

# Technical Datasheet



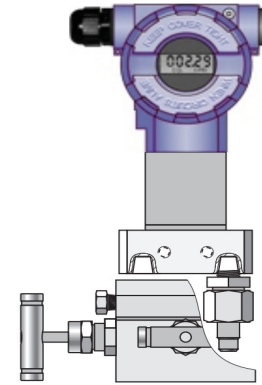
## D Series

### Low ranges, SMART Differential Pressure Transmitter



#### Key Features

- ATEX - Intrinsically Safe  
IECEX - Intrinsically Safe
- SIL 2 certificate
- Compliant to NAMUR NE-43
- High accuracy  $\pm 0.01\%$  (better accuracy upon request)
- Fully HART ® compatible
- Static pressure limit up to 1 bar
- 4-20mA, with digital communications
- Suitable for clean gasses
- Programmable range, zero shift, characteristic and damping ratio with local panel keys
- Linearisation of output signal on 20 point curve for specific application is available
- Write protection option through DKAP-03 communicator, 'D-Soft' program or software using library EDDL



#### Product applications

The D Series SMART Differential Pressure Transmitter is suitable for a wide range of applications for measuring:

- Differential Pressure
- Flow

The choice of models available ensures that the Delta Transmitter is suitable for use in:

- Air & Flue gasses
- Any clean & dry gas

#### Series Overview

- The D-Series pressure, differential pressure and temperature transmitters offer customers reliable and accurate solutions to their individual process requirements.
- Available with a wide range of process connections and easily configurable via the D-Soft software, the D-Series can be used for a variety of applications when pressure, differential pressure, temperature, level or flow measurements are needed.

Other products in the series include:

- SMART Differential Pressure Transmitter
- SMART Pressure Transmitter
- SMART Temperature Transmitter



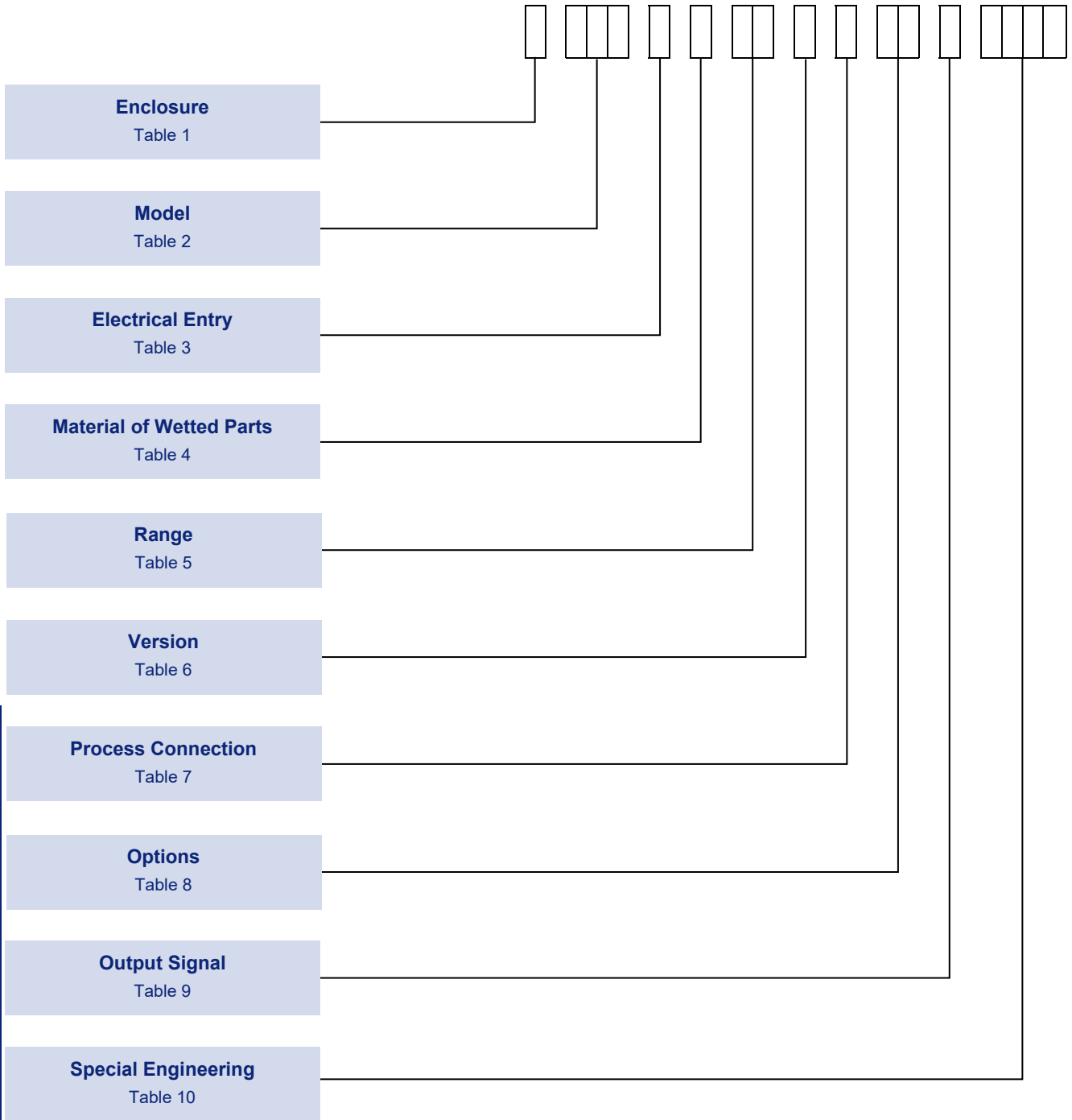
#### How can we help you?

