Pressure switch
For the process industry
Model 204, 208

Applications

- Power generation
- Waste water management
- Oil and gas
- Petrochemical industries

Special features

- Internal switch point adjustment for critical applications
- Stainless steel case option for corrosive environment
- Switch point repeatability of ±1% of FSR for reliable switching
- Flange connection possibility for cleaning and inspection access

Fig. Left: Pressure switch, model 204, flameproof
Fig. Right: Pressure switch, model 204, weatherproof

Description

The model 204 mechanical pressure switch has been designed for control and monitoring applications. The stainless steel case option enables the pressure switch to perform in harsh operating conditions of the process industry.

The switch point repeatability to ±1% enables reliable switching in critical operating conditions.

High static pressure with diaphragm sealed sensor elements enable to meet a variety of applications in oil, gas, power, steel and petrochemical industries.

This wide setting range is often needed for the on/off control mode of cyclic applications.

The switch point can be specified on site, with internal adjustment options. Depending on the application, the appropriate variant for the contact version and the electrical connection can be selected. For example, hermetically sealed micro switches are suitable for explosive ambient conditions.

Specifications

Basic information	
Switch enclosure	■ GM style aluminium pressure die cast weatherproof to IP66 ■ GA style CF8 (304 SS) casting, weatherproof to IP66, fit for off shore ■ GA6 style CF8M (316 SS) casting, weatherproof to IP66, fit for off shore ■ GK style (Type-1) aluminium pressure die cast, weatherproof and flameproof to group IIC as per IS/IEC 60079-1 ■ GR style (Type-1) aluminium pressure die cast, weatherproof to IP66 and flameproof to group IIC as per IS/IEC 60079-1
Sealing	■ Nitrile for GM / GA ■ Neoprene for GK / GR
Measuring element	316L SS diaphragm
Wetted parts	Refer Ordering matrix

Output signal	
Ranges	Several ranges from vacuum to 15 bar.
Switching differential	Fixed; refer switching differential tables 2 & 3
Repeatability of the setpoint (note 3)	± 1.0% of FSR
Maximum working pressure	100 bar
Response time	<1 second
Scale accuracy (note 4)	±5% of FSR
Switching contacts with microswitch	■ 1 x SPDT (single pole double throw) ■ 2 x SPDT (single pole double throw)
Switching function (note 8)	Instrument quality snap acting microswitch

Operating condition	
Permissible ambient temperature	–10°C ... +60°C
Permissible medium temperature	–20°C ... +110°C
Ingress protection	IP66
Process connection	■ 1/4" NPT(F) per ASME B1.20.1 for model 204 ■ 1/2" NPT(F) per ASME B1.20.1 for model 204 Other connections through adaptor ■ 1" ... 2" ANSI 150/300 for model 208. Refer ordering matrix
Electrical connection	1/2" NPT(F) per ASME B1.20.1 single entry standard Dual entry on request
Mounting	■ Panel ■ Wall ■ 2" pipe (only for Model 204)

Ordering matrix

Sample model number — **GM 204 3 4 □ □ □ S1 ZZ**

Switch enclosure
- GM style aluminium pressure die cast weatherproof to IP66 — **GM**
- GA style CF8 (304 SS) casting, weatherproof to IP66, fit for off shore — **GA**
- GA6 style CF8M (316 SS) casting, weatherproof to IP66, fit for off shore – **GA6**
- GK style (Type-1) aluminium pressure die cast, weatherproof and flameproof to group IIC as per IS/IEC 60079-1 — **GK**
- GR style (Type-1) aluminium pressure die cast, weatherproof to IP66 and flameproof to group IIC as per IS/IEC 60079-1 — **GR**

Model
- Fixed differential mode, threaded connection with maximum working pressure upto 100 bar — **204**
- Fixed diffferential model, flanged connection — **208**

Sensor material
- 316L SS — **3**
- 316L SS + Teflon backup sheathing, teflon 'O' ring for model 204 — **T**
- 316L SS + Teflon backup sheathing, teflon insert for model 208 — **T**
- Hastelloy C — **H**
- Monel — **M**

Wetted part
- 304 SS / CF8 — **4**
- 316 SS / CF8M — **2**
- 316L SS / CF3M — **3**
- Hastelloy C — **H**
- Monel – suitable for wet chlorine — **M**
- 316L SS welded construction — **W**

Note : If sensor material code T, wetted part 4, 2, 3 are recommended for dry chlorine service. Do not use wet chlorine.

Range code
- Refer table-1 — □

Switch code and rating
- Refer table-4 — □

Electrical entry code
- Refer table-5 — □

Process connection

Model 204
- 1/4" NPT(F) per ASME B1.20.1 — **S1**
- 1/2" NPT(F) per ASME B1.20.1 — **S2**

Model 208
- 1" ANSI 150 RF possible in B021, B029, B030, B032, B034 — **F1**
- 1" ANSI 300 RF possible in B021, B029, B030, B032, B034 — **F2**
- 1½" ANSI 150 RF possible in B021, B029, B030, B032, B034 — **F5**
- 1½" ANSI 300 RF possible in all ranges — **F6**
- 2" ANSI 150 RF possible in all ranges — **F7**
- 2" ANSI 300 RF possible in all ranges — **F8**

Seal 'O' ring
- Non 'O' Ring — **ZZ**
- Buna-N — **OB**
- Viton (MWT : 205°C) standard for Tyre press application — **OV**
- EPDM (MWT : 125°C) — **OE**
- Teflon (MWT : 250°C) — **OT**
- Silicone (MWT : 200°C) — **OS**

For available other options refer page 8

Table 1: Range code and availability

Range code	Range	204	208
B001 / K108	(-1) ... 0 bar / Kg/Cm²	✓	×
B094	0.1 ... 1 bar / Kg/Cm²	✓	✓
B034 / K103 *	1.5 ... 15 bar / Kg/Cm²	✓	✓
B032 / K102 *	0.7 ... 7 bar / Kg/Cm²	✓	✓
B029 / K101 *	0.3 ... 1.6 bar / Kg/Cm²	✓	✓
B030 / K082 *	0.4 ... 4.0 bar / Kg/Cm²	✓	✓
B021 / K089 *	0.08 ... 0.4 bar / Kg/Cm²	✓	✓
B003 / K007	(-)0.5 ... 0.5 bar / Kg/Cm²	✓	×
S060	(-)14.5 ... 0 psi	✓	×
S054	1.5 ... 15 psi	✓	✓
S066 *	21.76 ... 217.56 psi	✓	✓
S065 *	10.15 ... 101.53 psi	✓	✓
S063 *	4.35 ... 23.21 psi	✓	✓
S044 *	5.8 ... 58 psi	✓	✓
S062 *	1.16 ... 5.8 psi	✓	✓
S061	(-)7.25 ... 7.25 psi	✓	×
W185	(-)375 ... 375 mmWC	✓	×
W009	(-)350 ... 350 mmWC	✓	×
W011	(-)200 ... 200 mmWC	✓	×
W005	(-)1000 ... 0 mmWC	✓	×
M046	10 ... 100 mbar	✓	✓

