

Technical Datasheet

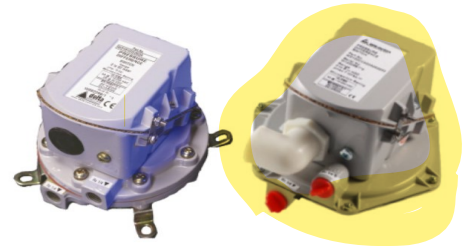


Performance Series Differential Pressure Switch

Models: 310 & 316

Key Features

- Precision stainless steel mechanism for harsh environments and high humidity
- Models for fixed switching differential operation
- Set point adjustable over whole range against calibrated scale with tamperproof adjuster
- Die Cast aluminium Epoxy Coated enclosure
- IP66/NEMA 4X Weatherproof enclosure
- Ranges from +/-2.5mbar (+/-1in.H₂O) to 75 mbar (30in.H₂O), static pressure up to 15 bar (217psi)
- Safety vented or blow out device as standard



Series Overview

Designed in the mid-1970s and developed over subsequent years, the Performance Series switch range offers users the broadest range of options, the highest levels of set-point repeatability and the confidence of long term performance that a mature product such as this can prove.

The models 310/316 Performance Series differential pressure switches utilise a Nitrile diaphragm based sensor. This, when coupled with a precision stainless steel mechanism designed to minimise friction in the moving parts, helps deliver the market leading performance customers have come to expect from the series.

Others products in the series include:

- Absolute Pressure Switches: Model 207
- Relative Pressure Switches: Model 200
- Temperature Switches: Model 700

Product applications

The 310 / 316 is suitable for a wide range of applications in:

- Oil & Gas
- Chemical
- Petrochemical
- Refining
- Power
- Food Industry

The choice of models available ensures that the 310 / 316 is suitable for use in:

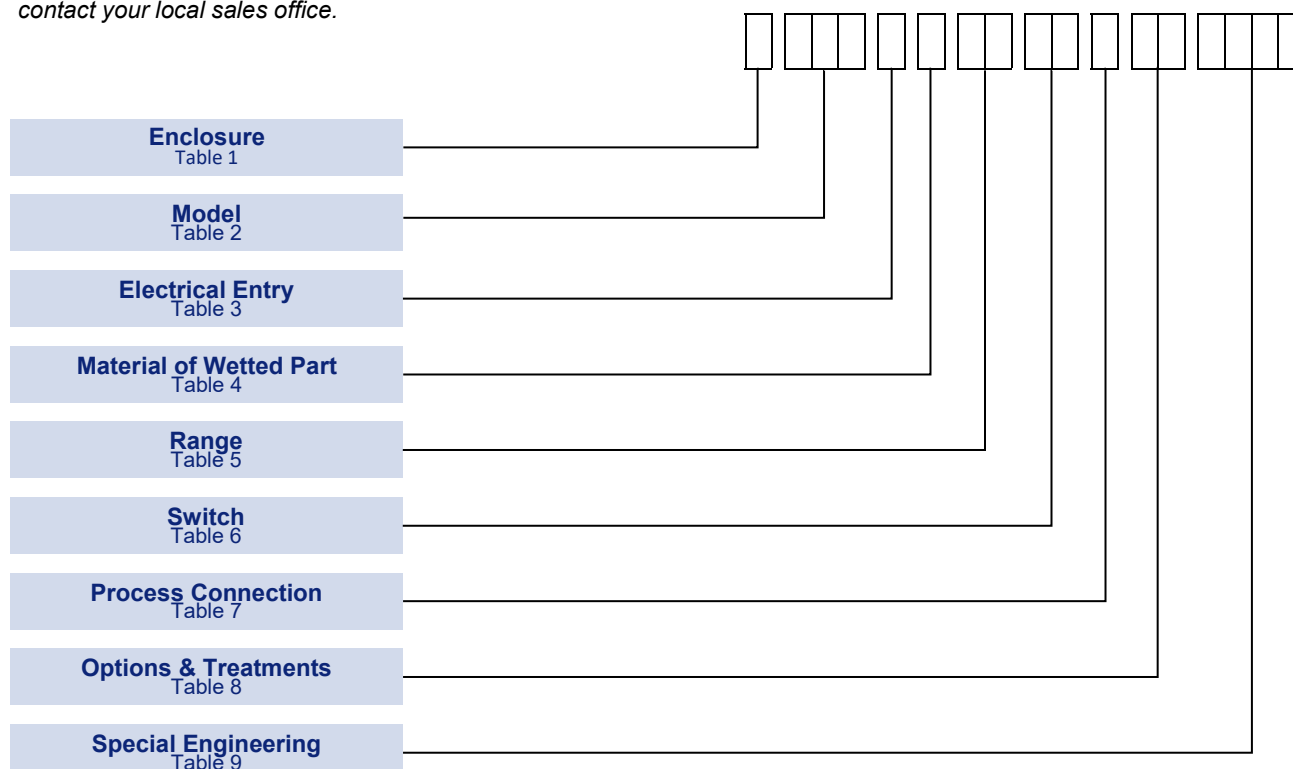
- Corrosive atmospheres
- Resistant to chemical attack