Delta Mobrey's offers fast, efficient and knowledgeable support when and where you need it. Please visit our web site at [www.delta-mobrey.com](http://www.delta-mobrey.com) to find your local support centre or call us on:

**+44 (0) 1252 729140**

# How to order

Transmitters 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 transmitter that best suits your needs, please contact your local sales office.




**D-Series**  
Low ranges, SMART Differential Pressure Transmitter

**NOTE:** Only the most common options are shown in this datasheet. Should you require a feature that is not shown, please contact your local sales office for further details.

**NOTE:** The non-standard option code is shown by "X" in the part number. Should you require any clarification on this codes please contact your local sales office.


## Enclosure

Refer to 'Approvals' section for details about the certification on Flameproof & Intrinsically Safe models .

TABLE 1 

ENCLOSURES TYPES	Code
<b>WEATHERPROOF ENCLOSURE</b>	
<b>General Purpose</b> Aluminum housing, IP66, with display.	<b>W</b>
<b>For Aggressive Atmosphere</b> 316 Stainless steel housing, IP66, with display.	<b>A</b>
<b>FLAMEPROOF ENCLOSURES</b>	
Aluminum housing, IP66, with display. (Ex d) // 1/2GD -	<b>H</b>
316 Stainless steel housing, IP66, with display. (Ex d) // 1/2GD - I M2	<b>R</b>
Aluminum housing, IP66, with display. (Ex d) // G	<b>2</b>
316 Stainless steel housing, IP66, with display. (Ex d) // G - I M2	<b>3</b>
<b>INTRINSICALLY SAFE ENCLOSURES</b>	
Aluminum housing, IP66, with display. (Ex ia) // 1/2G	<b>5</b>
316 Stainless steel housing, IP66 with display. (Ex ia) // 1/2G - I M1	<b>4</b>
Aluminum housing, IP66, with display. (Ex ia/Da ) // 1/2GD	<b>7</b>
316 Stainless steel housing, IP66 with display. (Ex ia/Da) // 1/2GD - I M1	<b>6</b>
<b>INTRINSICALLY SAFE &amp; FLAMEPROOF ENCLOSURES</b>	
Aluminum housing, IP66, with display. (Ex ia / Ex d according to the installation) // 1/2GD	<b>8</b>
316 Stainless steel housing, IP66 with display. (Ex ia / Ex d according to the installation) // 1/2GD - I M2/M1	<b>9</b>

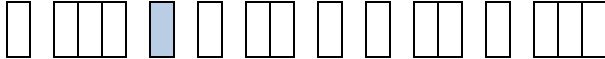
## Model

TABLE 2 

	Code
<b>D34 SMART Differential Pressure Transmitter</b> For applications up to 100 mbar. Static pressure up to 1 bar. Refer Table 5.	<b>D34</b>

