

## Pressure Switch VM Series **Model VM2/4**

- Compact and rugged design
- ATEX Flameproof EExd IIC 2 GD
- Stainless steel enclosure as standard
- All welded construction for process connection and diaphragm – reduced risk of leakage under extreme conditions
- Ranges available between 0.25bar/4psi and 700bar/10,000psi
- Variety of wetted parts including NACE MR-01-75 compatible option
- Field adjustable set point

### Performance **characteristics**

#### Enclosure options

- Weatherproof IP66/NEMA 4X
- Weatherproof IP66/flameproof EEx IIC 2 GD
  - T6 (Tamb –60 Deg C to + 65 Deg C)
  - T5 (Tamb –60 Deg C to + 80 Deg C)

#### Wetted parts options

- Nickel alloy (Monel) diaphragm and process connection for NACE MR-01-75 – all welded construction.

#### Standard electrical ratings

- Refer to Table 6

#### Process connection

- Rc 1/4 (1/4" Bsp tr int) or 1/4" NPTF (other sizes via adaptors only)

#### Unit weight

1.5kg/3.3lbs approx

#### Set point Repeatability

+/- 1% of adjustable range

#### Ambient temperature range

- -40 to +80 deg C (-40 to +176F) intermittently down to -60 deg C (-76 degF) - ATEX (VM2)
- -40 to +85 deg C (-40 to +185F) for the weatherproof version (VM2)
- -25 to +60 deg C (-13 to +140F) Limited by materials used in sensing element (VM4 only)



### Product **applications**

Designed for volume manufacture, the **VM2/4 switch** is ideally suited to meet the requirements of OEM manufacturers of:

- Wellhead control safety shutdown systems
- Water or gas deluge fire protection systems
- Fuel and lubrication systems, as found on gas turbines, compressors and other rotating machinery
- Valve Actuators

The choice of models available ensures the **VM Series** is suitable for use in:

- general purpose applications
- aggressive outdoor atmospheres, eg: marine or coastal environments
- hazardous areas

#### How can we **help you?**

Delta Controls' range of reliable pressure and temperature measurement instruments can be customised to meet individual requirements. For technical advice or to discuss your application, please contact us on +44 (0) 20 8939 3500

**Terminal strip – For ease of use**

Pull out connector suitable for 2.5mm<sup>2</sup> / 14awg wire is provided.

**Earthing / Grounding**

Internal and external

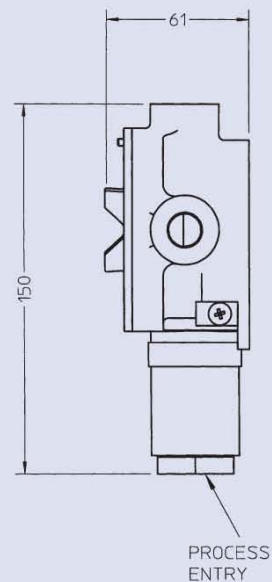
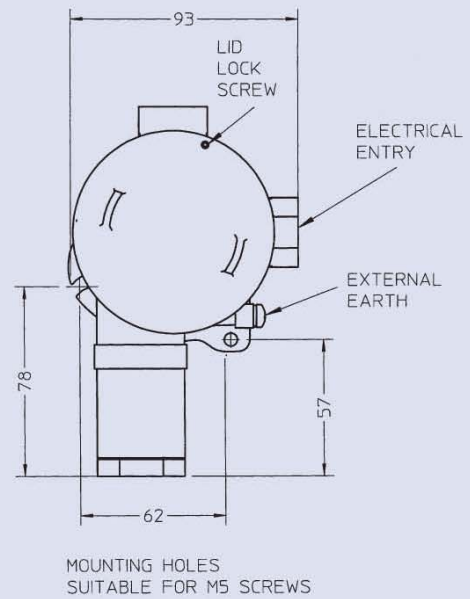
**Mounting**

Via 2 integral cast lugs with holes to suit M5 screws.  
The instrument should not be sited in locations that transmit excessive shock, pressure pulsations or vibration.

**Intrinsic safety**

Pressure switches neither store nor generate electrical energy and are therefore classed as ‘simple apparatus’. Because of the low voltages and currents normally used in these types of circuit it is recommended that the optional gold contact microswitch is used.

**Figure 1**



When ordering, please state the relevant product code for each instrument, made up as follows:



**Enclosure.** See Table 1

**Model.** See Table 2

**Electrical connection.** See Table 3

**Material of wetted parts.** See Table 4

**Range.** See Table 5

**Options.** See Table 8

**Process connection.** See Table 7

**Switching options.** See Table 6

**Enclosure**

<b>TABLE 1</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
	<b>Code</b>
<b>Stainless Steel Weatherproof – IP66/NEMA 4X</b> For general use or aggressive atmospheres e.g marine	A
<b>Stainless Steel Weatherproof/Flameproof – IP66/NEMA 4X</b> <b>ATEX /EEx d IIC T6 2GD</b> For use in aggressive atmospheres e.g. marine.	R

**Model**

<b>TABLE 2</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
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	<b>Code</b>
<b>Fixed Switching Differential</b> For applications up to 100 bar / 1500 psi Over-range up to 155 bar / 2250 psi Refer to Table 5	VM2
<b>Fixed Switching Differential</b> For applications up to 700 bar / 10,000 psi Over-range up to 1000 bar / 15,000 psi Refer to Table 5	VM4

**Electrical Entry**

<b>TABLE 3</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
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	<b>Code</b>
M20 X 1.5 ISO Thread	0
1/2" NPT INT	2

**Material of Wetted Parts**

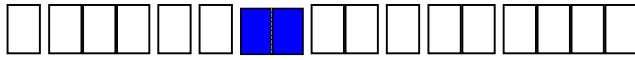
<b>TABLE 4</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
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For reduced risk against leakage under extreme or unusual conditions, the diaphragm is welded directly to the process connection.

