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

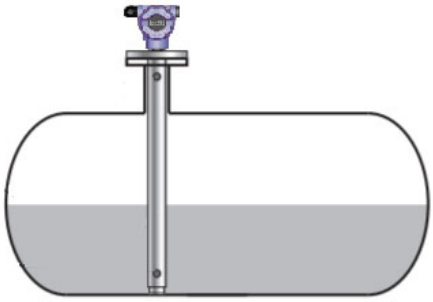
www.delta-mobrey.nt-rt.ru | | dye@nt-rt.ru

Технические характеристики на уровнемеры D45, буйковые уровнемеры MLT100, аналоговые погружные уровнемеры 9700, указатели уровня компании Delta Mobrey

Technical **Datasheet**

D Series
SMART Level probe for pressurised tanks

Model: D45



Key **Features**

- ATEX - Flameproof and Intrinsically Safe
  UKEx - Flameproof and Intrinsically Safe
  IECEx - Flameproof and Intrinsically Safe
- High accuracy ±0.16%
- Fully HART ® compatible
- 4-20mA analogue with digital communications
- Fully welded sensor guarantees tightness of oil systems for long term usage
- Programmable range, zero shift, characteristic and damping

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 Ultrasonic Level transmitters
- SMART Pressure Transmitter
- SMART Temperature Transmitter

Product **applications**

The D Series SMART Level Probe is a Differential Pressure transmitter suitable for measuring level in a pressurised tank:

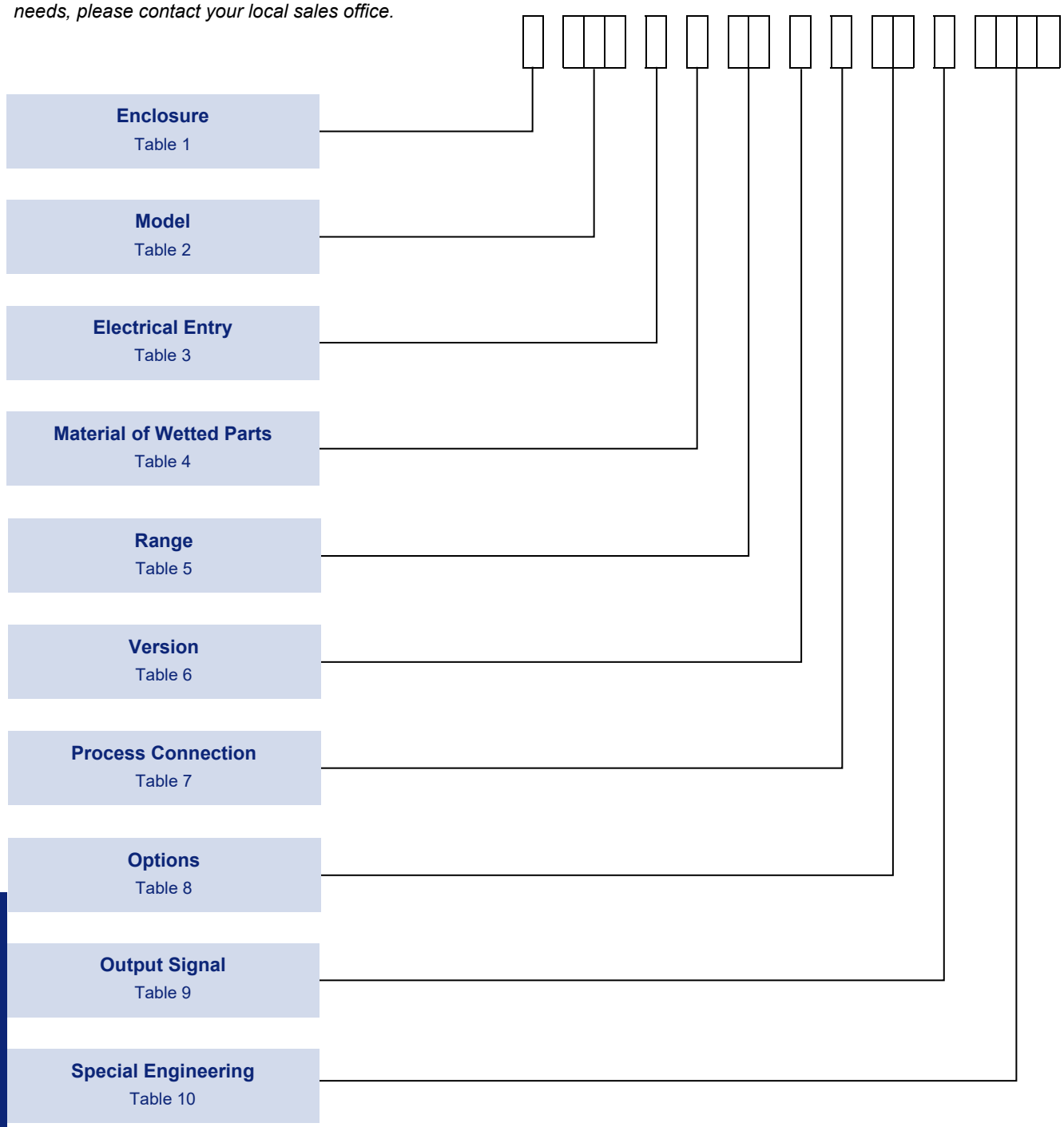
- Stainless Steel wetted parts
- Compact construction

