Алматы (7273)495-231
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Курган (3522)50-90-47
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Ноябрьск (3496)41-32-12
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Саранск (8342)22-96-24
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35
Тольятти (8482)63-91-07
Томск (3822)98-41-53
Тула (4872)33-79-87
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Улан-Удэ (3012)59-97-51
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Чебоксары (8352)28-53-07
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Чита (3022)38-34-83
Якутск (4112)23-90-97
Ярославль (4852)69-52-93

Россия +7(495)268-04-70 **Казахстан** +7(7172)727-132 **Киргизия** +996(312)96-26-47

www.delta-mobrey.nt-rt.ru | | dye@nt-rt.ru

Технические характеристики на датчики перепада давления и дифференциального давления, компактные D компании Delta Mobrey

Technical **Datasheet**

D Series
SMART Compact Pressure Transmitter
Model: D23

Key **Features**

- Compact design and robust construction.
- 4-20mA output signal.
- Fully HART ® compatible.
- ATEX certified (both protection mode: Intrinsic Safety & Flameproof)
- IECEx Certified Flameproof only (Intrinsic Safety is coming soon)
- Gold plated diaphragm.
- Hastelloy C276 wetted parts option.

Series **Overview**

The D-Series pressure, differential pressure and temperature transmitters offer customers cost-effective and accurate solutions to their individual process requirements.

Available with a wide range of process connections and is 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:

- D33 SMART Compact Differential Pressure Transmitter
- D21 SMART HART Pressure Transmitter with display

Product **applications**

The D23 D-Series is suitable for a wide range of applications for measuring:

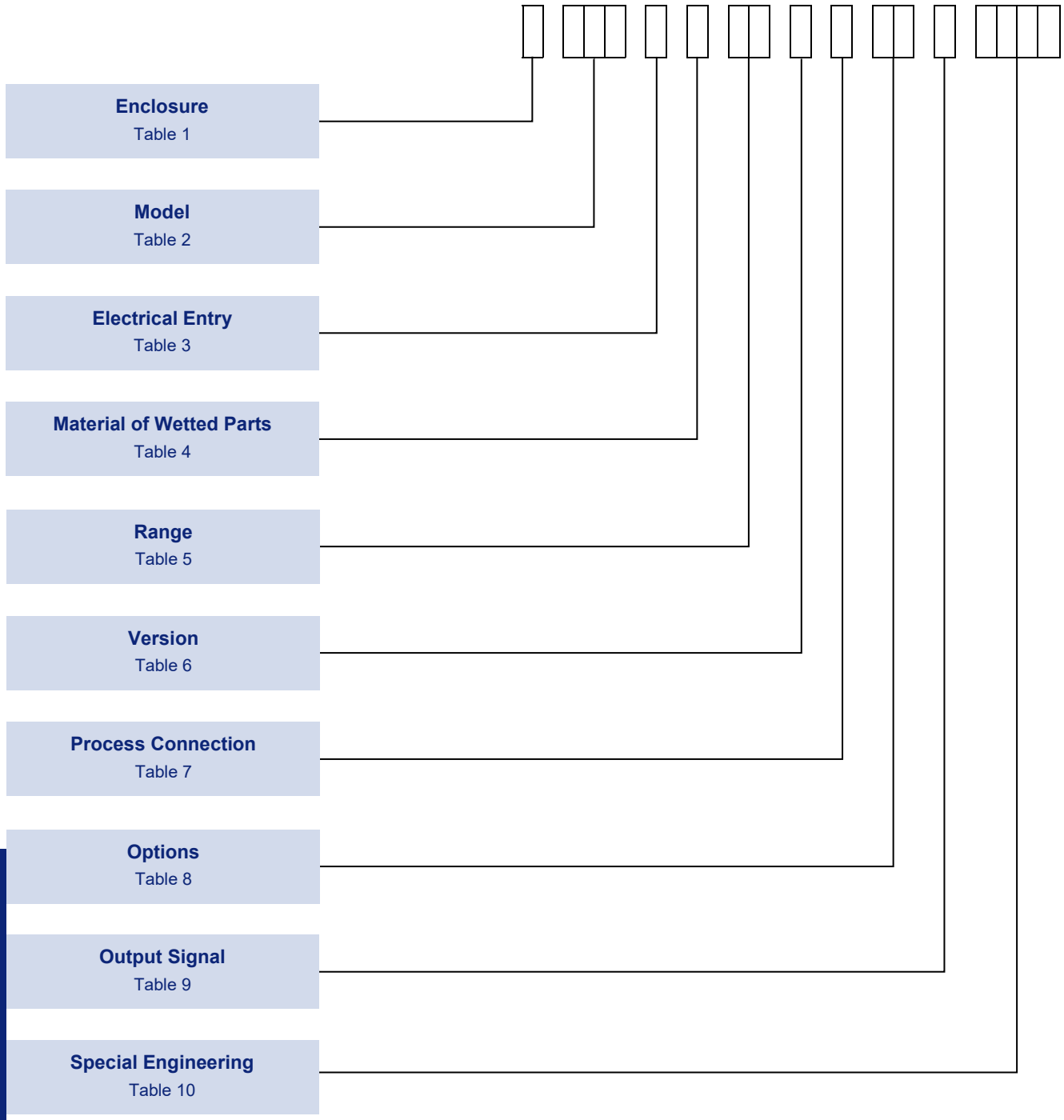
- Pressure (Gauge, vacuum & absolute)
- Level

The choice of models available ensures that the D23 D-Series is suitable for use in:

- Corrosive atmospheres
- Resistant to chemical attack

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.



***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

TABLE 1

NOTE 1:
Refer to the 'Approvals' section for details about the certification on Intrinsically Safe models & Flameproof model.

NOTE 2:
An aluminium enclosure with programmable local display is available, please contact local sales for more details.

NOTE 3:
Flameproof enclosure available only with electric connection type 8 & A

ENCLOSURES TYPES	Code
WEATHERPROOF ENCLOSURE	
304 Stainless steel housing, IP65.	**B**
316 Stainless steel housing, IP65.	**D**
304 Stainless steel housing, IP66.	**G**
316 Stainless steel housing, IP66.	**K**
304 Stainless steel housing, IP67.	**M**
316L Stainless steel housing, IP68.	**Q**
INTRINSICALLY SAFE ENCLOSURES (ZONE 0)	
304 Stainless steel housing, IP65. (Ex ia)	**C**
316 Stainless steel housing, IP65. (Ex ia)	**F**
304 Stainless steel housing, IP66. (Ex ia)	**J**
316 Stainless steel housing, IP66. (Ex ia)	**L**
304 Stainless steel housing, IP67. (Ex ia)	**N**
316L Stainless steel housing, IP68. (Ex ia)	**S**
FLAMEPROOF ENCLOSURES (ZONE 1)	
316L Stainless steel housing, IP68. (Ex d)	**Z**

Model

TABLE 2

	Code
D23 SMART Compact Pressure Transmitter For applications up to 1380 bar. Overpressure limit up to 1600 bar. Refer Table 5.	**D23**

Electrical Entry

TABLE 3

NOTE: Code 1
Available on Enclosure code G,K,J & L only.
NOTE: Code 3
Available on Enclosure code B,D,C & F only.
NOTE: Code 4
Available on Enclosure code M & N only.

	Code
PZ type connection, packing gland M20x1.5	**1**
PD type connection, DIN43650 Connector	**3**
PM12 type connection, thread M12x1 & connector with cable 3m length	**4**

NOTE: Code 7
Available on Enclosure code Q & S only.
NOTE: Code 8
Available on Enclosure code Q, S & Z only.
NOTE: Code A
Available on Enclosure code Z only.

(Table 3 continued…)	Code
SG type connection, cable 3m length	**7**
SGM type connection, cable 3m length	**8**
FL type connection, thread 1/2" NPTM & cable 2m length	**A**

Material of Wetted Parts

TABLE 4

	Code
Stainless Steel 316L diaphragm and process connection	**A**
Hastelloy C276 diaphragm and process connection	**B**
Gold plated diaphragm and Stainless Steel 316L process connection	**C**

Range

TABLE 5

Code	Nominal measuring range (FSO)		Minimum set range		Rangeability	Overpressure limit (without hysteresis)	
A0	-100...100 mbar	(-10...10 kPa)	20 mbar	(2 kPa)	10:1	1 bar	(100 kPa)
A2	-15...70 mbar *	(-1,5...7 kPa)	5 mbar	(0,5 kPa)	17:1	0,5 bar	(50 kPa)
C0	-1...1,5 bar	(-100...150kPa)	0,12 bar	(12 kPa)	20:1	4 bar	(400 kPa)
C1	-1…7 bar	(-100…700 kPa)	0,07 bar	(7 kPa)	114:1	14 bar	(1,4 MPa)
C3	-0,5...0,5 bar	(-50...50 kPa)	50 mbar	(5 kPa)	20:1	2 bar	(200 kPa)
D0	0...0,25 bar	(0...25 kPa)	25 mbar	(2,5 kPa)	10:1	1 bar	(100 kPa)
D1	0...1 bar	(0...100 kPa)	50 mbar	(5 kPa)	20:1	2 bar	(200 kPa)
D3	0...2 bar	(0...200 kPa)	100 mbar	(10 kPa)	20:1	4 bar	(400 kPa)
D4	0...7 bar	(0...0,7 MPa)	0,07 bar	(7 kPa)	100:1	14 bar	(1,4 MPa)
E1	0...25bar	(0...2.5MPa)	0,25 bar	(25 kPa)	100:1	50bar	(5 MPa)
E2	0...70 bar	(0...7 MPa)	0,7 bar	(70 kPa)	100:1	140 bar	(14 MPa)
F0	0…160 bar	(0…16 MPa)	1,6 bar	(160 kPa)	100:1	450 bar	(45 MPa)
F1	0...300 bar	(0...30 MPa)	3 bar	(300 kPa)	100:1	450 bar	(45 MPa)
F5	0...600 bar	(0...60 MPa)	6 bar	(600 kPa)	100:1	1200 bar	(120 MPa)
G0	0…1000 bar	(0…100 MPa)	10 bar	(1 MPa)	100:1	1200 bar	(120 MPa)
H0	0...1,3 bar abs	(0...130 kPa abs)	100 mbar abs	(10 kPa abs)	13:1	2 bar	(200 kPa)
H1	0...7 bar abs	(0...0,7 MPa abs)	100 mbar abs	(10 kPa abs)	70:1	14 bar	(1,4 MPa)
J0	0...25 bar abs	(0...2,5 MPa abs)	0,25 bar abs	(25 kPa abs)	100:1	50 bar	(5 MPa)
J1	0...70 bar abs	(0...7 MPa abs)	0,7 bar abs	(70 kPa abs)	100:1	140 bar	(14 MPa)

****only for transmitters without diaphragm seal.***

Version

TABLE 6

	Code
Applies when no option is required.	**0**
Extended thermal compensation range –40 to +80°C	**C**

Process Connection

TABLE 7

Other thread specification & sizes are available. Ask for details.