How can we help you?

Delta Mobrey offers fast, efficient and knowledgeable support when and where you need it. Please visit our website at www.delta-mobrey.com to find your local support centre or call us on:
+44 (0) 1252 729 140

How to order

Switches can be configured by selecting codes representing the desired features from the tables that follow. The chart below, describes how the model code is built up. For assistance in configuring a switch that best suits your needs, please contact your local sales office.



Technical Specification

Set point Repeatability:	1% of span.
Scale Accuracy:	± 3% of full scale at reference temperature.
Storage Temperature:	-25 to +80°C / -13 to +176°F
Ambient Temperature:	-25 to +80°C / -13 to +176°F; SPECIAL ENGINEERING -60 to +80°C (-76 to 176 °F)
Maximum Process Temperature:	At the process connection, the component parts withstand temperatures up to +80° C (+176°F). For higher media temperatures (use Code A or S Table 4), refer to the Operating Instruction for installation procedures or contact your local sales office.
Enclosure Classification:	Weatherproof
Ingress Protection:	IP 66 / NEMA 4X
Pollution Degree:	Pollution degree 3 according EN60947-5-1 (For extreme conditions where condensation may readily form, then sealed contacts should be used)
Switch Output:	1 x SPDT snap action microswitch (standard) Hermetically sealed (optional)
Electrical Rating:	See Table 6
Terminal Block:	Suitable for wire section up to 2,5 mm ² / 14 AWG
Grounding Connection:	One internal and one external suitable for wire section up to 4 mm ² / 12 AWG
Electrical Safety Class:	Safety electrical class 1 according IEC 61298-2:2008
Process Connection:	Rc 1/4 (BSP) INT
Weight:	1.7kg / 3.7lb to 3.74kg / 8.1lb depending on model

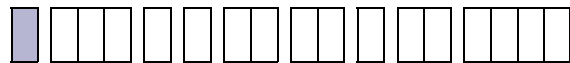
Enclosure

INTRINSIC SAFETY AS SIMPLE APPARATUS AND LOW POWER APPLICATION

Because of the low voltages and currency of I.S. circuits, we recommend using gold and/or sealed contacts.

NOTE: In the interest of safety the enclosure W with electrical connection code 1 cannot be use for intrinsic safety application

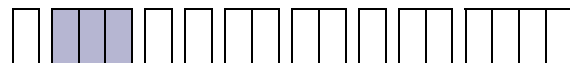
TABLE 1



WEATHERPROOF ENCLOSURES	Code
General Purpose The basic enclosure is pressure die-cast in zinc alloy, offering weather protection not less than NEMA 4 + 13/IP66.	W

Models

TABLE 2



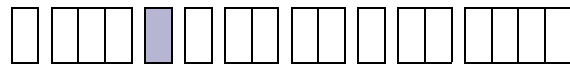
	Code
Static/line pressure from -500 mbar (-7psi) to + 500 mbar (7psi)	310
Static/line pressure from full vacuum - 1000mbar (-30in. Hg) to 15bar (217psi).	316

Electrical Entry

Standard option code 1 (20 mm dia.) is provided with a nylon 22/20 reducer and fibre washer suitable for a standard M20 cable gland and back nut

If a metal cable gland is site fitted it must either be earthed locally or an earth/gland plate must be used to connect the body of the gland at the enclosure earthing point. Earth/gland plates can be provided either factory fitted or in kit form for site assembly. Ask for details.

