Orion®
INSTRUMENTS

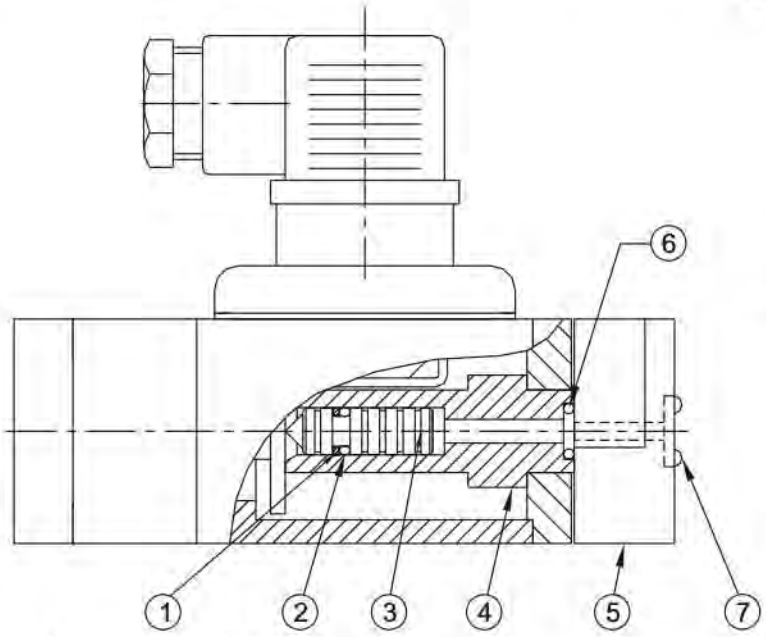
CATALOGUE

HM/HO HYDRAULIC PRESSURE SWITCHES



Orion® INSTRUMENTS

PRESSURE CAPSULE DETAILS

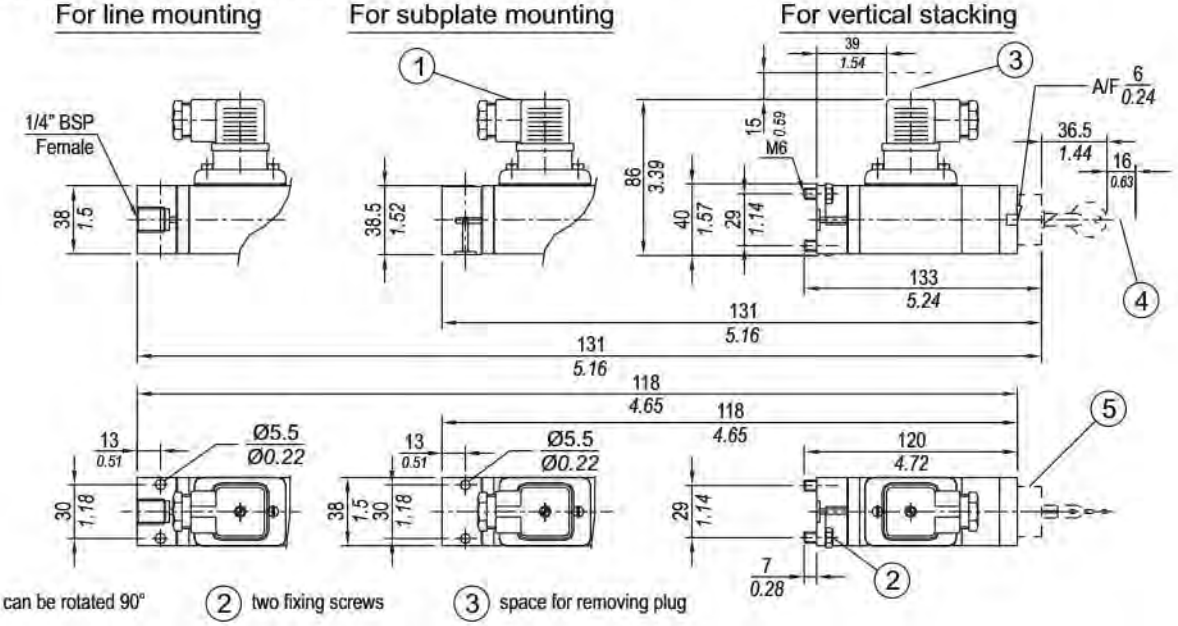


No. Description

1. Backup ring
2. *Piston seal*
3. *Piston*
4. *Pressure housing*
5. *Base*
6. *Pressure housing seal*
7. *Base seal* (O ring)
   (N.A for line mounting style)

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING



(1) can be rotated 90° (2) two fixing screws (3) space for removing plug

(4) space for removing key (5) lockable protective cap

APPROX. DIMENSIONS IN mm / inches

HYDRAULIC PRESSURE SWITCHES HM/HO

General information:
HM series pressure switches have a machined aluminium powder coated enclosure and are recommended for manifold mounting hydraulic applications. When fitted with different types of chemical seals these can also be used for various processes The repeat accuracy is better than ±1 % FSR. A connector to DIN 43650 is provided for wiring.

Features:
- Compact
- Lightweight
- Three mounting styles
- Lockable protective cap to avoid tampering (optional)
- Choice of wetted parts to suit working media
- Electrical rating : 5A, 250 VAC; 0.2 A, 250 VDC (res.)

Some Applications : Used in compressors, hydraulic power packs, manifolds/stacks with sandwich plates, etc.

Range Selection Table

Range Code	Range (falling pressure) bar *(psi)*	*Approximate Maximum Differential bar *(psi)*	Maximum Working Pressure bar *(psi)*
040	3 - 40 *(43.51 - 580.15)*	5 *(72.52)*	200 *(2900.76)*
100	10 - 100 *(145.04 - 1450.38)*	12 *(174.05)*	200 *(2900.76)*
200	7 - 200 *(101.52 - 2900.76)*	24 *(348.09)*	200 *(2900.76)*
400	100 - 400 *(1450.38 - 5801.51)*	40 *(580.15)*	400 *(5801.51)*

*differential rises with setpoint (Graphs available on request)

Wetted Parts Table for HM Hydraulic Series.

	Standard	Optional	Special
Piston	EN8	S.S.	for special wetted parts through chemical seals, please refer page 330,331 & 332 and specify in text accordingly.
Piston Seal	Viton	Viton	
Pressure housing	Aluminium	Brass/ M.S.	
Housing Seal	Nitrile	Viton	
Base	M.S.	Brass	
Base Seal	Nitrile	Viton	

How to order HM Hydraulic Series pressure switches.

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
Model	Range Code	Base Type	Protective Cap	Wetted Parts	Enclosure*
HM - Hydraulic Pressure Switch HO - Hydraulic Pressure Switch	Hydraulic Pressure Range	S - for Subplate mounting. L - for line Mounting V - for vertical Stacking	U - without any protective cap P - with a lockable protective cap	M - for Standard Wetted parts. B - for Brass pressure housing, brass base, SS piston. All seals of Viton only X - Specify wetted parts in text as	0 - IP 65

*HM series flameproof versions will be available with 1/4" BSPF threading arrangement only. For corrosive media, a separate chemical seal can be provided.
eg. A hydraulic pressure switch, pressure range from 5 to 40 bar, as a vertical element with a lockable protective cap & standard wetted parts with a standard enclosure shall be specified by

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
HM	040	V	P	M	0

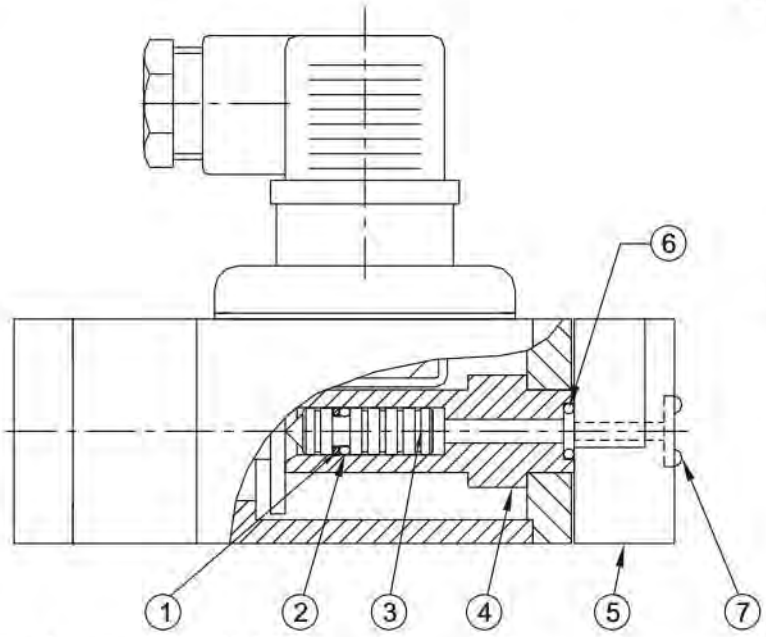
Please specify full model number to avoid ambiguity. If only the first two groups are specified while ordering, pressure switches with standard wetted parts will be supplied.