M20x1.5 (male) with Ø4mm hole	**A**
M20x1.5 (male) with Ø12mm hole	**B**
G1/2" (male) with Ø4mm hole	**D**
G1/2" (male) with Ø12mm hole	**E**
G1/4" (male) (Pressure limits: min 10 mbar / max 400 bar)	**F**
1/2" NPT Male (Pressure limits: max 690 bar)	**G**
1/2" NPT Female via adaptor (Pressure limits: max 690 bar)	**H**
M30x2 with flush diaphragm (Pressure limits: min 0.1 bar / max 70 bar)	**I**
G1" with flush diaphragm (Pressure limits: min 0.1 bar / max 70 bar)	**J**
G1/2" with flush diaphragm (Pressure limits: min 2.5 bar / max 300 bar)	**K**

Options

TABLE 8

Combination of more than one option is available.

	Code
Applies when no option is required	**00**
Stainless Steel tag plate mounted on wire	**30**

Output Signal

TABLE 9

Note: For the constructions certified for Hazardous area, the instruments are supplied as standard with ATEX marking on the label. The instrument will be supplied with nameplate marked according to the selected code on Table 9,

	Code
4 to 20mA (Weatherproof or Hazardous Area with ATEX marking)	**O**
4 to 20mA (Hazardous Area with IECEx marking)	**6**

Special Engineering

TABLE 10

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

	Code
Please consult Delta Mobrey sales engineering for special requirements	**TBA**

Application & Construction

The D23 SMART Pressure Transmitters are suitable for measurement of the pressure, under pressure and absolute pressure of gases, vapours and liquids. The active sensing element is a piezoresistive silicon sensor separated from the medium by a diaphragm and by a specifically selected type of manometric liquid.

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

Communication with the transmitter is carried out with:

– a DKAP communicator,

– some other HART type communicators,(*)

– a PC using a HART/USB/Bluetooth converter and D-Soft configuration software

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

Installation

The transmitter is not heavy, so it can be installed on the installation without additional mounting bracket. When the pressure of steam or other hot media is measured, a siphon or impulse line should be used. The needle valve placed upstream the transmitter simplifies installation process and enables the zero point adjustment or the transmitter replacement. The transmitter's electrical connections should be performed with twisted cable. The place for the communicator should be assigned before the communicator installation.

Technical Data

Metrological parameters

Accuracy ≤ ±0.1% of calibrated range

Long-term stability ≤ accuracy for 3 years
(for the nominal measuring range)

Thermal error < ±0,08% (FSO) / 10°C
(0,1% for ranges A0, A2)
max. ±0,25% (FSO) in the whole compensation range
(0,4% for ranges A0, A2)

Thermal compensation range -25...80°C
-40...80°C – special version
Response time 16..230ms (programmable)
Additional electronic damping 0...30 s
Error due to supply voltage changes 0.002% (FSO) / V

Electrical parameter

Power supply: 7.5...55 V DC (Ex ia 7.5...28 VDC)

Output signal 4...20 mA + Hart 5, two wire transmission

Load resistance $R\ [\Omega] \leq \frac{U_{sup}\ [V] - 7.5V}{0.0225A}$

Resistance required for communication min 240 Ω

Materials

Wetted parts and diaphragms: 316Lss, Hastelloy C 276, Au

Casing: 304ss
Optional: 316ss

Operating conditions

Operating temperature range (ambient temp.)
-40...85°C
Ex version -40…80°C

CAUTION: the medium must not be allowed to freeze in the impulse line or close to the process connection of the transmitter

Medium temperature range -40...120°C
over 120°C – measurement with the use of impulse line or diaphragm seals

Approvals

GLOBAL CERTIFICATION

IECEx Certified

FLAMEPROOF:
Certificate No.: IECEx KDB 19.0005X

IEC 60079-0, IEC 60079-1, IEC 60079-31

For Zone 1 models **(Refer Table 1 for Enclosure code)**

Ex db IIC T6/T5/T4 Gb
Ex tb IIIC T85°C/T100°C/T120°C Db

INTRINSICALLY SAFE:
Certificate No.: Coming soon for intrinsically Safe version
IEC 60079-0, IEC 60079-11

EUROPEAN DIRECTIVES

ATEX Directive 2014/34/EU

INTRINSICALLY SAFE:
Certificate No.: KDB 14ATEX0121X
EN 60079-0, EN 60079-11, EN 60079-26, EN 50303

For Zone 0 models **(Refer Table 1 for Enclosure code)**

I M1 Ex ia I Ma
II 1/2G Ex ia IIC T4/T5/T6 Ga/Gb
II 1D Ex ia IIIC T105°C Da

FLAMEPROOF:
Certificate No.: KDB 19 ATEX0030X

EN 60079-0, EN 60079-1, EN 60079-31

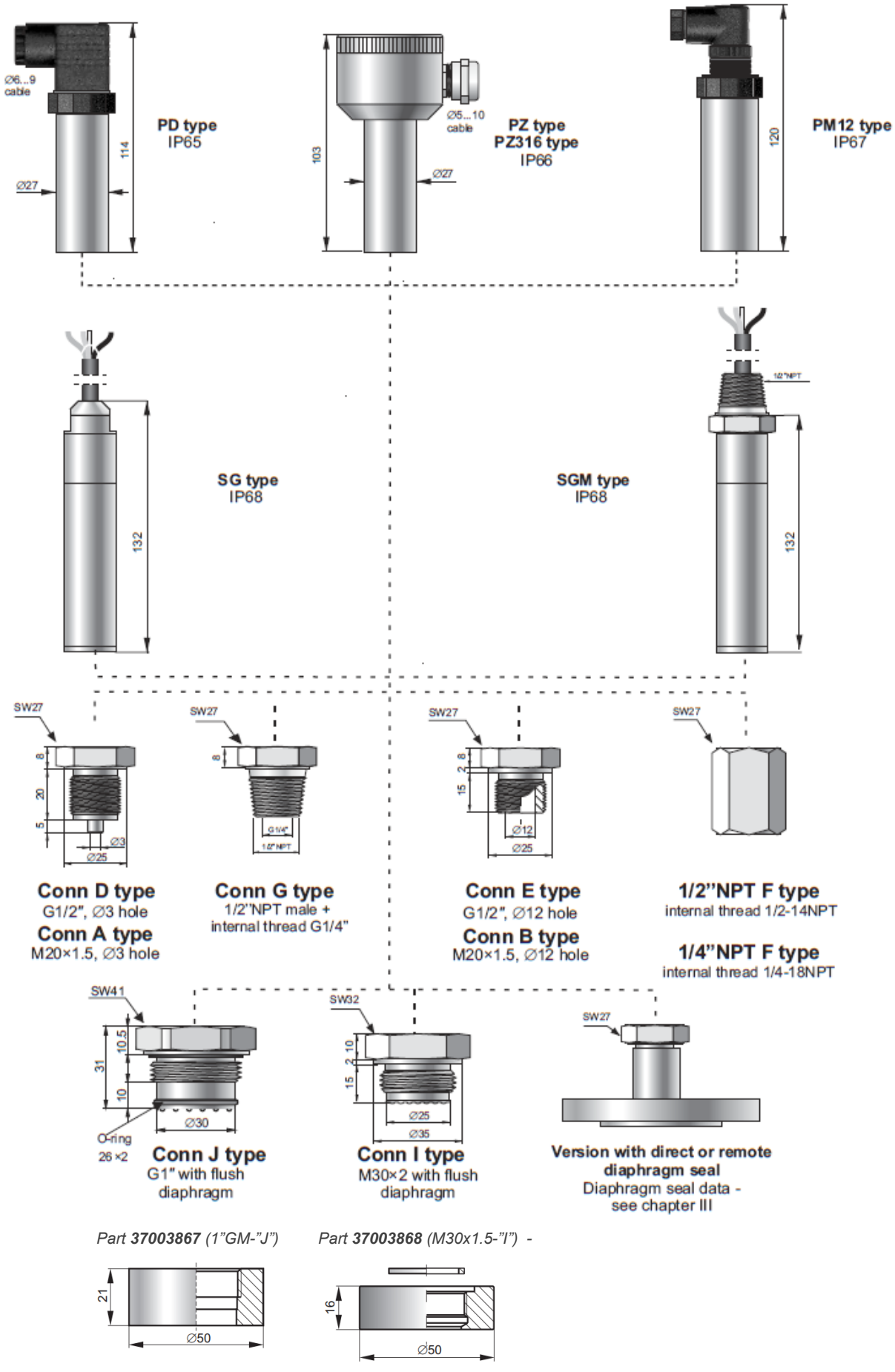
For Zone 1 models **(Refer Table 1 for Enclosure code)**