## Electrical Entry


**NOTE: Code 1**  
Available on Enclosure code W, A, 5 & 4 as standard.

TABLE 3 

	Code
M20x1.5 thread	<b>0</b>
Packing gland M20x1.5	<b>1</b>
Electrical connection with thread 1/2NPT Female	<b>2</b>

## Material of Wetted Parts

**NOTE: Codes A, C & D**  
Only applicable with process connection code P & Q.

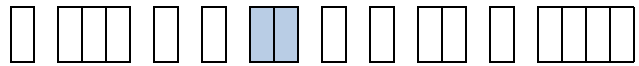
TABLE 4 

	Code
Stainless Steel 304 process connection	<b>C</b>

**D-Series**  
Low ranges, SMART Differential Pressure Transmitter

## Range

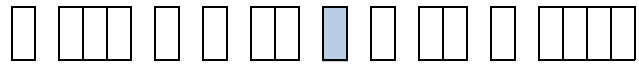
TABLE 5



Code	Nominal measuring range (FSO)		Minimum set range		Rangeability	Overpressure limit/ Static pressure limit
A0	-100...100 mbar	(-10...10 kPa)	20 mbar	(2 kPa)	10:1	1 bar / 1 bar
A1	-25...25 mbar	(-2.5...2.5 kPa)	5 mbar	(500 Pa)	10:1	1 bar / 1 bar
B1	-7...7 mbar	(-700...700 Pa)	1 mbar	(100 Pa)	14:1	350 mbar / 350 mbar
B2	0...25 mbar	(0...2500Pa)	1 mbar	(0.1 kPa)	25:1	1 bar / 350 mbar
B3	-2.5...2.5 mbar	(-250...250Pa)	0.2 mbar	(20 kPa)	25:1	350 mbar / 350 mbar

## Version

TABLE 6

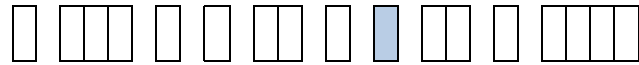


Combination of more than one option is available.

	Code
Applies when no option is required	0
Surge arrester for Ex ia version	1
Protection class IP67	6
SIL2 - Functional Safety Certificate	Z

## Process Connection

TABLE 7



	Code
Process connection with impulse line for 6mm OD elastic pipe	O
1/4" NPT Female on the cover flanges. Cover flanges material SS304 Allows mounting with valve manifold.	C

## Options

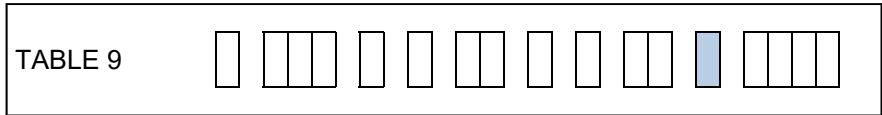
TABLE 8



Combination of more than one option is available.

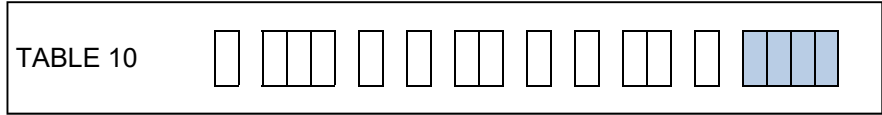
	Code
Applies when no option is required	00
Mounting bracket for 2" pipe (type AL), stainless steel	10
Stainless Steel rating label riveted to the housing	20
Stainless Steel Tag plate mounted on wire	30
Mounting bracket for 2" pipe (type AL) zinc steel	40
Stainless Steel rating label riveted to the housing, Stainless Steel Tag plate mounted on wire	A0
Connector to weld impulse pipes Ø12 and Ø14 mm, material 15HM	C0

## Output Signal



	Code
4 to 20mA	0

## Special Engineering



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

	Code
Please consult Delta sales engineering for special requirements	TBA

## Technical Data

### Metrological parameters

**Accuracy:**

- Range B2  $\leq \pm 0.075\%$  of the calibrated range
- Range B3  $\leq \pm 0.25\%$  of the calibrated range
- Range B1  $\leq \pm 0.1\%$  of the calibrated range
- Range A1  $\leq \pm 0.1\%$  of the calibrated range
- Range A0  $\leq \pm 0.075\%$  of the calibrated range

**Thermal error**  
for all ranges  $\leq \pm 0.1\%$  (FSO) / 10°C  
max.  $\pm 0.4\%$  (FSO) in the whole compensation range

**Thermal compensation range** -10...70°C

**Zero shift error for static pressure**  
Zeroing the transmitter in conditions of static pressure can eliminate this error.