HM/HO HYDRAULIC PRESSURE SWITCHES



Orion® INSTRUMENTS

PRESSURE CAPSULE DETAILS

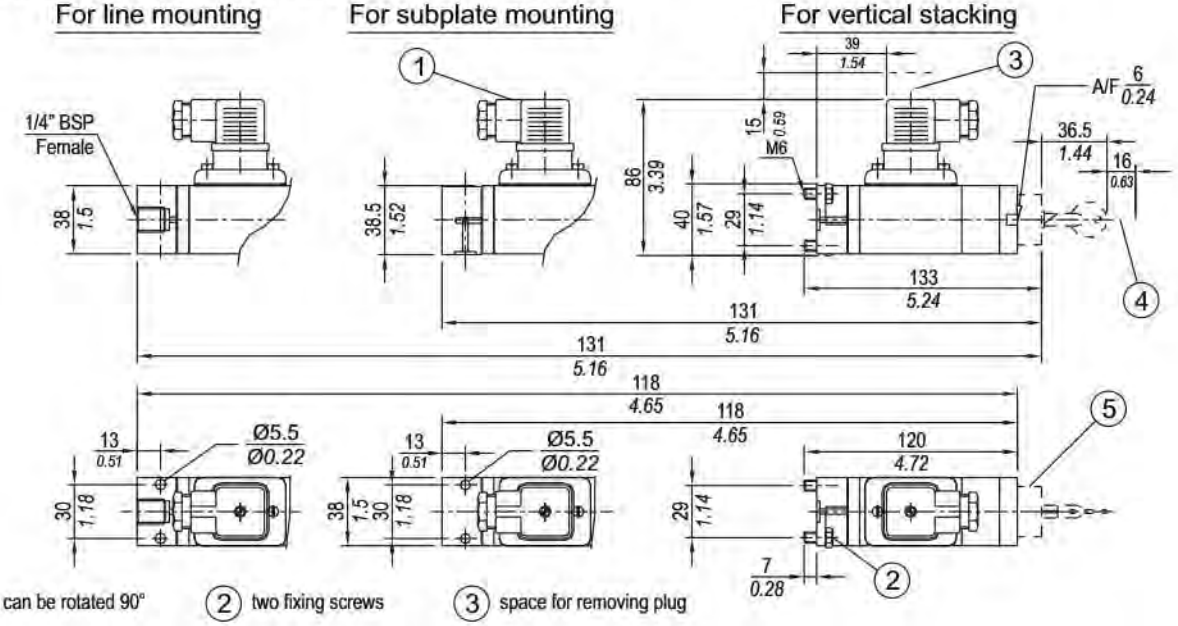


No. Description

1. Backup ring
2. *Piston seal*
3. *Piston*
4. *Pressure housing*
5. *Base*
6. *Pressure housing seal*
7. *Base seal* (O ring)
   (N.A for line mounting style)

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING



(1) can be rotated 90° (2) two fixing screws (3) space for removing plug

(4) space for removing key (5) lockable protective cap

APPROX. DIMENSIONS IN mm / inches

HYDRAULIC PRESSURE SWITCHES HM/HO

General information:
HM series pressure switches have a machined aluminium powder coated enclosure and are recommended for manifold mounting hydraulic applications. When fitted with different types of chemical seals these can also be used for various processes The repeat accuracy is better than ±1 % FSR. A connector to DIN 43650 is provided for wiring.

Features:
- Compact
- Lightweight
- Three mounting styles
- Lockable protective cap to avoid tampering (optional)
- Choice of wetted parts to suit working media
- Electrical rating : 5A, 250 VAC; 0.2 A, 250 VDC (res.)

Some Applications : Used in compressors, hydraulic power packs, manifolds/stacks with sandwich plates, etc.

Range Selection Table

Range Code	Range (falling pressure) bar *(psi)*	*Approximate Maximum Differential bar *(psi)*	Maximum Working Pressure bar *(psi)*
040	3 - 40 *(43.51 - 580.15)*	5 *(72.52)*	200 *(2900.76)*
100	10 - 100 *(145.04 - 1450.38)*	12 *(174.05)*	200 *(2900.76)*
200	7 - 200 *(101.52 - 2900.76)*	24 *(348.09)*	200 *(2900.76)*
400	100 - 400 *(1450.38 - 5801.51)*	40 *(580.15)*	400 *(5801.51)*

*differential rises with setpoint (Graphs available on request)

Wetted Parts Table for HM Hydraulic Series.

	Standard	Optional	Special
Piston	EN8	S.S.	for special wetted parts through chemical seals, please refer page 330,331 & 332 and specify in text accordingly.
Piston Seal	Viton	Viton	
Pressure housing	Aluminium	Brass/ M.S.	
Housing Seal	Nitrile	Viton	
Base	M.S.	Brass	
Base Seal	Nitrile	Viton	

How to order HM Hydraulic Series pressure switches.

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
Model	Range Code	Base Type	Protective Cap	Wetted Parts	Enclosure*
HM - Hydraulic Pressure Switch HO - Hydraulic Pressure Switch	Hydraulic Pressure Range	S - for Subplate mounting. L - for line Mounting V - for vertical Stacking	U - without any protective cap P - with a lockable protective cap	M - for Standard Wetted parts. B - for Brass pressure housing, brass base, SS piston. All seals of Viton only X - Specify wetted parts in text as	0 - IP 65

*HM series flameproof versions will be available with 1/4" BSPF threading arrangement only. For corrosive media, a separate chemical seal can be provided.
eg. A hydraulic pressure switch, pressure range from 5 to 40 bar, as a vertical element with a lockable protective cap & standard wetted parts with a standard enclosure shall be specified by

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
HM	040	V	P	M	0

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

Orion®
INSTRUMENTS

PRESSURE SWITCHES
PRESSURE DIFFERENCE SWITCHES
VACUUM SWITCHES
From 1.5 mbar to 600 bar

MT Dual Pressure Switches

CATALOGUE

Certificate No.: FM72815
ISO 9001:2008

Kaustubha Udyog AN ISO9001:2008 COMPANY

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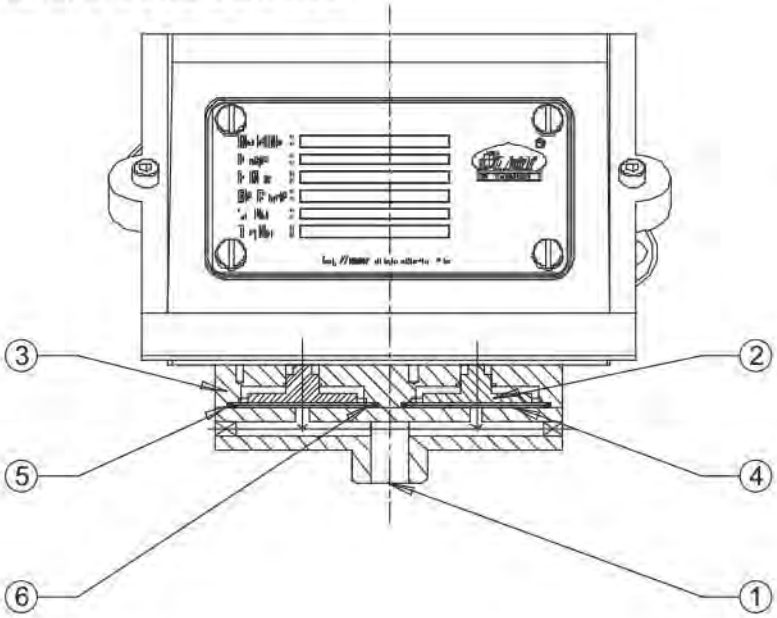
Website : http://www.orion-instruments.com

