

Technical Datasheet



GR Series Pressure Switch

Models: GR2 & GR4

Key Features

- Compact and rugged design.
- Hermetically sealed snap switch SPDT & DPDT
- Aluminum alloy or Stainless Steel body
- Field adjustable set point
- Weatherproof, flameproof, Explosion proof and intrinsically safe execution
- Ranges available between 0.25-700 bar (4-10,000 psi).
- High maximum working pressure models, up to 1000 bar / 15,000 psi.
- Optional weatherproof, Flameproof and Intrinsically Safe pre wired terminal enclosures

Series Overview

Launched in the mid-1990s, the GR Compact Series provides users with a robust and hermetically sealed switch for use in safe and hazardous areas.

- The GR Series switches are all housed in a compact and rugged enclosure making them particularly suitable for panel mounting in harsh environments.
- All models in the Compact Series come with hermetically sealed switch contacts and flying leads as standard

Other products in the series include:

- Differential Pressure Switches: Model GR3-GR6
- Temperature Switches: Model GR 7



Product applications

The GR Series is suitable for a wide range of applications in:

- Oil & Gas
- Chemical
- Petrochemical
- OEM

The choice of models available ensures that the GR Series is suitable for use in:

- Corrosive atmospheres
- Resistant to chemical attack

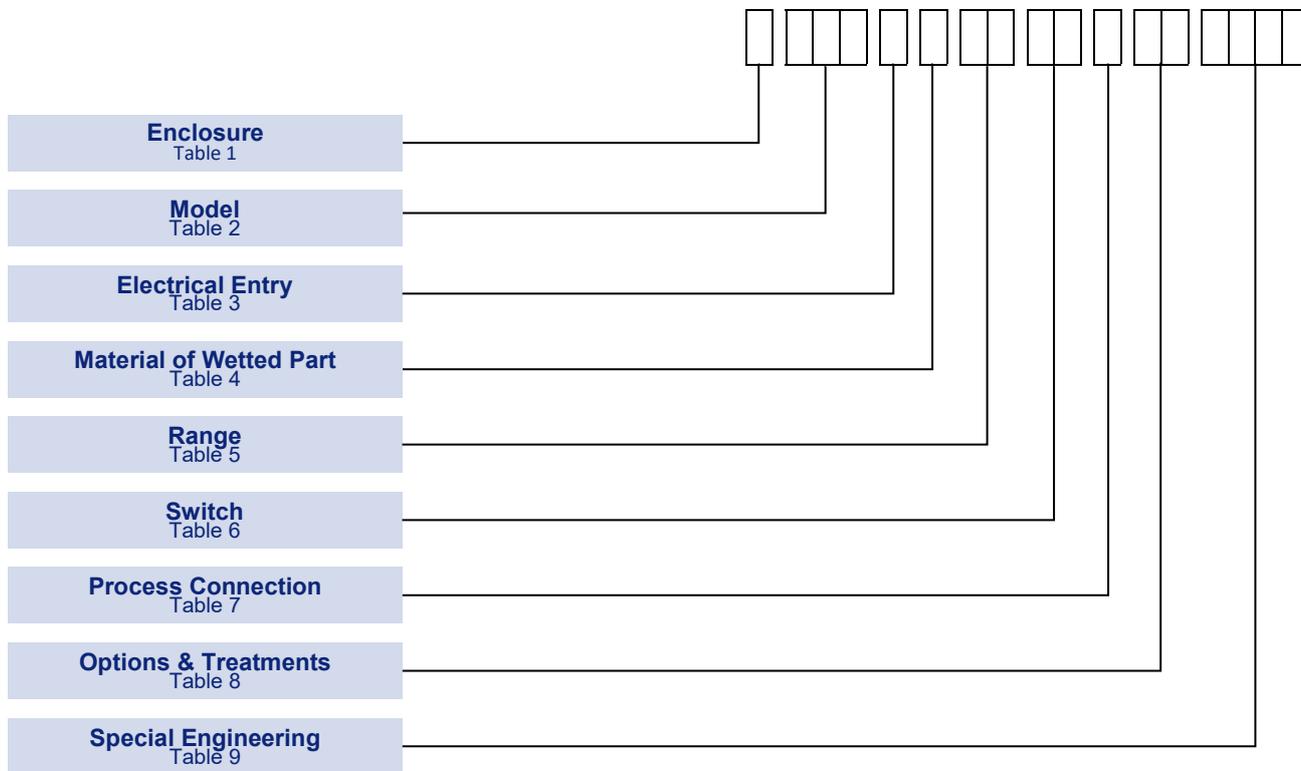
How can we help you?