* Chemical seal options availble for model 204 only. See datasheet DS 70.01. For SPDT function, the minimum switching differential shall be arrived by applying 1.3 multiplication factor to values given in differential Table. For DPDT function, the minimum switching differential shall be arrived by applying 1.5 multiplication factor to values given in differential tables '2 & 3'.

Table 2: Switching differential for model 204, 208, GM / GA enclosure

Range code	Range	Unit	Switching differential for contact verions – GM / GA enclosures					
			D, 3, 4	5	9, G	DD,33,44	55	99, GG
B001 / K108	(-1) ... 0	bar / Kg/Cm²	0.08	0.19	0.15	0.10	0.25	0.23
B094	0.1 ... 1	bar / Kg/Cm²	0.08	0.18	0.24	0.10	0.23	0.24
B034 / K103	1.5 ... 15	bar / Kg/Cm²	0.60	0.70	-	0.70	0.85	-
B032 / K102	0.7 ... 7	bar / Kg/Cm²	0.45	0.50	0.90	0.65	0.60	1.00
B029 / K101	0.3 ... 1.6	bar / Kg/Cm²	0.10	0.18	0.20	0.13	0.23	0.24
B030 / K082	0.4 ... 4.0	bar / Kg/Cm²	0.20	0.36	0.40	0.35	0.47	0.53
B021 / K089	0.08 ... 0.4	bar / Kg/Cm²	0.05	0.06	0.08	0.07	0.08	0.10
B003 / K007	(-)0.5 ... 0.5	bar / Kg/Cm²	0.07	0.17	0.20	0.09	0.22	0.23
S060	(-)14.5 ... 0	psi	1.16	2.76	2.18	1.51	3.58	3.26
S054	1.5 ... 15	psi	1.16	2.61	2.90	1.45	3.33	3.48
S066	21.76 ... 217.56	psi	7.25	10.15	-	8.70	12.33	-
S065	10.15 ... 101.53	psi	5.08	7.25	13.05	7.25	8.70	14.50
S063	4.35 ... 23.21	psi	1.16	2.61	2.32	1.51	3.39	3.48
S044	5.8 ... 58	psi	2.54	5.22	5.08	3.31	6.79	7.61
S062	1.16 ... 5.8	psi	0.36	0.87	0.73	0.48	1.13	1.09
S061	(-)7.25 ... 7.25	psi	1.02	2.47	2.18	1.32	3.20	3.26
W185	(-)375 ... 375	mmWC	60	120	-	70	130	-
W009	(-)350 ... 350	mmWC	60	120	-	70	130	-
W011	(-)200 ... 200	mmWC	80	100	-	100	130	-
W005	(-)1000 ... 0	mmWC	150	160	-	180	210	-
M046	10 ... 100	mbar	7	10	10	9	13	15

Note: Consult factory for differential values of T code switch.

Table 3: Switching differential for model 204, 208, GK / GR enclosure

Range code	Range	Unit	Switching differential for contact verions – GK / GR enclosures					
			D, 3, 4	5	9, G	DD,33,44	55	99, GG
B001 / K108	(-1) ... 0	bar / Kg/Cm²	0.14	0.31	0.27	0.17	0.37	0.30
B094	0.1 ... 1	bar / Kg/Cm²	0.14	0.29	0.30	0.17	0.32	0.36
B034 / K103	1.5 ... 15	bar / Kg/Cm²	0.70	0.90	-	0.85	1.10	-
B032 / K102	0.7 ... 7	bar / Kg/Cm²	0.50	0.70	1.20	0.70	0.80	1.20
B029 / K101	0.3 ... 1.6	bar / Kg/Cm²	0.14	0.30	0.29	0.17	0.36	0.32
B030 / K082	0.4 ... 4.0	bar / Kg/Cm²	0.32	0.60	0.63	0.38	0.72	0.70
B021 / K089	0.08 ... 0.4	bar / Kg/Cm²	0.08	0.09	0.09	0.08	0.11	0.12
B003 / K007	(-)0.5 ... 0.5	bar / Kg/Cm²	0.13	0.27	0.27	0.15	0.32	0.30
S060	(-)14.5 ... 0	psi	2.09	4.50	3.92	2.51	5.39	4.35
S054	1.5 ... 15	psi	2.03	4.20	4.35	2.465	4.64	5.22
S066	21.76 ... 217.56	psi	8.70	13.05	-	12.33	15.95	-
S065	10.15 ... 101.53	psi	7.25	10.15	14.50	8.70	11.60	17.40
S063	4.35 ... 23.21	psi	2.09	4.35	4.21	2.51	5.22	4.64
S044	5.8 ... 58	psi	4.57	8.70	9.14	5.48	10.44	10.15
S062	1.16 ... 5.8	psi	0.65	1.31	1.31	0.80	1.57	1.45
S061	(-)7.25 ... 7.25	psi	1.83	3.92	3.92	2.18	4.70	4.35
W185	(-)375 ... 375	mmWC	90	150	-	120	180	-
W009	(-)350 ... 350	mmWC	90	150	-	120	180	-
W011	(-)200 ... 200	mmWC	90.00	150.00	-	110.00	180.00	-
W005	(-)1000 ... 0	mmWC	210.00	300.00	-	260.00	360.00	-
M046	10 ... 100	mbar	9.00	15.00	18.00	11.00	18.00	20.00

Note: Consult factory for differential values of T code switch.

