Differential pressure switches

DM 300 360

● High static pressure ● Diaphragm sensor ● High repeatability ● Setpoint adjustment ●

This compact version in Switzer series DM 300 Differential Pressure Switches using components of high reliability and is specifically designed for OEMs.

Series 300 Compact Pressure Difference Switches are designed and made to the latest standards to comply with current international philosophy of process instrumentation. The series is compact, easy to install and features high sensitivity over the entire adjustable range together with high static pressure capability.

The sensing element is mounted external to the switch mechanisms which are of stainless steel for arduous atmospheres and high humidity. Sensing element and switching modes can be combined to offer the variety needed to suit the different applications.

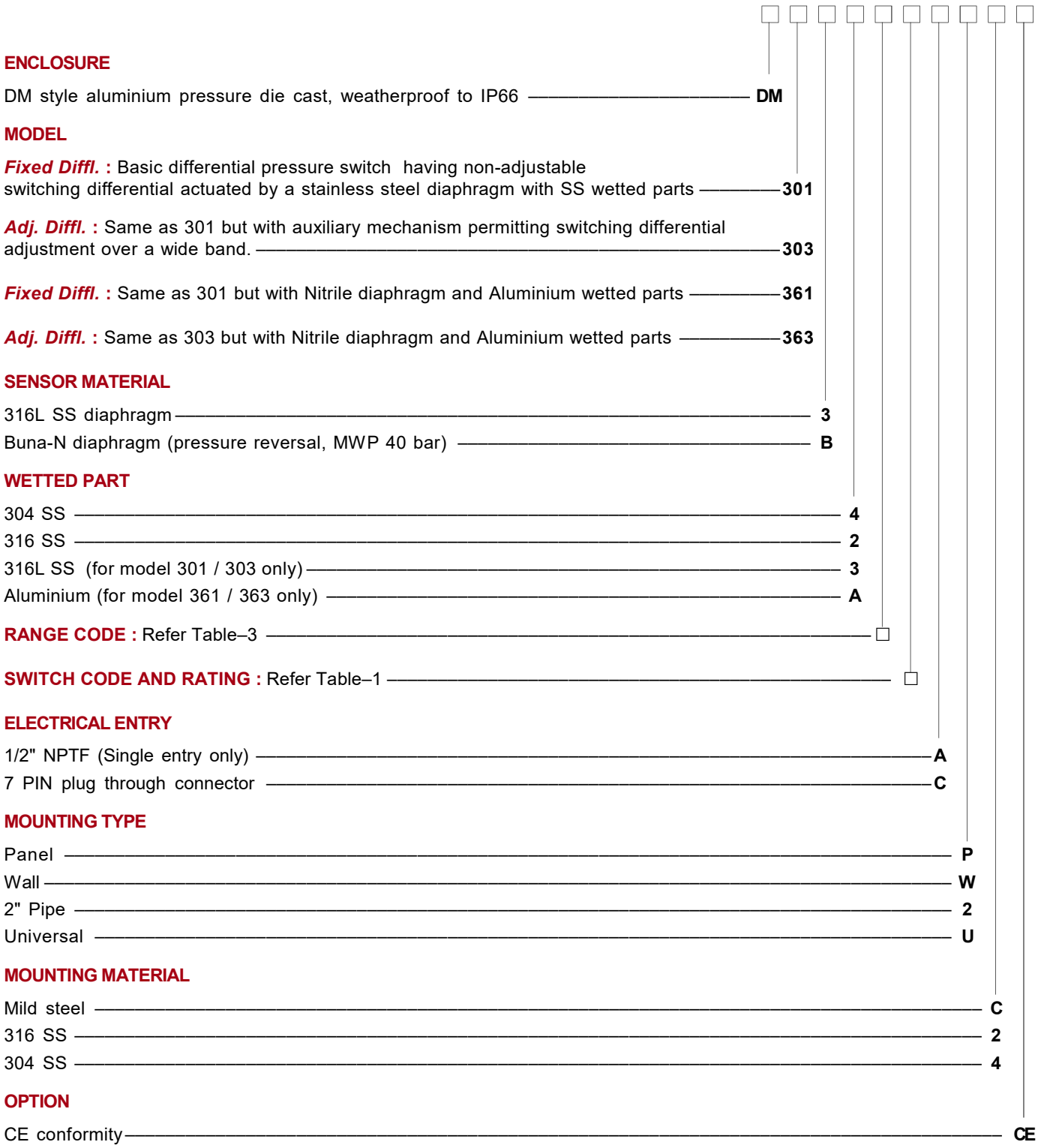
The mechanical movements are restricted to absolute minimum which ensures long term stability.

