DIAPHRAGM SENSORS

CENTER ZERO INSTRUMENTS

SALIENT FEATURES

- Ideal for measurement of positive and negative differential pressure on the same dial with a zero center point.
- Cost effective and reliable.
- Simple and compact design.
- Available in small convoluted diaphragm sensor.
- Adjustable reed contact switching.
- Gauge+ switch or only switch models.
- Manufactured in ISO certified plant.
- Exported worldwide.

Ambit Instruments manufactures quality compound instruments designed to measure the difference in pressure when it changes from positive to negative between two points in a system and show it on a single dial instrument. They are also known as center zero instruments. A magnetic movement senses the differential pressure. The instruments has separate pressure and indicating chambers.

These diaphragm instruments can indicate small values of differential pressure even when used at high line pressures. They provide continuous information regarding system conditions helping in eliminating premature servicing of equipment, avoid unscheduled down time of costly processes and detect abnormal system conditions. Ranges are stated in the same way they are indicated on the Dial face with a centre zero point and equal but opposite values on either side of the zero point.

Switching Facility : Instruments can be supplied with reed switches to initiate alarms, activate other equipment, or shut the system down. Two switches are used when high and low limits are desired. Gauge-switch models provide the user with both, gauge readout and switch operation.

APPLICATIONS :

Determine filter loading, set filter by-pass, or initiate filter cleaning cycle.
Determine obstructions in process lines.
Check conditions of pumps, heat exchangers, and other processing equipment.
Detect abnormal and reverse flow conditions.
Balance and adjust flow rates in piping systems.
Monitor liquid levels in storage tanks.

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MAGNETIC PRINCIPLE

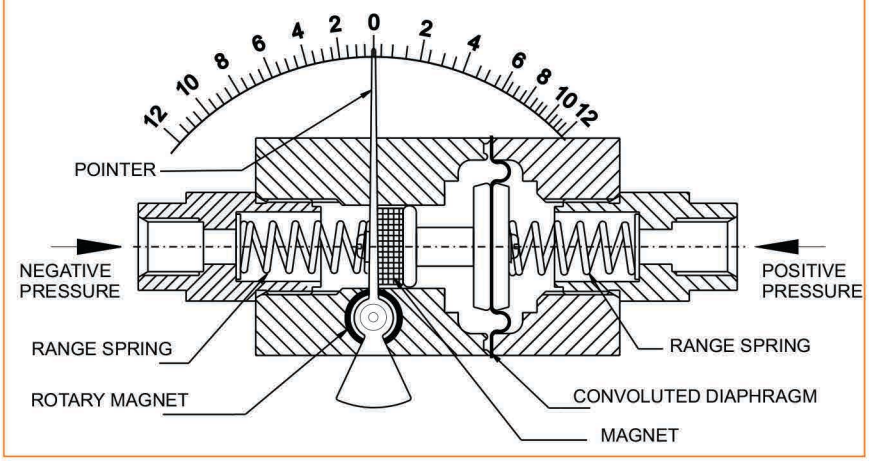
OPERATING PRINCIPLE

High and Low pressures are separated by a sensor assembly consisting of a magnet, diaphragm, and a range spring. The difference in pressure causes the sensor assembly to move in proportion to the change against a range spring.

A rotary magnet, located in a separate body cavity and isolated from the acting pressures, is rotated by magnetic coupling as per the linear movement of the sensor assembly. A pointer attached to the rotary magnet indicates differential pressure on the dial.

Switch : Reed switches are located adjacent to the pressure chamber and are activated by the magnetic field of the sensor assembly

COMPOUND INSTRUMENTS



TECHNICAL DATA

Ranges	:	0.075-0-0.075bar up to 4-0-4bar
Units of calibration	:	Kg/cm^2, bar, mbar, mm H_2O, IN H_2O, psi
Operating principle	:	Magnetic coupling with a convoluted diaphragm sensor.
Working pressure	:	100 bar / 1500 psi
Accuracy	:	± 2 % of FSD (Ascending)
Dial sizes	:	2.5"(63 mm), 3.5"(80 mm), 4"(100 mm), 4.5"(115 mm)& 6"(150 mm)
Body Material	:	Aluminium, Brass & SS-316.
Temperature	:	80°C Max. for the media.
Protection	:	IP 65 for gauge
Migration of media	:	Zero migration between high and low pressures.
Connections	:	¼" NPT (F) or ¼" BSP(F) (on request,longer lead time)
Wetted parts	:	Diaphragm, ceramic magnet, SS 304 spring. Other internal parts in Aluminium, brass, or SS-316 as per the gauge body.
Seals	:	Buna-N (Standard), Viton
Porting	:	In line (standard), Bottom or Back.
Switch	:	SPST or SPDT, one or two. Switches are field adjustable. The set points can be increased or decreased externally with simple screwdriver adjustments. When two switches are used, either switch can be adjusted independently.
Dial case	:	Stainless steel case and flange
Window	:	Glass (Standard), Acrylic, Toughened glass on request.
Other options	:	Glycerine filling, red resettable follower pointer, dual scale, DIN plug, Strainer in (+) connection