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
Storage Temperature:	Flying leads. -40 to +85°C (-40 to +185°F) Pre wired junction box: see also the Operating Manual of the junction box
Ambient Temperature:	Flying leads. -40 to +85°C (-40 to +185°F) Pre wired junction box. see also the Operating Manual of the junction box
Maximum Process Temperature:	at the process connection, the component parts withstand up to +85°C (+185°F). For higher media temperatures, refer to Operating Instruction for installation practice or contact your local sales office.
Enclosure classification:	Weatherproof / Flameproof / Intrinsically Safe / Explosion Proof
Ingress protection:	Flying leads. IP 66 / NEMA 4X
Pollution degree:	Flying leads. 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 or 1 x DPDT (2 SPDT Synchronized with 2% of span) snap action hermetically sealed microswitch
Electrical rating:	See Table 6
Electrical connection:	Flying leads: threaded with single core wire 18 AWG High Duty PVC insulated. Rated insulation voltage CSA 600Va.c. Pre-wired junction box. Refer to Table 3
Grounding connection:	Flying leads. One internal through a single core 18 AWG and one external suitable for wire section up to 4 mm ² / 12 AWG
Electrical Safety Class:	Flying leads. safety electrical class 1 according IEC 61298-2:2008
Process Connection:	Rc ¼ (BSP), ¼ -18 NPT Internal, ½ -14 NPT Internal, ½-14 NPT External
Weight:	Enclosure Code "H", "W" & "5" 0.6kg/1.32lb, "R", "A" & "4" 0.9kg/2.67lb. Pre wired junction box codes in Table 3 "C", "D", "V" & "W" add 0.3kg/0.66lb, "K" add 0.5kg/1.1lb.

Enclosure

FINISH

Enclosures W, H, 5 and T, aluminium; Epoxy paint is optional see Code 50 in Table 8.

Enclosures A, R, 4 and U are natural finish stainless steel.

⁽¹⁾ Approved by CSA to CANADIAN & NORTH AMERICAN standards

⁽²⁾ Safety Parameters

Ui: 30 V; Ii: 300 mA; Pi: 0.6 W; Ci: 0; Li: 0.

⁽³⁾ Double marking ATEX and UKEx on the same product nameplate; EAC Ex on request

TABLE 1

ENCLOSURE TYPES (BODY):	Code
WEATHERPROOF ENCLOSURE	
General Purpose Enclosure in clean anodized aluminium with ingress protection IP66, NEMA type 4	W
Aggressive Atmospheres Enclosure in austenitic stainless steel, with ingress protection IP66, NEMA type 4X	A
FLAMEPROOF ENCLOSURE ^{(1) (3)} Approved for use in a Zone 1 hazardous locations Ex db IIC T6/T4 Gb, IP66 The temperature class is related to the ambient temperature range see Approval section for more information	
General Purpose Enclosure in clean anodized aluminium with ingress protection IP66, NEMA type 4	H
Aggressive Atmospheres Enclosure in austenitic stainless steel with ingress protection IP66, NEMA type 4X	R
INTRINSIC SAFETY ENCLOSURE ^{(1)(2) (3)} Approved for use in a Zone 0 & Zone 20 hazardous locations Ex ia IIC T6/T4 Ga, Ex ia IIIC T85/T135°C Db IP66 The temperature class is related to the ambient temperature range see Approval section for more information	
General Purpose Enclosure in clean anodized aluminium with ingress protection IP66, NEMA type 4	5
Aggressive Atmospheres Enclosure in austenitic stainless steel, with ingress protection IP66, NEMA type 4X	4
EXPLOSION PROOF, HERMETICALLY-SEALED ELECTRICAL ASSEMBLY ⁽¹⁾ Approved for use in Division 1 and 2 hazardous locations Class I Groups A, B, C, D Class II Groups E, F, G	
General Purpose Enclosure in clean anodized aluminium with ingress protection IP66, NEMA type 4	T
Aggressive Atmospheres Enclosure in austenitic stainless steel, with ingress protection IP66, NEMA type 4X	U

Models

TABLE 2

	Code
Fixed Switching Differential For applications up to 100 bar / 1500 psi Over-range up to 155 bar / 2250 psi	GR2
Fixed Switching Differential For applications up to 700 bar / 10,000 psi Over-range up to 1000 bar / 15,000 psi	GR4

GR Series
Models: GR2 & GR4

Electrical Entry

See **TECHNICAL DATA** and **DIMENSIONS** fig 1 to 4.