Table 4: Switch code, rating and availability (note 9)

Switch code		Contact version	AC rating	DC rating in Ampere						Availability in models	
				Resistive			Inductive				
SPDT	DPDT			250V	125V	30V	250V	125V	30V	SPDT	DPDT
D	DD	General purpose	15A 250 / 125V	0.2	0.4	2.0	0.02	0.03	1.0	204 & 208	
3	33	General purpose	15A 250 / 125V	-	-	-	-	-	-	204 & 208	
4	44	With Gold alloy contact.	1A 125V	-	0.5	0.5	-	0.25	0.25	204 & 208	
5	55	General purpose with good DC rating.	5A 250 / 125V	0.2	0.4	4.0	0.2	0.4	3.0	204 & 208	
9	99	Hermetically sealed, inert gas filled with Silver alloy contact.	1A 115V 400 Hz.	-	-	3.0 ✶	-	-	1.0 ✶	204 & 208	
G	GG	Hermetically sealed, inert gas filled with Gold plated contact.	-	-	-	1.0 ✶	-	-	0.25 ✶	204 & 208	
-	T	General purpose DPDT switch	10A 250V	-	-	1.0	-	-	4.0	-	204

Notes: 9, G micro switches are not possible in W005, B034, W185, W009, W011
TT code switch option is available.
T, TT code switch are available only with B021 range in 204 model.
✶ For Codes 9, 99, G, GG; DC Rating of Resitive and Inductive is 28V

Table 5: Electrical entry

Size ✶	Single entry		Dual entry	
	GM / GA	GK / GR	GM / GA	GK / GR
1/2" NPT(F) per ASME B1.20.1	A	A	N	N
3/4" NPT(F) per ASME B1.20.1 through adaptor	L	-	O	-
M20 × 1.5 per ISO724 ✶✶	E	E	EB	EB
7 pin plug through connector ✶✶✶	C	-	-	-
9 pin plug through connector	D	-	-	-

✶ Cable gland available on request
✶✶ Possible in GK and GR enclosure as direct. Others through adaptor.
✶✶✶ Possible only in GM enclosure.

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Options for model 204

- Diaphragm Seal (Possible Ranges: B021, B030, B029, B032 & B034 only)
- Special Range
- Optional MWP (200 bar)
- Full Vacuum withstandability
- Ammonia service (use EPDM ‘O’ ring)
- Oxygen service (use teflon ‘O‘ ring)
- Nuclear grade cleaning
- NACE Preparation (Available only with 316L SS / CF3M wetted parts)
- Blow out disc (not available in GR)
- Flushing
- 1/2" NPT(F) per ASME B1.20.1 Process connection
- Replaceable mild steel adaptor
- Optional scale accuracy ±2% (Not available in GR case)
- Line fault monitoring

Notes

1. Style GM / GA is weatherproof only if all entries and joint faces are properly sealed. Style GK / GR is weatherproof only if cover 'O' ring is retained in position and flameproof only if proper FLP cable gland is used. It is recommended to procure cable glands along with GK / GR instruments to avoid neglect of it while installation.

2. Intrinsic Safety (Exi) — Pressure switches are classified as simple apparatus as they neither generate nor store energy. Hence pressure switches in weatherproof (GM / GA) enclosures also may be used in intrinsically safe systems without certification provided the power source is certified IS. Because of the low voltages and currents it is recommended to use gold contact and / or sealed contacts.

3. Accuracy & Repeatability are not different for all blind pressure switches. A shift of ±2% may be observed in setpoint when pressure falls from full static pressure. Settings will also shift with varying temperature.

4. The instrument is calibrated in the mounting position depicted in the drawing. Mounting in any other direction will cause a minor range shift, especially in low and compound ranges. Ranges above 1 bar will not experience this shift.

5. A pressure switch is a switching device and not a measuring instrument — eventhough it has a scale to assist setting. For this reason, Test Certificates will not contain individual ON-OFF switching values at different scale readings. Maximum differential obtained alone will be declared, besides other specifications.

6. Select working range of the instrument such that the set value lies in the mid 35% of the range i.e., between 35% and 70% of range span.

7. Switching differentials furnished are nominal values under test conditions at mid-scale and will vary with range settings and operating conditions.

8. On and off settings should not exceed the upper or lower range value.

9. DPDT action is achieved by two SPDT switches synchronised to practical limits i.e., ±2% of FSR. (Synchronisation is applicable at Setpoint only. Not applicable at Reset points.) Deadband for DPDT contacts are higher than that of SPDT as force required to actuate the contacts are more. Please refer respective range table for exact values.

10. Contact life of microswitches are 5×10^5 switching cycles for nominal load. To quench DC sparks, use diode in parallel with inductance, ensuring polarity. A 'R–C' network is also recommended with 'R' value in Ohms equal to coil resistance and 'C' value in micro Farads equal to holding current in Amps.

11. Ambient temperature range: All models are suitable for operating within a range of ambient temperature from (-) 10°C to (+) 60°C provided the process does not freeze within this range. Below 0°C, precautions should be taken in humid atmospheres to prevent frost formation inside the instrument from jamming the mechanism. Occasional excursions beyond this range are possible but accuracy might be impaired. The microswitch is the limiting factor which should never exceed the limits (–) 50°C to (+) 80°C.

12. Fluid Temperature: A pressure switch when connected to the process is not subjected to through flow and therefore is not fully exposed to the fluid temperature. Use of adequate length of impulse piping will greatly reduce excessive heating of the sensing element. For e.g., connection of 7.5 cm of 12 mm dia impulse piping will reduce water temperature of 100°C to 65°C at an ambient temperature of 50°C. Ask factory for piping nomogram for different temperatures.

13. Ensure that impulse pipework applies no stress on sensing element housing and use spanners to hold pressure port / housing when connections are made.

14. A more versatile and wide range of pressure and differential pressure swittches are available in Series PS01, 200, 020, 300 and S20 Series upto 700 bar.

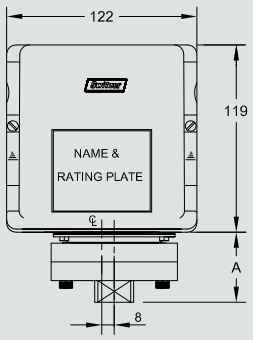
15. Custom built instruments are available for special service requirements under Special Engineering Category.

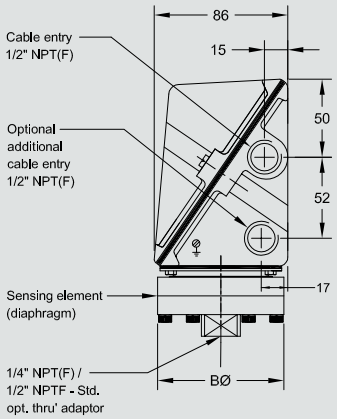
16. Accuracy figures are exclusive of test equipment tolerance on the claimed values.