II 2G Ex db IIC T6/T5/T4 Gb
II 2D Ex tb IIIC T85°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

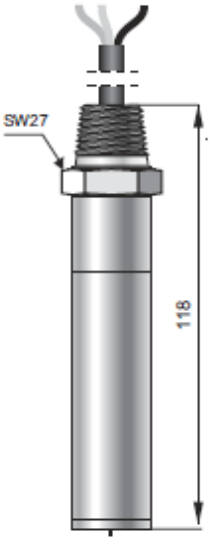
Restriction of hazardous substances (RoHS 2) 2011/65/EU
Compliant to RoHS.
The folloing stabdard was applied: EN IEC 63000:2018

Dimensions

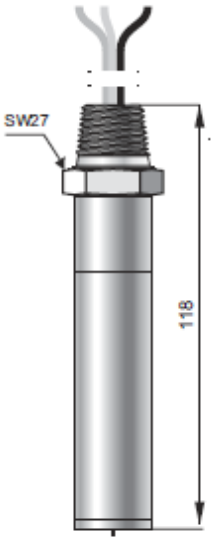

Ø6...9 cable
114
Ø27
PD type
IP65
103
Ø5...10 cable
Ø27
PZ type
PZ316 type
IP66
120
PM12 type
IP67
132
SG type
IP68
1/2"NPT
132
SGM type
IP68
SW27
8
20
5
Ø3
Ø25
Conn D type
G1/2", Ø3 hole
Conn A type
M20×1.5, Ø3 hole
SW27
8
G1/4"
1/2" NPT
Conn G type
1/2"NPT male +
internal thread G1/4"
SW27
8
2
15
Ø12
Ø25
Conn E type
G1/2", Ø12 hole
Conn B type
M20×1.5, Ø12 hole
SW27
1/2"NPT F type
internal thread 1/2-14NPT
1/4"NPT F type
internal thread 1/4-18NPT
SW41
10.5
31
10
Ø30
O-ring
26 ×2
Conn J type
G1" with flush
diaphragm
SW32
10
2
15
Ø25
Ø35
Conn I type
M30×2 with flush
diaphragm
SW27
Version with direct or remote
diaphragm seal
Diaphragm seal data -
see chapter III
Part 37003867 (1"GM-"J")
21
Ø50
Part 37003868 (M30x1.5-"I") -
16
Ø50

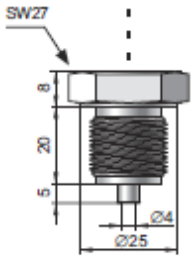
Dimensions

SGM (1/2"NPTM)
cable connection
IP68
(IP66 for gauge pressure <80bar)

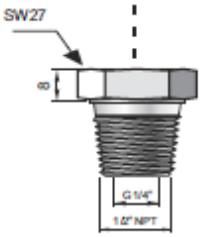


FL (1/2"NPTM)
flying leads
IP68
(IP66 for gauge pressure <80bar)

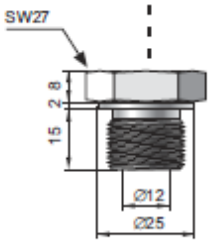




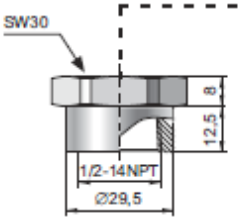
Conn D type
G1/2", Ø4 hole



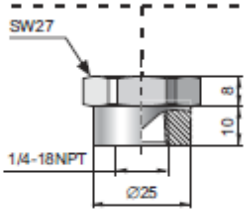
Conn G type
1/2"NPT male +
internal thread G1/4"



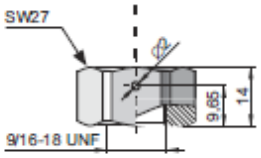
Conn E type
G1/2", Ø12 hole



Conn V type
1/2-14 NPT female



Conn T type
1/4-18 NPT female



Conn U - Autoclave
type F-250-C
(9/16-18 UNF)

FM00720

D-Series
Model: D23

Technical **Datasheet**

D Series
Analogue Compact Pressure Transmitter
Model: D22

Key **Features**

- Compact design and robust construction.
- 4-20mA two-wire or 0-10 V output.
- Any range from 0/25 mbar up to 0/1380 bar.
- ATEX & IECEx certification—Ex ia & Ex d
- Gold plated diaphragm.
- Hastelloy C276 wetted parts option.

Product **applications**

The D22 D-Series is suitable for a wide range of applications for measuring:

- Pressure (Gauge, vacuum & absolute)
- Level

The choice of models available ensures that the D22 D-Series is suitable for use in:

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Other products in the series include:

- D32 Analogue Compact Differential Pressure Transmitter

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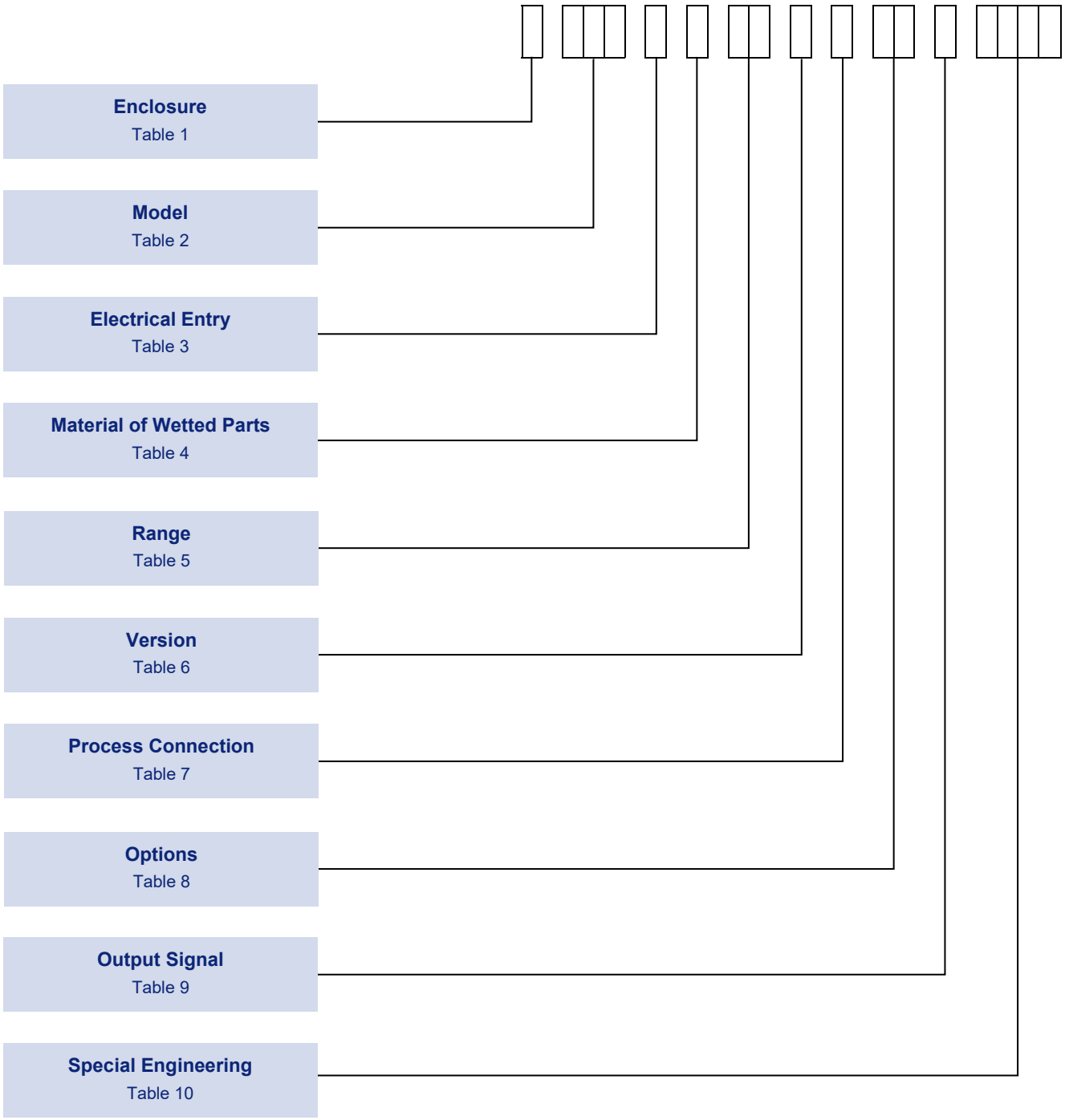

***NOTE**: Only the most common options are shown in this datasheet. Should you require a feature that is not shown, please contact your local sales office for further details.*

***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

TABLE 1

NOTE 1:
Refer to the 'Approvals' section for details about the certification on Intrinsically Safe models and Flameproof models.

NOTE 2:
An aluminium enclosure with programmable local display is available, please contact local sales for more details.