BULLETIN NO. : KA170217

MT DUAL PRESSURE RANGES

PRESSURE CAPSULE DETAILS



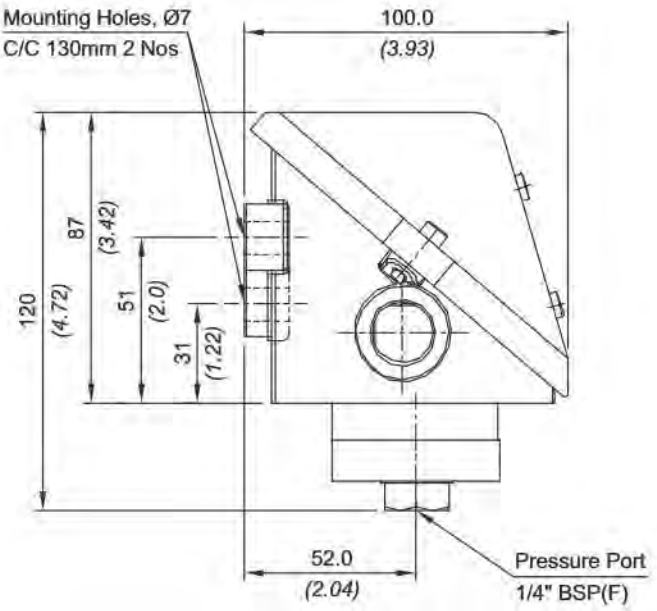
No. Description

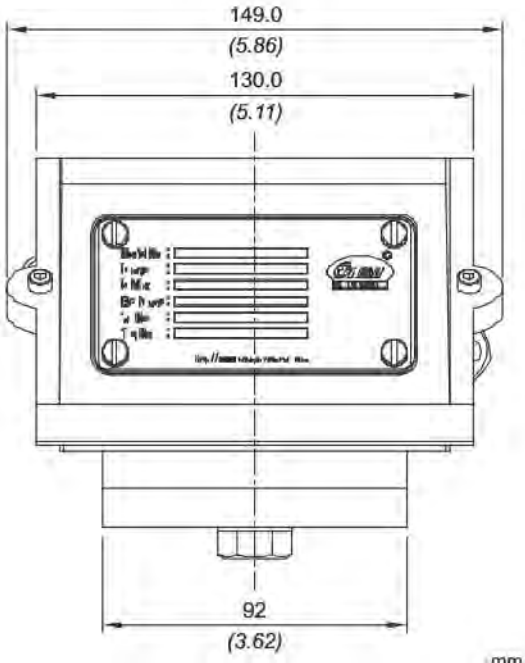
1. Pressure Port
2. Plunger
3. Disc Plate
4. *Diaphragm*
5. *'O' Ring*
6. *Backup Ring*

Note : *wetted parts* are mentioned in italics.

*Presure ports are brazed with flange

INSTALLATION DRAWING





APPROX. DIMENSIONS IN mm / inches

RANGE SELECTION TABLE

Range Code	Range bar *(psi)*	†Differential bar *(psi)* Approximate Maximum for "A8" microswitch	Maximum Working Pressure bar *(psi)*
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 - 145.38)*	0.60 *(8.70)*	25 *(362.6)*
H15	1.0 - 15.0 *(14.5 - 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, values with neoprene diaphragm (Graphs available on request)
*Differentials of miroswitches A1 through A7 and A9 will vary.
Please indicate specifically the differential value in enquiry/order, when it is critical in your application.

HOW TO ORDER INDUSTRIAL DUAL 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.	**MT** = Industrial dual pressure switch with diecast Aluminium enclosure to IP66 as per IS/IEC 60529	**1** = Al. head ½" NPT threads **3** = Al. head M20 X 1.5 threads	**KF2** = Dual pressure switch, fixed differential with scale in bar **KF3** = Dual pressure switch, fixed differential with scale in psi	**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 **A8** = General purpose microswitch rated at 5 A; 250 VAC **A9** = General purpose microswitch rated at 5 A; 250 VAC	**S1** = SS316 / ¼" BSP(F) **S2** = SS316 / ¼" NPT(F)	**0** = Neoprene **1** = Teflon **2** = SS 316L **3** = Hastelloy C **4** = Monel

eg. Industrial Dual switch with ½" NPT cable entry in aluminium housing as 1SPDT pressure switch, fix differential with scale having 0.2 bar to 2.6 bar pressure range, with 5 A microswitch, SS316 pressure housing with ¼" BSP port size & teflon diaphragm shall be specified by

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
☐	MT	1	KF2	H03	A8	S1	1

Please specify full model number to avoid ambiguity.

Orion®
INSTRUMENTS

PRESSURE SWITCHES
PRESSURE DIFFERENCE SWITCHES
VACUUM SWITCHES
From 1.5 mbar to 600 bar

DS Dual High Range Pressure Difference Switches

CATALOGUE

Certificate No.: FM72815
ISO 9001:2008

Kaustubha Udyog AN ISO9001:2008 COMPANY

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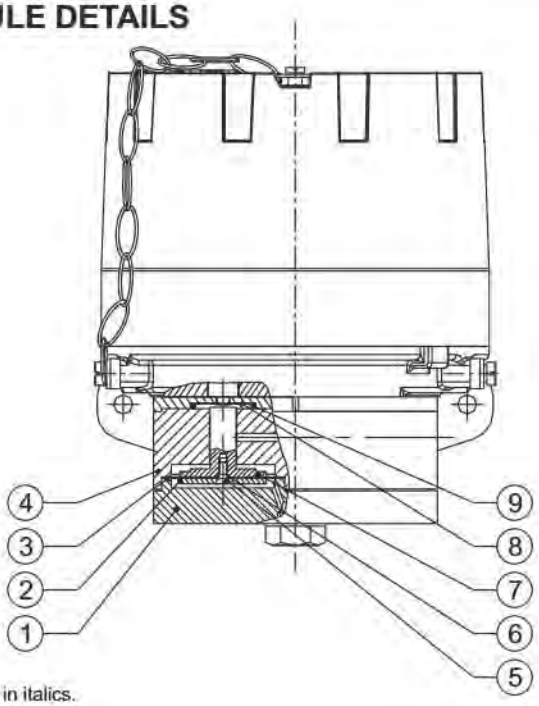
Website : http://www.orion-instruments.com

BULLETIN NO. : KA131028

DS DUAL HIGH RANGE PRESSURE DIFFERENCE SWITCHES

PRESSURE CAPSULE DETAILS

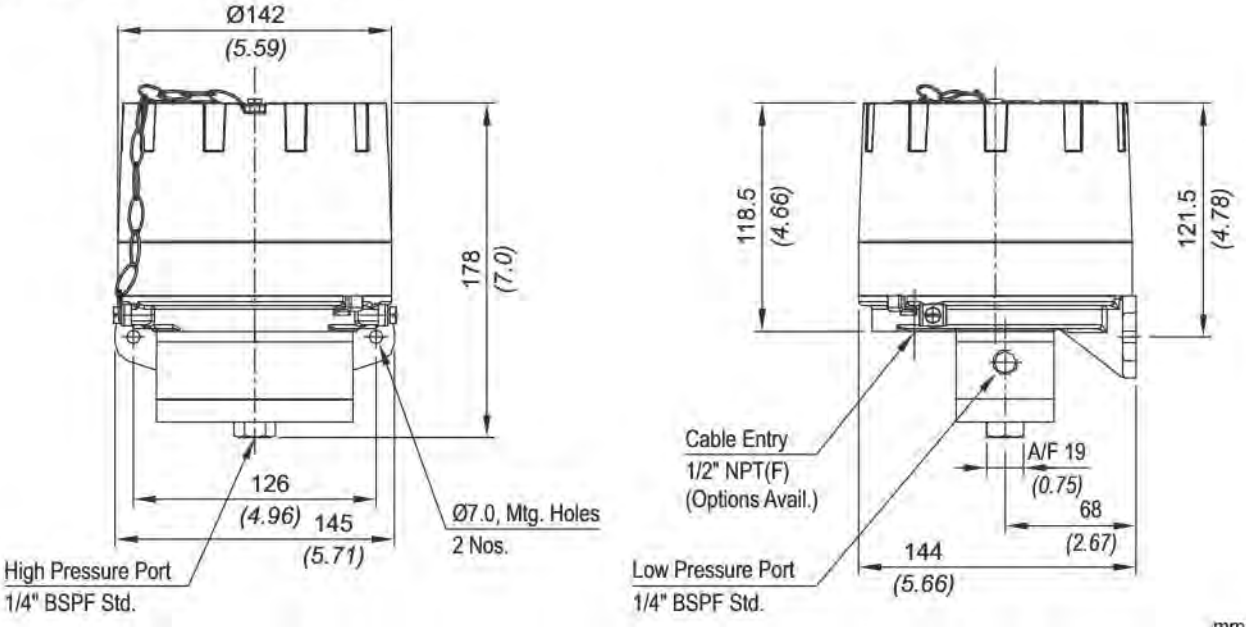


No. Description

1. *Pressure Housing*
2. *HP Plunger(S.S.316)*
3. *Diaphragm*
4. *Disc*
5. *CSK Screw(SS)*
6. *0-Ring (Teflon)*
7. *LP Plunger(S.S.316)*
8. *Sealing Diaphragm (Teflon)*
9. *Sealing 0-Ring (Teflon)*

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING



APPROX. DIMENSIONS IN mm / inches

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 DUAL 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.	**DS** = Dual Pressure Switch with diecast Aluminium enclosure to IP 66 as per IS 2147	**1** = 1/2" NPT threads **2** = 3/4" NPT threads **3** = M20 X 1.5 cable gland	**EF2** = pressure difference switch, fixed differential with scale in bar **EF3** = pressure difference switch, fixed differential with scale in psi ***EA2** = pressure difference switch, adjustable differential with scale in bar ***EA3** = pressure difference switch, adjustable differential with scale in psi *Available only with option A9 in Group 6	**H01** = (0.1 - 1.0) **H02** (0.1 - 1.5) **H03** = (0.2 - 2.6) **H04** = (0.2 - 3.6)	**A8** = General purpose microswitch rated at 5 A; 250 VAC **A7** = 2SPDT microswitches **A9** = General purpose microswitch rated @ 5A, 250 VAC	**S1** = SS316 / ¼" BSP(F) **S2** = SS316 / ¼" NPT(F) **A1** = Aluminium / ¼" BSP(F) **A2** = Aluminium / ¼" NPT(F)	**0** = Neoprene **1** = Teflon