Dimensions in mm

Model 204 in GM

On-line mounting

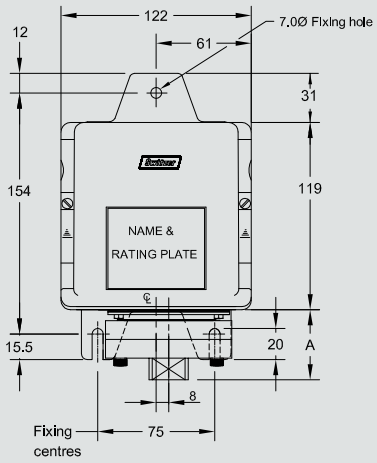


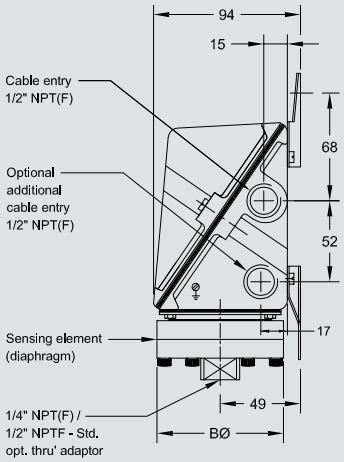


► Dim 'A' varies from 45 to 74 ±2 depending on range

► Dim 'BØ' varies from 66 to 88 depending on range

Wall mounting

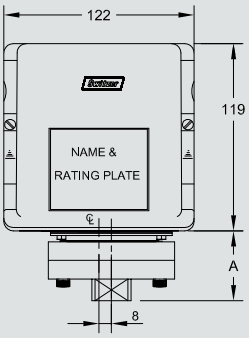


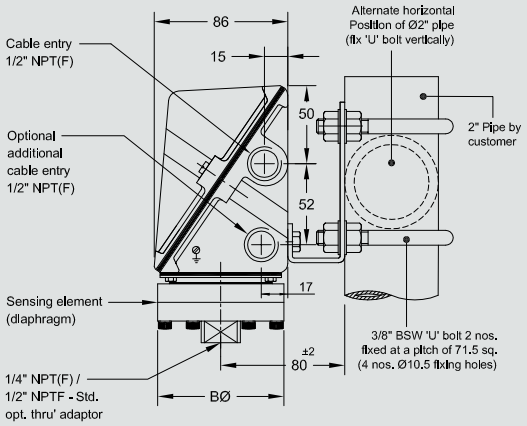


Dim 'A' varies from 45 to 74 ±2 depending on range

Dim 'BØ' varies from 66 to 88 depending on range

2" pipe mounting





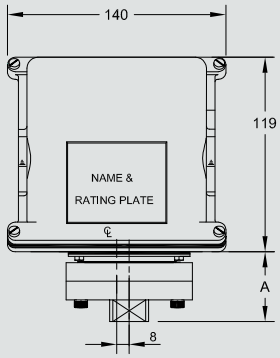
Dim 'A' varies from 45 to 74 ±2 depending on range

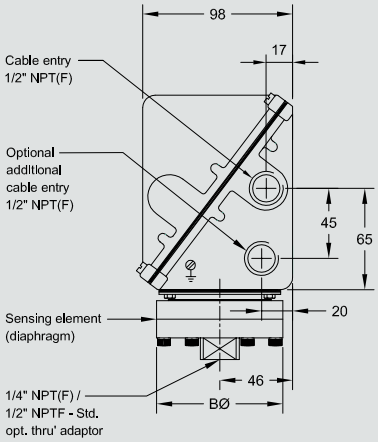
Dim 'BØ' varies from 66 to 88 depending on range