ENCLOSURES TYPES	Code
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304 Stainless steel housing, IP65.	**B**
316 Stainless steel housing, IP65.	**D**
304 Stainless steel housing, IP66.	**G**
316 Stainless steel housing, IP66.	**K**
304 Stainless steel housing, IP67.	**M**
304 Stainless steel housing, IP66/67.	**O**
316L Stainless steel housing, IP68.	**Q**
INTRINSICALLY SAFE ENCLOSURES (ZONE 0)	
304 Stainless steel housing, IP65. (Ex ia)	**C**
316 Stainless steel housing, IP65. (Ex ia)	**F**
304 Stainless steel housing, IP66. (Ex ia)	**J**
316 Stainless steel housing, IP66. (Ex ia)	**L**
304 Stainless steel housing, IP67. (Ex ia)	**N**
304 Stainless steel housing, IP66/67. (Ex ia)	**P**
316L Stainless steel housing, IP68. (Ex ia)	**S**
FLAMEPROOF ENCLOSURES (ZONE 1)	
316L Stainless steel housing, IP68. (Ex d)	**Z**

Model

TABLE 2

	Code
D22 Analogue Compact Pressure Transmitter For applications up to 1380 bar. Overpressure limit up to 1600 bar. Refer Table 5.	**D22**

Electrical Entry

TABLE 3

NOTE: Code 1
Available on Enclosure code G,K,J & L only.
NOTE: Code 3
Available on Enclosure code B,D,C & F only.
NOTE: Code 4
Available on Enclosure code M & N only.
NOTE: Code 5
Available on Enclosure code O & P only.

	Code
PZ type connection, packing gland M20x1.5	**1**
PD type connection, DIN43650 Connector	**3**
PM12 type connection, thread M12x1 & connector with cable 3m length	**4**
PK type connection, cable 3m length	**5**

NOTE: Code 6
Available on Enclosure code M & N only.
NOTE: Code 7 & 8
Available on Enclosure code Q & S only.
Note: Code A & B
Available on Enclosure code Z only.

Refer Table 1 for Enclosure

(Table 3 continued…)	Code
PKD type connection, cable 3m length	6
SG type connection, cable 3m length	7
SGM type connection, thread 1/2” NPT Male & cable 3m length	8
FL type connection, thread 1/2" NPT Male & flying leads 2m length (for Ex d only)	A
SGM type connection, thread 1/2” NPT Male & cable 3m length (for Ex d only)	B

Material of Wetted Parts

TABLE 4

	Code
Stainless Steel 316L diaphragm and process connection	A
Hastelloy C276 diaphragm and process connection	B
Gold plated diaphragm and Stainless Steel 316L process connection	C

Range

TABLE 5

Code	Nominal measuring range (FSO)		Code	Nominal measuring range (FSO)	
D0	0...0.25 bar	(0...25 kPa)	E3	0...10 bar*	(0...1 MPa)
D1	0...1 bar*	(0...100 kPa)	E5	0...40 bar*	(0...4 MPa)
D2	0...2.5 bar*	(0...250 kPa)	E6	0…60 bar*	(0…6 MPa)
D5	0...0.4 bar	(0...40 kPa)	F0	0…160 bar*	(0…16 MPa)
D6	0...0.6 bar	(0...60 kPa)	F2	0...100 bar*	(0...10 MPa)
D7	0...1.6 bar*	(0...160 kPa)	F3	0...250 bar*	(0...25 MPa)
D8	0...4 bar*	(0...400 kPa)	F4	0...400 bar*	(0...40 MPa)
D9	0...6 bar*	(0...600 kPa)	F5	0…600 bar*	(0…60 MPa)
E0	0...16 bar*	(0...1.6 MPa)	G0	0…1000 bar*	(0…100 MPa)
E1	0...25 bar*	(0...2.5 MPa)	M0	0…-1 bar	(0…-100 kPa)

**Available in bar (absolute pressure).*

NOTE: For Ex ia version, *any measuring range. 0...25 mbar to 0...1000 bar (over pressure, under pressure); 400 mbar ÷ 80 bar (absolute pressure).*

	Measuring range			
	25 mbar	100 mbar	400 mbar	0...1 bar + 1000 bar
Overpressure Limit (repeated, without hysteresis)	1 bar	1 bar	2,5 bar	4 x range; max 1200 bar
Damaging Overpressure	2 bar	2 bar	5 bar	8 x range; max 2000 bar
Accuracy	0,6%	0,3%	0,2% (0,16% - special version code A)	
Long term stability	0,6% / year	0,2% / year	0,1% / year	
Thermal error	Typically 0,5% / 10°C Max 0,6% / 10°C	Typically 0,3% / 10°C Max 0,4% / 10°C		Typically 0,2% / 10°C Max 0,3% / 10°C

NOTE: For Ex d version, *any measuring range. 0...25 mbar to 0...1380 bar (over pressure, under pressure); 400 mbar ÷ 80 bar (absolute pressure).*

	Measuring range				
	25 mbar	100 mbar	400 mbar	0...1 bar + 160 bar	0...160 bar + 1380 bar
Overpressure Limit (repeated, without hysteresis)	1 bar	1 bar	2,5 bar	4 x range	2 x range; max. 1600 bar
Damaging Overpressure	2 bar	2 bar	5 bar	8 x range; max 2000 bar	
Accuracy	0,6%	0,3%	0,2% (0,16% - special version)		
Long term stability	0,6% / year	0,2% / year	0,1% / year		
Thermal error	Typically 0,5% / 10°C Max 0,6% / 10°C	Typically 0,3% / 10°C Max 0,4% / 10°C		Typically 0,2% / 10°C Max 0,3% / 10°C	

Version

TABLE 6

NOTE: Code 4
Only available with process connection code A & D.

NOTE: Code A
Available for ranges > 400 mbar

NOTE: Code B
Only available with output signal code O.

Refer Table 7 for Process Connection
Refer Table 9 for Output Signal

	Code
Applies when no option is required.	**0**
For oxygen service (sensor filled with Fluorolube fluid)	**4**
High overload capacity and integrated circuit offering excess voltage protection	**9**
Accuracy < 0.16%	**A**
Response time < 30ms	**B**

Process Connection

TABLE 7

Other thread specification & sizes are available. Ask for details.

M20x1.5 (male) with Ø4mm hole	**A**
M20x1.5 (male) with Ø12mm hole (Pressure limits: min 0.25 bar / max 350 bar)	**B**
G1/2" (male) with Ø4mm hole	**D**
G1/2" (male) with Ø12mm hole (Pressure limits: min 0.25 bar / max 350 bar)	**E**
G1/4" (male) (Pressure limits: min 10 mbar / max 400 bar)	**F**
1/2" NPT Male (Pressure limits: max 690 bar)	**G**
1/2" NPT Female via adaptor (Pressure limits: max 690 bar)	**H**
M30x2 with flush diaphragm (Pressure limits: min 0.1 bar / max 70 bar)	**I**
G1" with flush diaphragm (Pressure limits: min 0.1 bar / max 70 bar)	**J**
G1/2" with flush diaphragm (Pressure limits: min 2.5 bar / max 300 bar)	**K**

(Table 7 continued…)	Code
M20x1.5 (male) with radiator (Pressure limits: min 160 mbar / max 40 bar, max. temperature up to 170°C)	**R**
G1/2” (male) with radiator (Pressure limits: min 160 mbar / max 40 bar) max. temperature up to 170°C)	**S**

Options

TABLE 8

Combination of more than one option is available.

	Code
Applies when no option is required	**00**
Stainless Steel tag plate mounted on wire	**30**

Output Signal

TABLE 9

NOTE: Code D,E,F & G

Not available with Zone 0 Enclosures.
Refer Table 1 for Enclosure.

Note : Code O & 6

Note: for the constructions certified for Hazardous area, the instruments are supplied as standard with ATEX marking on the label. The instrument will be supplied with nameplate marked according to the selected code on Table 9,

Refer Technical Data for more details.

	Code
4 to 20mA (Weatherproof or Hazardous Area with ATEX marking)	**O**
4 to 20mA (Hazardous Area with IECEx marking)	**6**
0 to 10VDC / power supply 13-30VDC	**C**
0 to 2.5VDC / power supply 3.3VDC	**D**
0 to 3.3VDC / power supply 4.5VDC	**E**
0 to 5VDC / power supply 8 to 14VDC	**F**
0.5 to 4.5VDC / power supply 8 to 14VDC	**G**

Special Engineering

TABLE 10

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

	Code
Please consult Delta Mobrey sales engineering for special requirements	**TBA**

Application & Construction

The D22 Analogue Compact Pressure Transmitters are suitable for measurement of the pressure, under pressure and absolute pressure of gases, vapours and liquids. The active sensing element is a piezoresistive silicon sensor separated from the medium by a diaphragm and by a specifically selected type of manometric liquid. The electronics is placed in a casing with a degree of protection from IP 65 to IP 68, depending on the type of electrical connection applied.

Calibration

Potentiometers can be used to shift the zero position and the range by up to ±10%, without altering the settings.

Installation

The transmitter is not heavy, so it can be installed on the installation without an additional mounting bracket. When the pressure of steam or other hot media is measured, a siphon or impulse line should be used. The needle valve placed upstream the transmitter simplifies the installation process and enables the zero point adjustment or the transmitter replacement.

When the special process connections are required for the measurement of levels and pressures (e.g. at food and chemical industries), the transmitter is provided with a Delta diaphragm seal. Contact a Delta Mobrey sales representatives to get a quote for a suitable diaphragm seal.