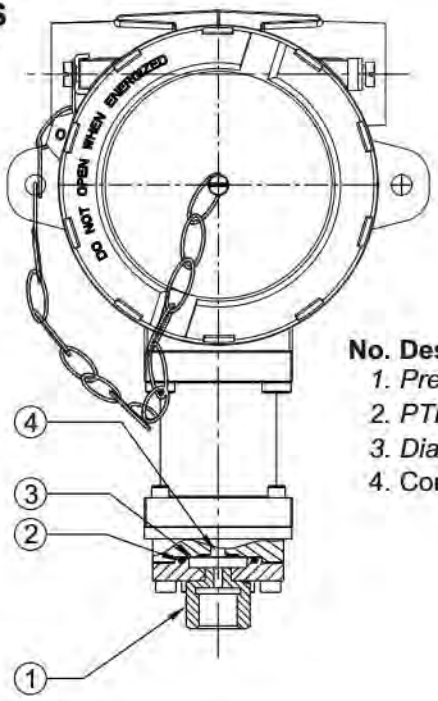
eg. A dual high range pressure difference switch with fixed differential having 0.1 bar to 1 bar pressure range, with 5 Amp. microswitch, SS316 pressure housing with ¼" BSP port size & neoprene diaphragm shall be specified by

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
☐	DS	3	EF2	H01	A8	S1	0

Please specify full model number to avoid ambiguity.

FC

PRESSURE CAPSULE DETAILS

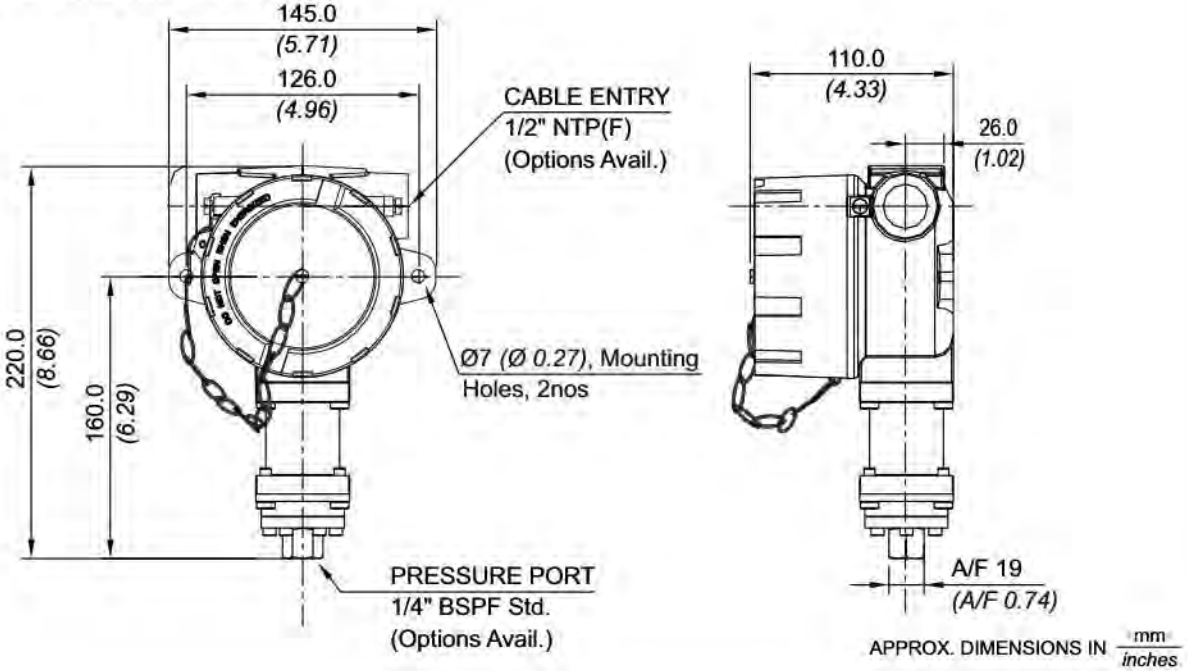


No. Description

1. *Pressure Port*
2. *PTFE O-Ring*
3. *Diaphragm*
4. Conical Plunger

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING



APPROX. DIMENSIONS IN mm / *inches*

FC/FE HYDRAULIC DIAPHRAGM RANGES

RANGE SELECTION TABLE

Range Code	Range bar *(psi)*	Differential* bar *(psi)*	Maximum Working Pressure bar *(psi)*
		Approximate Maximum for "A8" microswitch	
H1T	0.5 - 10 *(7.25 - 145.04)*	1 *(14.50)*	150 *(2175.51)*
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 *(146.04 - 1450.38)*	12 *(174.05)*	200 *(2900.76)*
H2H	7 - 200 *(101.52 - 2900.76)*	24 *(348.09)*	400 *(5801.52)*
H4H	40 - 400 *(580.15 - 5801.52)*	50 *(725)*	500 *(7251.88)*
H7H	70 - 700 *(1015.26 - 10152.64)*	60 *(870)*	800 *(11603)*
H1K	100 - 1000 *(1450.37 - 14503.77)*	70 *(1015.26)*	1100 *(15954.15)*

Note:

1. The minimum differential increases with the setpoint. The differential values mentioned in the above table are approximate maximum for FSR. The differential value will vary according to the pressure range selected and microswitch type. For actual values of differential please contact sales office.

Note: Welded diaphragm also available as shown

2. When using 2SPDT switching arrangement, both microswitches may not actuate and/or deactuate at the same point. A small stage gap, normally upto +/- 5% FSR (depending on range code) may be observed. The On-Off differential (hysterisis) typically tends to be atleast double of those published for 1SPDT pressure switches.

If actuation and/or deactuation at same point is critical part of operation, then it can be achieved by using a separate DPDT relay. This relay will need a separate power supply for it's coil.