Dimensions in mm

Model 204 in GA

On-line mounting

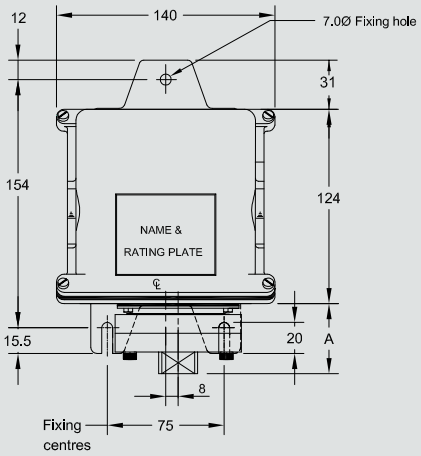


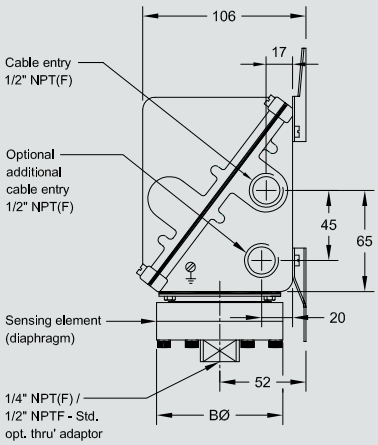


► Dim 'A' varies from 45 to 74 $^{\pm 2}$ depending on range

► Dim 'BØ' varies from 66 to 88 depending on range

Wall mounting

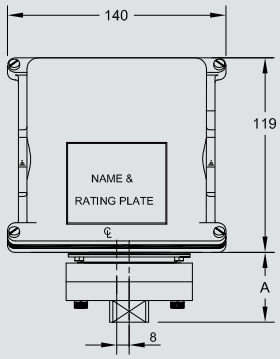


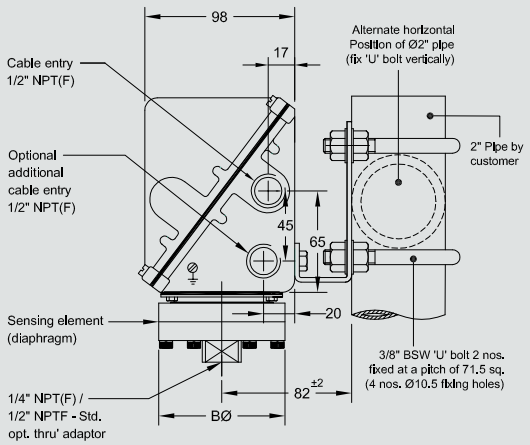


► Dim 'A' varies from 45 to 74 $^{\pm 2}$ depending on range

► Dim 'BØ' varies from 66 to 88 depending on range

2" pipe mounting





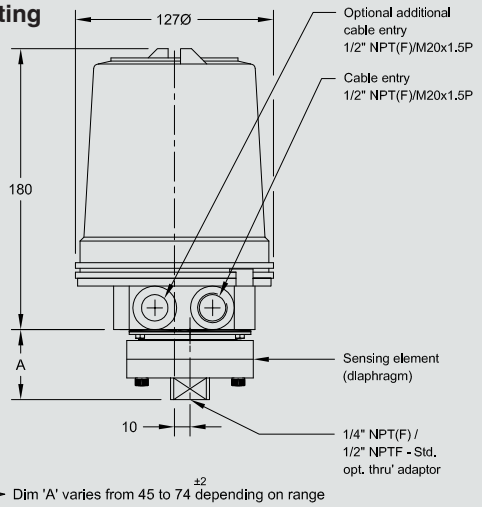
► Dim 'A' varies from 45 to 74 $^{\pm 2}$ depending on range

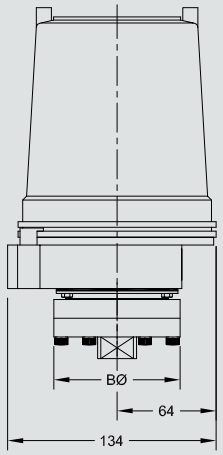
► Dim 'BØ' varies from 66 to 88 depending on range

Dimensions in mm

Model 204 in GK

On-line mounting

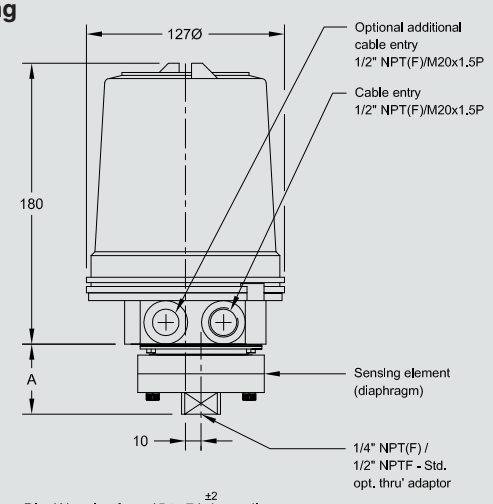


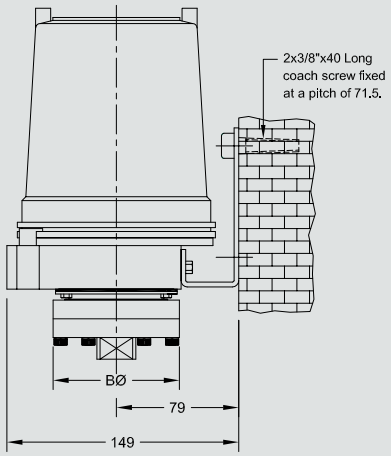


► Dim 'A' varies from 45 to 74 depending on range

► Dim 'BØ' varies from 66 to 88 depending on range

Wall mounting

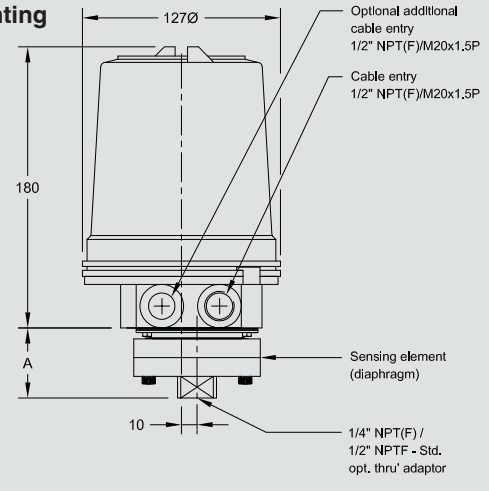


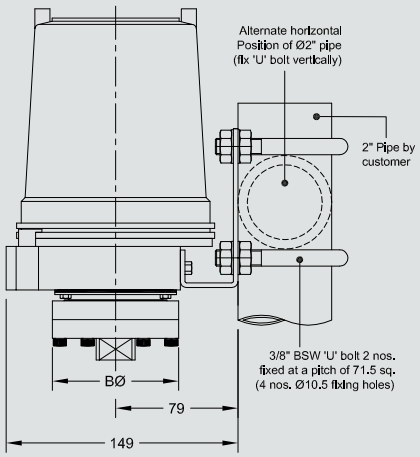


► Dim 'A' varies from 45 to 74 depending on range

► Dim 'BØ' varies from 66 to 88 depending on range

2" pipe mounting





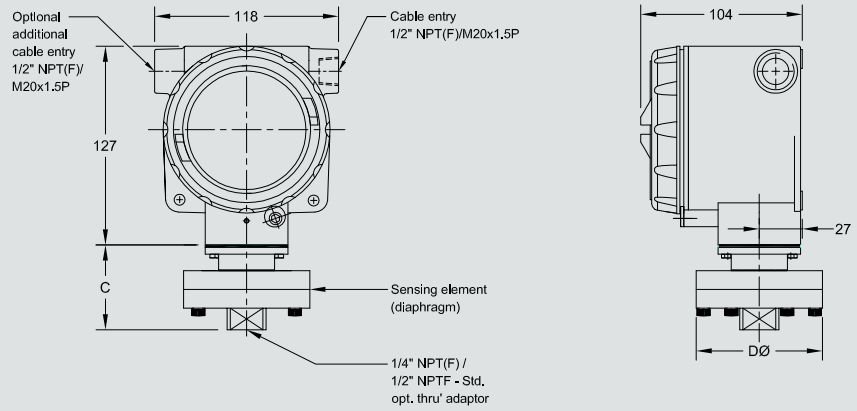
► Dim 'A' varies from 45 to 74 depending on range