HOW TO ORDER

Select a model from individual catalogue of 300 DGC and add "**CZ**" at the beginning of the product code.

Note : For this instrument with switch, the setting range is between 40 to 90% of the range.

DIAPHRAGM

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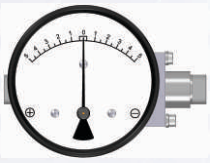
CZ 300DGC

Low range CZ 400DGC also available

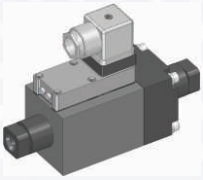
ΔP Range: 0.075 - 0 - 0.075 bar
upto 4 - 0 - 4 bar

COMBINATIONS

Gauge



Switch



Gauge+switch
(with a terminal strip inside)

Gauge+switch
(with a DIN plug on top)

Specifications

Accuracy	±2% of the FSD (Ascending)
Migration	No migration ; Zero leakage from high to low port
Range	0.075-0-0.075 to 4-0-4 bar or equivalent ranges in other units
First marking on the scale	20% of the FSD
Sensing element	Diaphragm
Wetted parts	Diaphragm, body material, SS 302 spring & ceramic magnet
Case material & dial size	Stainless steel (SS 304): 2.5", 3.5", 4", 4.5", 6" Engineering polymer: 2.5", 4.5", 6" Bayonet: 4"
Mounting	Direct, front flange,2" pipe & surface mounting
Maximum working pressure	100 bar / 1500 psi
Maximum process temperature	0 to 80°C (32 to 175°F)
Body material	Aluminum, Brass, SS 316 & Monel
Diaphragm	Buna-N, Viton, EPDM
Window	Float glass(Std.), toughened glass, acrylic & safety glass
Connection	1/4" NPT(F) (Std.), 1/4" BSP(F) and others through adaptor
Porting	In-line, rear, bottom, bottom & vent, in-line & vent, in-line & bottom in-line & back, bottom vent in-line
Over range protection	Up to the max. working pressure from high side
Protection for gauge & switch	IP 65 / NEMA-4

Options	Switches
Liquid filling	1 or 2 SPDTs with a terminal strip
Customer logo	1 or 2 SPDTs with a DIN plug
Dual scale	
Colour band	

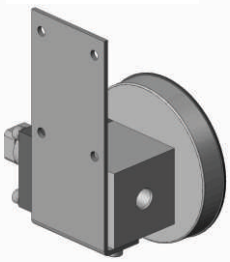
Available in engineering polymer (EP) Case

6.0" 4.5" 2.5"

- Removable glass
- Strong and durable
- Panel mounting possible
- Condensation can be cleaned
- Light weight

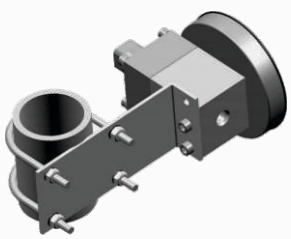
MOUNTING BRACKETS

Surface mounting

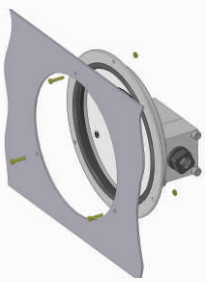


Horizontal pipe mounting

Vertical pipe mounting



Panel / Flange mounting



How to order CZ 300DGC

SELECT MODEL

1 Series — CZ 300DGC

2 Type

G	Gauge	S	Switch
GS	Gauge + Switch		

3 Body material

A	Aluminum	S	SS-316
B	Brass	M	Monel

4 Dial size

2.5	2.5" (63mm)	4.5	4.5" (115 mm)
3.5	3.5" (80 mm)	6.0	6.0" (150 mm)
4.0	4.0" (100mm)		