The choice of models available ensures that the Delta Mobrey 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.*

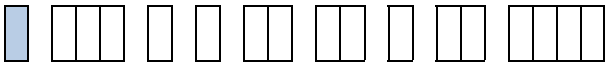
***NOTE 2:** The non-standard option code is shown by "X" in the part number. Should you require any clarification on this codes please contact your local sales office.*

***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



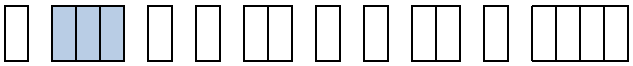
Refer to the 'Approvals' section for details about the certification on Flameproof & Intrinsically Safe models .

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

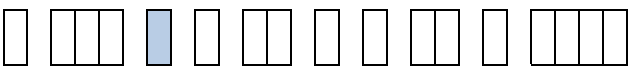
TABLE 2



	Code
SMART Level Probe for pressurised tanks For applications standard up to 16 bar (above, on request). Refer Table 5.	**D45**

Electrical Entry

TABLE 3



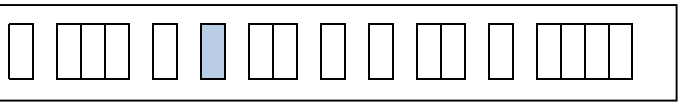
NOTE: Code 0
Available on Enclosure code H & R as standard.

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

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

Material of Wetted Parts

TABLE 4

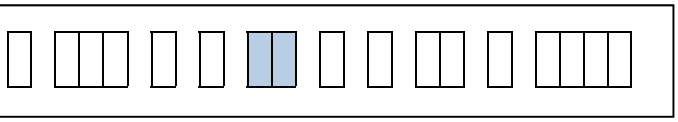


Note : Material of wetted parts are available in Stainless Steel and Aluminium. It will be defined in the last 4 digit of the part, the Special Engineering code.

	Code
Not applicable. **(SEE NOTE 1)**	**X**

Range

TABLE 5

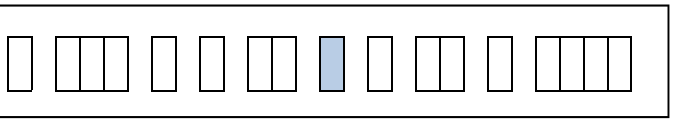


Code	Nominal measuring range (FSO)		Minimum set range	Accuracy for nominal measuring range
XX	0...6000 mmH_2O	(0...60 kPa)	600 mm H_2O	± 0.16%
XX	0...1600 mmH_2O	(0...16 kPa)	160 mm H_2O	± 0.2%

NOTE:
Measuring range is XX because it is specified in the last 4 digit of the part number, as part of the full configuration of the instrument together with the length of the protection tube

Version

TABLE 6



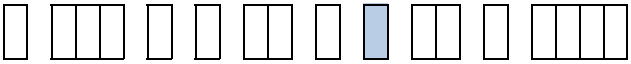
A combination of more than one option is available.

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

	Code
Applies when no option is required	**0**
Surge arrester for Ex ia version	**1**
Protection class IP67	**6**

Process Connection

TABLE 7



NOTE 1:
Process connection will be defined in the last 4 digit of the part, the Special Engineering code

	Code
Process connection size and rating. **(SEE NOTE 1)**	**X**

Options

A combination of more than one option is available (i.e. Code 23 - combination of code 20 & 30)

TABLE 8

	Code
Applies when no option is required	**00**
Stainless Steel rating label riveted to the housing	**20**
Stainless Steel Tag plate mounted on wire	**30**
Stainless Steel plate riveted to the housing. Stainless Steel tag plate mounted on wire.	**A0**

Output Signal

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

TABLE 9

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

Special Engineering

Last 4 digits of model code identify the construction as below. Each single construction will require a specific part number, identifying the length of the protection tube.

Please specify the requirement of the application

1. Range and calibration required
2. Length of the protection tube.
3. Material of the wetted parts

TABLE 10

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

Application & Construction

The level measurement is carried out using a differential pressure transmitter, enabling the compensation for static pressure or vacuum in the tank. The value processed is just the hydrostatic pressure of the medium measured at the level of the lower diaphragm connected to “H” side of the instrument. This pressure is the sum of the hydrostatic pressure of the liquid and the vapour pressure phases of the medium. In most practical applications the density of the vapour phase of the medium is negligibly small and therefore the measured hydrostatic pressure relates only to the height of the liquid phase For media where the density of the vapour phase is significant (e.g. propane), the level measured can be treated as the theoretical level of the liquid level obtained by adding the actual liquid phase to the condensed vapour phase..