TABLE 3



	Code
Clearance for 20mm (3/4in) outside dia conduit.	1
M20 x 1.5-adaptor.	0
1/2-14 NPT INT adaptor.	2
3/4-14 NPT INT adaptor.	3

Material of Wetted Parts

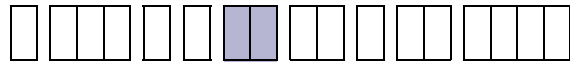
TABLE 4



	Code
MODEL 310 Flanges pressure die cast zinc alloy. Diaphragm and seals are nitrile.	C
MODEL 316 Flanges die cast aluminium alloy. Diaphragm and seals are nitrile.	D

Setting Ranges

TABLE 5



Model 310

P_{static} - maximum static/line pressure
 P_{max} - maximum working pressure
 and maximum one side pressure
 side H

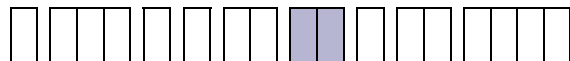
P_{static}		P_{max}		RANGE			
mbar	psi	mbar	In.H ₂ O	mbar	Code	In.H ₂ O	Code
-500 to +500	-7 to +7	60	25	-2.5 to +2.5	B3	-1 to +1	BN
		60	25	0 to 5	B5	0 to 2	BR
		60	25	0 to 15	C2	0 to 6	C4
		60	25	0 to 25	C5	0 to 10	C9
		100	40	7.5 to 75	D5	3 to 30	D9

Model 316

P_{static}		P_{max}		RANGE			
bar		bar	psi	mbar / bar	Code	In.H ₂ O / psi	Code
-1 to 15	-30 in Hg to 217 psi	15	217	0 to 60	D2	0 to 25	D4
				0 to 100	D8	0 to 40	DH
				0 to 400	F1	0 to 160	F4
				0 to 1.0	G0	0 to 15	GB
				0 to 1.6	G8	0 to 20	GZ

Switch Options

TABLE 6



Model 310, & 316 - a much wider variety of switching options is available on Model 306

UL/CSA RATING (RESISTIVE) § see note	IEC947-5-1 / EN 60947-5-1 RATING						Contact	Code
	Designation & Utilisation Category	Rated operational current I_e (A) At rated operational voltage U_e	U_i	U_{imp}	VA Rating			
					Make	Break		
5 Amps @ 110/250V AC Light Duty for AC only	AC14 D300 DC13 R300	0.6/0.3A @ 120/240 V AC 0.22/0.1A @ 125/250V DC	250V	0.8kV	432 28	72 28	SPDT	00
5 Amps @ 110/250V AC and 2 Amps @ 30V DC General purpose precision	AC14 D300 DC13 R300	0.6/0.3A @ 120/240 V AC 0.22/0.1A @ 125/250V DC	250V	0.8kV	432 28	72 28	SPDT	02
1 Amp @ 125V AC and § 100mA @ 30V DC Gold Alloy contacts for low voltage switching	1A @ 125 VAC RESISTIVE (IEC 1058-1/EN 61058-1)						SPDT	04

The electrical rating is dependent on the microswitch fitted to the instrument. The electrical ratings defined by each approval that the microswitch complies with and is shown on the product nameplate, ie UL/CSA, or IEC. It should be noted that the instrument must be used within the electrical rating specified from the approval you require. This table lists the actual IEC ratings against the Designation & Utilization Category marked on the nameplates. In the absence of any verification by UL/CSA the microswitch § manufacturer's rating is stated in **italics and bold**. If in doubt seek guidance from the factory.

NOTE: For low energy circuits e.g. 30V and up to 100mA, we recommend using gold alloy contact switches.

U_i = rated insulation voltage

U_{imp} = rated impulse to withstand voltage across contacts.