HOW TO ORDER FLAMEPROOF HYDRAULIC RANGE PRESSURE SWITCHES

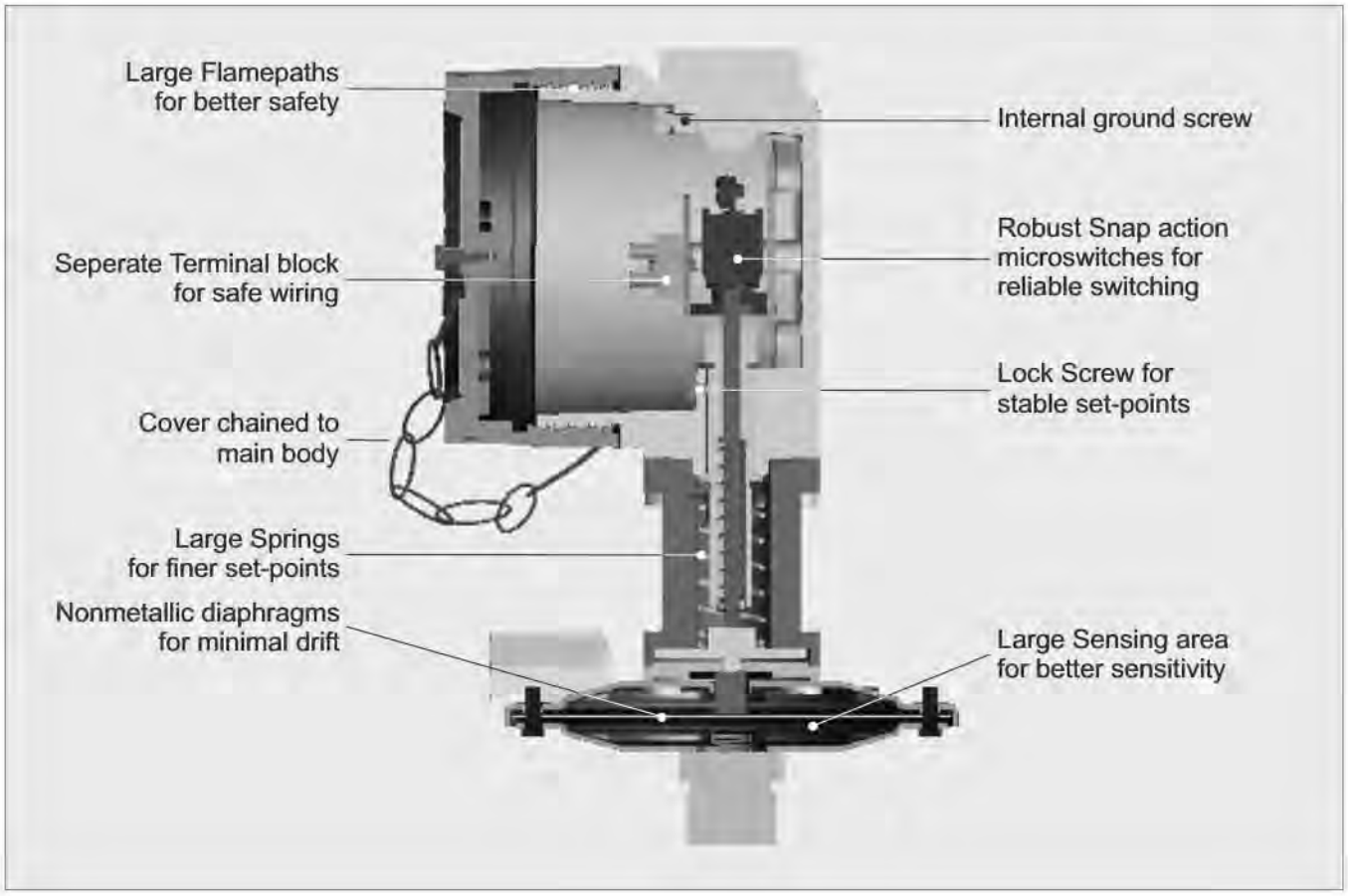
Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
Non standard allocation	Model	Cable Entry Size	Switch Type	Range Code (values in bar)	Microswitch Type	Pressure Port Material / Size	Diaphragm
☐ Reserved for non-standard options not covered in catalogue. Will be given by manufacturer, only after agreement of supply details with customer.	**FC** = IP66 Flameproof pressure switch, ATEx, IECEx & PESO approved **FE** = IP66 Flameproof pressure switch, PESO approved	**1** = Al. head ½" NPT threads **2** = Al. head ¾" NPT threads **3** = Al. head M20 x 1.5 threads ***4** = Grey CI head ½" NPT threads ***5** = Grey CI head ¾" NPT threads ***6** = Grey CI head M20 x 1.5 threads **7** = SS head ½" NPT threads **8** = SS head ¾" NPT threads **9** = SS head M20 x 1.5 threads * Not available in FE models	**P 1** = pressure switch, fixed differential without scale **P2** = pressure switch, fixed differential with scale in bar **P3** = pressure switch, fixed differential with scale in psi For adjustable differential please select microswitches A6 or C6 in group 6	**H1T** = (0.5 - 10) **H2T** = (2 - 20) **H4T** = (5 - 40) **H1H** = (10 - 100) **H2H** = (7 - 200) **H4H** = (40 - 400) **H7H** = (70 - 700) **H1K** = (100 - 1000)	**A1** = General purpose microswitch rated at 15 A; 250 VAC ***A6** = elements with adjustable deadband ***A7** = 2SPDT switching elements **A8** = General purpose microswitch rated at 5 A, 250 VAC; 5 A, 28 VDC ***B7** = 2SPDT Switching Elements **C6** = 1SPDT Adjustable Differential Please refer Page No. 122 for Microswitch options * Please refer note under Range Selection Table	**S1** = SS316 / ¼" BSP(F) **S2** = SS316 / ¼" NPT(F) **S3** = (welded diaphragm) SS316 / 1" BSP(M) **S4** = SS316 / 1/2" NPT(F) **S5** = SS316 / 1/2" NPT(M) **H1** = Hastelloy C / ¼" BSP(F) **H2** = Hastelloy C / ¼" NPT(F) **N1** = Monel / ¼" BSP(F) **N2** = Monel / ¼" NPT(F) Please refer Page No. 118 for Pressure Port options	**0** = Neoprene **1** = PTFE **2** = SS 316L **3** = Hastelloy C **4** = Monel **5** = Titanium **6** = Tantalum **7** = Inconel

eg. A flameproof switch for gas group IIC, with ½" NPT cable entry in aluminium housing as 1SPDT pressure switch, having 5 bar to 40 bar pressure range, with 15 Amp. microswitch, SS316 pressure housing with ¼" BSP port size & SS316L diaphragm shall be specified by

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
☐	FC	1	P1	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.

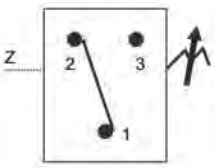
FC LOW RANGE PRESSURE DIFFERENCE SWITCHES



Approximate Weight :

Pressure difference switches with Aluminium enclosure : 2.25 Kg.
Pressure difference switches with Grey CI enclosure : 4.65 Kg.
Pressure difference switches with SS enclosure : 4.95 Kg.

Electrical Connection :

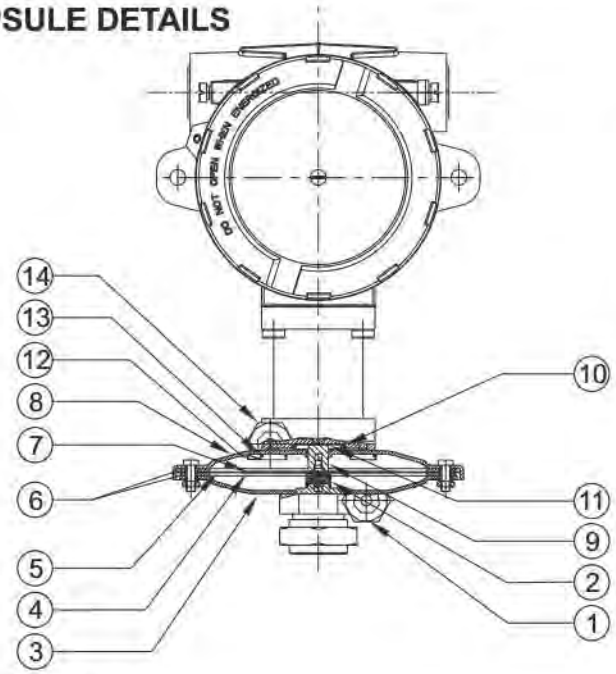


Some Applications :

Used in ventilation systems, clean rooms, clogged filters, etc.

Orion® INSTRUMENTS

PRESSURE CAPSULE DETAILS



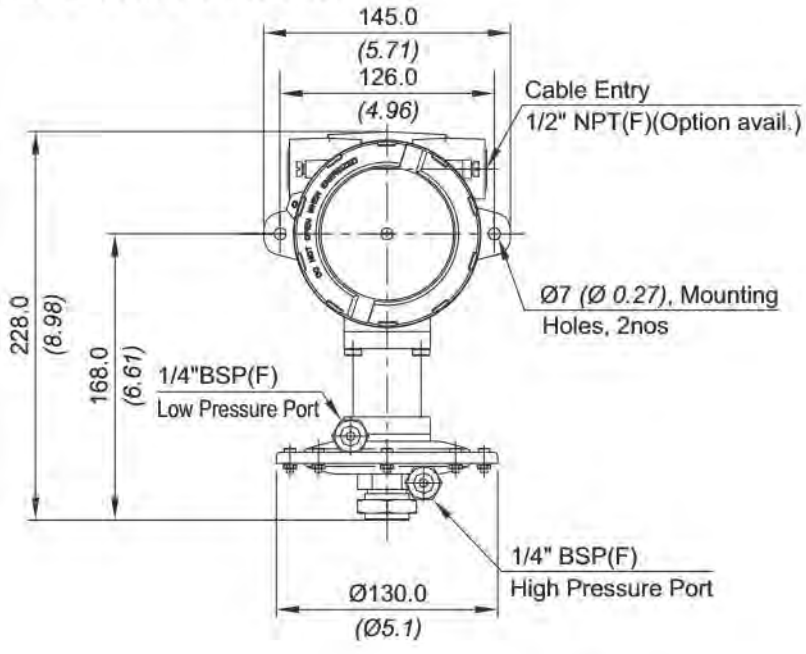
No. Description

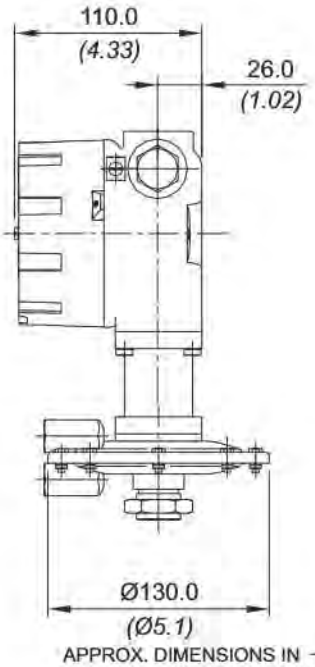
1. *High pressure port (S.S.)**
2. *Support spring (S.S.)*
3. *Bottom flange (S.S.)*
4. *Support plate (Aluminium)*
5. *Diaphragm (Neoprene)*
6. *Gasket (Nitrile)*
7. *Top plate (Aluminium)*
8. *Top flange (M.S.)**
9. *Transfer pin (Aluminium)*
10. *'O' ring (Nitrile)*
11. *Sealing diaphragm (Nitrile)*
12. *Top flange screw (M.S.)*
13. *Sealing 'O' ring (Nitrile)*
14. *Low pressure port (M.S.)**