► Dim 'BØ' varies from 66 to 88 depending on range

Dimensions in mm

Model 204 in GR

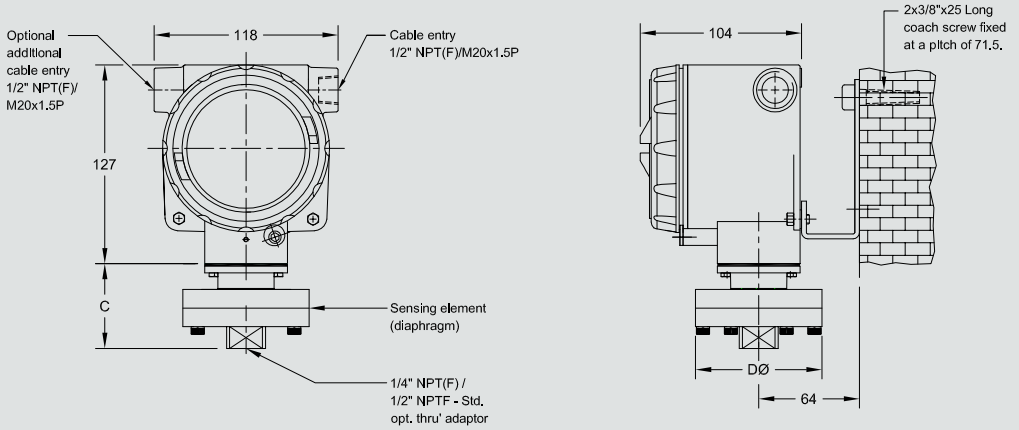
On-line mounting



► Dim 'C' varies from 53 to 83 ±2 depending on range

► Dim 'DØ' varies from 66 to 88 depending on range

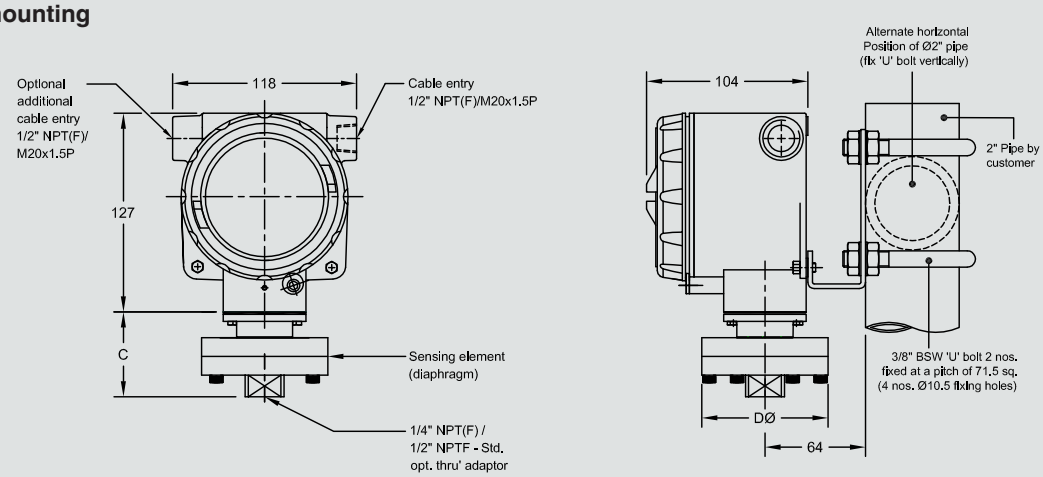
Wall mounting



► Dim 'C' varies from 53 to 83 ±2 depending on range

► Dim 'DØ' varies from 66 to 88 depending on range

2" pipe mounting



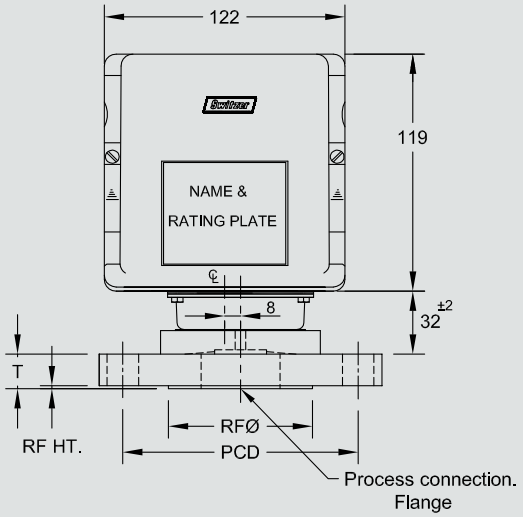
► Dim 'C' varies from 53 to 83 ±2 depending on range

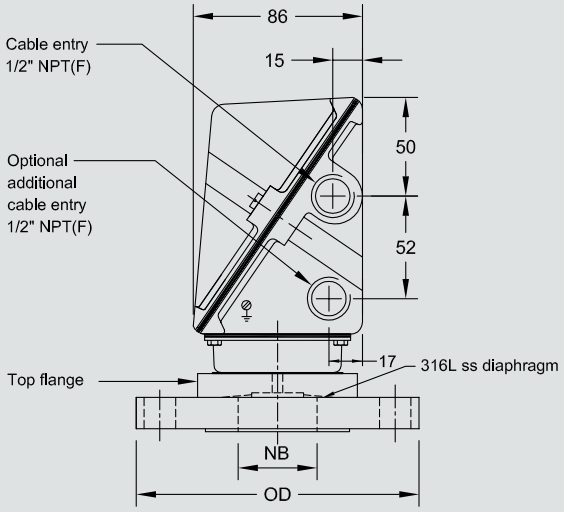
► Dim 'DØ' varies from 66 to 88 depending on range