Style DM Pressure Die Cast Aluminium weatherproof housing is best suited for harsh and outdoor mountings.

General specifications

Enclosure	DM style aluminium pressure die cast, weatherproof to IP66
Ranges	(–) 2.5 mbar to 15 bar, several standard ranges. Refer Ordering Matrix
Sensor	316 LSS / Nitrile diaphragm
Wetted Parts	Aluminium / 304 SS / 316 SS / 316L SS
Repeatability	±1% FSR ***(Note 1)***
Scale Accuracy	±5% FSR ***(Note 3)***
Range Setting	External with lock
Max. Working Pressure	110 bar for 301 & 303 1 bar / 15 bar for 361 & 15 bar for 363 ***(MWP - Note 10 & Table – 2)***
Ambient Temperature	(–)10 to 60°C
Max. Process Temp.	110°C with Nitrile O Ring For higher temperatures use longer impulse lines. Ask for piping nomogram #441184-4 ***(Note 12)***
Switching Element	Instrument quality snap acting SPDT microswitch ***(Note 7 & 8)***
Switching Differential	Fixed or wideband ajustable. Refer table '3'
Process Connection	1/4" NPT(F) standard. Adaptors for other sizes optional
Electrical Connection	1/2" NPTF with Nylon Cable gland to suit 8 to 11 mm OD cable standard
Mounting	Wall / Back panel / 2" Pipe
Weight	3.0 Kgs. for 301/303 2.2 Kgs for 361/363
Confirmity	BS 6134 :1991

Ordering matrix



The below "Options" are available, consult sales

Ammonia service (only for model 301 and 303, EPDM ‘O’ ring mandatory)

Oxygen service (only for model 301 and 303, Viton ‘O’ ring mandatory)

Blow out disc

Special repeatability (only for 301 and 303 models and not available in ranges M040, B032 and B034)

Seal ‘O’ ring – Viton (MWT 205°C, not available in Buna-N

Seal ‘O’ ring – EPDM (MWT 130°C, not available in Buna-N

NACE (available only with ‘6’ wetted parts)

Optional scale accuracy ±2%

Table 1 : SWITCH CODE, RATING & AVAILABILITY

SWITCH CODE (SPDT)	SWITCH CODE (DPDT)	AC RATING	DC RATING IN AMPS						AVAILABILITY OF SPCO & DPCO IN MODELS
			RESISTIVE			INDUCTIVE			
			220V	110V	24V	220V	110V	24V	
3	---	15A 250 / 125V	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	301, 361
D	---	15A 250 / 125V	0.2	0.4	2.0	0.02	0.03	1.0	301, 361
W	WW	15A 250 / 125V	0.3	0.5	6.0	0.05	0.1	4.0	303, 363
5	55	5A 250 / 125V	0.2	0.4	4.0	0.2	0.4	3.0	301, 361
J	---	5A 250V	N.A.	N.A.	5.0	N.A.	N.A.	3.0	301, 361
K	---	1A 125V	N.A.	N.A.	1.0	N.A.	N.A.	0.5	301, 361
9	99	1A 115V 400 Hz	N.A.	N.A.	3.0	N.A.	N.A.	1.0	301, 361
G	GG	N.R.	N.R.	N.R.	1.0	N.R.	N.R.	0.25	301, 361

Code 3, D & W – General purpose with Silver alloy contact.
Code 5 – For general purpose with DC rating with Silver alloy contact.
Code J – Argon sealed micro switch with silver contact.
Code K – Argon sealed micro switch with gold contact.
Code 9 – Hermetically sealed, inert gas filled with silver alloy contact.
Code G – Hermetically sealed, inert gas filled with gold plated contact.