Technical Data

Hysteresis, repeatability	0,05%
Response time	<120ms Version B: <30ms
Thermal compensation range	-10...80°C
Operating temperature range (ambient temp.)	-40...80°C
FL electrical connection (Code B)	-40...80°C*
SGM electrical connection (Code A)	-40...65°C*
**more information available in user 's manual and certificate*	
Medium temperature range	-40...130°C
over 130°C – measurement with use an impulse line or diaphragm seals	
CAUTION: The medium must not be allowed to freeze in the impulse line or close to the process connection of the transmitter.	
Output signal	4...20 mA, two wire transmission 0..10V
Material of wetted parts **Material of casing**	316Lss, Hastelloy C 276, Au 304ss, 316Lss
Power supply	output 4..20mA 8…36 V DC (Ex 9...28 V DC) Version B: 10.5...36 V DC (Ex 12...28 V DC ALW & ALM type connection: (11...36 V DC) output 0..10V 13…30 VDC
Error due to supply voltage changes	0,005%/ V
Load resistance	$R[\Omega] \leq \frac{(U_{sup}[V]-8V)}{0,02A}$

Approvals

EUROPEAN DIRECTIVES

ATEX Directive 2014/34/EU

INTRINSICALLY SAFE:
Certificate No.: FTZU 18 ATEX 0143X
EN 60079-0, EN 60079-11, EN 50303

For Zone 0 models **(Refer Table 1 for Enclosure code)**

M1 Ex ia I Ma
II 1/2G Ex ia IIC T4/T5/T6 Ga/Gb
II 1D Ex ia IIIC T110°C Da
II 1/2G Ex ia IIC T4 Ga/Gb (for transmitter with electrical connection ALW, ALM)

FLAMEPROOF:
Certificate No.: KDB 19 ATEX 0030X
EN60079-0, EN 60079-1, EN 60079-31

For Zone 1 models **(Refer Table 1 for Enclosure code)**

II 2G Ex db IIC T6/T5/T4 Gb
II 2D Ex tb IIIC T85°C/T100°C/T120°C Db

GLOBAL CERTIFICATION

IECEx Certified

INTRINSICALLY SAFE:
Certificate No.: IECEx FTZU 18.0023X
IEC 60079-0, IEC 60079-11

For Zone 0 models **(Refer Table 1 for Enclosure code)**

Ex ia I Ma
Ex ia IIC T4/T5/T6 Ga/Gb
Ex ia IIIC T110°C Da
Ex ia IIC T4 Ga/Gb (for transmitter with electrical connection ALW, ALM)

FLAMEPROOF:
Certificate No.: IECEx KDB 19.0005X
IEC 60079-0, IEC 60079-1, IEC 60079-31

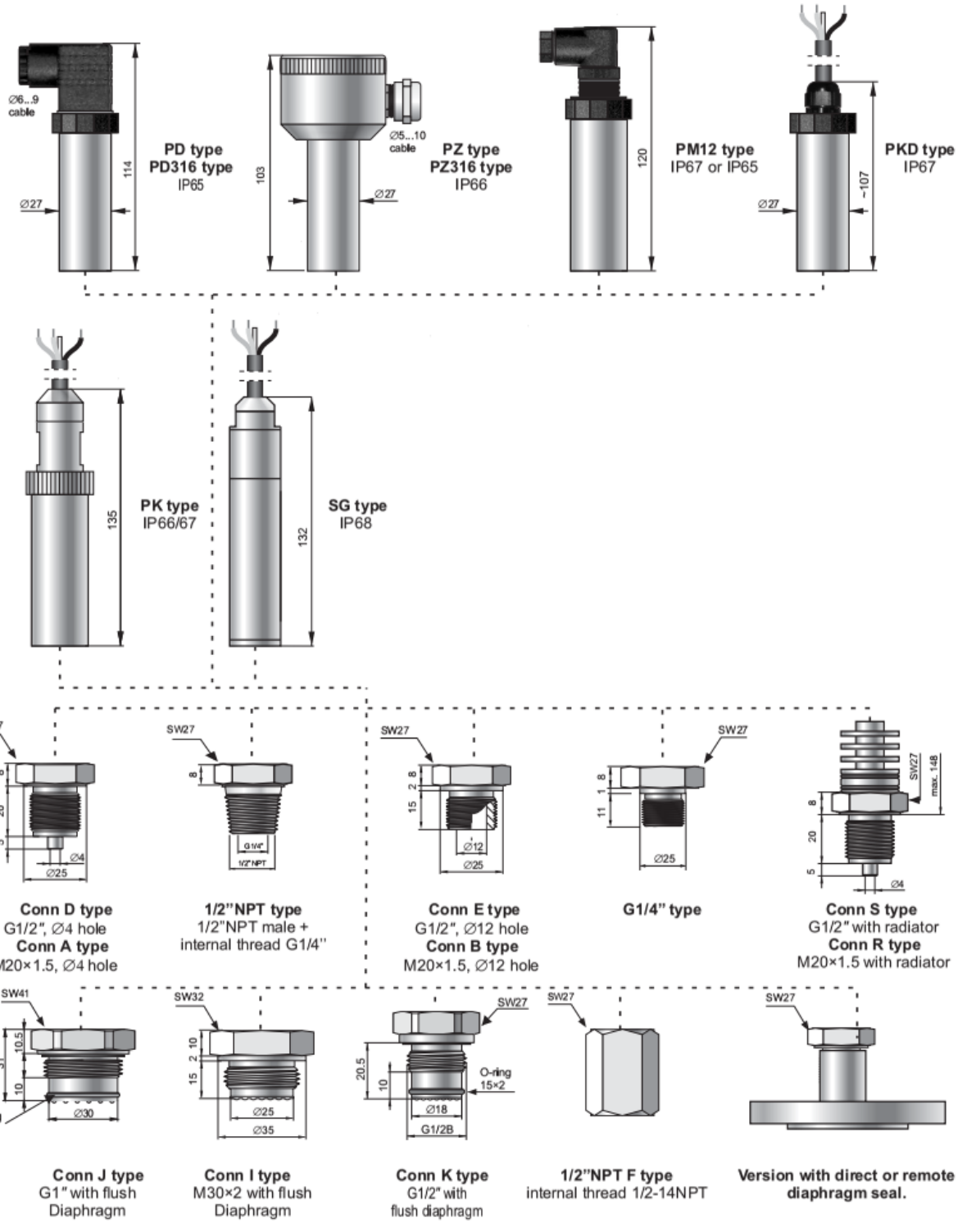
For Zone 1 models **(Refer Table 1 for Enclosure code)**

Ex db IIC T6/T5/T4 Gb
Ex tb IIIC T85°C/T100°C/T120°C Db

EMC Directive 2014/30/EU
Conformity assessment procedure: module A
The following standards were applied: EN 61326-1:2013; EN61326-2-3:2013

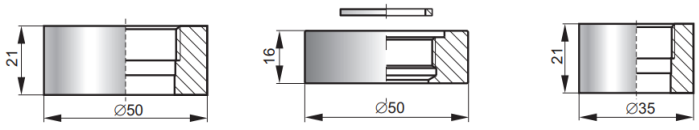
Restriction of hazardous substances (RoHS 2) 2011/65/EU
Compliant to RoHS.
The following standard was applied: EN IEC 63000:2018

Dimensions



Socket for flush diaphragm process connection (supplied on request)

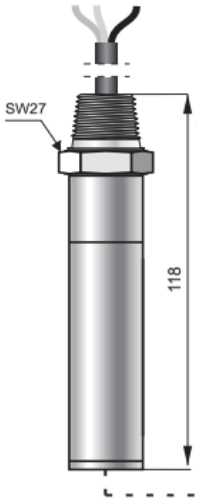
*Part **37003867** (1"GM-"J") - Part **37003868** (M30x1.5-"I") - Part. **37003869** (1/2" GM-"K")*



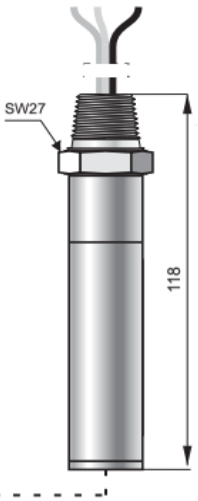
Weight may varies depending on model variant.

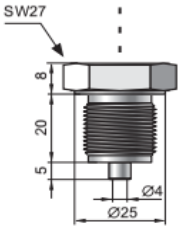
Dimensions

SGM (1/2"NPTM)
cable connection
IP68
(IP66 for gauge pressure <80bar)

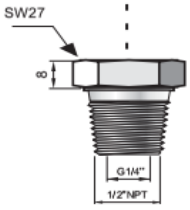


FL (1/2"NPTM)
flying leads
IP68
(IP66 for gauge pressure <80bar)

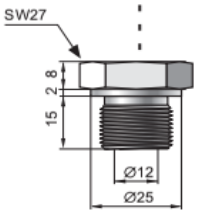




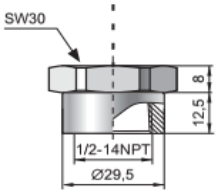
Conn D type
G1/2", Ø4 hole



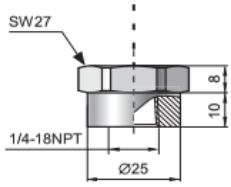
Conn G type
1/2"NPT male +
internal thread G1/4"



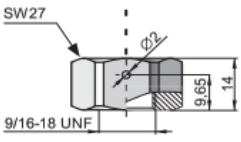
Conn E type
G1/2", Ø12 hole



Conn V type
1/2-14 NPT female



Conn T type
1/4-18 NPT female



Conn U - Autoclave
type F-250-C
(9/16-18 UNF)

WEIGHT

Model	Electrical Entry	Process Connection	Weight
D22	PD type	A	0.26 kg
		B	0.24 kg
	PZ type	A	0.92 kg