	<b>Code</b>
316 Stainless Steel diaphragm and process connection. All welded construction.	S
Nickel Alloy (Monel) diaphragm and process connection. All welded construction.	M

## Setting Ranges and Performance Data

TABLE 5



Figures given in tables are typical maxima for mid-range setting and are for guidance only. Value will vary across the range i.e. lower at or near the bottom of the range and higher at or near the top of the range.

### SI Units

Table 5A

VM2			SWITCHING DIFFERENTIAL mbar			
RANGE CODE	P max Bar	RANGE bar	02	03	04	05
DB	27	0.25 to 1.6	200	260	200	260
DC		0.4 to 2.5	320	416	320	416
DE		1.0 to 6	280	364	280	364
EA	70	1.6 to 10	430	450	430	450
EB		2.5 to 16	570	741	570	751
EC	112	4.0 to 25	1200	1560	1200	1560
ED		10 to 40	2700	3500	2700	3500
EF		16 to 75	3200	4160	3200	4160
FA	155	10 to 100	4300	5600	4300	5600

Table 5B

VM4			SWITCHING DIFFERENTIAL mbar			
RANGE CODE	P max Bar	RANGE bar	02	03	04	05
U7	1000	7 to 160	15,000	12,200	15,000	12,200
V7	1000	25 to 250	25,000	20,800	25,000	20,800
W7	1000	40 to 400	36,000	28,600	36,000	28,600
Y4	1000	100 to 700	63,000	48,600	63,000	48,600

### PSI Units

Table 5C

VM2			SWITCHING DIFFERENTIAL psi			
RANGE CODE	P max PSI	RANGE psi	02	03	04	05
DK	400	4 to 25	2.9	3.8	2.9	3.8
DP		6 to 40	4.6	6	4.6	6
DZ		16 to 100	4.1	5.3	4.1	5.3
EH	1000	1.6 to 10	6.2	6.5	6.2	6.5
EM		2.5 to 16	8.3	10.8	8.3	10.8
ER	1600	60 to 400	17	23	17	23
EW		160 to 600	39	51	39	51
EE		250 to 1000	46	60	46	60
F6	2250	160 to 1500	62	81	62	81

Table 5D

VM4			SWITCHING DIFFERENTIAL psi			
RANGE CODE	P max PSI	RANGE psi	02	03	04	05
UK	15,000	100 to 2300	217	177	217	177
VC	15,000	350 to 3500	362	302	362	302
W9	15,000	800 to 6000	522	415	522	415
YF	15,000	1600 to 10,000	913	705	913	705

## Switching Options

TABLE 6

UL/CSA RATING	IEC947-5-1 / EN 60947-5-1 RATING					VA rating		Contact	Code
	Designation & Utilisation Category	Rated operational current $I_o$ (A) at rated operational voltage $U_o$	$U_i$	$U_{imp}$	Make	Break			
5 Amps @ 110/250V AC and 2 Amps @ 30V DC General Purpose Precision	AC14 D300 DC13 R300	0.6/0.3A @ 120/240V AC 0.22/0.1A @ 125/250V DC	250V	0.8kV	432 28	72 28	SPDT DPDT	02 03	
1 Amp @ 125V AC and 0.1 Amp @ 30V DC Gold Alloy contacts – See Note	AC14 E150	0.3A @ 120VAC	125V	500V	216	36	SPDT DPDT	04 05	

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.  
For other switch options please consult Delta Controls Limited

## Process Connection

TABLE 7

Adaptors are available for applications where their use is permitted. Apply for details.

	Code
Rc 1/4 (1/4" BSP TAPER INTERNAL)	A
1/4 – 18 NPT FEMALE	F

## Options and Treatments

TABLE 8

Combinations available, apply for details.

	Code
<b>Tropicalisation</b> High humidity atmospheres	01
<b>Tag</b> Stainless steel <b> tied </b> to enclosure	30

## Unit Weights

1.5kg/3.3lbs Approx

## Applicable Directives

Low voltage Directive (LVD) 73/23/EC amended by 93/68/EEC. Switch products with enclosure code 'R' are also covered by the Explosive Atmospheres Directive ATEX-94/9/EC.

The following directives do not apply to switch products manufactured by Delta Controls:

- Electromagnetic Compatibility EMC – 89/336/EEC.
- Machinery Safety Directive MSD – 89/392/EEC.

In the interests of development and improvement, Delta Controls reserves the right to alter the specification of its products without prior notice. No legal liability will be accepted by Delta Controls for any errors, omissions or amendments to this publication.

**Pressure Equipment Directive 97/23/EC:** This product has a process connection size  $\leq$ DN25 and is therefore categorised as sound engineering practice under Cat 3.3 and therefore will not be CE marked under this directive or be accompanied by a declaration of conformity. It may however be CE marked where other directives have been applied e.g ATEX, LVD.