NOTE 1:

Other lengths available - please contact sales for engineering codes

NOTE 2:

Weatherproof junction box Code C can only be combined with Table 1 Enclosure Codes W and A

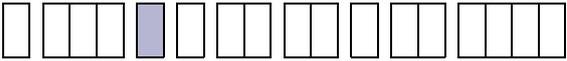
NOTE 3:

Intrinsically Safe terminal enclosure Code V and W can only be combined with Table 1 Enclosure Codes 4 and 5

NOTE 4:

For these version, will be supplied the instrument with flying leads configuration with standard certification, assembled with junction box with original manufacturer's certification.

Delta's Declaration of conformity will cover the whole assembly

TABLE 3 

	Code
Male conduit thread	
Factory Sealed Flying Lead with 1/2-14 NPT - M external conduit thread. See fig 1. 0.45m/18in. Long flying lead (Note 1).	A
Factory Sealed Flying Lead with M20x1,5 - M external conduit thread. See fig 1. 0.45m/18in. Long flying lead (Note 1).	U
Pre-wired Junction Box	
Weatherproof IP66/NEMA 4 pre-wired Junction Box. See fig 2. Bartec type 07-5177 glass filled polyester. Conduit entry tapped M20 x 1.5 (Note 2) Ambient temperature -20°C to +40°C.	C
Increased Safety IP66/NEMA 4 pre-wired Junction Box. See fig 2. Bartec type 07-5106 glass filled polyester. Conduit entry tapped M20 x 1.5 (Note 2) Ex eb IIC Gb (T _{amb} -20°C to +40 °C)	D ⁽⁴⁾
Flameproof pre-wired Junction Box. See fig 3. Cortem Group type SX16 die cast aluminium alloy IP66/NEMA 4. Conduit entry tapped 1/2-14 NPT - F Ex db IIC T6/T5 (T _{amb} -40 to +40°C) or (T _{amb} -40°C to +65 °C) Ex tb IIIC T85/T100 (T _{amb} -40 to +40°C) or (T _{amb} -40°C to +65 °C)	K ⁽⁴⁾
Intrinsically Safe pre-wired Junction Box with screw terminals. See fig 2. Bartec type 07-5185 or 07-5184 Glass filled polyester IP65/NEMA 4. Conduit entry tapped M20 x 1.5 Ex ia IIC T6 (T _{amb} -20 to +40°C)	V
Intrinsically Safe pre-wired Junction Box with DIN rail mounted terminals. See fig 2. Bartec type 07-5185 or 07-5184 Glass filled polyester IP65/NEMA 4. Conduit entry tapped M20 x 1.5 Ex ia IIC T6 (T _{amb} -20 to +40°C)	W

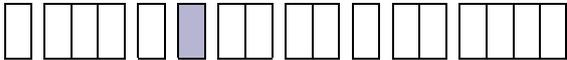
Material of Wetted Parts

GR Series
Models: GR2 & GR4

WELDED CONSTRUCTION

Codes S and T

For reduced risk against leakage under extreme or unusual conditions, the diaphragm may be welded directly to the process connection, eliminating the O-ring.

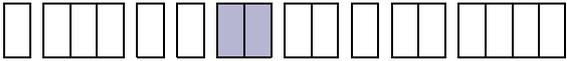
TABLE 4 

	Code
316 stainless steel diaphragm, process connection and Viton O-ring seal.	A
316 stainless steel diaphragm, process connection and Nitrile (Buna-N) O-ring seal	G
Nickel alloy (Monel) diaphragm, 316 stainless steel process connection and Viton O-ring seal for applications as laid down in NACE MR 01-75	K
Nickel alloy (Monel) diaphragm, 316 stainless steel process connection and Nitrile (Buna-N) O-ring seal	P
316 stainless steel diaphragm and process connection. All welded construction.	S
Nickel alloy (Monel) diaphragm and process connection. All welded construction (suitable for NACE MR 01-75)	T

Setting Ranges

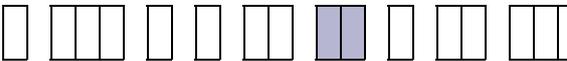
Due to manufacturing tolerances the figures quoted in these tables are for guidance only.