5 Connection

4N	1/4" NPT (F) (Std.)	4B	1/4" BSP (F)
ZZ	Special connection sizes using adaptor		

6 Porting

1	In-line (Std.)	5	In-line & vent
2	Rear / Back	6	In-line & bottom
3	Bottom	7	Bottom vent & in-line
4	Bottom & vent	8	In-line & back

7 Case

S4	SS 304 (Std.)	S6	SS 316
F4	SS 304 flange		
EP	Engineering polymer (available in 2.5", 4.5", 6.0"only)		
BF	Bayonet (available in 4.0" safety glass only)		

8 Window

F	Glass (Std.)	A	Acrylic
T	Toughened glass	L	Safety glass

9 Seals/Diaphragm

B	Buna-N (Std.)	E	EPDM
V	Viton		

10 Switch — Select option & specifications

5	One SPDT, with a DIN plug †
6	One SPDT, with a terminal strip
7	Two SPDTs, with two DIN plugs
8	Two SPDTs, with a terminal strip

Example: *Switch selection 51 is 1 SPDT with DIN plug with switch specifications 3VA, 30V, 0.3Amp*

† DIN plug mounted on the top.

+

SPDT Specifications (AC/DC max)

1 Standard	2	3
3 VA	5 VA	5 VA
30 V	125 V	175 V
0.3 Amp	0.25 Amp	0.25 Amp
Adjustable	Adjustable	Adjustable

11 Range — **Standard ranges : (Other ranges & units on request)**

Kg/cm²	0.075	0.25	-	0.5	0.75	1	-	1.6	2	2.5	3	-	4
bar	0.075	0.25	-	0.5	0.75	1	-	1.6	2	2.5	3	-	4
mbar	75-	250	-	-	750	-	-	-	-	-	-	-	-
psi	1	-	5	8	-	15	20	25	30	-	40	50	60
kPa	-	25	-	50	75	100	-	160	200	250	300	-	400

12 Options

0	None
A	Glycerine*
B	Red follower pointer on acrylic window *
C	Customer Logo
D	Dual scale
E	Colour band
F	Filter mesh in (+) connection
N	NACE
S	Silicone oil*
I	Oxygen service (Contact factory)
M1	2" horizontal pipe mounting bracket
M2	Surface mounting bracket
M3	2" vertical pipe mounting bracket

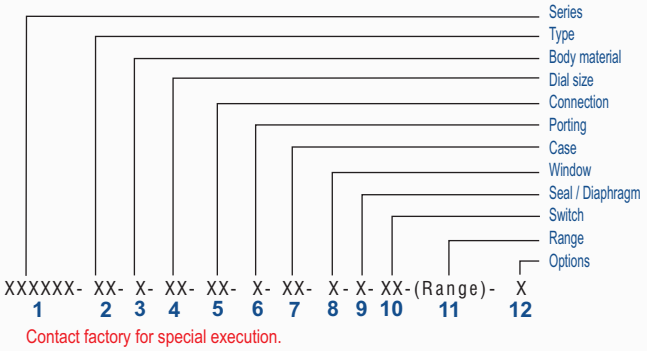
* Affects accuracy

Advantages :
Instrument automatically resets after line surges and cold start.
This eliminates balancing of differential pressure instrument after such events.