Technical **Datasheet**

D Series
SMART Pressure Transmitter
Model: D21

Key **Features**

- ATEX - Flameproof and Intrinsically Safe
- IECEx - Flameproof and Intrinsically Safe
- SIL 2 certificate
- Compliant to NAMUR NE-43
- High accuracy ±0.075% (better accuracy upon request)
- Fully HART ® compatible
- Static pressure limit up to 1200 bar
- 4-20mA, 0-20mA or 0-5mA analogue with digital communications
- Gold (Au) plated diaphragm option
- Hastelloy C276 wetted part option
- Programmable range, zero shift, characteristic and damping ratio with local panel keys
- Lightweight
- Linearisation of output signal on 20 point curve for specific applications is available
- Write protection option through the D-COMM communicator, 'D-Soft' program or software using library EDDL

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 Differential Pressure Transmitter with 2 remote chemical seals
- SMART Temperature Transmitter

Product **applications**

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

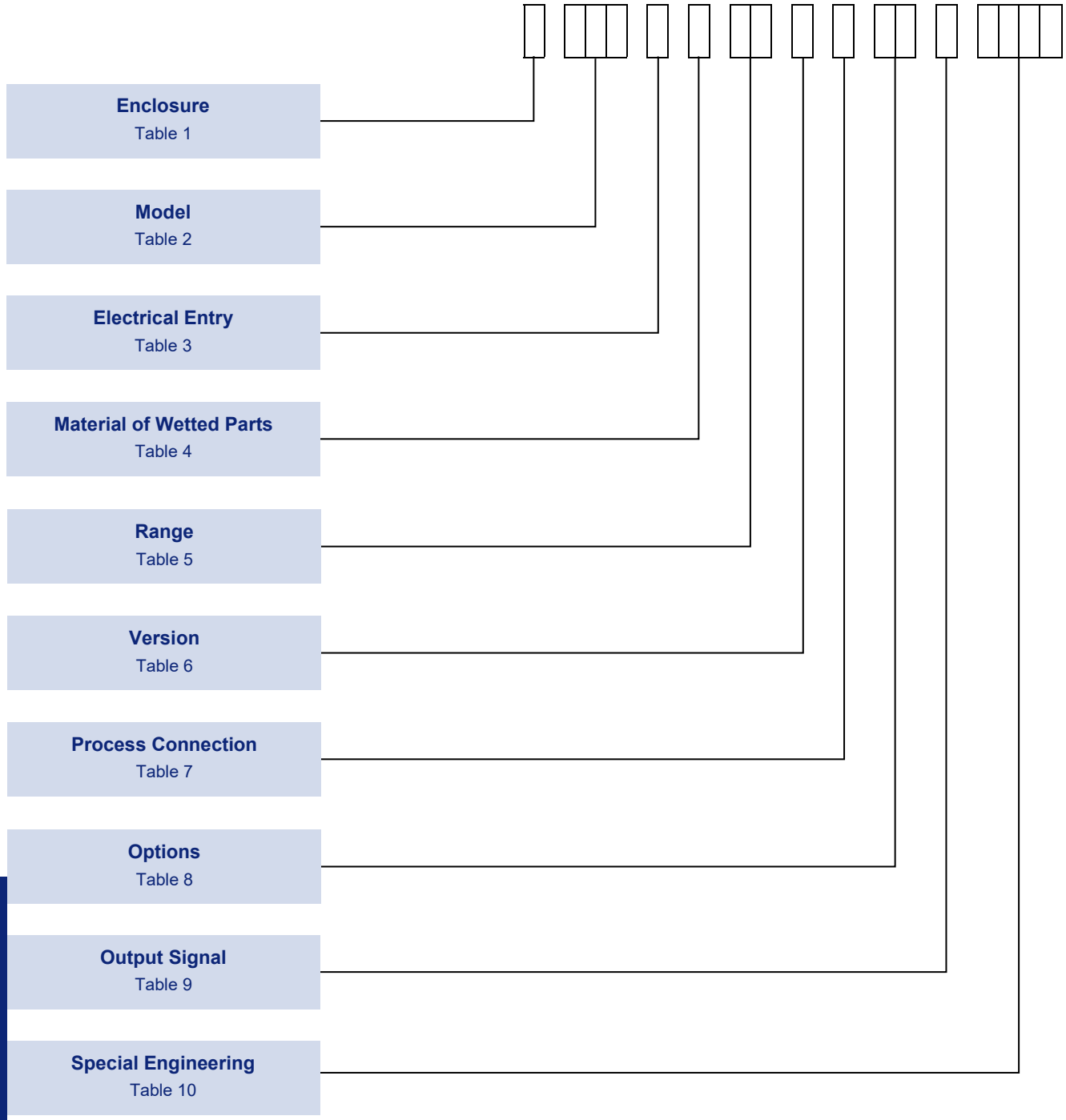
- Oil & Gas
- Chemical
- Petrochemical
- Power

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

- Corrosive atmospheres
- Resistant to chemical attack

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.



***NOTE 1**: 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 2:** 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.*

***NOTE 3:** Please confirm before ordering if the backlight of the display is required to be settled differently from our standard. It cannot be successively settled in field.*

- *Instruments in Std, Exd, Exi construction are normally supplied with backlight ON.*
- *instruments in Safety and double certified construction, are supplied with backlight OFF*

Enclosure

TABLE 1

Note 1: Refer to the 'Approvals' section for details about the certification on Flameproof & Intrinsically Safe models.
Note 2: For both Ex-ia & Ex-d construction, the protection mode is defined by selecting on the label the correct marking, before the installation of the instrument.

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

Model

TABLE 2

	Code
D21 SMART Pressure Transmitter For applications up to 1000 bar. Overpressure limit up to 1200 bar. Refer Table 5.	**D21**

Electrical Entry

TABLE 3

NOTE: Code 0
Available on Enclosure code H,R,2 & 3 as standard.

NOTE: Code 1
Available on Enclosure code W,A,4,5,6 & 7 as standard.

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

Material of Wetted Parts

TABLE 4

NOTE: Code C
Only available with range code E2, F0, F1, F5 & G0 with process connection code D.

	Code
Stainless Steel 316L diaphragm and process connection	**A**
Hastelloy C276 diaphragm and process connection	**B**
Gold plated diaphragm and Stainless Steel 316L process connection	**C**

Range

TABLE 5

Code	Nominal measuring range (FSO)		Minimum set range		Rangeability	Overpressure limit (without hysteresis)	
G0	0…1000 bar	(0…100 MPa)	10 bar	(1 MPa)	100:1	1200 bar	(120 MPa)
F5	0…600 bar	(0…60 MPa)	6 bar	(600 kPa)	100:1	1200 bar	(120 MPa)
F1	0...300 bar**	(0...30 MPa)	3 bar	(300 kPa)	100:1	450 bar	(45 MPa)
F0	0…160 bar**	(0…16 MPa)	1.6 bar	(160 kPa)	100:1	450 bar	(45 MPa)
E2	0...70 bar**	(0...7 MPa)	0.7 bar	(70 kPa)	100:1	140 bar	(14 MPa)
C5	-1…70bar**	(-0.1…70 MPa)	0.71 bar	(71 kPa)	100:1	140 bar	(14 MPa)
E1	0...25 bar**	(0...2.5 MPa)	0.25 bar	(25 kPa)	100:1	50 bar	(5 MPa)
C4	-1…25bar**	(-0.1…2.5 MPa)	0.26 bar	(26 kPa)	100:1	50 bar	(5 MPa)
D4	0...7 bar**	(0...0.7 MPa)	0.07 bar	(7 kPa)	100:1	14 bar	(1.4 MPa)
C1	-1…7bar**	(-100…700 kPa)	0.07 bar	(7 kPa)	114:1	14 bar	(1.4 MPa)
C0	-1…1.5 bar**	(-100…150 kPa)	0.12 bar	(12 kPa)	20:1	4 bar	(400 kPa)
D3	0...2 bar**	(0...200 kPa)	100 mbar	(10 kPa)	20:1	4 bar	(400 kPa)
D1	0...1 bar**	(0...100 kPa)	50 mbar	(5 kPa)	20:1	2 bar	(200 kPa)
C3	-0.5...0.5 bar**	(-50...50 kPa)	50 mbar	(5 kPa)	20:1	2 bar	(200 kPa)
D0	0...0.25 bar**	(0...25 kPa)	25 mbar	(2.5 kPa)	10:1	1 bar	(100 kPa)
A0	-100...100 mbar**	(-10...10 kPa)	20 mbar	(2 kPa)	10:1	1 bar	(100 kPa)
A2	-15...70 mbar */**	(-1.5...7 kPa)	5 mbar	(0.5 kPa)	17:1	0.5 bar	(50 kPa)
A1	-25...25 mbar */***	(-2.5...2.5 kPa)	2 mbar	(0.2 kPa)	25:1	1 bar	(100 kPa)
B1	-7...7 mbar */***	(-0.7...0.7 kPa)	1 mbar	(0.1 kPa)	14:1	1 bar	(100 kPa)
H0	0...1.3 bar abs	(0...130 kPa abs)	100 mbar abs	(10 kPa abs)	13:1	2 bar	(200 kPa)
H1	0...7 bar abs	(0...0.7 MPa abs)	100 mbar abs	(10 kPa abs)	70:1	14 bar	(1.4 MPa)
J0	0...25 bar abs	(0...2.5 MPa abs)	0.25 bar abs	(25 kPa abs)	100:1	50 bar	(5 MPa)
J1	0...70 bar abs	(0...7 MPa abs)	0.7 bar abs	(70 kPa abs)	100:1	140 bar	(14 MPa)
K5	0...300 bar abs	(0...30 MPa abs)	3 bar abs	(300 kPa abs)	100:1	450 bar	(45 MPa)

**Transmitter not available with diaphragm seal; not available in Ex d version.*
Transmitter available only in version **2
****Transmitter available only in version **2**; not available with SIL2 (Refer to Table 6)*

Version

TABLE 6

Combinations of more than one option is available.