Configuration

The settings of the following metrological parameters can be changed:

- The units of pressure in which the range is configured
- Start and end points of the range, time constant
- Inverted characteristics (output signal 20 to 4 mA)

Communication

The transmitter is configured and calibrated using a D-COMM communicator, some other communications (HART) or a PC using and HART/USB converted and D-Soft configuration software.

The data interchange with the transmitters enables the users the transmitter identification, as well as reading of the currently measured differential pressure value, output current and percent of range width.

Technical Data

Metrological parameters

Range od medium density up to 1.1g/cm^3 Standard constr.) .
over 1.1g/cm^3 Special constr.)

Error due to ambient temperature changes < ±0,4% of basic range for temperatures of -25...+80°C

Error due to supply voltage changes < ±0,002% of basic range / V

Zero shift error for static pressure 0,08% / 10 bar for lower range
0,1% / 10 bar for range no. 2

Electrical Parameters

As given in the datasheet of D31 SMART Differential Pressure Transmitter.

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

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 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

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 folloing stabdard 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

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

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

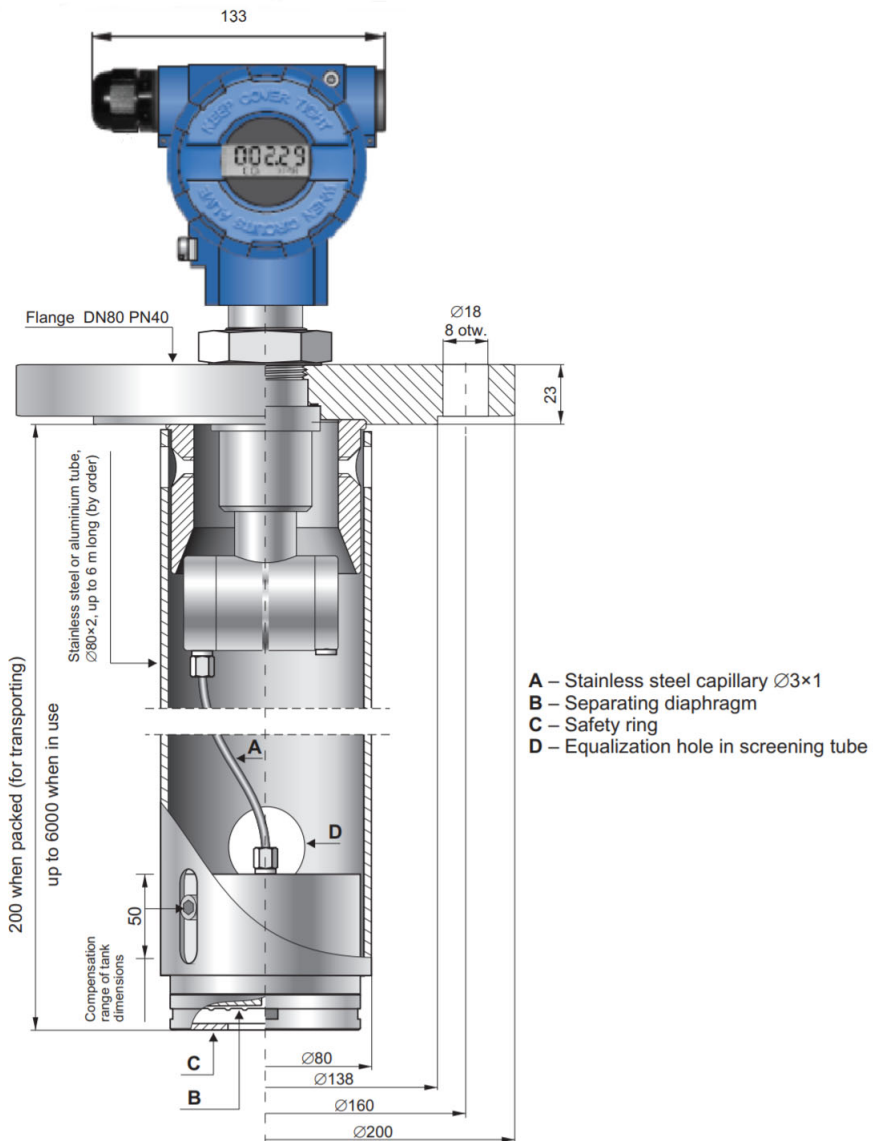
II 1/2G Ex ia IIC T5/T4 Ga/Gb
II 1D Ex ia IIIC T105°C Da

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

Installation

1. Installation of the instrument on pressurised tank



An example of configuration via Hand Held Communicator

To convert a rise in the level of liquid with **density 0.87** from **0 to 3200 mm** heigh to a current change from 4 to 20 mA. 1.
A) Install the transmitter in working position, place the seal at the appropriate height (tank empty).
B) Calculate the width of the measurement range in mmH_2O (4°C): 3200 mm × 0.87 g/cm = **2784 mmH_2O**.
C) Using the communicator, set the transmitter to use the units mmH_2O at 4°C.
D) To determine the start of the measurement range, read off via the communicator the hydrostatic pressure produced by the manometric fluid in the capillary (e.g. **-4250 mmH_2O**).
E) To determine the end-point of the measurement range, add the value **(-4250 mmH_2O**) and the width of the measurement range **(-4250 mmH_2O + 2784 mmH_2O= -1466 mmH_2O**) .
F) Using the communicator enter the calculated start **(-4250 mm**H_2O) and end-point (**-1466 mmH_2O**) of the measurement range and send as a block to the transmitter. After receiving these parameters the transmitter will perform measurements as required.