* Pressure ports are brazed with flange

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING





APPROX. DIMENSIONS IN mm / *inches*

FC 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 *(0.60 - 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 - 40.15)*	5 *(2.007)*	2 *(29.00)*
L15	10 - 150 *(4.015 - 60.22)*	5 *(2.007)*	2 *(29.00)*
L25	20 - 250 *(8.029 - 100.365)*	10 *(4.015)*	2 *(29.00)*
L35	50 - 350 *(20.073 - 140.51)*	35 *(14.05)*	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 FLAMEPROOF LOW RANGE 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.	**FC** = Flameproof pressure switch, ATEx & IECEx approved, with Aluminium head as per IS/IEC 60079-1 for Gas Gr. IIC	**1** = Al. head ½" NPT threads **2** = Al. head ¾" NPT threads **3** = Al. head M20 x 1.5 threads **4** = Grey CI head ½" NPT threads **5** = Grey CI head ¾" NPT threads **6** = Grey CI head M20 x 1.5 threads **7** = SS head ½" NPT threads **8** = SS head ¾" NPT threads **9** = SS head M20 x 1.5 threads	**D1** = pressure difference switch, fixed differential without scale **D2** = pressure difference switch, fixed differential with scale in mbar **D3** = pressure difference switch, fixed differential with scale in "wc	**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 ***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 For additional wetted parts please refer Pressure Capsule Details on Page 59	**0** = Neoprene **1** = Teflon

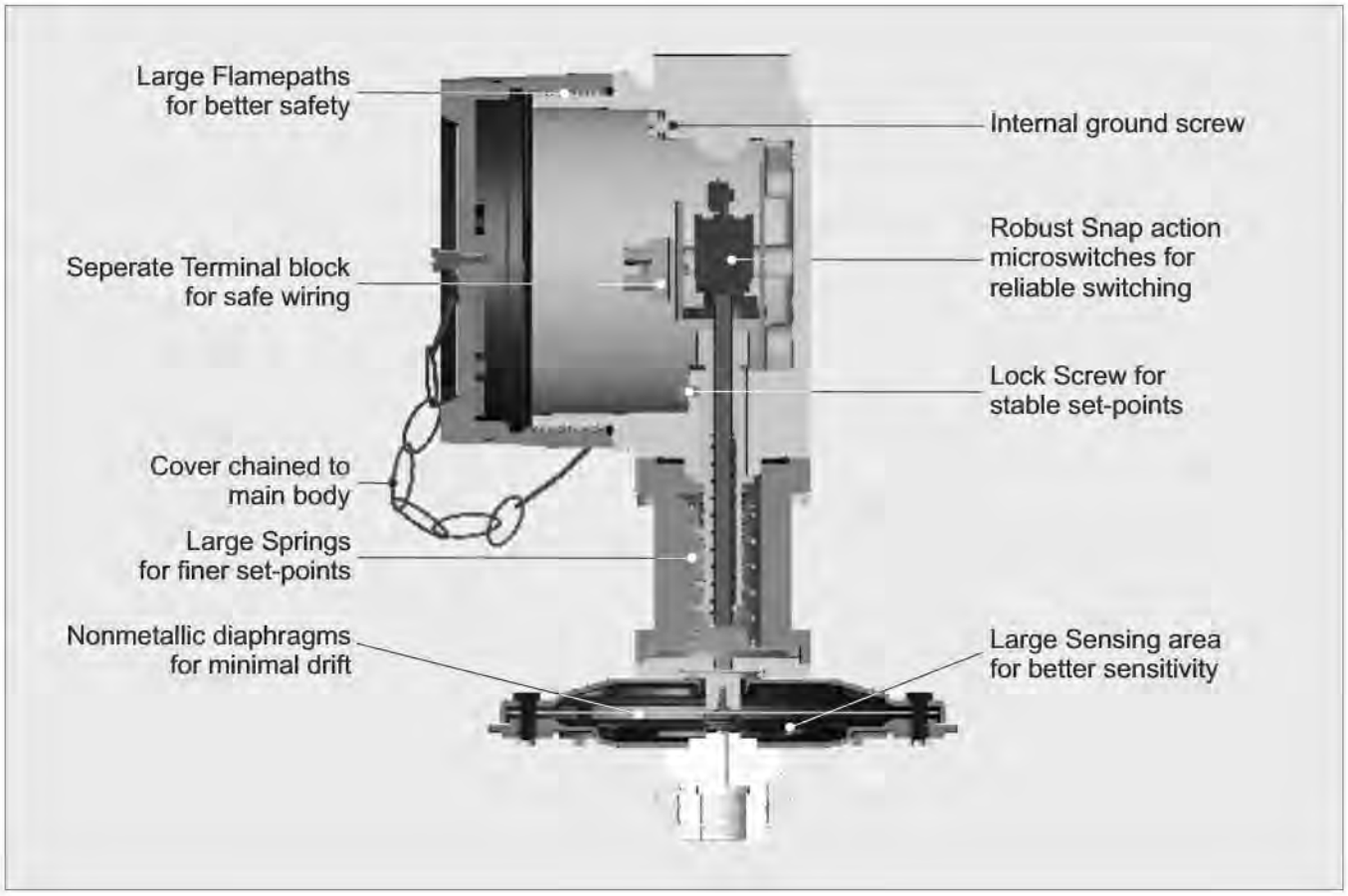
eg. A flameproof switch for gas group IIC, with ½" NPT cable entry in aluminium housing as 1SPDT pressure switch, having 0.1 bar to 1 bar pressure range, with 15 Amp. microswitch, SS316 pressure housing with ¼" BSP port size & neoprene diaphragm shall be specified by

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
☐	FC	1	D1	L03	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.

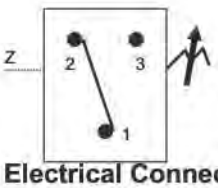
Bulletin No. KA121024

FC LOW PRESSURE RANGES



Approximate Weight :

Pressure switches with Aluminium enclosure : 2.2 Kg.
Pressure switches with Grey CI enclosure : 4.6 Kg.
Pressure switches with SS enclosure : 4.7 Kg.

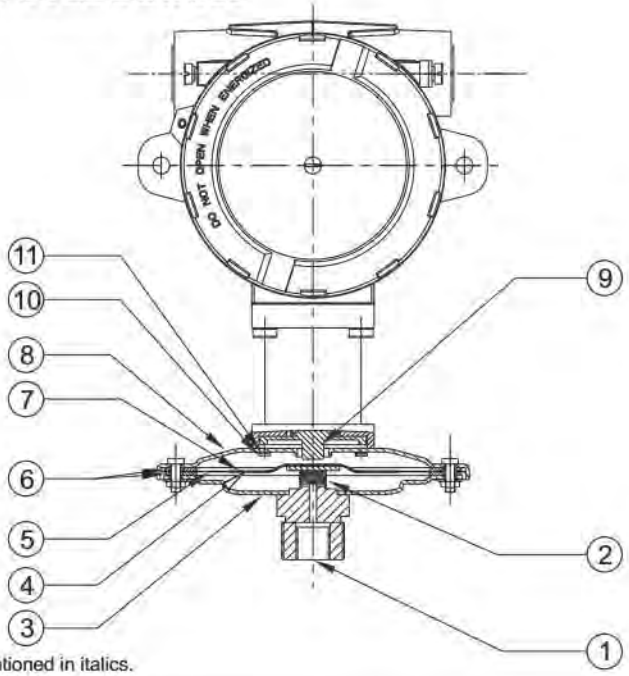


Electrical Connection :

Some Applications :

For loading & unloading of diesel tanks, clean rooms, air duct systems, ventilation systems, etc.

PRESSURE CAPSULE DETAILS

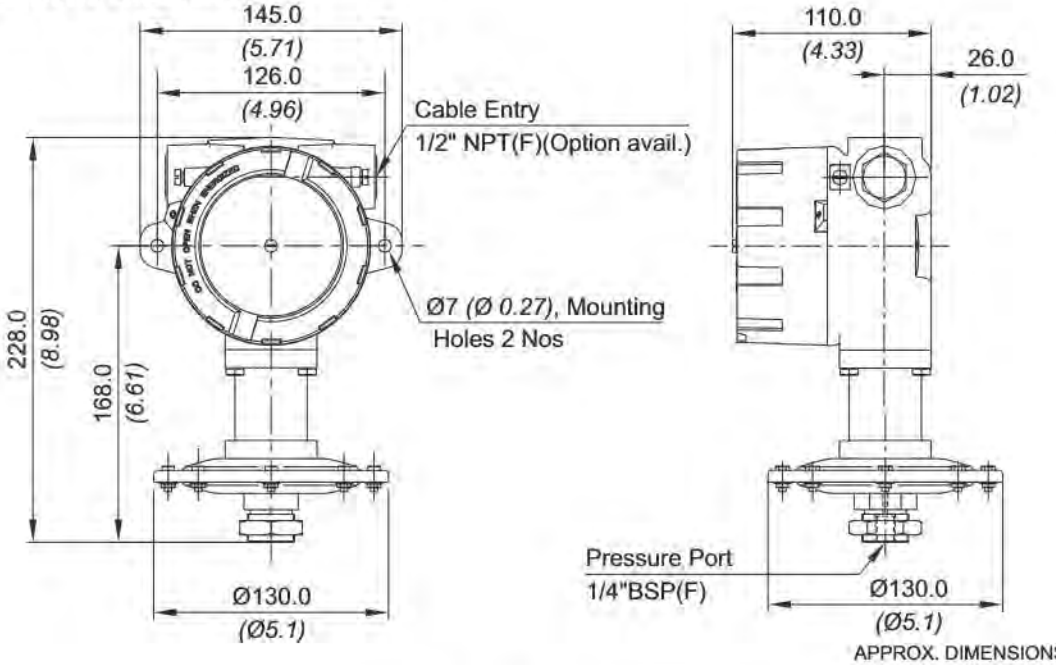


No.	Description
1.	*Pressure port (S.S.)**
2.	*Support spring (S.S.)*
3.	*Bottom flange (S.S.)*
4.	*Support plate (Aluminium)*
5.	*Diaphragm (Neoprene)*
6.	*Gasket (Nitrile)*
7.	Top plate (Aluminium)
8.	Top flange (S.S.)
9.	Plunger (Aluminium)
10.	Top flange screw (S.S.)
11.	Sealing 'O' ring (Nitrile)