Should the switching differential be critical for specific applications, our engineers should be consulted prior to ordering

TABLE 5 

MODEL	P _{max}		RANGE			
	bar	psi	bar	Code	psi	Code
GR2	27	400	0.25 to 1.6	DB	4 to 25	DK
			0.4 to 2.5	DC	6 to 40	DP
			1.0 to 6	DE	16 to 100	DZ
GR2	70	1000	1.6 to 10	EA	25 to 160	EH
			2.5 to 16	EB	40 to 250	EM
GR2	110	1600	4.0 to 25	EC	60 to 400	ER
			10 to 40	ED	160 to 600	EW
			16 to 75	EF	250 to 1000	EE
GR2	155	2250	10 to 100	FA	160 to 1500	F6
GR4	600	8700	0.25 to 1.6	DB	4 to 25	DK
			0.4 to 2.5	DC	6 to 40	DP
			1.0 to 6	DE	16 to 100	DZ
			1.6 to 10	EA	25 to 160	EH
			2.5 to 16	EB	40 to 250	EM
			4.0 to 25	EC	60 to 400	ER
			10 to 40	ED	160 to 600	EW
			16 to 75	EF	250 to 1000	EE
			10 to 100	FA	160 to 1500	F6
GR4	1000	15000	7 to 160	U7	100 to 2300	UK
			25 to 250	V7	350 to 3500	VC
			50 to 400	W7	800 to 6000	W9
			100 to 700	Y4	1600 to 10000	YF

Switch Options

TABLE 6 

Model GR2/4								
CSA RATING	IEC947-5-1 / EN 60947-5-1 RATING						Contact	Code
	Designation & Utilization Category	Rated operational current I_{ie} (A) At rated operational voltage U_e	U_i ⁽¹⁾	U_{imp} ⁽¹⁾	VA Rating			
					Make	Break		
11 A, 110/250V AC and 5/0.5 A, 30/125V DC Silver contacts	AC14 D300	0.6/0.3A, 120/240 V AC	250V	800V	432 28	72 28	SPDT DPDT DPDT	HS
	DC13 R300	0.22/0.1A, 125/250V DC						HD † HR ‡
5 A, 250V AC and 2 A, 30V DC Silver contacts with gold flash	AC14 D300	0.6/0.3A, 120/240 V AC	250V	500V	432 28	72 28	SPDT DPDT DPDT	HP
	DC13 R300	0.22/0.1A, 125/250V DC						HQ † HT ‡
1 A, 125V AC and 1 A, 30V DC Gold Alloy contacts—see note	AC14 E150	0.3A, 120VAC	125V	500V	216	36	SPDT DPDT DPDT	HV HW † HY ‡

† 2 Single pole, double throw, simultaneous falling under pressure
‡ 2 Single pole, double throw, simultaneous falling under pressure

The switch contacts are hermetically sealed inside a stainless steel enclosure for protection against aggressive and corrosive atmospheres.

 CSA listing applies to the explosionproof hermetically sealed switch which is suitable for use in hazardous areas as defined by NEC Article 500, Class I Groups A, B, C, D Class II Groups E, F, G Division 1 and 2.

NOTE: For low energy circuits e.g. 30V and up to 100mA, we recommend using gold alloy contact switches.
NOTE: For Enclosure codes 4 and 5, HS, HD and HR switching codes are unsuitable. Use gold contact switches.
⁽¹⁾ U_i = rated insulation voltage U_{imp} = rated impulse to withstand voltage across contacts.

GR Series
Models: GR2 & GR4

Process Connection

Other thread specifications and sizes are available without using adaptors.

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

TABLE 7

	Code
Rc 1/4 (1/4 BSP tr INT) to (ISO 7/1)	A
1/4—18 NPT INTERNAL	F
1/2—14 NPT INTERNAL (*)	H
1/2—14 NPT EXTERNAL	J
Combined 1/4—18 NPT INTERNAL + 1/2—14 NPT EXTERNAL (*)	Z

(*) Not recommended for use over 600 bar/8700 psi. Refer to Table 5.

Options & Treatments

Combinations available, apply for details.