**Ambient temperature:** -25...85°C  
**Operating temperature:** -25...85°C

### Electrical parameters

**Power supply:** 10...55 VDC / Exia: 10...5...30 VDC  
SIL2: 11.5...36 VDC / SIL2 Exia: 11.5...36 VDC

**Output signal** 4...20 mA + Hart, two wire transmission

**Load resistance (for standard version)**  $R [\Omega] \leq \frac{U_{sup} [V] - 10V}{0.0225A}$

**Resistance required for communication** min. 240  $\Omega$

**Additional electronic damping** 0...30 s

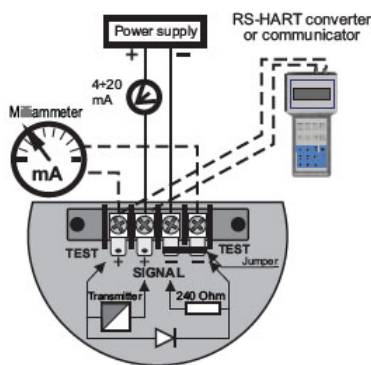
**Error due to supply voltage changes** 0.002% (FSO) / V

**Wetted parts:** Code C process connection: SS304  
Code (6mmOD elastic pipe): Brass  
Aluminium / 316SS

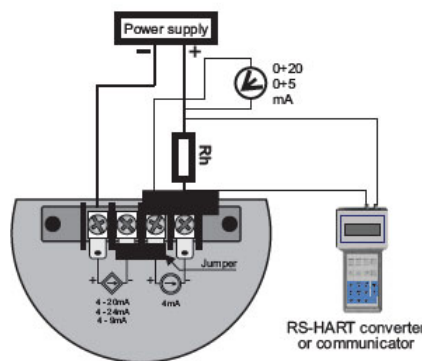
**Casing :** polycarbonate glass, hardened glass  
**Material of window:** polycarbonate glass, hardened glass (FSO) / V

### Electrical diagrams

Electrical diagrams for transmitters with HART protocol



Version with output signal: 4-20mA



Version with output signal: 0-5mA or 0-20mA

## Approvals

### GLOBAL CERTIFICATION

IECEX Certified - output signal code 6 (see table 9)

#### INTRINSICALLY SAFE:



Certificate No.: **IECEX FTZU 15.0027X**  
IEC 60079-0, IEC 60079-11,

For Zone 0/1 models

#### **Enclosure code 7 (refer Table 1)**

Ex ia IIC T4/T5 Ga/Gb  
Ex ia IIIC T105°C Da (version with PTFE shielded cable)

#### **Enclosure code 8 (refer Table 1)**

Ex ia I Ma  
Ex ia IIC T4/T5 Ga/Gb  
Ex ia IIB T4/T5 Ga/Gb (version with PTFE shielded cable)

Certificate No.: **KDB19ATEX006X**  
EN IEC 60079-0, EN 60079-11, EN 60079-26, EN 50303

For Zone 0/1,20 models

#### **Enclosure code 5 SIL version (refer Table 1)**

Ex ia IIC T4/T5 Ga/Gb

#### **Enclosure code 4 SIL version (refer Table 1)**

Ex ia I Ma  
Ex ia IIC T4/T5 Ga/Gb

#### **Enclosure code 7 (refer Table 1)**

Ex ia IIC T4/T5 Ga/Gb  
Ex ia IIIC T105°C Da

#### **Enclosure code 8 (refer Table 1)**

Ex ia I Ma  
Ex ia IIC T4/T5 Ga/Gb  
Ex ia IIIC T105°C Da

#### FLAMEPROOF:



Certificate No.: **IECEX KDB 19.006X**  
IEC 60079-0, IEC 60079-1, IEC 60079-11, IEC 60079-26, IEC 60079-31

