

Technical Datasheet



D Series SMART Compact Differential Pressure Transmitter

Model: D33



Key Features

- Accuracy $\pm 0.1\%$.
- 4-20mA + Hart output signal.
- Static pressure limit up to 413 bar.
- Gold plated diaphragm option.
- Hastelloy C276 wetted parts option.
- ATEX certified (both protection mode: Intrinsic Safety & Flameproof)
- IECEx Certified Flameproof only (Intrinsic Safety is coming soon)
- Gold plated diaphragm.

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:

- D32 Analogue Differential Pressure Transmitter
- D31 SMART HART Differential Pressure Transmitter with display
- D45 SMART HART Level Transmitter



Product applications

The D33 D-Series is suitable for a wide range of applications for measuring:

- Differential Pressure
- Level
- Flow

The choice of models available ensures that the D33 D-Series is suitable for use in:

- Corrosive atmospheres
- Resistant to chemical attack
- Hydrogen

How can we help you?

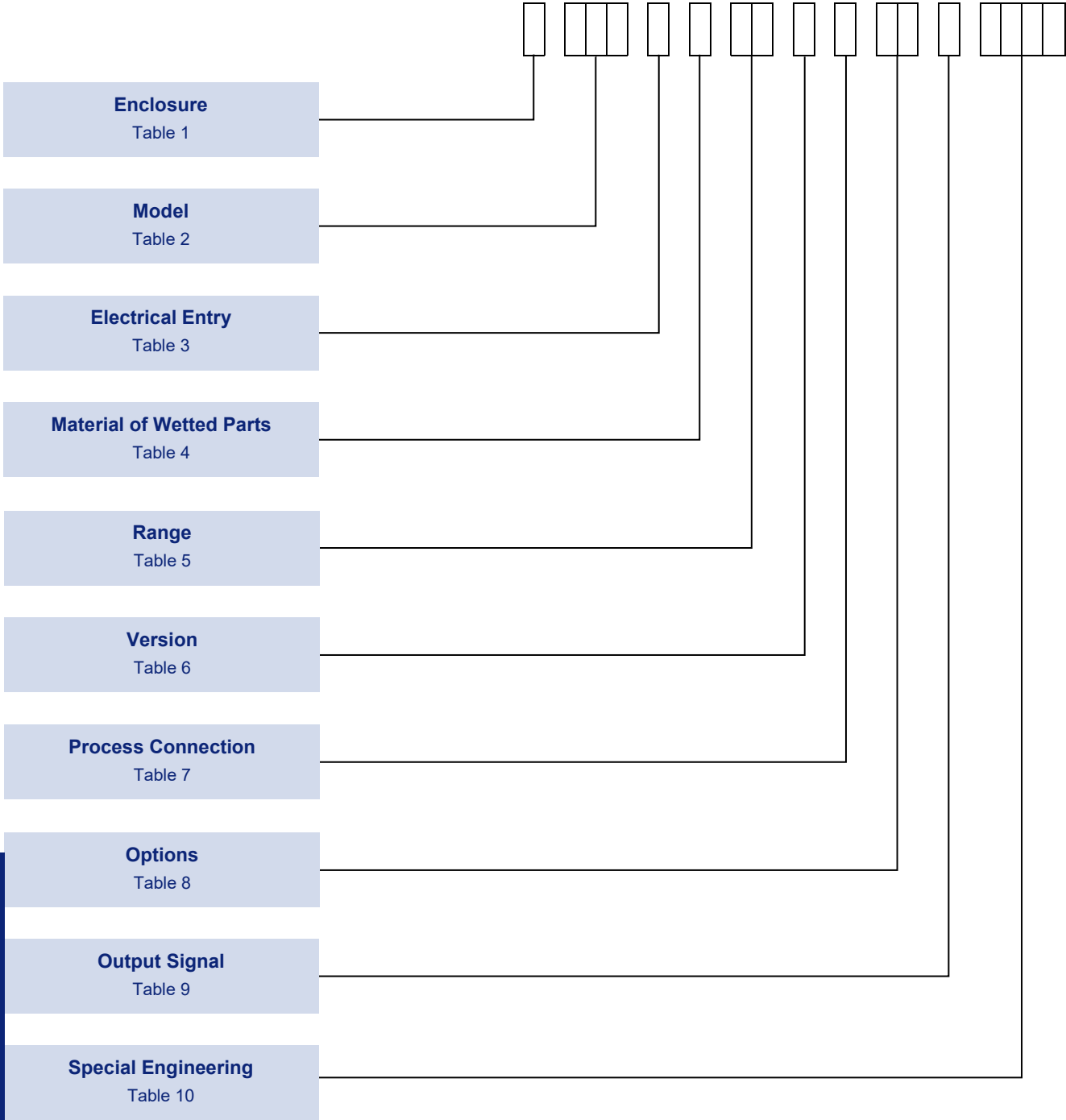
Delta Mobrey offers fast, efficient and knowledgeable support when and where you need it. Please visit our website at www.delta-mobrey.com to find your local support centre or call us on:

+44 (0) 1252 729140

D-Series
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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 these codes please contact your local sales office.