Process Connection

NOTE: For other thread sizes specify adaptors

TABLE 7



	Code
Rc 1/4 (1/4 BSP tr INT) to (ISO 7/1)	A

Options & Treatments

TABLE 8



	Code
Tagging - Variety of tagging methods are available.	APPLY FOR DETAILS
Applies when - no option is required and selection is made from special engineering	00

Special Engineering

Last 4 digits of model code only used when special engineering is required.

TABLE 9



	Code
Please consult Delta Mobrey's sales engineering for special requirements	TBA
End Line Resistors available factory wired (nominal contact rating may change)	

Performance Data

TABLE 10

Due to manufacturing tolerances the figures in these tables are for guidance only. Should the differential be critical for specific applications, our engineers should be consulted prior to ordering

Bar / mbar Units

MODELS 310 -

mbar units

TABLE 10A

Range Code	Range mbar	SPDT OPTION		
		00	02	04
B3	-2.5 to +2.5	0.25	0.8	0.4
B5	0 to 5	0.25	0.8	0.4
C2	0 to 15	0.25	1	0.5
C5	0 to 25	0.25	1	0.5
D5	7.5 to 75	1.25	5	2.5

MODELS 316 -

mbar units

TABLE 10B

Range Code	Range mbar / bar	SPDT OPTION		
		00	02	04
D2	0 to 60	1.5	6	3
D8	0 to 100	1.5	6	3
F1	0 to 400	3	12	6
G0	0 to 1.0	12.5	50	25
G8	0 to 1.6	12.5	50	25

PSI Units

MODELS 310 -

In.H₂O units

TABLE 10C

Range Code	Range In.H ₂ O	SPDT OPTION		
		00	02	04
BN	-1 to +1	0.1	0.32	0.16
BR	0 to 2	0.1	0.32	0.16
C4	0 to 6	0.1	0.40	0.2
C9	0 to 10	0.1	0.40	0.2
D9	3 to 30	0.5	2	1

MODELS 316 -

In.H₂O / *psi* units

TABLE 10D

Range Code	Range In.H ₂ O / <i>psi</i>	SPDT OPTION		
		00	02	04
D4	0 to 25	0.6	2.4	1.2
DH	0 to 40	0.6	2.4	1.2
F4	0 to 160	1.2	4.8	2.4
GB	0 to 15	0.18	0.72	0.36
GZ	0 to 20	0.18	0.72	0.36