Technical **Datasheet**

delta-mobrey

9700 Series Analogue Transmitter
Submersible Hydrostatic Level Transmitters
Model: 9790 - Flange Mounted

Key **Features**

- Two-wire 24 Vdc loop-powered
- 4 to 20 mA
- Accuracy ± 0.1% of calibrated span
- Ranges up to 200 m / 656 ft. H20, and 10:1 rangeability
- Ceramic capacitive sensor
- Low maintenance
- Fully submersible IP68 / NEMA 6P
- Reverse polarity protection
- Dedicated marine version

Product **applications**

The 9790 Transmitter is suitable for a wide range of applications in:

- Water Treatment
- Power
- Marine Market

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

- Corrosive atmospheres
- Resistant to chemical attack

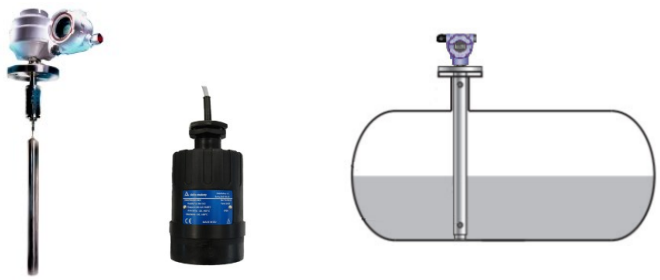
Series Overview

The 9700 Series range of tank level transmitters from Delta-Mobrey provide an accurate level measurement solution where in-tank problems such as foaming, vapor layers, and temperature gradients makes difficult the use of other instrumentation. Each transmitter version gives a high performance, has good long term stability, and is virtually maintenance free. Ceramic Capacitive Sensor (CCS) provides a “flush” diaphragm, avoiding the risks of sensor clogging. The sensor works like a capacitor with electrode surfaces on the inside comprising one measuring and one reference capacitor. The surfaces of the capacitors are gold-plated and linked to ASIC electronics. These electronics generate a signal proportional to the applied pressure, which is sent to the 4–20 mA signal conditioner

Other products

Other products we can offer:

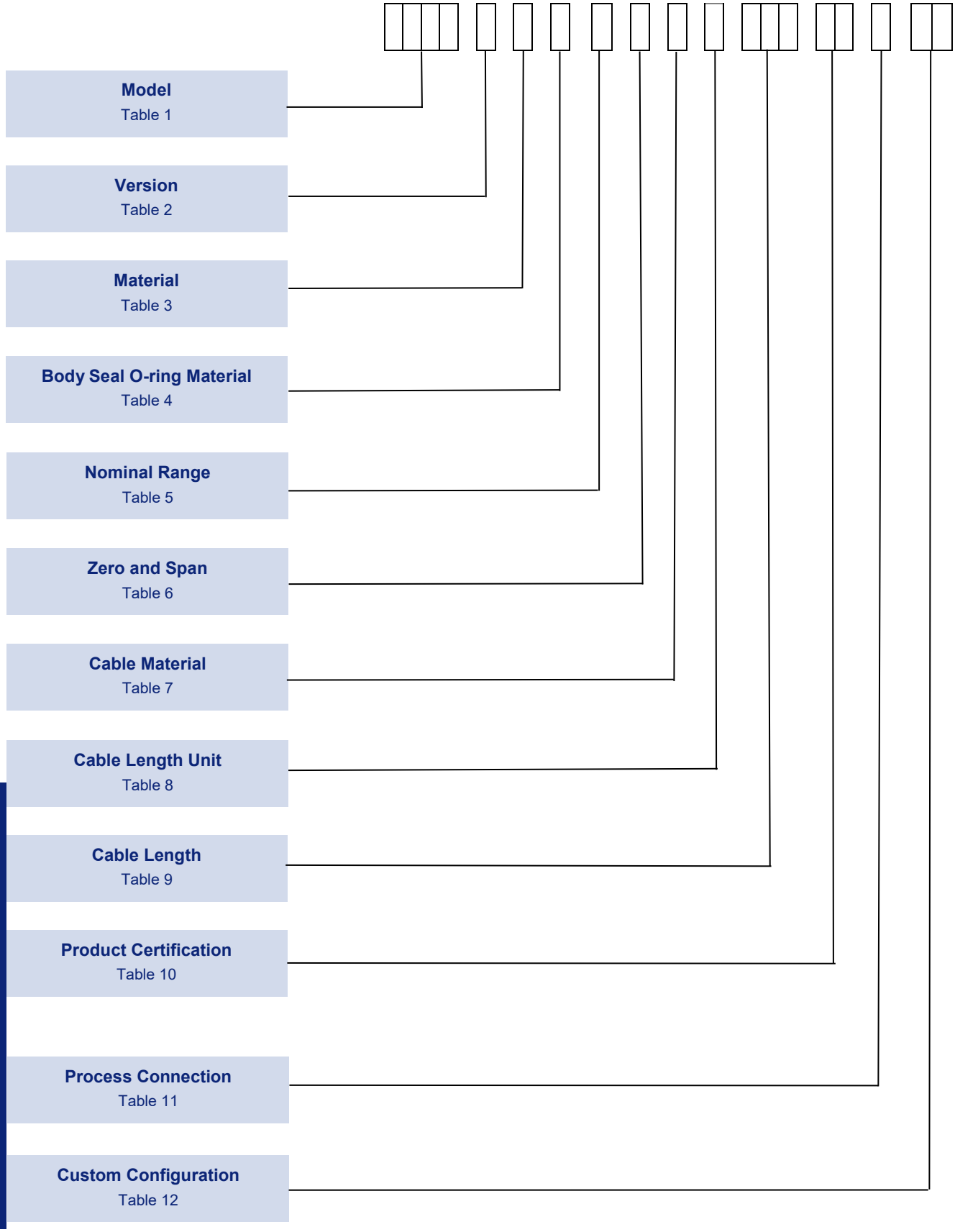
- MLT100 Smart Hart Displacer Level Transmitter
- DMSP900SH Hart Transmitters Ultrasonic Transmitters
- D45 SMART Level probe for pressurised tanks