N.A. – Not Available **N.R. –** Not Recommended

Table–2 : MAXIMUM WORKING PRESSURE RATING

Range Code	Wetted Parts				Max. Working Pressure (in Bar)			
	301	303	361	363	301	303	361	363
M009	N.A	N.A	Alumi-nium	N.A.	N.A	N.A.	1	N.A.
M012								
M040	304/ 316 SS	304 / 316 SS		Alumi-nium	110	110	15	15
M042								
M048								
B023								
B028		N.A.	N.A	N.A		N.A.	N.A	N.A.
B032								
B034								

N.A – Not available in these models

Table–3 : RANGE CODE & DIFFERENTIAL

Range Code	Range	Fixed differential				Adjustable differential	Fixed differential				Adjustable differential
		Model 301				Model 303	Model 361				Model 363
		D / 3	5	J / K	9 / G	W	D / 3	5	J / K	9 / G	W
		in mbar									
M009 ★	(–) 2.5 to 2.5 mbar	--	--	--	--	--	0.8	1.5	--	--	--
M012 ★	0 to 5 mbar	--	--	--	--	--	0.4	1.4	--	--	--
M040	3 to 25 mbar	6	6	10	10	--	0.8	-	--	--	--
M042	5 to 120 mbar	5	10	12	12	55 to 70	12	12	--	--	65 to 70
M048	50 to 350 mbar	12	20	30	30	80 to 200	20	25	60	60	95 to 200
B023	0.1 to 1.5 bar	60	85	120	120	350 to 900	70	90	250	250	400 to 900
B028 / K051	0.2 to4 bar / Kg/Cm²	175	350	500	500	--	300	600	700	700	--
B032 / K102 ★	0.7 to 7 bar / Kg/Cm²	300	500	--	--	--	--	--	--	--	--
B034 / K103 ★	1.5 to 15 bar / Kg/Cm²	800	1350	--	--	--	--	--	--	--	--

1. For On-Off differential values for DPDT (2 x SPDT) switching, apply a multiplication factor of 1.3 to the above values.
2. For Range codes B032 & B034 in model 301 DPCO switching is possible only for switch codes 3, D & 5.
3. ★ 9, G, J & K micro switches are not possible.
4. Pressure reversals are possible with Buna-N wetted parts only. MWP 40 bar.

Notes

1. Accuracy & Repeatability are not different for all blind differential 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.

2. 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.

3. A Differential Pressure switch is a switching device and not a measuring instrument — eventhough it has a scale with ±5% FSR accuracy 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.

4. 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.

5. For switching differential values please refer Table-1. Switching differentials furnished are nominal values under test conditions at mid-scale and will vary with range settings and operating conditions.

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

7. DPDT action is achieved by two SPDT switches synchronised to practical limits i.e., ±2% of FSR. Deadband for DPDT contacts are higher than that of SPDT as force required to actuate the contacts are more. Please refer respective differential table.

8. 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.

9. All differential pressure switches are calibrated by applying pressure to HI port, venting LO port to atmosphere. Inspection will also be limited to such a practice.

10. MWP: The value mentioned herein is the highest permissible pressure that can be applied. Cannot be proof tested for any higher pressure value.

11. Ambient temperature range: All models are suitable for operating within a range of ambient temperature from (–) 25°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 of (–) 50°C to (+) 80°C.

12. Fluid Temperature: A Differential 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 example 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 #441184–4 for different temperatures.

