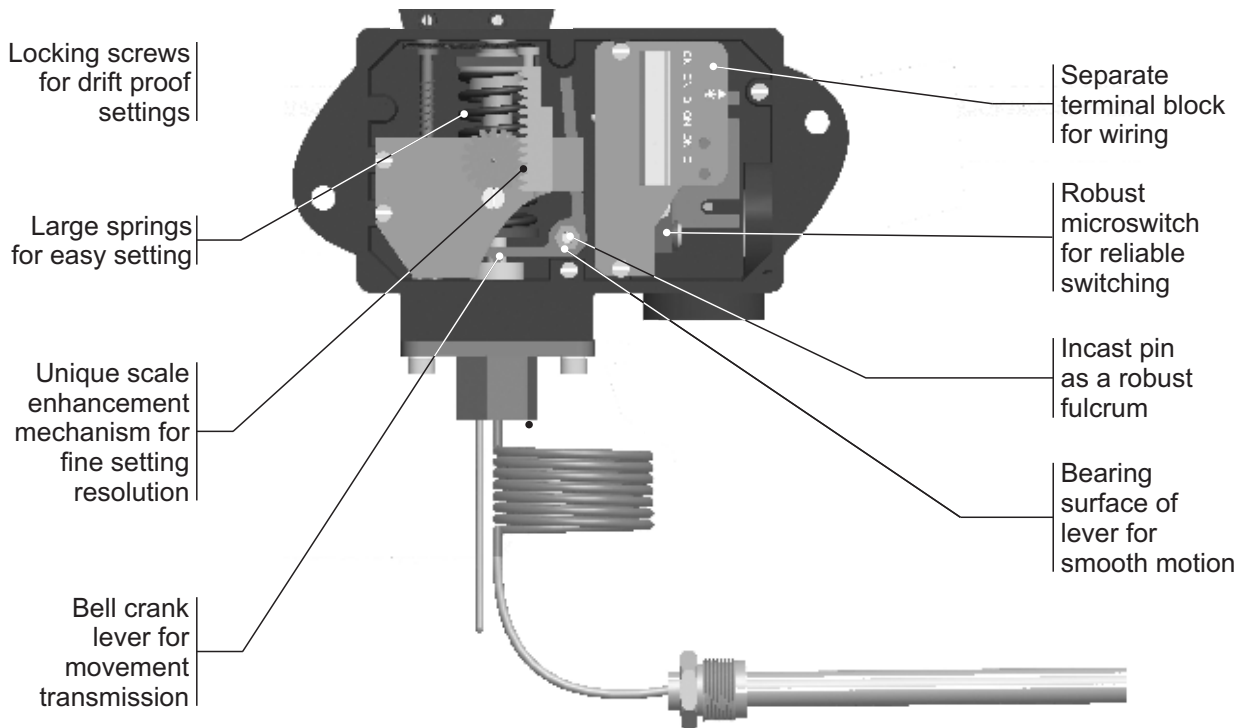
Switch type	Low Range Compound Switches	Temperature Switches
Repeatability (% FSR)	± 2	± 1
Range covered	-150 mm wc to 250 mm wc	25 °C to 215 °C
Enclosure Protection	IP 66	
Enclosure Material	Pressure die-cast aluminium	
Sensing element	Diaphragm Nylon reinforced neoprene diaphragm protected by Teflon	Bulb/Probe Brass
	Optional Teflon	
Pressure housing	SS 316	
Standard Optional		
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.	