9700-Series
Model: 9790

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.



Model

TABLE 1

	Code
Flange Mounted Submersible Hydrostatic Level Transmitter	9790

Version

TABLE 2

	Code
Commercial	C
Marine Approval	M

Material

TABLE 3

	Code
Stainless Steal 316	S
Aluminum Bronze	A

Note 1: purchaser's to verify the compatibility of material with process conditions (such as all chemical components, temperature, pressure, flow rate, abrasives, contaminants, etc.). Special construction to meet particular process conditions can be evaluated.

Note 2: The ceramic sensor is a "dry cell", meaning that no isolating diaphragm and fill fluid is needed. The process fluid acts directly onto the rugged, corro-

Body Seal O-ring Material

TABLE 4

	Code
Fluorocarbon (FPM/FKM)	1
Nitrile	2

Nominal Range

TABLE 5

Note: Pmax values are shown in PSI according to Intrinsically Safe CSA approved documentation. In brackets are shown the correspondent limit in ftH2O and mH2O.

	Code	Pmax in psi (*ft H20 / mH20*)
0 to 6.5 ft. (0 to 2 m) H20 depth	**A**	**14.2** (*32 / 10*)
0 to 16.4 ft. (0 to 5 m) H20 depth	**B**	**35.6** (*82 / 25*)
0 to 32.8 ft. (0 to 10 m) H20 depth	**C**	**71.1** (*164 / 50*)
0 to 65.6 ft. (0 to 20 m) H20 depth	**D**	**142.3** (*328 / 100*)
0 to 164 ft. (0 to 50 m) H20 depth	**E**	**142.3** (*328 / 100*)
0 to 328 ft. (0 to 100 m) H20 depth	**F**	**142.3** (*328 / 100*)
0 to 3.3 ft. (0 to 1 m) H20 depth	**G**	**7.1** (*16.4 / 5*)
0 to 11.5 ft. (0 to 3.5 m) H20 depth	**H**	**24.9** (*57.4 / 17.5*)

Zero and Span

TABLE 6

Note: the instrument is fixed range type. Any calibration within the measuring range to be specified at ordering stage.

	Code
Integral (fixed)	**1**

Cable Material

TABLE 7

Note: The glanding system used ensures absolute in-tegrity of the IP68 / NEMA 6P rating.
All cable used include venting capillary. For humid environments or sea water applications, bellows must be used (contact Delta Mobrey).

	Code
Polyurethane	**P**
Fluorinated ethylene-propylene (F.E.P)	**F**

Cable Length Unit

TABLE 8

	Code
English	**E**
Metric	**M**

Cable Length

TABLE 9

Length	Code	Unit
3 meters	003	**M**
5 meters	005	**M**
8 meters	008	**M**
10 meters	010	**M**
20 meters	020	**M**
30 meters / feet	030	**M / E**
40 meters	040	**M**
50 meters	050	**M**
60 meters	060	**M**
75 meters	075	**M**
100 meters	100	**M**
125 meters	125	**M**
150 meters / feet	150	**M/E**
200 meters	200	**M**
9 feet	009	**E**
15 feet	015	**E**
24 feet	024	**E**
60 feet	060	**E**
90 feet	090	**E**
120 feet	120	**E**
225 feet	225	**E**
300 feet	300	**E**
375 feet	375	**E**
450 feet	450	**E**
600 feet	600	**E**

Product Certifications

TABLE 10

	Code
Non-certified (non-hazardous area use only)	**NA**
CSA (Canada and USA)	**A6**