TABLE 8

	Code
Tropicalisation High humidity atmospheres	01
Marine and Offshore Saline atmosphere or salt spray	02
Ammonia Process (wetted) parts and construction suitable for atmospheric ammonia	03
Oxygen Service Process (wetted) parts are cleaned for oxygen and are oil free	04
Pipe mounting Bracket Permits local 2" pipework to be utilized for mounting the instrument. Details on application.	10
Tag Stainless steel tied to enclosure.	30
No options or Treatments Use this code when Special Engineering is required without options and treatments	00
Epoxy Paint for aluminium enclosures W, H in Table 1	50

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

Performance Data

bar Units

Due to manufacturing tolerances the figures quoted in these tables are for guidance only.

Should the switching differential be critical for specific applications, our engineers should be consulted prior to ordering

TABLE 10

MODEL GR2 **TABLE 10A**

Range		P _{max} bar	SWITCHING OPTIONS SWITCHING DIFFERENTIAL IN mbar					
Code	bar		HS	HD/HR	HP	HQ/HT	HV	HW/HY
DB	0.25 to 1.6	27	200	260	80	104	200	260
DC	0.4 to 2.5		320	416	128	166	320	416
DE	1.0 to 6		280	364	206	268	280	364
EA	1.6 to 10	70	430	450	300	390	430	450
EB	2.5 to 16		570	741	228	297	570	741
EC	4.0 to 25	112	1200	1560	480	624	1200	1560
ED	10 to 40		2700	3500	1200	1560	2700	3500
EF	16 to 75		3200	4160	1280	1664	3200	4160
FA	10 to 100	155	4300	5600	1720	2236	4300	5600

MODEL GR4 **TABLE 10B**

Range		P _{max} bar	SWITCHING OPTIONS SWITCHING DIFFERENTIAL IN mbar					
Code	bar		HS	HD/HR	HP	HQ/HT	HV	HW/HY
DB	0.25 to 1.6	600	260	340	200	260	260	340
DC	0.4 to 2.5		330	429	250	325	330	429
DE	1.0 to 6		880	1144	680	885	880	1144
EA	1.6 to 10		600	780	463	603	600	1144
EB	2.5 to 16		1300	1690	1000	1300	1300	1690
EC	4.0 to 25		1900	2470	1500	1950	1900	2470
ED	10 to 40		4200	5460	2200	2860	4200	5460
EF	16 to 75		4300	5590	3300	4300	4300	5590
U7	7 to 160	1000	9400	12220	7300	9500	9400	12220
V7	25 to 250		16000	20800	9000	11700	16000	20800
W7	50 to 400		22000	28600	17000	22100	22000	28600
Y4	100 to 700		37400	48620	30000	39000	37400	48620

MODEL GR2 **TABLE 10C**

Range		P _{max} psi	SWITCHING OPTIONS SWITCHING DIFFERENTIAL IN psi					
Code	psi		HS	HD/HR	HP	HQ/HT	HV	HW/HY
DK	4 to 25	400	2.9	3.8	1.2	1.5	2.9	3.8
DP	6 to 40		4.6	6	1.9	2.4	4.6	6
DZ	16 to 100		4.1	5.3	3	3.9	4.1	5.3
EH	25 to 160	1000	6.2	6.5	4.4	5.7	6.2	6.5
EM	40 to 250		8.3	10.8	3.3	4.3	8.3	10.8
ER	60 to 400	1600	17	23	7	9	17	23
EW	160 to 600		39	51	17	23	39	51
EE	250 to 1000		46	60	19	24	46	60
F6	160 to 1500	2250	62	81	25	32	62	81

psi Units

Due to manufacturing tolerances the figures quoted in these tables are for guidance only.

Should the switching differential be critical for specific applications, our engineers should be consulted prior to ordering

GR Series
Models: GR2 & GR4

Performance Data

TABLE 10

psi Units

Due to manufacturing tolerances the figures quoted in these tables are for guidance only.