Notes

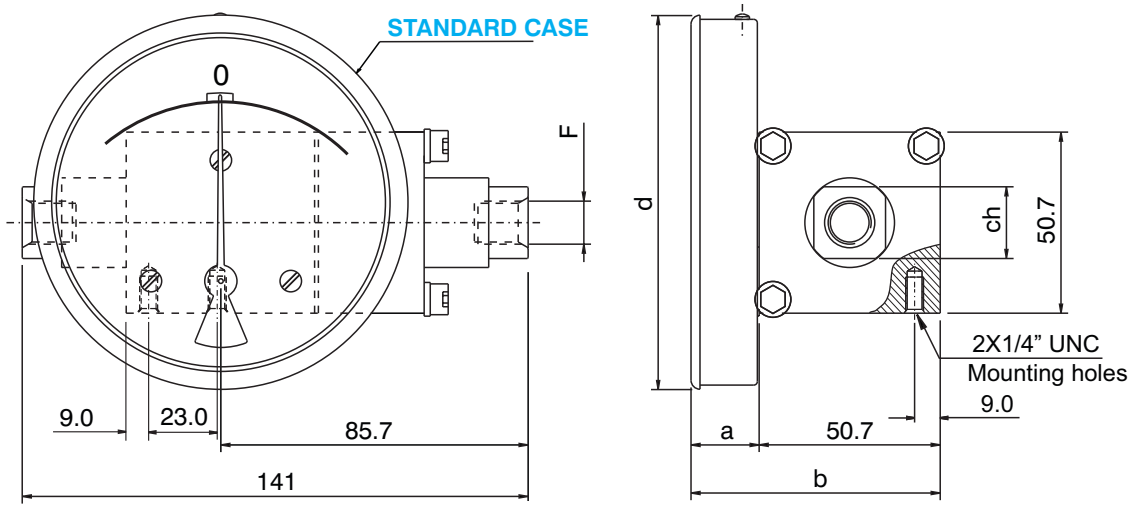
- Switch option not available with inline vent / bottom vent porting.
- Top vent not available with switch option.
- For SS 316 case, please contact factory (MOQ applies).
- Liquid filling + Follower pointer available.
- For Switch adjustment range and other specific details regarding the switch, please contact factory.
- Mounting bracket: Aluminum (Standard) ; SS (Optional)

Ordering code sequence

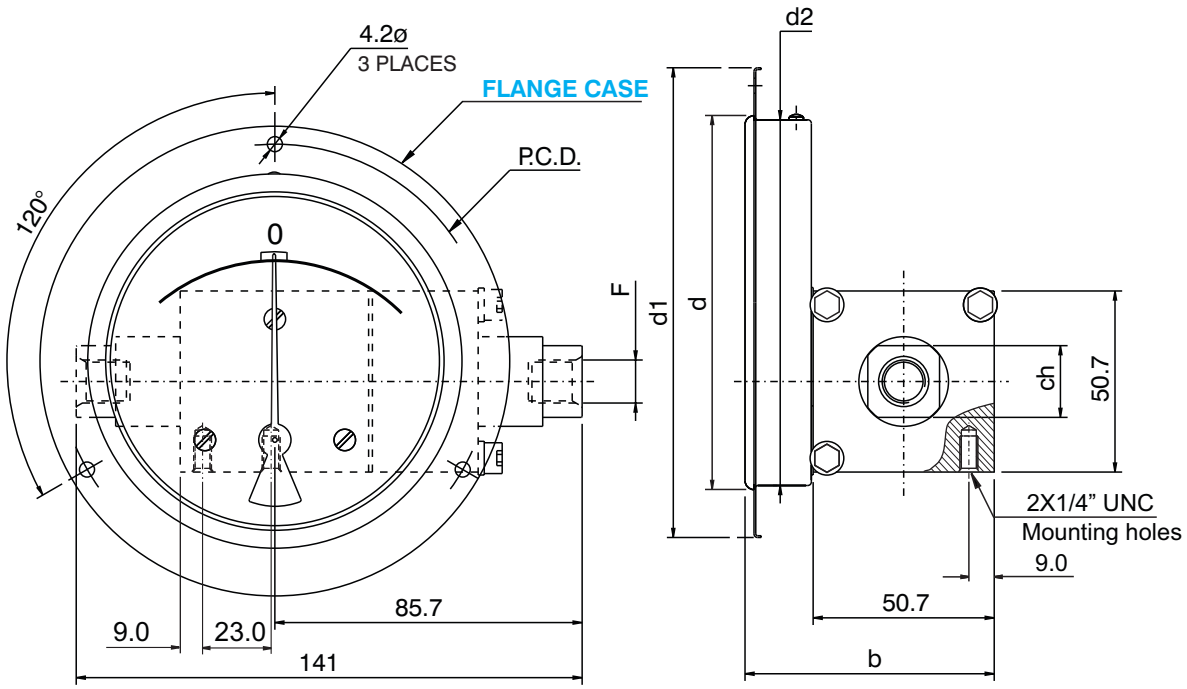


Contact factory for special execution.