Process Connection

TABLE 11

	Code
Slip-on flange, DN25 PN40 (DIN 2635)	**A**
Fixed flange, DN40 PN40 (DIN 2635)	**B**
Fixed flange, DN50 PN40 (DIN 2635)	**C**
Fixed flange, DN80 PN40 (DIN 2635)	**D**
Slip-on flange, 1-in. ASME B16.5 Class 150	**E**
Fixed flange, 2-in. ASME B16.5 Class 150	**F**
Fixed flange, 3-in. ASME B16.5 Class 150	**G**

Custom Configuration

TABLE 12

	Code
Custom configuration of actual range (customer to specify with order)	C1

Installation

The 9700 is available in both submersible versions and externally mounted (floodable) versions.
The housing contains the capacitive ceramic sensor and the electronics circuit board, all the components needed to produce an accurate and reliable measurement of the process. The glanding system used with the submersible versions ensures absolute integrity of the IP68 / NEMA 6P rating. IP68 / NEMA 6P units are generally factory fitted with the required length of vented cable fitted.

Technical Data

Metrological Parameters

Accuracy ±0.1% of calibrated span (includes effects of linearity, hysteresis and repeatability)

Stability ± 0.1% Upper Range Limit (URL) per 6 months

Temperature Effect ±0.015% Upper Range Limit (URL) per °C / °F (over ambient temp. range)

Response time ~60mS (~10mS with link1 removed) or a 63% response to pressure change and 150mS for a 90% response to pressure change

Load resistance

R = 50 x (supply voltage -10V) Ω $R\ [\Omega] \leq \frac{U_{sup}\ [V] - 10V}{0.0225A}$

Electrical parameters

Power supply 10-30V d.c.

Output signal Two-wire, 4-20mA

Materials

Wetted parts Sensor Ceramic

Sensor housing 316 Stainless steel, Aluminium bronze

Seal rings Fluorocarbon (FPM/FKM), Nitrile

Cable Polyurethane Fluorinated Ethylyene Polypropylene (FEP)

Ingress protection IP68 / NEMA 6P (200 m / 656 ft. H20)

Operating conditions

Operating temperature range (ambient temp.)

-20 to + 90°C (-20 to +80°C Ex ia)

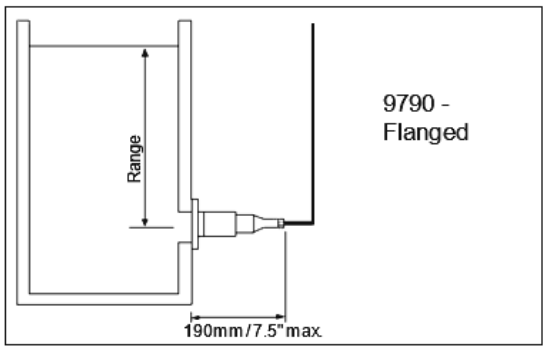
-Process medium temperature range
-20 to + 60 °C / -4 to +140 °F

Measuring range
Up to 200 m / 656 ft. H20

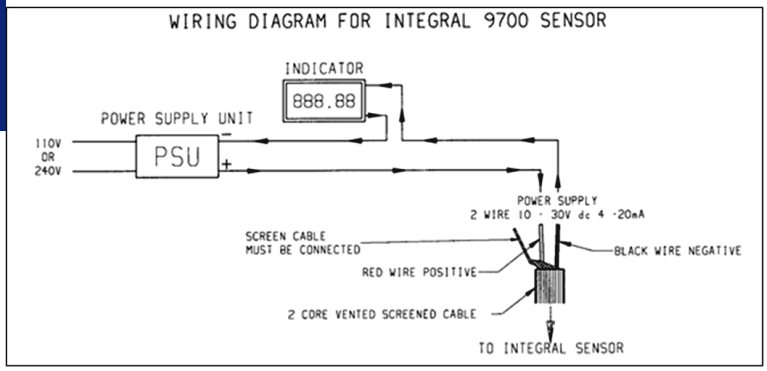
Overrange limit
See table 5

Span adjustment
+10 to +100% of Upper Range Limit (URL

Mounting Option



Electrical diagrams



9700-Series
Model: 9790

Approvals

NORTH AMERICA CERTIFICATION

Hazardous area certification (CSA Nr.176418)

C US

CSA (Canada and USA) CL I, Div 1, Groups C and D
CL II, Div 1, Groups E, F and G
CL III
Ex ia IIB T4
AEx ia IIB T4

EUROPEAN DIRECTIVE

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

Marine approvals

Lloyds Register	Certificate Nr. 98/00014
BV	Certificate Nr. 07173/E0 BV
DNV	Certificate Nr. TAA000002H