Should the switching differential be critical for specific applications, our engineers should be consulted prior to ordering

MODEL GR4

TABLE 10D

Range		P _{max} psi	SWITCHING OPTIONS SWITCHING DIFFERENTIAL IN psi					
Code	psi		HS	HD/HR	HP	HQ/HT	HV	HW/HY
DK	4 to 25	8700	3.8	4.9	2.9	3.8	3.8	4.9
DP	6 to 40		4.8	6.2	3.6	4.7	4.8	6.2
DZ	16 to 100		13	17	10	13	13	17
EH	25 to 160		9	11	7	9	9	17
EM	40 to 250		19	25	15	19	19	25
ER	60 to 400		28	36	22	28	28	36
EW	160 to 600		61	79	32	41	61	79
EE	250 to 1000		62	81	48	62	62	81
UK	100 to 2300	15000	136	177	106	138	136	177
VC	350 to 3500		232	302	131	170	232	302
W9	800 to 6000		319	415	247	321	319	415
YF	1600 to		543	705	435	566	543	705

Electrical Connection

Terminal Enclosure

Suitable for conductor sizes up to 2,5mm²/14AWG non-pinching, clamped.

Optional Extras

Chemical Seals

Chemical seals of our own or proprietary manufacture can be fitted when required.

Electrical Isolation

These products are not suitable for electrical isolation. Always isolate circuit separately to carry out any electrical work.

Approvals



EUROPEAN DIRECTIVE

Low Voltage Directive (LVD) 2014/35/EU

Compliant to LVD

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

Compliant to RoHS

Pressure Equipment Directive (PED) 2014/68/EU

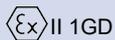
Compliant to PED as pressure accessory

ATEX Directive 2014/34/EU

Factory Sealed Flying Lead version (Table 3 Code A or U)

INTRINSICALLY SAFE

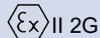
Certificate No. Baseefa06ATEX0091X



- Ex ia IIC T6 / T4 Ga (-40°C ≤ Ta ≤ +60°C) / (-40°C ≤ Ta ≤ +85°C)
- Ex ia IIIC T₂₀₀85°C / T₂₀₀135°C Da (-40°C ≤ Ta ≤ +60°C) / (-40°C ≤ Ta ≤ +85°C)

FLAMEPROOF

Certificate No. Baseefa02ATEX0214X



- Ex db IIC T6 / T4 Gb (-40°C ≤ Ta ≤ +60°C) / (-40°C ≤ Ta ≤ +85°C)

In case of pre-wired junction box see also the certificate of the supplier of the junction box



UK REGULATIONS

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

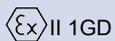
Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016

Conform to UK SI 2016 No 1107 regulation

Factory Sealed Flying Lead version (Table 3 Code A or U)

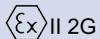
INTRINSICALLY SAFE

Certificate No. SGS24UKEX0056X



- Ex ia IIC T6 / T4 Ga (-40°C ≤ Ta ≤ +60°C) / (-40°C ≤ Ta ≤ +85°C)
- Ex ia IIIC T₂₀₀85°C / T₂₀₀135°C Da (-40°C ≤ Ta ≤ +60°C) / (-40°C ≤ Ta ≤ +85°C)

FLAMEPROOF



Certificate No. BAS21UKEX0636X

- Ex db IIC T6 / T4 Gb (-40°C ≤ Ta ≤ +60°C) / (-40°C ≤ Ta ≤ +85°C)

In case of a pre-wired junction box please also see also the suppliers' certificate for the junction box

Approvals



CANADA AND UNITED STATES

The instrument includes an explosion proof, hermetically-sealed electrical assembly snap switch for Hazardous Location CSA Class 6248-01 & 6248-81

File No: 176418

- Class I, Division 1 and 2, Groups A, B, C & D; Group E,F & G



EURASIAN CONFORMITY MARK

Hazardous Areas

Factory Sealed Flying Lead version (Table 3 Code A or U)

INTRINSICALLY SAFE

Certificate No. EAЭC RU C-GB.HA65.B.01199/21



- 0Ex ia IIC T6 / T4 Ga X (-40°C≤Ta≤+60°C) / (-40°C≤Ta≤+85°C)
- Ex ia IIIC T85°C / T135°C Da X (-40°C≤Ta≤+60°C) / (-40°C≤Ta≤+85°C)



FLAMEPROOF

Certificate No. EAЭC RU C-GB.HA65.B.01199/21

- 1Ex d IIC T6 / T4 Gb X (-40°C≤Ta≤+60°C) / (-40°C≤Ta≤+85°C)