For Zone 0/1, 20/21 models

#### **Enclosure code H (refer Table 1)**

Ex ia/db IIC T6/T5 Ga/Gb  
Ex ia/tb IIIC T105°C Da/Db

#### **Enclosure code R (refer Table 1)**

Ex db ia I Mb  
Ex ia/db IIC T6/T5 Ga/Gb  
Ex ia/tb IIIC T105°C Da/Db

For Zone 1, 21 models

#### **Enclosure code 2 (refer Table 1)**

Ex ia/db IIC T6/T5 Gb  
Ex ia/tb IIIC T105°C Db

#### **Enclosure code 3 (refer Table 1)**

Ex db ia I Mb  
Ex ia/db IIC T6/T5 Gb  
Ex ia/tb IIIC T105°C Db

#### INTRINSICALLY SAFE & FLAMEPROOF (\*):

(\* According to the selection on the label)



Certificate No.: **IECEX KDB 19.0006X**  
IEC 60079-0, IEC 60079-1, IEC 60079-11, IEC 60079-26, IEC 60079-31

For Zone 0/1, 20/21 or 0/1, 20 models

#### **Enclosure code 8 (refer Table 1)**

Ex ia/db IIC T6/T5 Ga/Gb  
Ex ia/tb IIIC T105°C Da/Db  
Or

#### **Enclosure code 9 (refer Table 1)**

M2 Ex db ia I Mb  
Ex ia/db IIC T6/T5 Ga/Gb  
Ex ia/tb IIIC T105°C Da/Db  
Or

Ex ia IIC T5/T4 Ga/Gb  
Ex ia IIIC T105°C Da

Ex ia I Ma  
Ex ia IIC T5/T4 Ga/Gb  
Ex ia IIIC T105°C Da

## Approvals

### EUROPEAN DIRECTIVE)

ATEX Directive 2014/34/EU - output signal code O (see table 9)

### INTRINSICALLY SAFE:



Certificate No.: **FTZU 19ATEX0111X**  
EN IEC 60079-0, EN 60079-11, EN 50303

For Zone 0/1 models



**Enclosure code 5 (refer Table 1)**  
II 1/2G Ex ia IIC T4/T5 Ga/Gb  
II 1D Ex ia IIIC T105°C Da (version with PTFE shielded cable)

**Enclosure code 4 (refer Table 1)**  
I M1 Ex ia I Ma  
II 1/2G Ex ia IIC T4/T5 Ga/Gb  
II 1D Ex ia IIIC T105°C Da (version with PTFE shielded cable)

Certificate No.: **KDB19ATEX0045X**  
EN IEC 60079-0, EN 60079-11, EN 60079-26, EN 50303

For Zone 0/1,20 models

**Enclosure code 5 SIL version (refer Table 1)**    **Enclosure code 4 SIL version (refer Table 1)**  
II 1/2G Ex ia IIC T4/T5 Ga/Gb    I M1 Ex ia I Ma  
II 1/2G Ex ia IIC T4/T5 Ga/Gb

**Enclosure code 7 (refer Table 1)**    **Enclosure code 8 (refer Table 1)**  
II 1/2G Ex ia IIC T4/T5 Ga/Gb    I M1 Ex ia I Ma  
II 1D Ex ia IIIC T105°C Da    II 1/2G Ex ia IIC T4/T5 Ga/Gb

### FLAMEPROOF:



Certificate No.: **KDB19ATEX0045X**  
EN IEC 60079-0, EN 60079-1, EN 60079-11, EN 60079-26, EN 60079-31, EN50303

For Zone 0/1, 20/21 models



**Enclosure code H (refer Table 1)**  
II 1/2G Ex ia/db IIC T6/T5 Ga/Gb  
II 1/2D Ex ia/tb IIIC T105°C Da/Db

**Enclosure code R (refer Table 1)**  
I M2 Ex db ia I Mb  
II 1/2G Ex ia/db IIC T6/T5 Ga/Gb  
II 1/2D Ex ia/tb IIIC T105°C Da/Db

For Zone 1, 21 models

**Enclosure code 2 (refer Table 1)**    **Enclosure code 3 (refer Table 1)**  
II 2G Ex ia/db IIC T6/T5 Gb    I M2 Ex db ia I Mb  
II 2D Ex ia/tb IIIC T105°C Db    II 2G Ex ia/db IIC T6/T5 Gb

### INTRINSICALLY SAFE & FLAMEPROOF (\*):

(\* According to the selection on the label



Certificate No.: **KDB19ATEX0045X**  
EN IEC 60079-0, EN 60079-1, EN 60079-11, EN 60079-26, EN 60079-31, EN50303  
For Zone 0/1, 20/21 or 0/1, 20 models