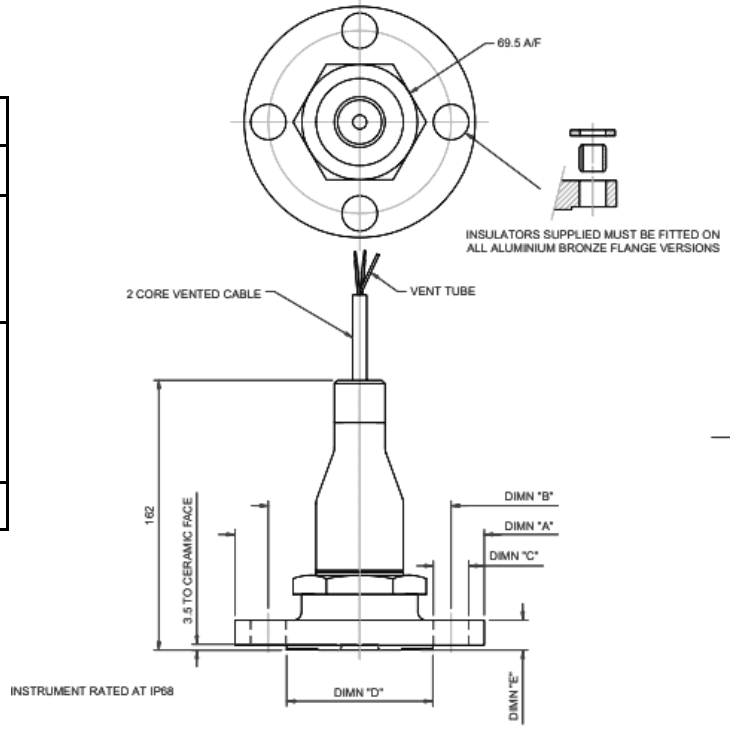
Dimensions

WEIGHT

Model	Weight
9710 (sensor only)	0.7 kg / 1.54 lbs
Bellows Enclosure Polyester (p/n 71411/773) IP67 Grey (RAL 7001)	1.2 kg
Enclosure Polyester (p/n 9710/077/01) Grey (RAL 7001)	0.7 kg
Vented Cable in air (water)	71 (16) kg/km

Total weight varies with different cable length

FLANGE TYPE	DIM'N A	DIM'N B	DIM'N C	DIM'N D	DIM'N E
DN40 PN40 DIN2635	Ø150.0	110.0 PCD	4 X Ø18.0	Ø88.0	18.0
DN50 PN40 DIN2635	Ø165.0	125.0 PCD	4 X Ø18.0	Ø102.0	20.0
DN80 PN40 DIN2635	Ø200.0	160.0 PCD	8 X Ø18.0	Ø138.0	24.0
2" ANSI B16.5 CLASS 150lb	Ø152.0	120.6 PCD	4 x Ø19.0	Ø92.0	19.0
3" ANSI B16.5 CLASS 150lb	Ø190.0	152.4 PCD	4 x Ø19.0	Ø127.0	24.0



Technical **Datasheet**

delta-mobrey

9700 Series Analogue Transmitter
Submersible Hydrostatic Level Transmitters
Model: 9780 - Pole mounted

Key **Features**

- Two-wire 24 Vdc loop-powered
- 4 to 20 mA
- Accuracy ± 0.1% of calibrated span
- Ranges up to 200 m / 656 ft. H20, and 10:1 rangeability
- Ceramic capacitive sensor
- Low maintenance
- Fully submersible IP68 / NEMA 6P
- Reverse polarity protection
- Dedicated marine version

Product **applications**

The 9780 Transmitter is suitable for a wide range of applications in:

- Water Treatment
- Power
- Marine Market

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

- Corrosive atmospheres
- Resistant to chemical attack

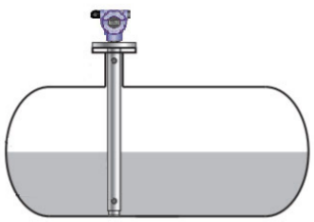
Series Overview

The 9700 Series of tank level transmitters from Delta Mobrey provide an accurate level measurement solution where in-tank problems such as foaming, vapor layers, and temperature gradients require managing. Each transmitter, within the range, delivers high performance, has long-term stability, and is virtually maintenance-free. Ceramic Capacitive Sensors (CCS) provide a “flush” diaphragm, which prevents the sensor from clogging, sustaining the level of accuracy. The sensor works like a capacitor with the electrode surfaces positioned inside, comprising of, one measuring and one reference capacitor. The surfaces of the capacitors are gold-plated and linked to ASIC electronics. These electronics generate a signal proportional to the applied pressure, which is sent to the 4–20 mA signal conditioner.

Other products

Other products we can offer:

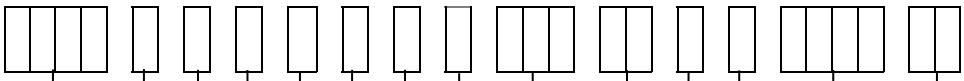
- MLT100 Smart Hart Displacer Level Transmitter
- DMSP900SH Hart Transmitters Ultrasonic Transmitters
- D45 SMART Level probe for pressurised tanks



9700-Series
Model: 9780

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.