STANDARD DIMENSIONS



DIAL ø	F	a	b	d	ch
63 (2.5")	1/4" BSP - 1/4" NPT	19	69.7	66	20
80 (3.5")	1/4" BSP - 1/4" NPT	19	69.7	83	20
100 (4")	1/4" BSP - 1/4" NPT	19	69.7	104.3	20
115 (4.5")	1/4" BSP - 1/4" NPT	19	69.7	119.7	20
150 (6")	1/4" BSP - 1/4" NPT	19	69.7	154.3	20

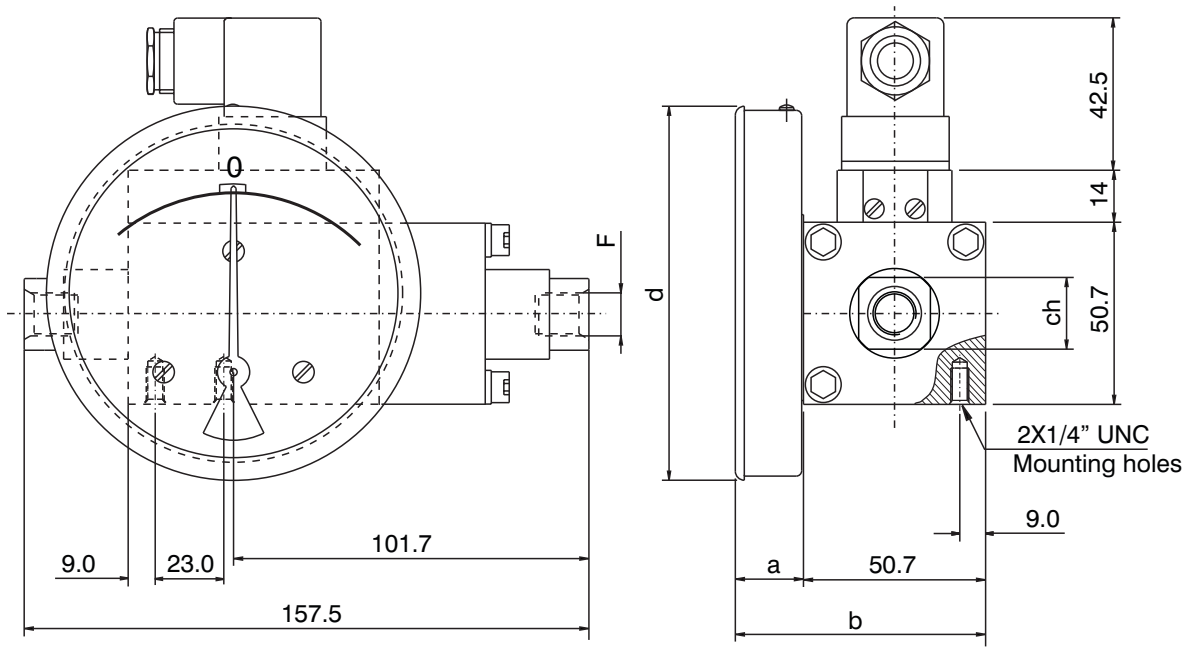


DIAL ø	F	a	b	d1	d2	ch	p.c.d.	* d
63 (2.5")	1/4" BSP - 1/4" NPT	19	69.7	93	65	20	83	66
80 (3.5")	1/4" BSP - 1/4" NPT	19	69.7	109	82	20	99	83
100 (4")	1/4" BSP - 1/4" NPT	19	69.7	131	102	20	121	104.3
115 (4.5")	1/4" BSP - 1/4" NPT	19	69.7	146	117	20	136	119.7
150 (6")	1/4" BSP - 1/4" NPT	19	69.7	181	152.5	20	171	154.3