WETTED PARTS

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

\* Higher ranges available on request

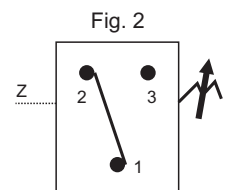
# MD TEMPERATURE SWITCHES



**Approximate Weight :** 0.950 Kg.

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

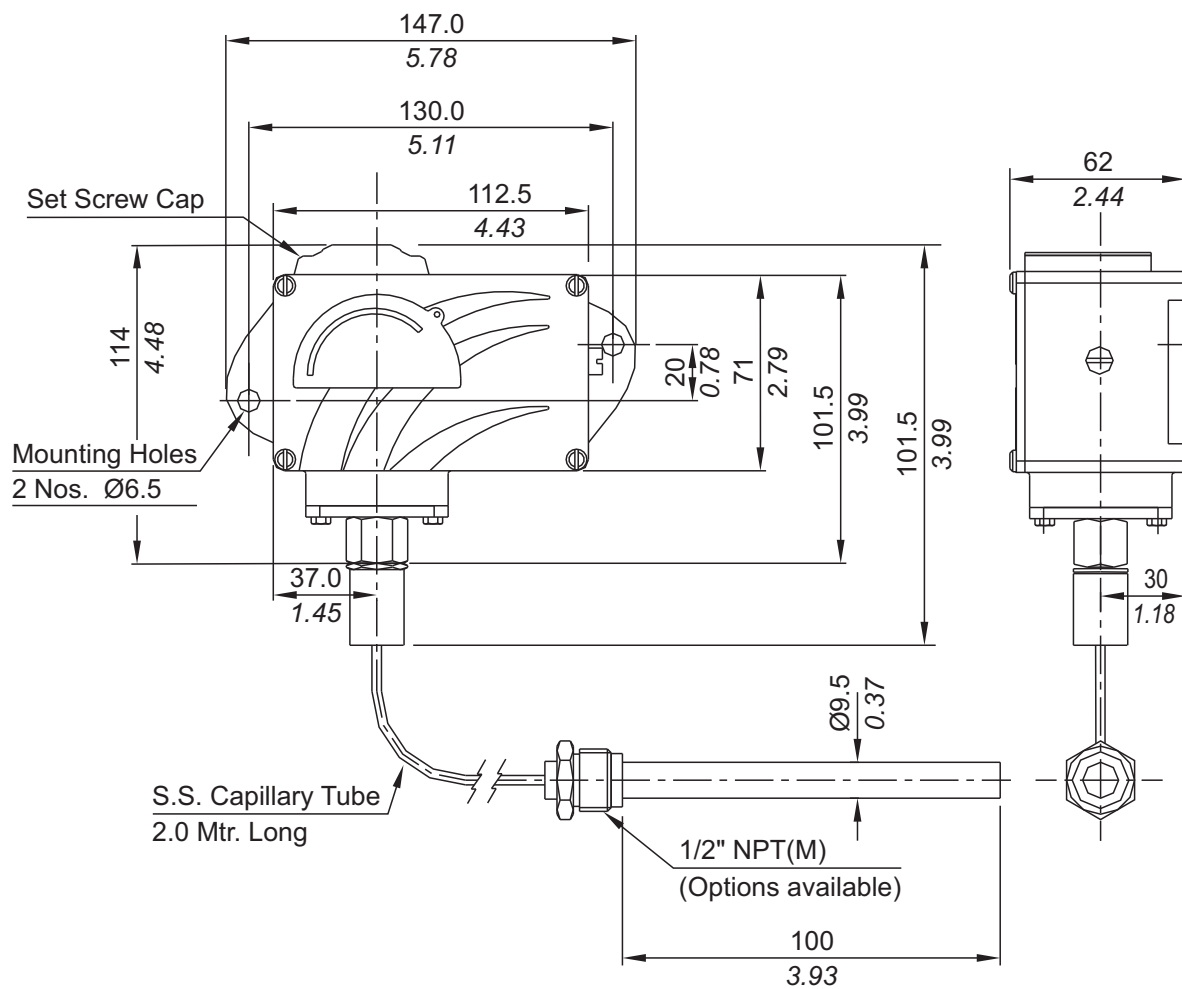
**Electrical Connection :**







## INSTALLATION DRAWING



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

# MD TEMPERATURE SWITCHES

## 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. Differentials 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
<input type="checkbox"/> Reserved for Non-standard Options not covered in Catalogue. Will Be given by Manufacturer, Only after Agreement of Supply details With customer.	<b>MD</b> = Industrial temp. switch with diecast Aluminum Enclosure to IP66	<b>1</b> = 1/2" NPT threads <b>2</b> = 3/4" NPT threads <b>3</b> = M20 X 1.5 threads	<b>TF1</b> = Temperature Switch, fixed differential without scale <b>TF2</b> = Temperature Switch, fixed differential with scale in °C	<b>T1H</b> = 25 - 90 <b>T2H</b> = 70 - 150 <b>T3H</b> = 120 - 215	<b>A1</b> = General purpose microswitch rated at 15 A; 250 VAC <b>A7</b> = 2SPDT switching elements	<b>B1</b> = Brass / Dia. 9.5 mm, 123 mm length, with 3/8" BSP (M) thermowell connection <b>B2</b> = Brass / Dia. 9.5 mm, 123 mm length, with 3/8" NPT (M) thermowell connection <b>B3</b> = Brass / Dia. 9.5 mm, 123 mm length, with 1/2" NPT (M) thermowell connection	<b>2</b> = 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
<input type="checkbox"/>	MD	1	TF1	T1H	A1	B1	2

Please specify full model number to avoid ambiguity.

## Introduction

MZ series pressure switches have been designed for applications that require cost effective outdoor mounting, in aggressive environments. The tough polycarbonate cover, fitted on a stainless steel base, retained by SS screws offers excellent resistance to corrosion, and also allows a view of the internal scale and working of the pressure switch. The reliable microswitch offers narrow deadband, switching values, which have excellent repeatability. By using appropriate capsules and wetted parts, MZ series pressure switches can be used for thousands of applications.

## APPLICATIONS

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

## PRODUCT SPECIFICATIONS:

- Storage temperature : Atmospheric temperature
- Operating ambient temperature : - 20° C to + 60° C
- Media temperature : for rubber diaphragms 80° C max
- Can be offered for higher temperatures with other capsule combinations
- Setpoint repeatability :  $\pm 1\%$  of FSR
- Enclosure : Tough Polycarbonate and SS to IP 66
- Switch output : SPDT / 2SPDT
- Process connection :  $\frac{1}{4}$ " BSP standard,
- Approximate weight : 1 kg

## FEATURES

- Robust
- Externally visible scale for viewing, alongwith internal working of the switch
- Enclosure protection : IP 66 standard
- Reliable accurate microswitches for long life switching
- Customized arrangements for switching values on request
- Easy safe wiring options
- Locking and sealing arrangement to avoid tampering of setpoints on field
- Accuracy +/- 1 % FSR
- Warranty : 2 years

\*Accuracy changes with switch configuration