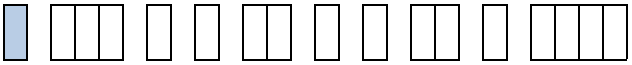
Enclosure

NOTE 1:

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

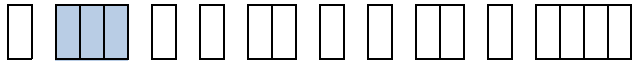
NOTE 2:

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

TABLE 1 

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 25 bar. Overpressure limit up to 413 bar. Refer Table 5.	D33

Electrical Entry

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 7


Available on Enclosure code Q & S only.

NOTE: Code 8

Available on Enclosure code Q, S & Z only.

NOTE: Code A & B

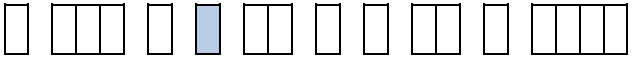
Available on Enclosure code Z only.
Refer Table 1 for Enclosure

TABLE 3 

	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
SG type connection, cable 3m length	7
SGM type connection, cable 3m length	8
FL type connection, thread 1/2" NPTM & cable 2m length (for Ex d only)	A
SGM type connection, thread 1/2"NPT Male& cable 3m length (for Ex d only)	B


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Material of Wetted Parts

TABLE 4 

	Code
Stainless Steel 316L diaphragm and process connection	A
Hastelloy C276 diaphragm and Stainless Steel 316L process connection (See Note 1)	D
Stainless Steel 316L diaphragm. Other wetted parts in stainless steel 316L. FPM Viton gasket.	E
Hastelloy C276 diaphragm. Other wetted parts in stainless steel 316L. FPM Viton gasket.	F
Gold plated diaphragm. Other wetted parts in stainless steel 316L. FPM Viton gasket.	G
Stainless Steel 316L diaphragm. Other wetted parts in stainless steel 316L. NBR gasket (for oxygen service)	H
Hastelloy C276 diaphragm. Other wetted parts in stainless steel 316L. NBR gasket (for oxygen service)	I
Gold plated diaphragm. Other wetted parts in stainless steel 316L. NBR gasket (for oxygen service)	J
Stainless Steel 316L diaphragm. Other wetted parts in stainless steel 316L. PTFE gasket.	K
Hastelloy C276 diaphragm. Other wetted parts in stainless steel 316L. PTFE gasket.	L
Gold plated diaphragm. Other wetted parts in stainless steel 316L. PTFE gasket.	M

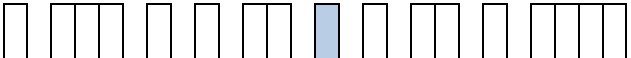
Range

TABLE 5 

Code	Nominal measuring range (FSO)		Minimum set range		Rangeability	Overpressure limit/ Static pressure limit
A1	-25...25 mbar *	(-2,5..2.5 kPa)	2 mbar	(0,2 kPa)	25:1	C type: 20 bar
A0	-100...100 mbar	(-10...10 kPa)	10 mbar	(1 kPa)	20:1	C-type : 250 / 320 / 413 bar PN-Type : 40bar (70bar for range E2)
B0	-5...70 mbar	(-0.05...7 kPa)	4 mbar	(0.4 kPa)	18:1	
C3	-0,5...0,5 bar	(-50...50 kPa)	0.1 bar	(10 kPa)	10:1	
D0	0...0,25 bar	(0...25 kPa)	10 mbar	(1 kPa)	25:1	
D1	0...1 bar	(0...100 kPa)	50 mbar	(5 kPa)	20:1	
D2	0...2.5 bar	(0...250 kPa)	0.2 bar	(20 kPa)	12.5:1	
E0	0...16 bar	(0...1,6 MPa)	1.6 bar	(160 kPa)	10:1	
E2	0...70bar	(0...7MPa)	7 bar	(700 kPa)	10:1	

*only for transmitters without diaphragm seal.