    In 301 / 303 Higher temperatures greater than 70 deg. by using seal O rings of different material for different temperatures as below:

    130°C for EPDM and 205°C for Viton.

13. Style DM is weatherproof only if all entries and joint faces are properly sealed.

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

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

16. A more versatile and wide range of Pressure & Differential Pressure Switches are available in Series 200, 020, 300 & S20 Series upto 700 bar.

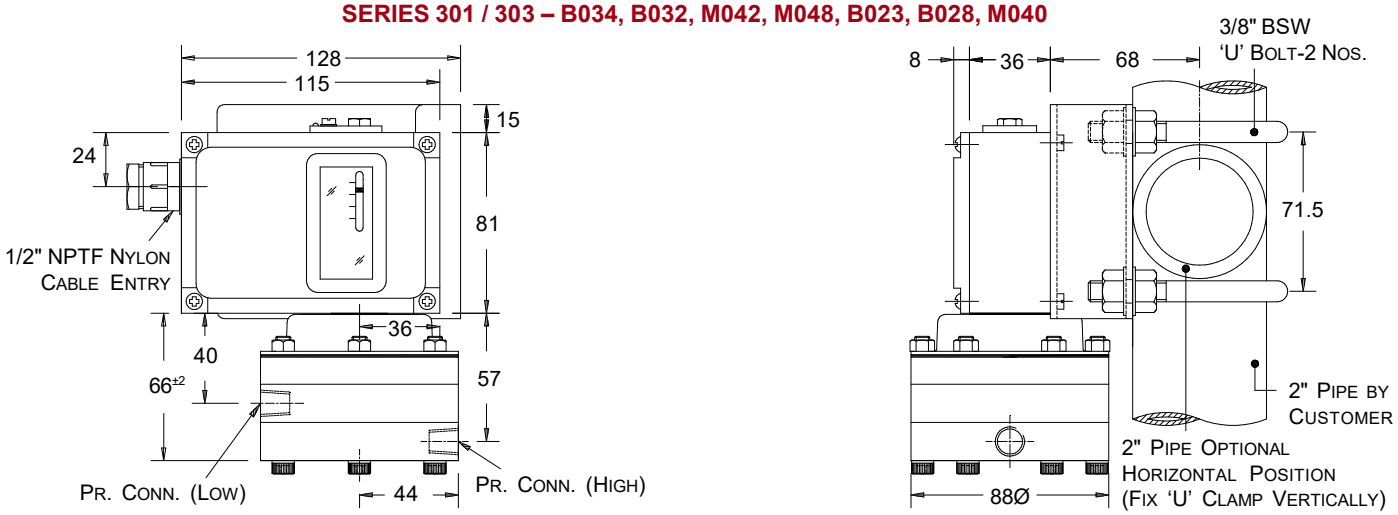
17. Complementary instrumentation for pressure is available in 200 series.