NOTE:
Surge arrester is available as standard for Ex d version.

NOTE: Code 2
Available on all ranges except range code H0,H1,J0,J1,G0,F5 & K5 with process connection code B,E, & G.

NOTE: Code 4
Only available with process connection code D.

NOTE: Code Z
Not available with range code A1, A2 & B1 & F5.

NOTE: Code E
Not available with process connection code H,I,J & K.

Refer Table 5 for Range
Refer Table 7 for Process Connection

	Code
Applies when no option is required.	**0**
Surge arrester for Ex ia version	**1**
Ultra stable version	**2**
Accuracy ±0.05%	**3**
For oxygen service (sensor filled with Fluorolube fluid)	**4**
Extended thermal compensation range –40 to +80°C	**5**
Protection class IP67	**6**
SIL2 - Functional Safety Certificate	**Z**
Wetted parts suitable for NACE MR-01-75 application.	**E**
Accuracy ±0.04%	**M**

Process Connection

TABLE 7

NOTE: Codes B & E
Not available with range code G0, F0,F1 & F5.

NOTE: Codes I,J & K
Socket available at extra cost (see fig.1)

M20x1.5 (male) with Ø4mm hole	**A**
M20x1.5 (male) with Ø12mm hole	**B**
G1/2" (male) with Ø4mm hole	**D**
G1/2" (male) with Ø12mm hole	**E**
1/2" NPT Male (Pressure Limits: max. 690 bar) & G1/4" Female (Pressure Limits: max. 1000 bar)	**G**
1/2” NPT Female via adaptor (Pressure limits: max 690 bar)	**H**
M30x2 with flush diaphragm (Pressure limits: min 0.1 bar / max 70 bar)	**I**
G1" with flush diaphragm (Pressure limits: min 0.1 bar / max 70 bar)	**J**
G1/2" with flush diaphragm (Pressure limits: min 2.5 bar / max 300 bar)	**K**

Options

TABLE 8

Combination of more than one option is available.
(i.e. Code 13 - combination of code 10 & 30)

	Code
Applies when no option is required	**00**
Mounting bracket for 2" pipe, material 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, material zinced steel	**40**

Output Signal

TABLE 9

Note: Please refer to APPROVALS page for marking & protection.

	Code
4 to 20mA (Weatherproof or Hazardous Area with ATEX marking)	**O**
4 to 20mA (Hazardous Area with IECEx marking)	**6**
4 to 20mA (Hazardous Area with UKEx marking)	**7**

Special Engineering

TABLE 10

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

	Code
Please consult Delta Mobrey sales engineering for special requirements	**TBA**

Application & Construction

The SMART Pressure Transmitters are suitable for the measurement of pressure, under pressure, and absolute pressure of gases, vapours and liquids. The active sensing element is a piezoresistive silicon sensor separated from the medium by a diaphragm and by a specifically selected type of manometric liquid. 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, rotation of the casing by 0-340° relative to the sensor, and a choice of cable direction.

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

Communication with the transmitter is carried out with:

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

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

Installation

The transmitter can be installed directly on the installation. A universal mounting bracket is provided to transmitter fitting on 2" pipe. When the pressure of steam or other hot media is measured, a siphon or impulse line should be used. The needle valve placed upstream the transmitter simplifies installation process and enables the zero point adjustment or the transmitter replacement When the special process connections are required for the measurement of levels and pressures (e.g. at food and chemical industries), the transmitter is provided with a diaphragm seal. The transmitter's electrical connections should be performed with twisted cable. The place for the communicator should be assigned before the communicator installation.

Technical Data

Metrological Parameters

Accuracy ≤ ±0 .075% of the calibrated range (≤±0.1% for range B1)
Special version: ≤±0.05% of the calibrated range (≤0.04% on request)

Long-term stability ≤ accuracy for 3 years
(for the nominal measuring range) or ≤2 x accuracy for 5 year
Version 2 (range F1,F0,E2,C5,E1,C4,D4,C1,C0,D3,D1,C3,D0) :
≤ accuracy for 6 years
or ≤2 x accuracy for 5 years

Thermal error < ±0.05% (FSO) / 10°C
(0.1% for ranges A0, A1, A2, B1)
max. ±0.25% (FSO) in the whole compensation range

Thermal compensation range -25...80°C
-40 ...80°C – special version

Response time 16...480ms(programmable)
Ex d version: 150ms

Additional electronic damping 0...60 s

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

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

Resistance required for communication 240Ω min.

Electrical parameters

Power supply:
10...55 VDC / Exia:10.5...30 VDC / Exd:10.5...45 VDC
SIL2: 15...45 VDC / SIL2 Exia: 16...28 VDC

Output signal 4...20 mA, two wire transmission
Special Version: 0...20 / 0...5 / 4...20 [mA]
Hart Version (SIL is only 5) Ver. 5 as standard (Ver.7 on request)

Operating conditions

Operating temperature range (ambient temp.) -40...85° C
Ex i version -40…80 °C
Ex d version -40…75 °C

Process medium temperature range
-40...120 °C
over 120 °C –measurement with the use of impulse line or diaphragm seals

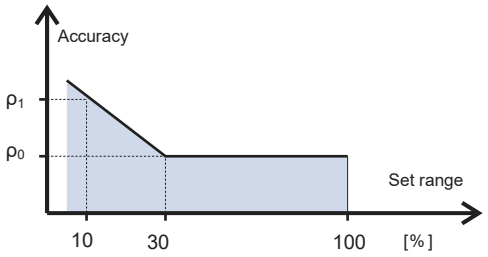
CAUTION: the medium must not be allowed to freeze in the impulse line or close to the process connection of the transmitter

Materials

Wetted parts and Diaphragms 316LSS, Hastelloy C 276, Au

Casing Aluminium, 316SS

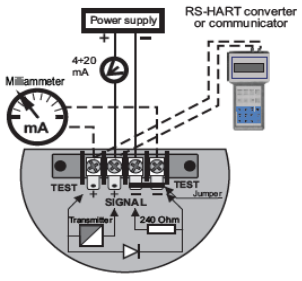
Accuracy depending on the set range



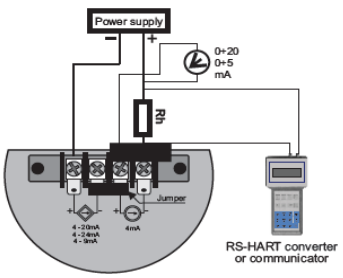
ρ_0 – error for range 30...100% FSO
ρ_1 – error for range 10% FSO
$\rho_1 = 2 \times \rho_0$
Numerical error values are given in the technical data under metrological parameters

Electrical diagrams

Electrical diagrams for transmitters with HART protocol



Version with output signal: 4-20mA



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

D-Series
Model: D21

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

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

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

Functional Safety Certified
Meets the requirements of IEC 61508: 2010 part 1-7 ; IEC 61511-1:2016+IEC 61511-1:2016/AMD1:2017
IEC 62061:2005 + IEC 62061:2005/AMD1:2012 + IEC 62061:2005/AMD2:2015 for use in safety related systems.
Systematic capability: SC 3;
SIL2 @ HFT 0; Route 1_H
SIL3 @ HFT 1; Route 1_H
Certificate No. UDT-CERT No.1005/CW/001

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

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 7 (refer Table 1)
II 1/2G Ex ia IIC T4/T5 Ga/Gb
II 1D Ex ia IIIC T105°C Da

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

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)
II 2G Ex ia/db IIC T6/T5 Gb
II 2D Ex ia/tb IIIC T105°C 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.: **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 8 (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 9 (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

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 201/68/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 4 SIL version (refer Table 1)
I M1 Ex ia I Ma
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 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

FLAMEPROOF:

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

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)
II 2G Ex ia/db IIC T6/T5 Gb
II 2D Ex ia/tb IIIC T105°C 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