*Pressure port is brazed with flange

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING



APPROX. DIMENSIONS IN mm / inches

FC LOW PRESSURE RANGES

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 - 6.021)*	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 - 40.150)*	5 *(2.007)*	2 *(29.00)*
L15	10 - 150 *(4.015 - 60.22)*	5 *(2.007)*	2 *(29.00)*
L25	20 - 250 *(8.029 - 100.36)*	10 *(4.015)*	2 *(29.00)*
L35	50 - 350 *(20.073 - 140.52)*	25 *(10.04)*	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 FLAMEPROOF LOW 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 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.	**FC** = Flameproof pressure switch, ATEx & IECEx approved, with Aluminium head as per IS/IEC 60079-1 for Gas Gr. IIC	**1** = Al. head ½" NPT threads **2** = Al. head ¾" NPT threads **3** = Al. head M20 x 1.5 threads **4** = Grey CI head ½" NPT threads **5** = Grey CI head ¾" NPT threads **6** = Grey CI head M20 x 1.5 threads **7** = SS head ½" NPT threads **8** = SS head ¾" NPT threads **9** = SS head M20 x 1.5 threads	**P 1** = pressure switch, fixed differential without scale **P2** = pressure switch, fixed differential with scale in mbar **P3** = pressure switch, fixed differential with scale in "wc	**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 ***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 **2** = SS316L

eg. A flameproof switch for gas group IIC, with ½" NPT cable entry in aluminium housing as 1SPDT pressure switch, 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
☐	FC	1	P1	L03	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

MZ HYDRAULIC DIAPHRAGM PRESSURE SWITCHES

Transparent tough polycarbonate cover for visibility

Separate terminal block for wiring

Cable gland as a standard accessory

Internal setscrew to avoid easy access to setpoint

Large spring for ease of setpoint

IP66 enclosure for excellent ingress protection

Sealing facility to avoid tampering of working switch

Non corroding exteriors for a long life of the switch

SS316 & PTFE as wetted parts to switch a wide variety of media

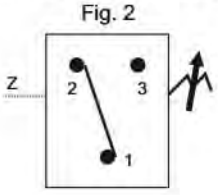
Approximate Weight : 0.680 Kg.

Some Applications :

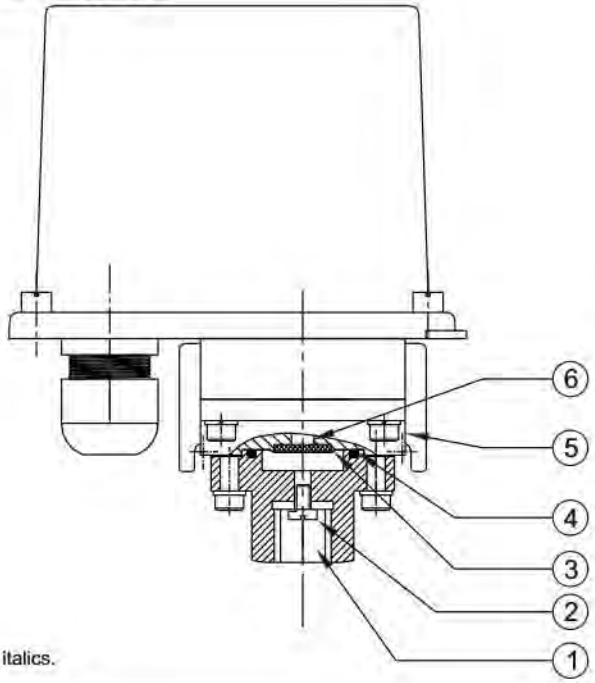
High Pressure applications requiring diaphragm as sensing element like water treatment plants, etc.

Electrical Connection :

Fig. 2



PRESSURE CAPSULE DETAILS

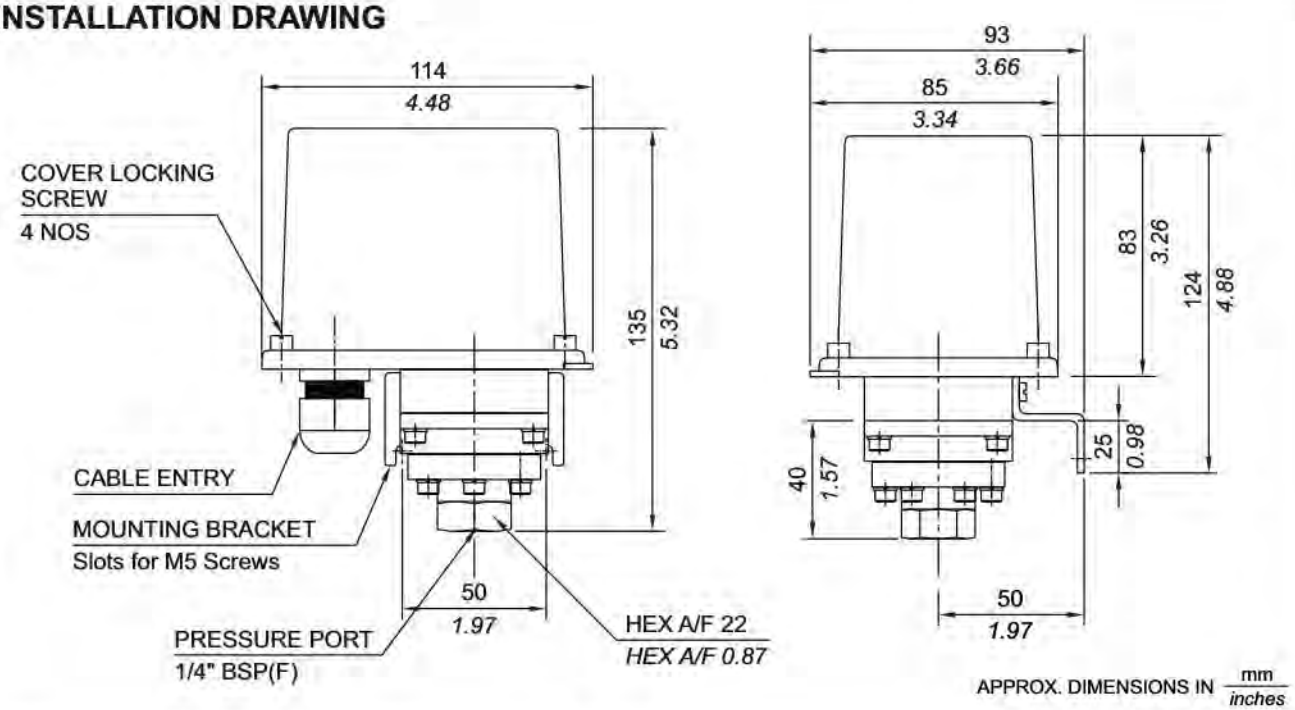


No. Description

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

Note : *wetted parts* are mentioned in italics.

INSTALLATION DRAWING



APPROX. DIMENSIONS IN mm / *inches*

MZ HYDRAULIC DIAPHRAGM PRESSURE SWITCHES

RANGE SELECTION TABLE

Range Code	Range bar *(psi)*	Differential* bar *(psi)*	Maximum Working Pressure bar *(psi)*
		Approximate Maximum for "A8" microswitch	
H1T	0.5 - 10 *(7.25 - 145.04)*	1 *(14.50)*	150 *(2175.51)*
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 *(146.04 - 1450.38)*	12 *(174.05)*	200 *(2900.76)*
H2H	7 - 200 *(101.52 - 2900.76)*	24 *(348.09)*	400 *(5801.52)*
H4H	40 - 400 *(580.15 - 5801.52)*	50 *(725)*	500 *(7251.88)*
H7H	70 - 700 *(1015.26 - 10152.64)*	70 *(1015.26)*	800 *(11603)*
H1K	100 - 1000 *(1450.37 - 14503.77)*	100 *(1450.37)*	1100 *(15954.15)*

Note:

1. The minimum differential increases with the setpoint. The differential values mentioned in the above table are approximate maximum for FSR. The differential value will vary according to the pressure range selected and microswitch type. For actual values of differential please contact sales office.