*** PANEL CUTOUT = d + 1**

GAUGE + SWITCH WITH REED CONTACTS

WITH DIN PLUG



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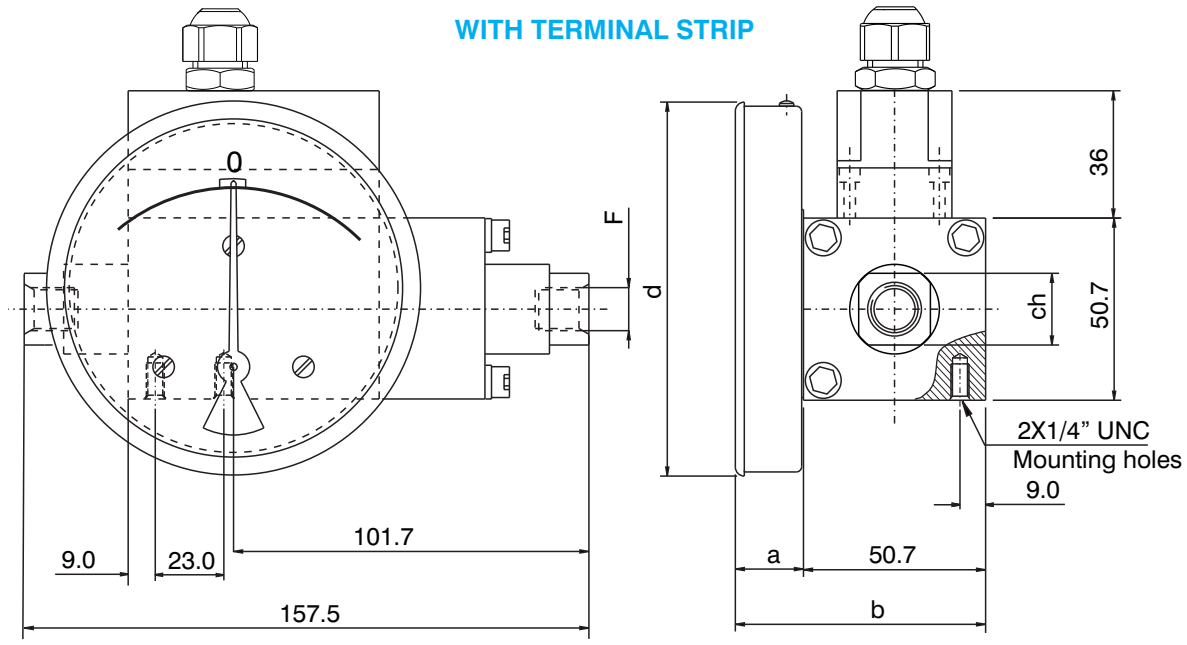
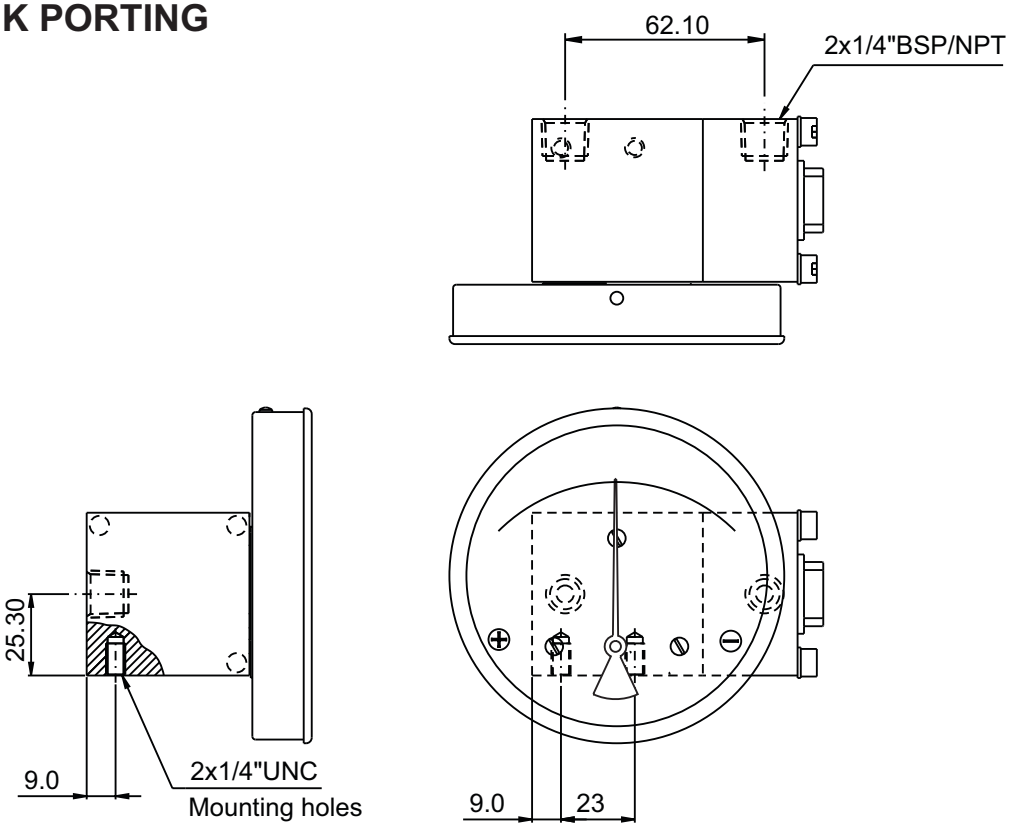
150 (6")	1/4" BSP - 1/4" NPT	19	69.7	154.3	20