Approvals

**EUROPEAN DIRECTIVE****Low Voltage Directive (LVD) 2014/35/EU**

Compliant to LVD

Pressure Equipment Directive (PED) 2014/68/EU

Compliant to PED according pressure accessory

Restriction of hazardous substances (RoHS 2) 2011/65/EU

Compliant to RoHS

**UK REGULATION****Electrical Equipment (Safety) Regulations 2016**

Conform to UK SI 2016 No 1101 regulation

Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

Conform to UK SI 2012 No. 3032

Pressure Equipment (Safety) Regulations 2016

Conform to UK SI 2016 No 1105 regulation

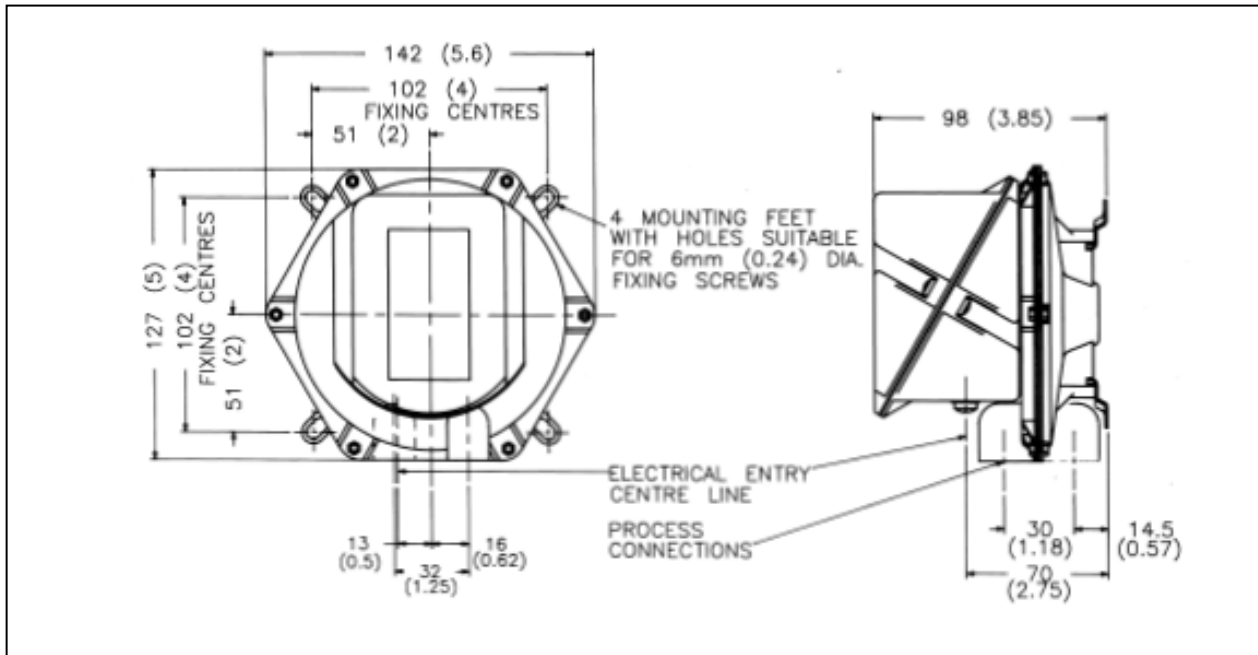
**EURASIAN CONFORMITY MARK**

If EAC certification is required, this must be stated at the point of sale to ensure the correct marking of the instrument.

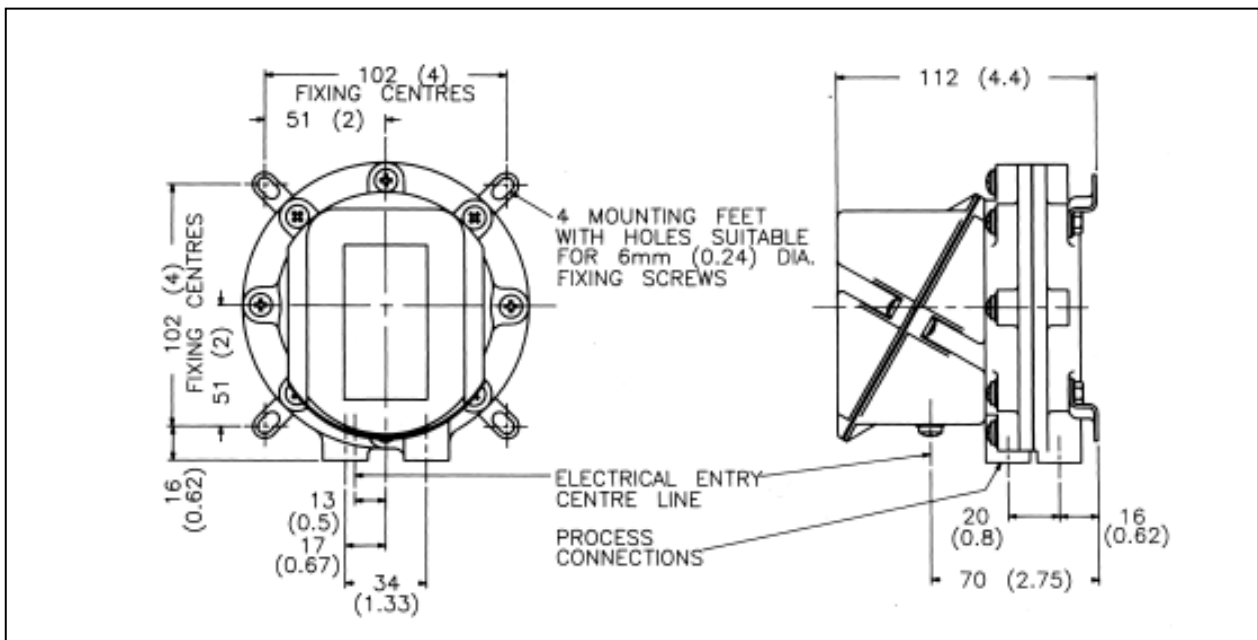
Dimensions

All dimensions mm (Inches)

MODELS 310



MODELS 316



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