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

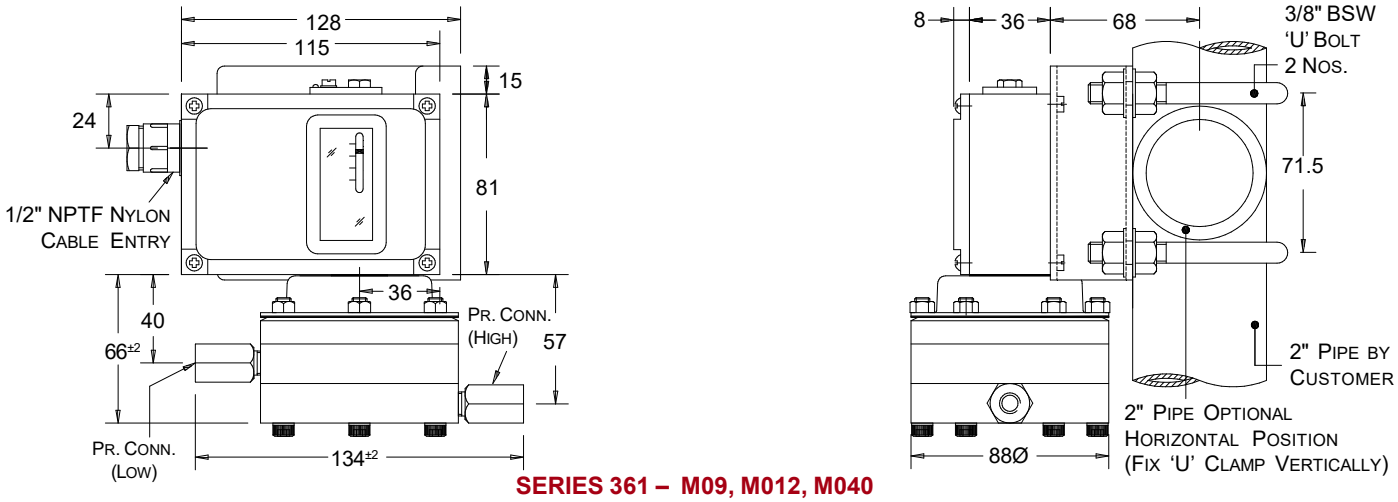
19. **All performance data are guaranteed to ±5%.**

Dimensions in mm

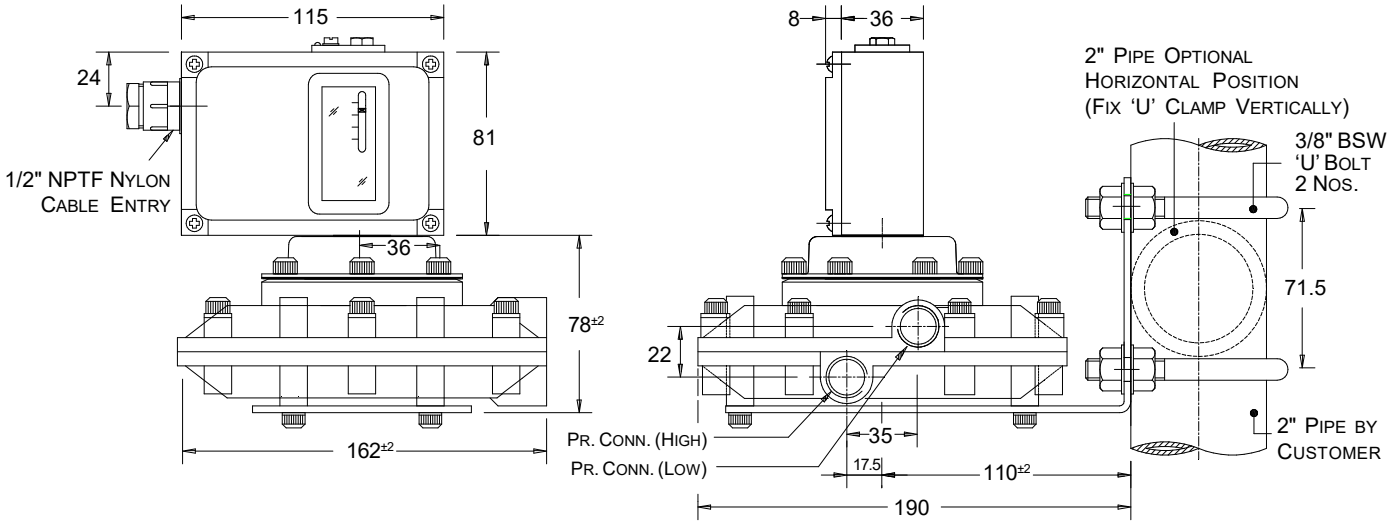
SERIES 301 / 303 – B034, B032, M042, M048, B023, B028, M040



SERIES 361 / 363 – M042, M048, B023, B028



SERIES 361 – M09, M012, M040



Note : The Instrument will be mounted directly on to wall / back panel.

This is not a contractual document. Prior notification of changes in specifications is impracticable due to continuous improvement

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