WITH TERMINAL STRIP

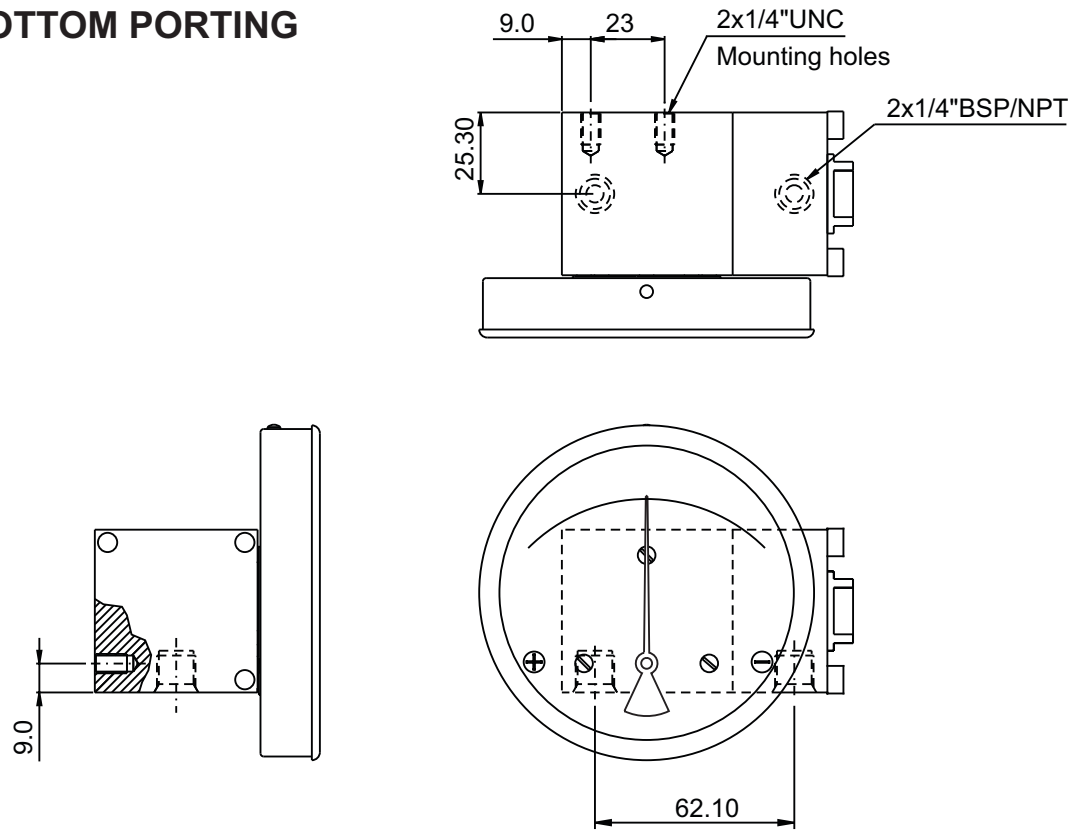


PORTING DETAILS

BACK PORTING



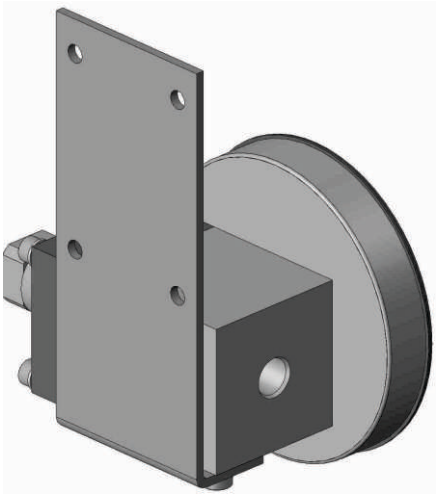
BOTTOM PORTING



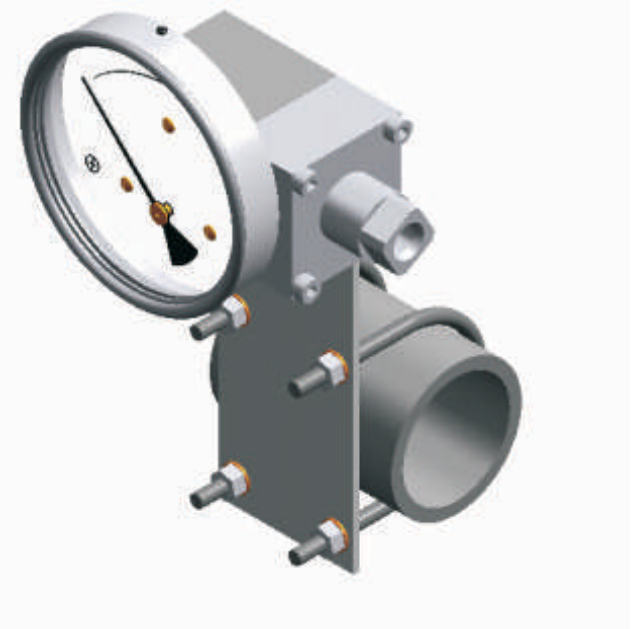
NOTE : 2x1/4”UNC MOUNTING HOLES PROVIDED ON REQUEST.

MOUNTING COMBINATIONS