**Enclosure code 2 (refer Table 1)**  
II 1/2G Ex ia/db IIC T6/T5 Ga/Gb  
II 1/2D Ex ia/tb IIIC T105°C Da/Db  
Or  
II 1/2G Ex ia IIC T5/T4 Ga/Gb

**Enclosure code 3 (refer Table 1)**  
M2 Ex db ia I Mb  
II 1/2G Ex ia/db IIC T6/T5 Ga/Gb  
II 1/2D Ex ia/tb IIIC T105°C Da/Db  
or

II 1D Ex ia IIIC T105°C Da    I M1 Ex ia I Ma  
II 1/2G Ex ia IIC T5/T4 Ga/Gb  
II 1D Ex ia IIIC T105°C Da

### **EMC Directive 2014/30/EU**

Conformity assessment procedure: module A  
The following standards were applied: EN 61326-1:2013; EN61326-2-3:2013

### **2014/68/EU Pressure Equipment Directive**

For Nameplate Parameter **PS>200 bar**: The transmitters in PED version according to Module A of Directive 2014/68/EU have specified on the nameplate parameters PS>200bar, P(range).....T(amb.).....

For Nameplate Parameter **PS< 200bar**, P(range).....T(amb.).... are manufactured on the basis of Article 4, Clause 3 of Directive 2014/68/EU in accordance with the sound engineering practice

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

Compliant to RoHS. The following standard was applied: EN IEC 63000:201

## Approvals

### UK REGULATIONS

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

Output signal code 7 (see table 9)

#### INTRINSICALLY SAFE:



Certificate No.: **ExVeritas 22UKEX1416X**  
EN IEC 60079-0, EN 60079-11, EN60079-26 , EN 50303

For Zone 0/1, 20 models



#### **Enclosure code 5 SIL version (refer Table 1)**

II 1/2G Ex ia IIC T4/T5 Ga/Gb

#### **Enclosure code 7 (refer Table 1)**

II 1/2G Ex ia IIC T4/T5 Ga/Gb  
II 1D Ex ia IIIC T105°C Da

#### **Enclosure code 4 SIL version (refer Table 1)**

I M1 Ex ia I Ma

II 1/2G Ex ia IIC T4/T5 Ga/Gb

#### **Enclosure code 8 (refer Table 1)**

I M1 Ex ia I Ma

II 1/2G Ex ia IIC T4/T5 Ga/Gb

II 1D Ex ia IIIC T105°C Da

#### FLAME- PROOF:



Certificate No.: **22UKEX1416X**  
EN IEC 60079-0, EN 60079-1, EN 60079-11, EN 60079-26, EN 60079-31, EN50303

For Zone 0/1, 20/21 models



#### **Enclosure code H (refer Table 1)**

II 1/2G Ex ia/db IIC T6/T5 Ga/Gb

II 1/2D Ex ia/tb IIIC T105°C Da/Db

For Zone 1, 21 models

#### **Enclosure code 2 (refer Table 1)**

II 2G Ex ia/db IIC T6/T5 Gb

II 2D Ex ia/tb IIIC T105°C Db

#### **Enclosure code R (refer Table 1)**

I M2 Ex db ia I Mb

II 1/2G Ex ia/db IIC T6/T5 Ga/Gb

II 1/2D Ex ia/tb IIIC T105°C Da/Db

#### **Enclosure code 3 (refer Table 1)**

I M2 Ex db ia I Mb

II 2G Ex ia/db IIC T6/T5 Gb

II 2D Ex ia/tb IIIC T105°C Db

#### INTRINSICALLY SAFE & FLAMEPROOF (\*):

(\* According to the selection on the label



Certificate No.: **22UKEX1416X**  
EN IEC 60079-0, EN 60079-1, EN 60079-11, EN 60079-26, EN 60079-31, EN50303