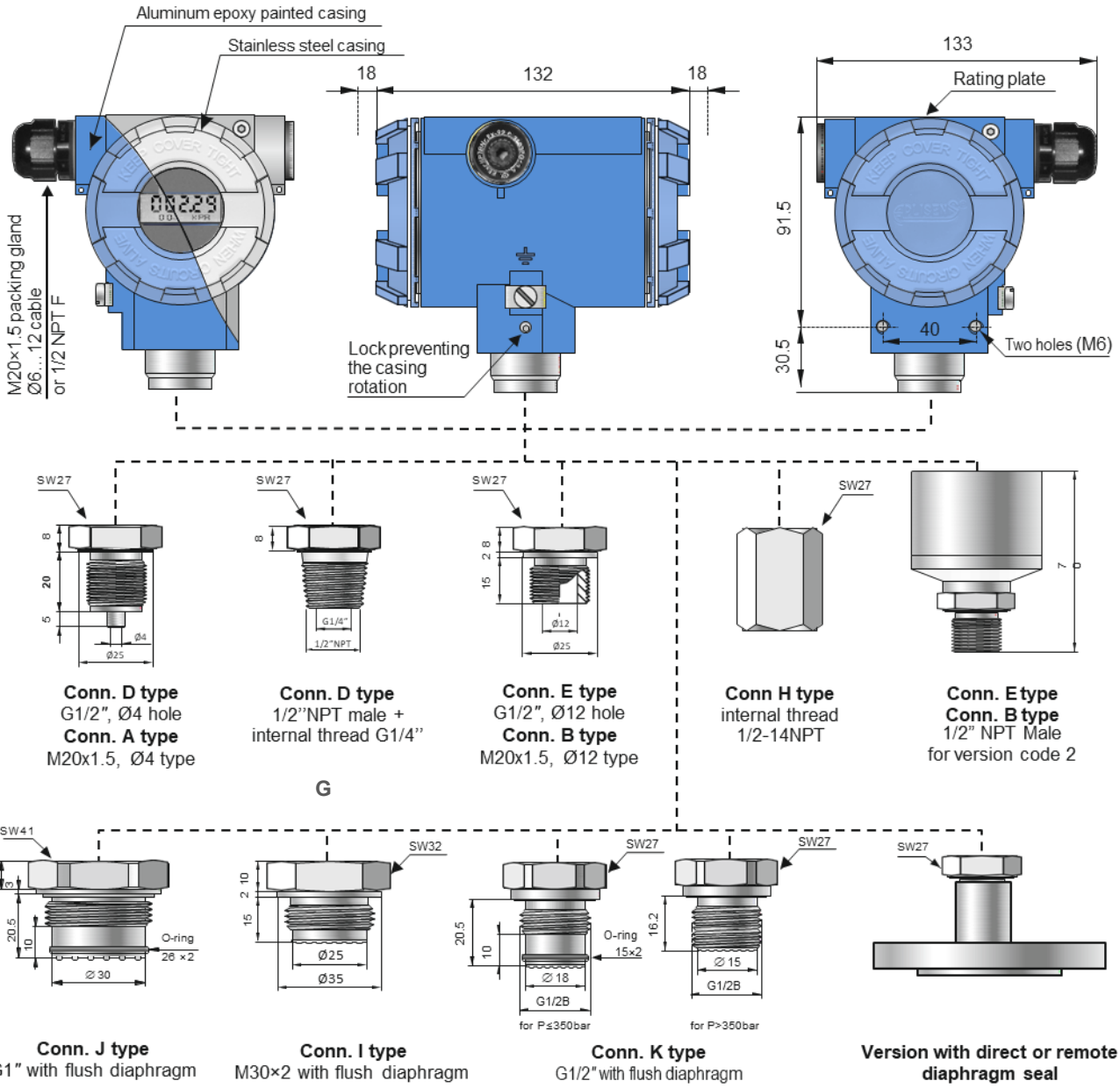
Enclosure code 2 (refer Table 1)
II 1/2G Ex ia/db IIC T6/T5 Ga/Gb
II 1/2D Ex ia/tb IIIC T105°C Da/Db
or

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

Dimensions

Figure 1
(All dimensions in mm)



Conn. D type
G1/2", Ø4 hole
Conn. A type
M20x1.5, Ø4 type

Conn. D type
1/2"NPT male +
internal thread G1/4"

Conn. E type
G1/2", Ø12 hole
Conn. B type
M20x1.5, Ø12 type

Conn H type
internal thread
1/2-14NPT

Conn. E type
Conn. B type
1/2" NPT Male
for version code 2

G

Conn. J type
G1" with flush diaphragm

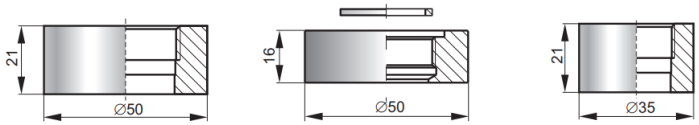
Conn. I type
M30×2 with flush diaphragm

Conn. K type
G1/2" with flush diaphragm

Version with direct or remote diaphragm seal

Socket for flush diaphragm process connection (supplied on request)

*Part **37003867** (1"GM-"J") - Part **37003868** (M30x1.5-"I") - Part. **37003869** (1/2" GM-"K")*



WEIGHT

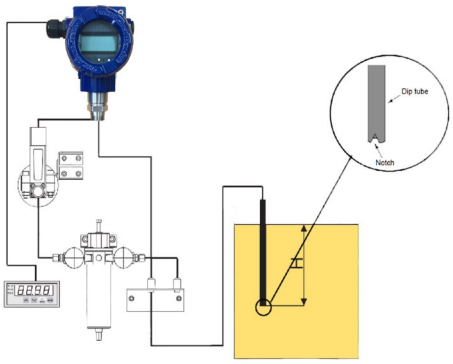
Model	Weight
D21 / Connection G1/2"	0.46 kg

Technical **Datasheet**

Bubble System

Bubble Type Level Measurement System

Models: D21/D31 Transmitters



Key **Features**

- A simple, accurate and low cost installation
- For use in open or closed tanks
- Suitable for highly corrosive process fluid
- Allows for remote installation of the electronic system with only the tube in contact with the process
- Can be used with air or any inert gas compatible with the process

Series Overview

Our D Series pressure and differential pressure transmitters can be used for the measurement of liquid level in a Bubble Type System. We can customise an installation to your specific requirements, down to the type of liquid. The system can also be designed to measure the weight level in both open and closed tanks & channels. The working medium is normally air or inert gas compatible with the liquid measured.

The gas supply system can either be air with its own compressor, adapted to be fed with an existing mains pneumatic system (compressed air distribution system). Or alternatively fed with inert gas coming from a cylinders system, depending on the type of liquid measured. In addition to the transmitters we can also provide other Bubble Type System components or even the whole system.

Others products include:

- D21 SMART HART Pressure Transmitter with display
- DMSP900/400 Ultrasonic Level Transmitter
- D31 SMART HART Differential Pressure Transmitter

Product **applications**

The Bubble Type Level Measurement System is suitable for a wide range of applications including:

- Chemical
- Petrochemical
- Food industry
- Pharmaceutical
- Water treatment

Using this system ensures:

- An accurate level measurement for aggressive, corrosive media
- Suitable for use in corrosive atmospheres
- Resistant to chemical attack

D-Series Bubble System
Models: D21/D31 Transmitters

How it works

The Bubble system is based on the principle of measuring pressure to allow a constant air flow inside a probe tube, by opening the bottom of the tube immersed in liquid at a higher pressure than the maximum liquid level.

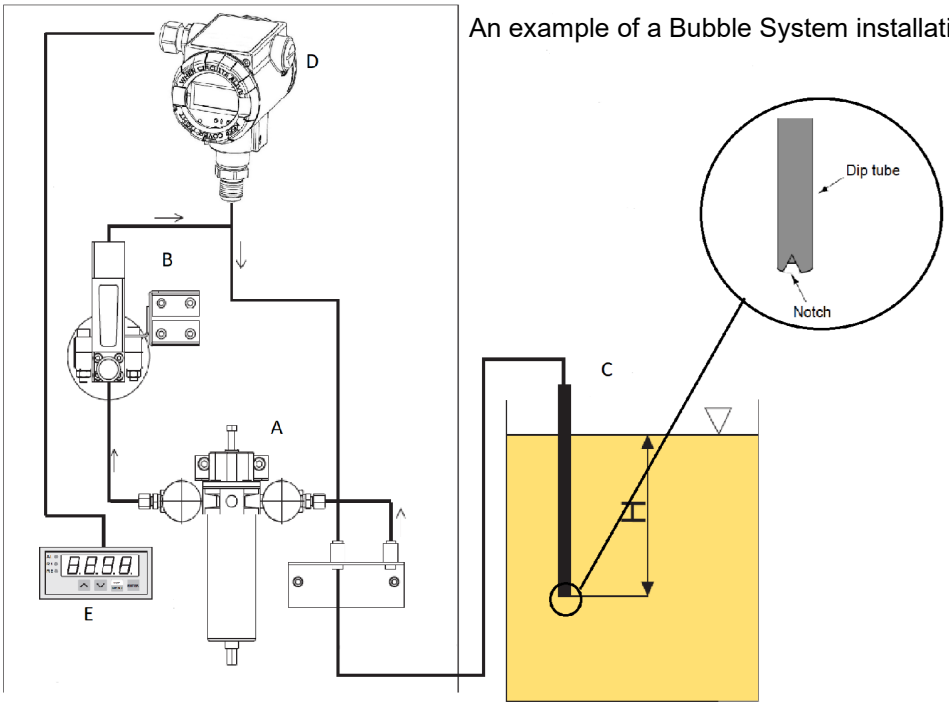
As the liquid level in the tank varies, the back pressure exerted on the air leaving the tube also varies; these variations are detected precisely by the pressure transmitter giving a signal output 4...20mA proportional to the liquid level. A flow regulator keeps the bubbling air flow constant for any level value, ensuring highly reliable and accurate measurement.

System Components

The basic system for an open tank:

A. An air supply system to generate a flow of dry and filtered air flow
B. A rotameter with a flow regulator system to supply a constant flow rate of gas
C. The straight tubing system inserted inside the tank up to the desired measuring height
D. The pressure instrument to measure the increase of pressure in the system necessary to mantain a constant flow rate of air. This signal is directly proportional to the level of fluid in the tank
⇒ For level measurement in an open atmosphere tank, use a D21 Pressure Transmitter
⇒ For level measurement in a pressurised tank, use a D31 Differential Pressure Transmitter
E. A digital electronic display with a 24Vdc power supply for the field mount indicating the liquid level

Other configurations can be customised according to your requirements for the installation.



An example of a Bubble System installation

How to order

Please contact our Sales and Engineering department to discuss your requirements further.

Алматы (7273)495-231
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Курган (3522)50-90-47
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Ноябрьск (3496)41-32-12
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Саранск (8342)22-96-24
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35
Тольятти (8482)63-91-07
Томск (3822)98-41-53
Тула (4872)33-79-87
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Улан-Удэ (3012)59-97-51
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Чебоксары (8352)28-53-07
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Чита (3022)38-34-83
Якутск (4112)23-90-97
Ярославль (4852)69-52-93

Россия +7(495)268-04-70 **Казахстан** +7(7172)727-132 **Киргизия** +996(312)96-26-47

www.delta-mobrey.nt-rt.ru | | dye@nt-rt.ru