Dimensions in mm

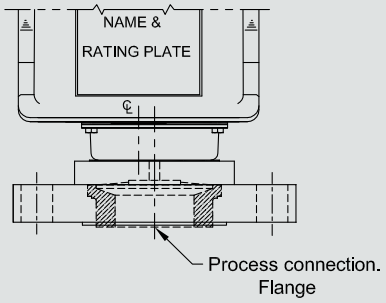
Model 208 in GM

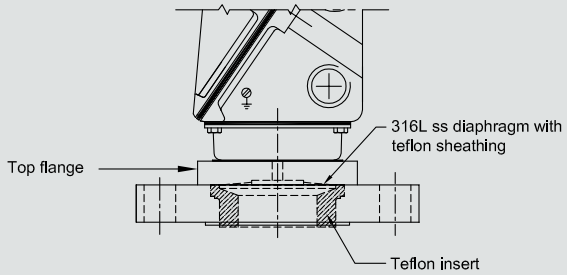
Online mounting





Opt. : Flange with teflon insert





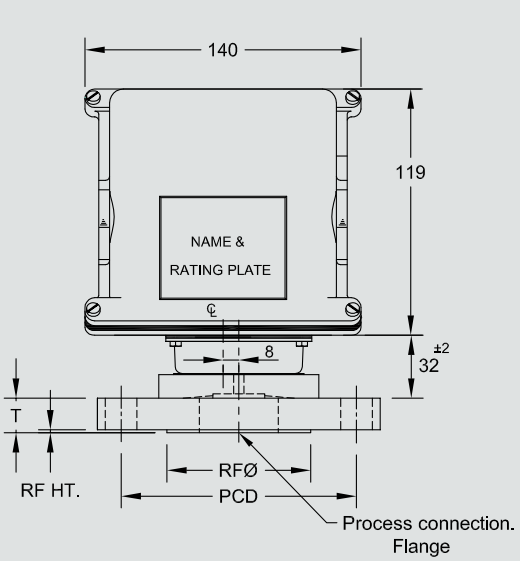
Flange data (Process connection)										
Sl.	Flange size ansi	Pr. rating	+2.0 -0.0 O.D.	+1.0 -0.0 P.C.D	No.of bolts & bolt dia.	±1.0 NB Ø	±0.2 Hole Ø	±1.0 RF Ø	±0.25 RF HT.	+3.0 -0.0 Thk.T
1	1"	150 RF	108.0	79.3	4x1/2"	25	13.5	50.8	1.6	14.2
2		300 RF	124.0	88.9	4x5/8"	25	19	50.8	1.6	17.5
3	1-1/2"	150 RF	127.0	98.4	4x1/2"	40	16	73	1.6	17.5
4		300 RF	155.5	114.3	4x3/4"	40	22	73	1.6	20.6
5	2"	150 RF	152.5	120.7	4x5/8"	50	19	92	1.6	19.0
6		300 RF	165.0	127.0	8x5/8"	50	19	92	1.6	22.4

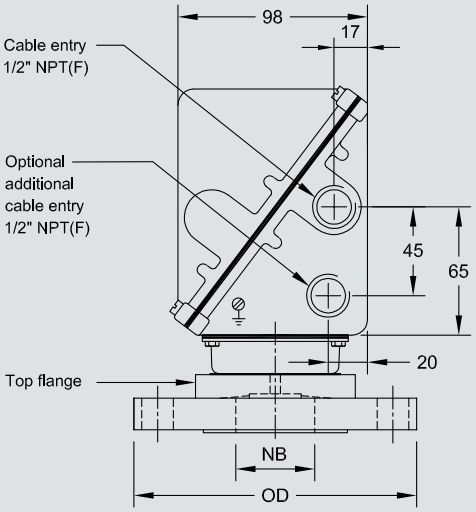
Note : Sl. 1 to 3 Top flange od similar to flange od .

Dimensions in mm

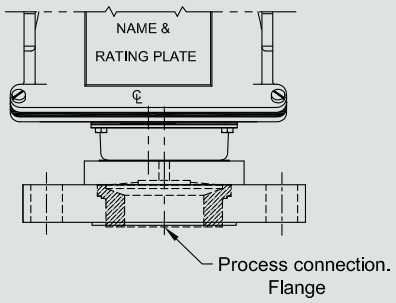
Model 208 in GA

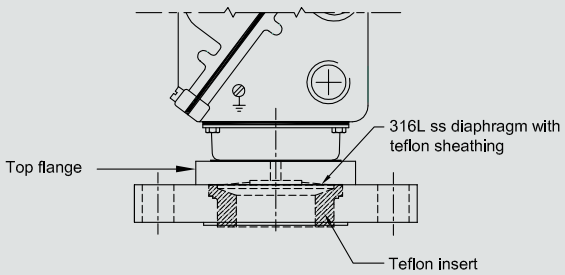
Online mounting





Opt. : Flange with teflon insert





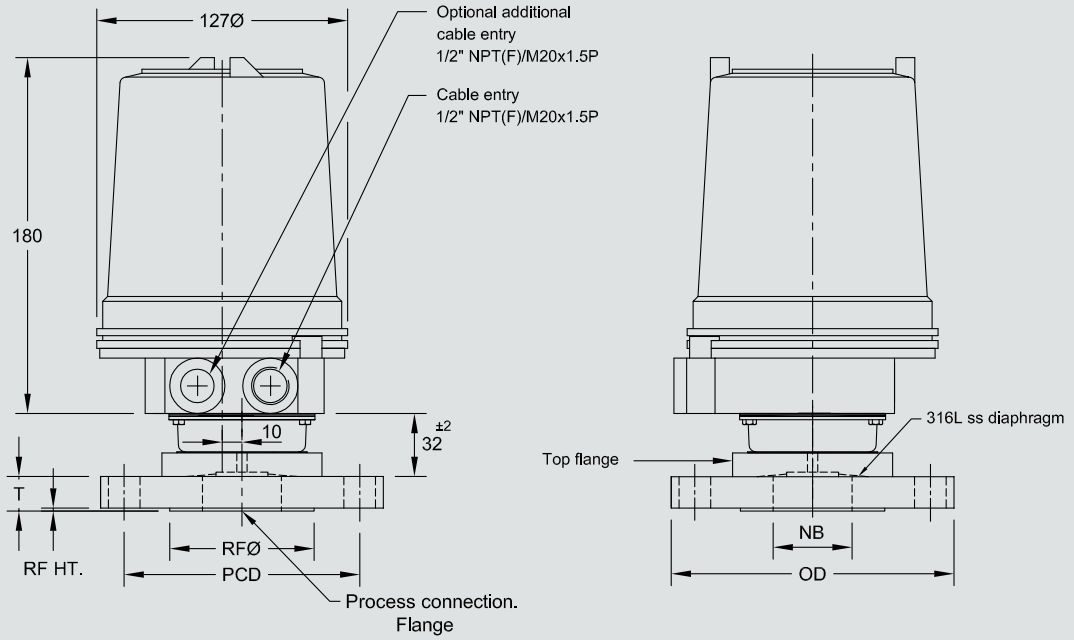
Flange data (Process connection)										
Sl.	Flange size ansi	Pr. rating	+2.0 -0.0 O.D.	+1.0 -0.0 P.C.D	No.of bolts & bolt dia.	±1.0 NB Ø	±0.2 Hole Ø	±1.0 RF Ø	±0.25 RF HT.	+3.0 -0.0 Thk.T
1	1"	150 RF	108.0	79.3	4x1/2"	25	13.5	50.8	1.6	14.2
2		300 RF	124.0	88.9	4x5/8"	25	19	50.8	1.6	17.5
3	1-1/2"	150 RF	127.0	98.4	4x1/2"	40	16	73	1.6	17.5
4		300 RF	155.5	114.3	4x3/4"	40	22	73	1.6	20.6
5	2"	150 RF	152.5	120.7	4x5/8"	50	19	92	1.6	19.0
6		300 RF	165.0	127.0	8x5/8"	50	19	92	1.6	22.4

Note : Sl. 1 to 3 Top flange od similar to flange od .