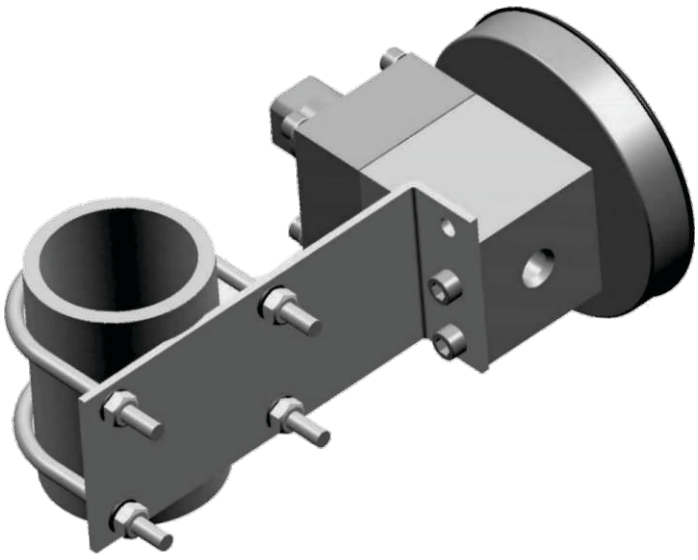
SURFACE MOUNTING



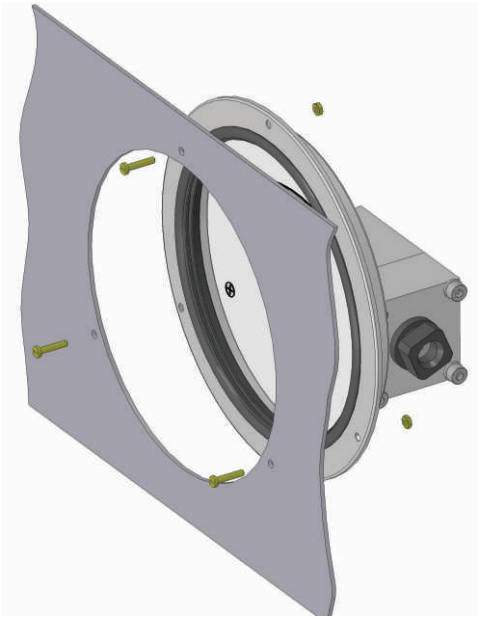
HORIZONTAL PIPE MOUNTING



VERTICAL PIPE MOUNTING

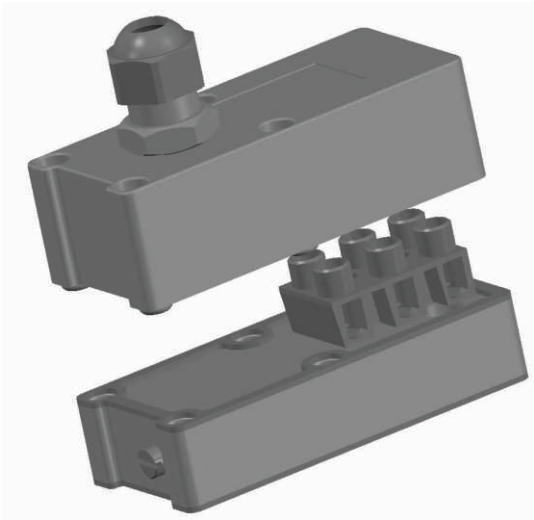


PANEL MOUNTING



SWITCH COVER COMBINATIONS

With terminal strip and PG gland



With DIN plug