Note: Welded diaphragm also available as shown

2. When using 2SPDT switching arrangement, both microswitches may not actuate and/or deactuate at the same point. A small stage gap, normally upto +/- 5% FSR (depending on range code) may be observed. The On-Off differential (hysterisis) typically tends to be atleast double of those published for 1SPDT pressure switches.

If actuation and/or deactuation at same point is critical part of operation, then it can be achieved by using a separate DPDT relay. This relay will need a separate power supply for it's coil.

HOW TO ORDER PROCESS HYDRAULIC DIAPHRAGM 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 and Material of Enclosure	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.	**MZ** = Process pressure switch with a weatherproof enclosure rated IP66/IP68 as per IS/IEC 60529 Note : Contact sales office for IP 68 enclosure	**1** = Polycarbonate Enclosure ½" NPT threads **2** = Polycarbonate Enclosure ¾" NPT threads **3** = Polycarbonate Enclosure M20 x 1.5 threads **4** = Diecast Al. Enclosure ½" NPT threads **5** = Diecast Al. Enclosure ¾" NPT threads **6** = Diecast Al. Enclosure M20 x 1.5 threads **7** = SS Enclosure ½" NPT threads **8** = SS Enclosure ¾" NPT threads **9** = SS Enclosure M20 x 1.5 threads Note : For dual cable entries contact sales office	**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 only with option A7 and A9 in Group 6	**H1T** = (0.5 - 10) **H2T** = (2 - 20) **H4T** = (5 - 40) **H1H** = (10 - 100) **H2H** = (7 - 200) **H4H** = (40 - 400) **H7H** = (70 - 700) **H1K** = (100 - 1000)	**A8** = General purpose microswitch **A7** = 2SPDT microswitches **A9** = General purpose microswitch * Please refer to page nos. 290 & 291 for options and specifications of microswitches Please contact sales office for additional information	**S1** = SS316 / ¼" BSP(F) **S2** = SS316 / ¼" NPT(F) **S3** = (welded diaphragm) SS316 / 1" BSP(M) **S4** = SS316 / ½" NPT(F) **S5** = SS316 / ½" NPT(M) **H1** = Hastelloy C / ¼" BSP(F) **H2** = Hastelloy C / ¼" NPT(F) **N1** = Monel / ¼" BSP(F) **N2** = Monel / ¼" NPT(F) More options available, please contact sales office	**0** = Neoprene **1** = PTFE **2** = SS 316L **3** = Hastelloy C **4** = Monel

eg. A process pressure switch with fixed differential having 5 bar to 40 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
☐	MZ	3	PF2	H1T	A8	S1	0

Please specify full model number to avoid ambiguity.

Bulletin No. KA221010

MZ VACUUM SWITCHES

Transparent tough polycarbonate cover for visibility

Separate terminal block for wiring

Cable gland as a standard accessory

Internal setscrew to avoid easy access to setpoint

Large spring for ease of setpoint

IP66 enclosure for excellent ingress protection

Sealing facility to avoid tampering of working switch

Non corroding exteriors for a long life of the switch

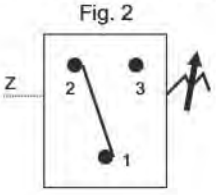
SS316 & teflon as wetted parts to switch a wide variety of media

Approximate Weight : 1.160 Kg.

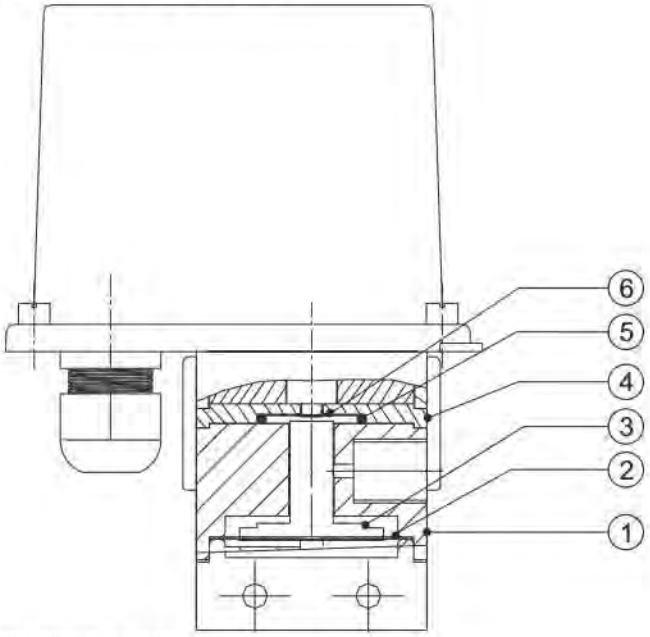
Some Applications :
Used in filters, vacuum pumps, blower systems, etc.

Electrical Connection :

Fig. 2



PRESSURE CAPSULE DETAILS

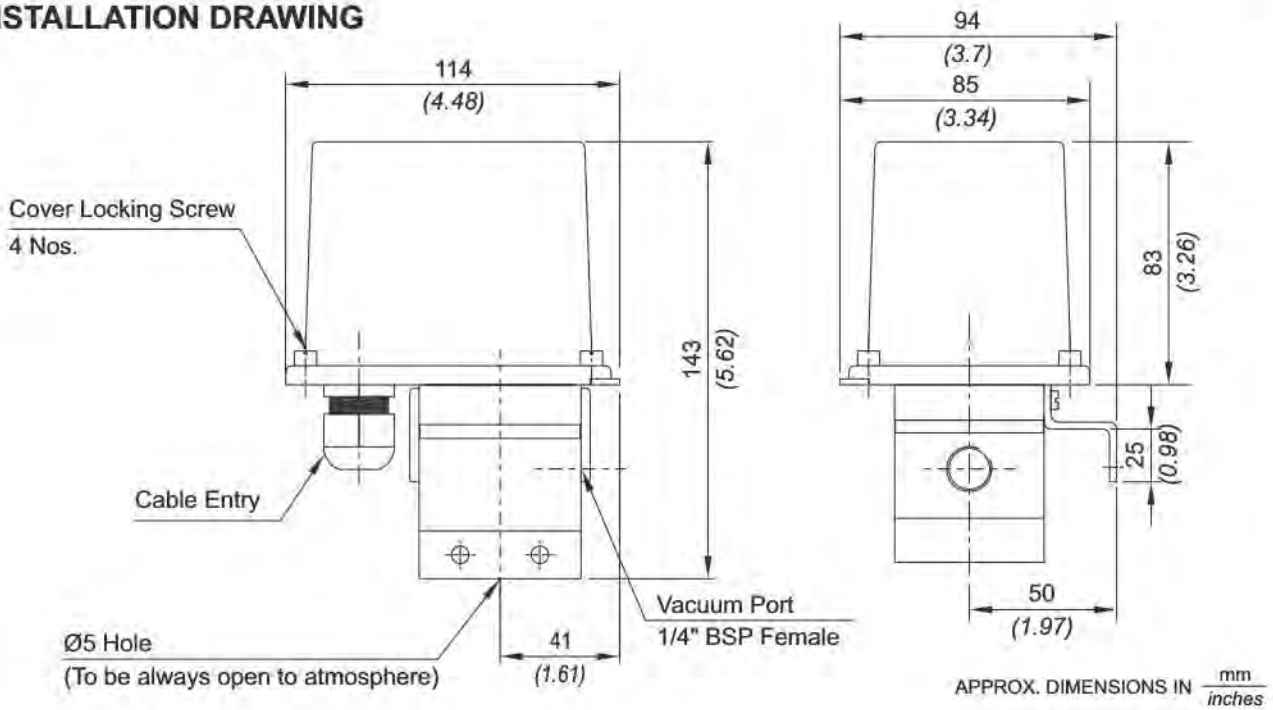


No. *Description*

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 "A8" microswitch	
V00	† 760 - 100 *(29.92 - 3.94)*	50 *(1.97)*	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.

HOW TO ORDER PROCESS 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.	**MZ =** Process pressure switch with tough transparent polycarbonate enclosure to IP66 as per IS2147	**3 =** M20 X 1.5 cable gland	**VF2 =** vacuum switch, fixed differential with scale in mmHg **VF3 =** vacuum switch, fixed differential with scale in "Hg ***VA2 =** vacuum switch, adjustable differential with scale in mmHg ***VA3 =** vacuum switch, adjustable differential with scale in "Hg *Available only with option A9 in Group 6	**V00 =** († 760 - 100)	**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	**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 process vacuum switch with fixed differential having 760 mmHg vac to 100 mmHg vac vacuum 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
☐	MZ	3	VF2	V00	A8	S1	0

Please specify full model number to avoid ambiguity.

Bulletin No. KA121024