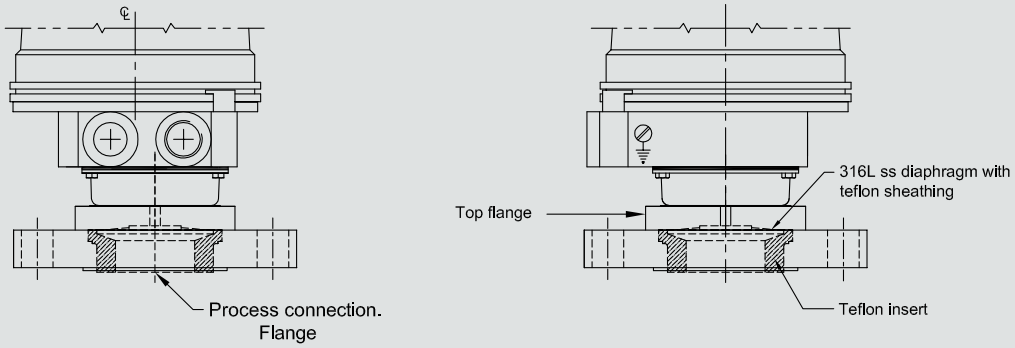
Dimensions in mm

Model 208 in GK

Online mounting



Opt. : Flange with teflon insert



Flange data (Process connection)										
Sl.	Flange size ansi	Pr. rating	+2.0 -0.0 O.D.	+1.0 -0.0 P.C.D	No.of bolts & bolt dia.	±1.0 NB Ø	±0.2 Hole Ø	±1.0 RF Ø	±0.25 RF HT.	+3.0 -0.0 Thk.T
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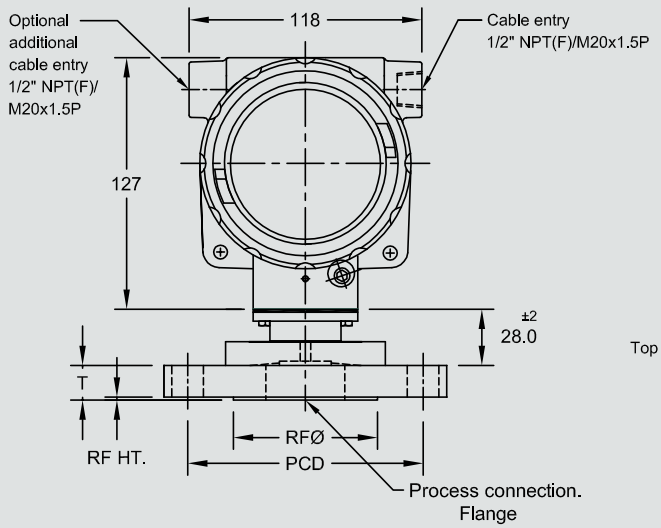
5	2"	150 RF	152.5	120.7	4x5/8"	50	19	92	1.6	19.0
6		300 RF	165.0	127.0	8x5/8"	50	19	92	1.6	22.4

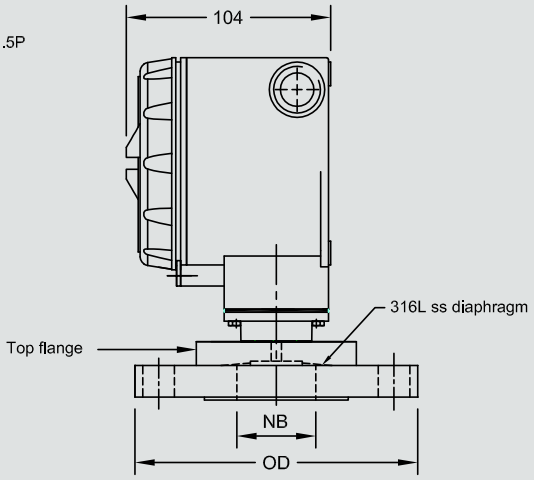
Note : Sl. 1 to 3 Top flange od similar to flange od .

Dimensions in mm

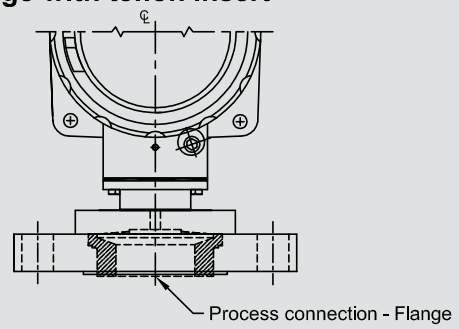
Model 208 in GR

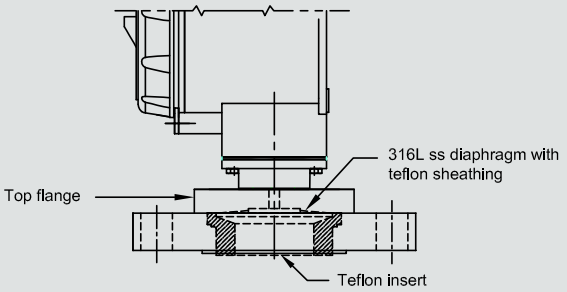
Online mounting





Opt. : Flange with teflon insert





Flange data (Process connection)										
Sl.	Flange size ansi	Pr. rating	+2.0 -0.0 O.D.	+1.0 -0.0 P.C.D	No.of bolts & bolt dia.	±1.0 NB Ø	±0.2 Hole Ø	±1.0 RF Ø	±0.25 RF HT.	+3.0 -0.0 Thk.T
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5	2"	150 RF	152.5	120.7	4x5/8"	50	19	92	1.6	19.0
6		300 RF	165.0	127.0	8x5/8"	50	19	92	1.6	22.4

Note : Sl. 1 to 3 Top flange od similar to flange od .

Ordering information

Switch enclosure / Model / Sensor material / Wetted parts / Range code / Switch code and rating / Electrical entry code / Process connection / Seal 'O' ring

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