For Zone 0/1, 20/21 or 0/1, 20 models



#### **Enclosure code 2 (refer Table 1)**

II 1/2G Ex ia/db IIC T6/T5 Ga/Gb

II 1/2D Ex ia/tb IIIC T105°C Da/Db

or

II 1/2G Ex ia IIC T5/T4 Ga/Gb

II 1D Ex ia IIIC T105°C Da

#### **Enclosure code 3 (refer Table 1)**

M2 Ex db ia I Mb

II 1/2G Ex ia/db IIC T6/T5 Ga/Gb

II 1/2D Ex ia/tb IIIC T105°C Da/Db

or

I M1 Ex ia I Ma

II 1/2G Ex ia IIC T5/T4 Ga/Gb

II 1D Ex ia IIIC T105°C Da



## Installation

The instrument can be supplied with a universal Delta mounting bracket for 2" pipe (Refer Table 8). The base economical version is supplied with impulse line for 6mm OD elastic pipe in Brass. The process connections code C has 1/4" NPT-F connection and can be fitted directly to a 3- or 5 valve manifold. We recommend factory-mounted transmitters with VM type valve manifold.

The instrument should be installed in vertical position, in such a way that any condensed liquid, flew off from the device. To prevent dust from entering the measuring cells, the impulse line should be attached with care, with particular attention paid to the tightness of the connections between the impulse line and the transmitter.

Where there is a significant different in height between the place where the instrument is installed and the place where the process pressure is taken, the temperature of the impulse line may affect the measurement. Connecting a compensating pipe close to the impulse line, can minimise this effect.

## Construction

The SMART Differential Pressure Transmitters are suitable for measuring differential pressure of gases. The active sensing element is a piezoresistive silicon sensor This instrument is suitable for the measurement of differential pressures in furnaces, chimney draughts, air ducts. The root extraction option, enable the instrument to be used in gas flow measurement, in combination with our flow orifices and Pitot tubes in low pressure application. The casing is made of cast aluminium alloy with epoxy coating or 316 stainless steel with degree of protection IP66/67. The design of the casing enables the use of a local display, rotation of the display,

The communication standard for data interchange with the transmitter is the Hart protocol.

Communication with the transmitter is carried out with:

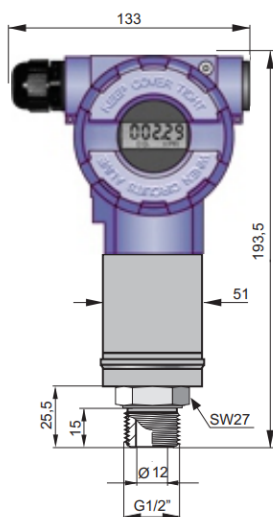
- a DKAP-03 communicator,
- some other Hart type communicators, (\*)
- a PC using a HART/USB/Bluetooth converter and D-Soft configuration software

(\*) .eddl file available at [www.delta-mobrey.com](http://www.delta-mobrey.com)

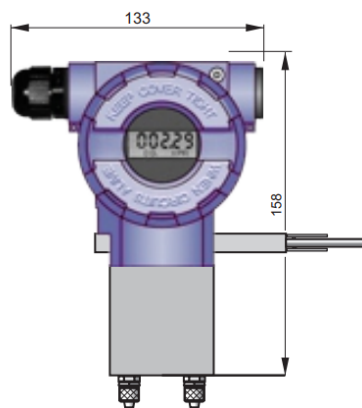
The data interchange with the transmitter enables the users to:

- ♦ identify the transmitter;
- ♦ configure the output parameters:
  - measurement units and the values of the start points and end points at the measurement range;
  - damping time constant;
  - conversion characteristic (inversion, user's non-linear characteristic);
- ♦ read the currently measured pressure value of the output current and the percentage output control level;
- ♦ force an output current with a set value;
- ♦ calibrate the transmitter in relation to a model pressure

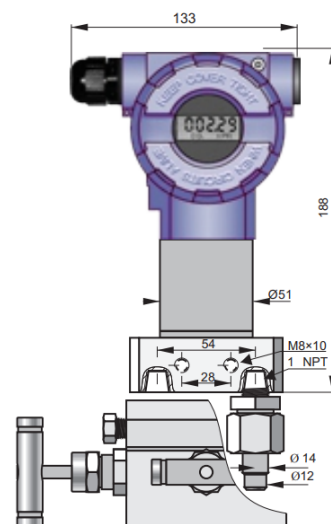
## Dimensions



Process connection 1/2"GM for gauge pressure measurement



Basic economic version with Process connection with impulse line for 6mm OD elastic pipe



Process connection type C, with or without valve manifold

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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