Version

TABLE 6 

	Code
Applies when no option is required.	0
For oxygen service (sensor filled with Fluorolube fluid)	4
Static Pressure 320 bar (C-type only)	7
Static Pressure 413 bar (C-type only)	8

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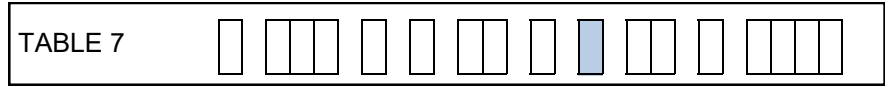
Process Connection

NOTE: Codes C & D

Available with NACE MR-01-75 certificate

Note: Codes C

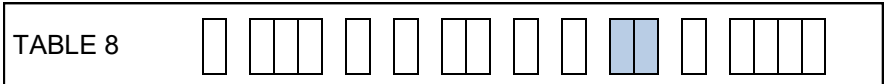
With M10 threaded holes according to DIN19213, Pmax is 250bar



	Code
G 1/2" (male)	Y
1/4" NPT Female	Q
1/4" NPT Female on the cover flanges. Cover flanges material SS316L. Allows mounting with valve manifold (C type)	C
C type process connection rotated 90°	M
1/2" NPT Female via adaptor on the cover flanges for C type process connection. Material AISI316	N
Connection for fitting diaphragm seal (GP/PN)	9
1/4" NPT Female on the cover flanges. Cover flanges material SS316L. Allows mounting with 7/16-20 UNF threaded holes according to IEC61518	D
D type process connection rotated 90°	R

Options

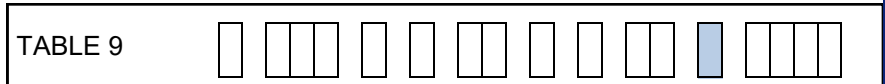
Combination of more than one option is available.



	Code
Applies when no option is required	0
Stainless Steel Tag plate mounted on wire	3
Mounting bracket for 2" pipe (only version with C-type process connection), zinc steel	5
Mounting bracket for 2" pipe (only version with C-type process connection), stainless steel	6
Mounting bracket for 2" pipe (only version with process connection Code P & Q), stainless steel	7
Adapter for differential pressure transmitters with C-type process connection, output thread 1/2NPT Female in SS316L	8
Connector to weld impulse pipes Ø12 and Ø14 mm, material 15HM (only version with C-type process connection)	C
Connector to weld impulse pipes Ø12 and Ø14 mm, material 15HM(SO) or SS316(S) (only version with process connection Code P & Q)	D

Output Signal

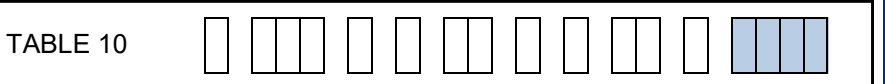
Note: For the constructions certified for Hazardous area, the instruments are supplied as standard with ATEX marking on the label. The instrument will be supplied with nameplate marked according to the selected code on Table 9,



	Code
4 to 20mA (Weatherproof or Hazardous Area with ATEX marking)	0
4 to 20mA (Hazardous Area with IECEx marking)	6

Special Engineering

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



	Code
Please consult Delta Mobrey sales engineering for special requirements	TBA

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Application & Construction

The D33 SMART Compact Differential Pressure Transmitters are suitable for measuring the differential 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 simple construction of the instrument allows the full features offered by any SMART Hart type.

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

(*) .eddl file available at 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

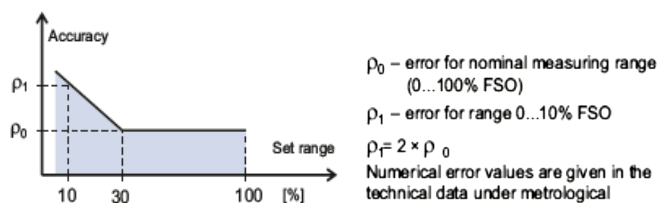
Installation

The transmitter is not heavy, so it can be installed 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 is placed upstream and the transmitter simplifies the installation process and enables the zero point adjustment or the transmitter replacement. The transmitter's electrical connections should be performed with a twisted cable. The place for the communicator should be assigned before the communicators installation.

Technical Data

Metrological parameters

Accuracy $\leq \pm 0.1\%$ of calibrated range



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
Hart Version	Ver. 5 as standard
Load resistance	$R [\Omega] \leq \frac{U_{sup} [V] - 7.5V}{0.0225A}$
Resistance required for communication	min 240 Ω

Materials

Wetted parts:	Type P, PN process connection: 316Lss Type P(H) process connection: 316Lss or Hastelloy C276 Type C process connection: 316Lss
Diaphragms:	316Lss, Hastelloy C 276, Au
Casing :	304ss Option : 316ss

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

Thermal error $< \pm 0,08\%$ (FSO) / 10°C
max. $\pm 0,3\%$ (FSO) in the temperature range -25...80°C

Thermal compensation range -25...80°C

Response time 16..230ms (programmable)

Additional electronic damping 0...30 s

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

Operating conditions

Operating temperature range (ambient temp.) -25...85°C
Ex version -25...80°C

Medium temperature range -25...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.