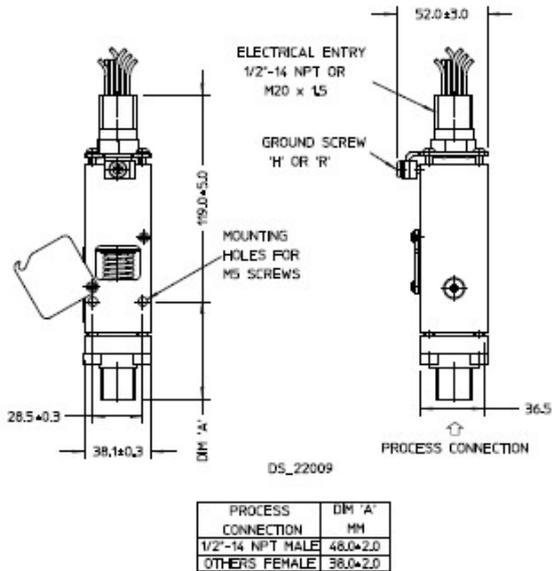
In case of pre-wired junction box please see the certificate from the supplier of the junction box

If EAC certification is required, this must be made known to our sales team at the time of ordering for the correct marking of

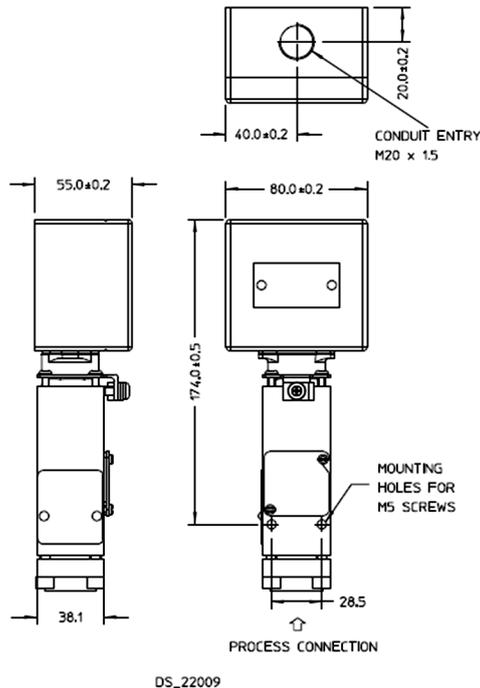
Dimensions

All dimensions in mm (Inches)

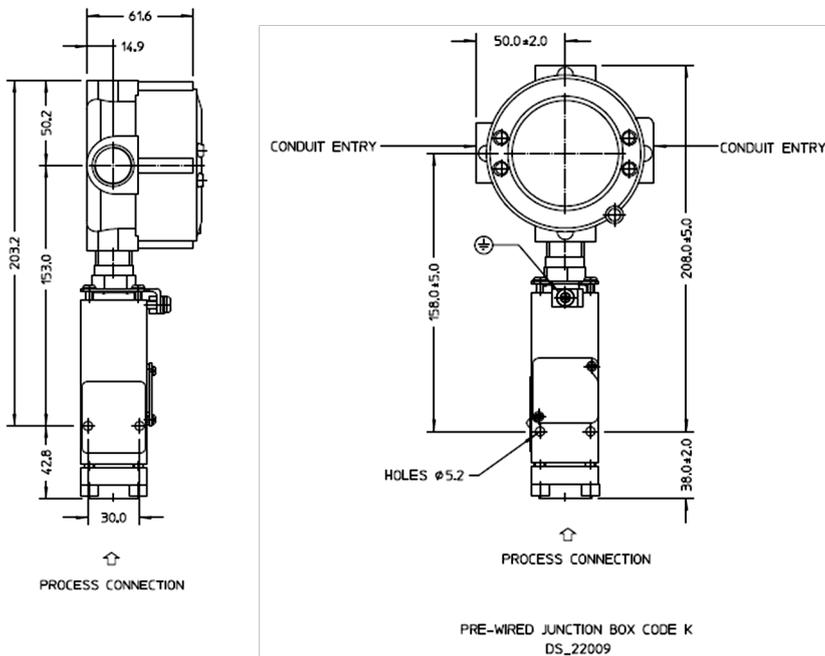
Enclosures codes W,A,H,R,S,4 as in table 1 with Flying leads code A, U



Enclosures codes W,A,H,R as in table 1 with Terminal Box code V, W, C, D



Enclosures codes H,R as in table 1 with Terminal Box code K



In the interest of development and improvement Delta Mobrey Ltd, reserves the right to amend, without notice, details contained in this publication. No legal liability will be accepted by Delta Mobrey Ltd for any errors, omissions or amendments.

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GR Series
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