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

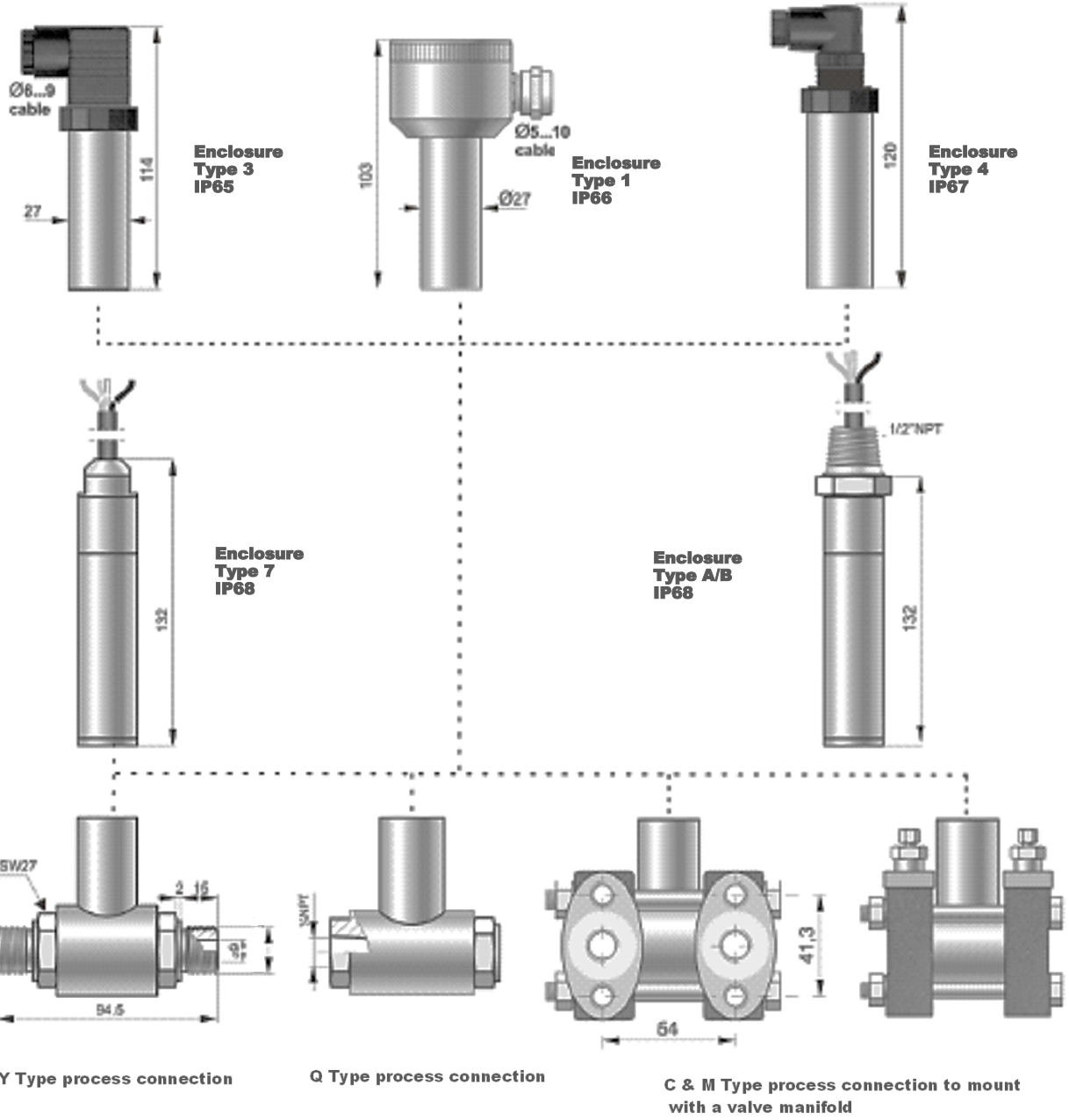
The following standards were applied: EN 61326-1:2013; EN61326-2-3:2013

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

Compliant to RoHS.

The following standard was applied: EN IEC 63000:2018

Dimensions



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