Model
Table 1

Version
Table 2

Material
Table 3

Body Seal O-ring Material
Table 4

Nominal Range
Table 5

Zero and Span
Table 6

Cable Material
Table 7

Cable Length Unit
Table 8

Cable Length
Table 9

Product Certification
Table 10

Process Connection
Table 11

Overall Length Unit
Table 12

Overall Length
Table 13

Custom Configuration
Table 14

Model

TABLE 1

	Code
Pole Mounted Submersible Hydrostatic Level Transmitter	**9780**

Version

TABLE 2

	Code
Commercial	**C**
Marine Approval	**M**

Material

TABLE 3

	Code
Stainless Steal 316	**S**
Aluminum Bronze	**A**

Note 1: purchaser's to verify the compatibility of material with process conditions (such as all chemical components, temperature, pressure, flow rate, abrasives, contaminants, etc.). Special construction to meet particular process conditions can be evaluated.

Note 2: The ceramic sensor is a "dry cell", meaning that no isolating diaphragm and fill fluid is needed. The process fluid acts directly onto the rugged, corrosion resistant sensor.

Body Seal O-ring Material

TABLE 4

	Code
Fluorocarbon (FPM/FKM)	**1**
Nitrile	**2**

Nominal Range

TABLE 5

Note: Pmax values are shown in PSI according to Intrinsically Safe CSA approved documentation. In brackets are shown the correspondent limit in ftH2O and mH2O.

	Code	Pmax in psi (*ft H20 / mH20*)
0 to 6.5 ft. (0 to 2 m) H20 depth	**A**	**14.2** (*32 / 10*)
0 to 16.4 ft. (0 to 5 m) H20 depth	**B**	**35.6** (*82 / 25*)
0 to 32.8 ft. (0 to 10 m) H20 depth	**C**	**71.1** (*164 / 50*)
0 to 65.6 ft. (0 to 20 m) H20 depth	**D**	**142.3** (*328 / 100*)
0 to 164 ft. (0 to 50 m) H20 depth	**E**	**142.3** (*328 / 100*)
0 to 328 ft. (0 to 100 m) H20 depth	**F**	**142.3** (*328 / 100*)
0 to 3.3 ft. (0 to 1 m) H20 depth	**G**	**7.1** (*16.4 / 5*)
0 to 11.5 ft. (0 to 3.5 m) H20 depth	**H**	**24.9** (*57.4 / 17.5*)

Zero and Span

TABLE 6

	Code
Integral (fixed)	**1**

Note: the instrument is fixed range type. Any calibration within the measuring range to be specified at ordering stage.

Cable Material

TABLE 7

	Code
Polyurethane	**P**
Fluorinated ethylene-propylene (F.E.P)	**F**

Note: The glanding system used ensures absolute integrity of the IP68 / NEMA 6P rating.
All cable used include venting capillary. For humid environments or sea water applications, bellows must be used (contact Delta Mobrey for details).

Cable Length Unit

TABLE 8

	Code
English	**E**
Metric	**M**

Cable Length

TABLE 9

Length	Code	Unit
3 meters	003	**M**
5 meters	005	**M**
8 meters	008	**M**
10 meters	010	**M**
20 meters	020	**M**
30 meters / feet	030	**M / E**
40 meters	040	**M**
50 meters	050	**M**
60 meters	060	**M**
75 meters	075	**M**
100 meters	100	**M**
125 meters	125	**M**
150 meters / feet	150	**M/E**
200 meters	200	**M**
9 feet	009	**E**
15 feet	015	**E**
24 feet	024	**E**
60 feet	060	**E**
90 feet	090	**E**
120 feet	120	**E**
225 feet	225	**E**
300 feet	300	**E**
375 feet	375	**E**
450 feet	450	**E**
600 feet	600	**E**

Product Certifications

TABLE 10

	Code
Non-certified (non-hazardous area use only)	**NA**
CSA (Canada and USA)	**A6**

Process Connection

TABLE 11

	Code
Fixed flange, DN40 PN40 (DIN 2635)	**B**
Fixed flange, DN50 PN40 (DIN 2635)	**C**
Fixed flange, DN80 PN40 (DIN 2635)	**D**
Fixed flange, 2-in. ASME B16.5 Class 150	**F**
Fixed flange, 3-in. ASME B16.5 Class 150	**G**

Overall Length Units

TABLE 12

	Code
English	**E**
Metric	**M**

Overall Length

TABLE 13

	Code
mm or inches, depending on overall length units	**XXXX**

Custom Configuration

TABLE 14

	Code
Custom configuration of actual range (customer to specify with order)	**C1**

Approvals

NORTH AMERICA CERTICATION

Hazardous area certification (CSA Nr.176418)

CSA (Canada and USA) CL I, Div 1, Groups C and D
CL II, Div 1, Groups E, F and G
CL III
Ex ia IIB T4
AEx ia IIB T4

EUROPEAN DIRECTIVE

EMC Directive 2014/30/EU

Conformity assessment procedure: module A

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

Marine approvals

Lloyds Register	Certificate Nr. 98/00014
BV	Certificate Nr. 07173/E0 BV
DNV	Certificate Nr. TAA000002H

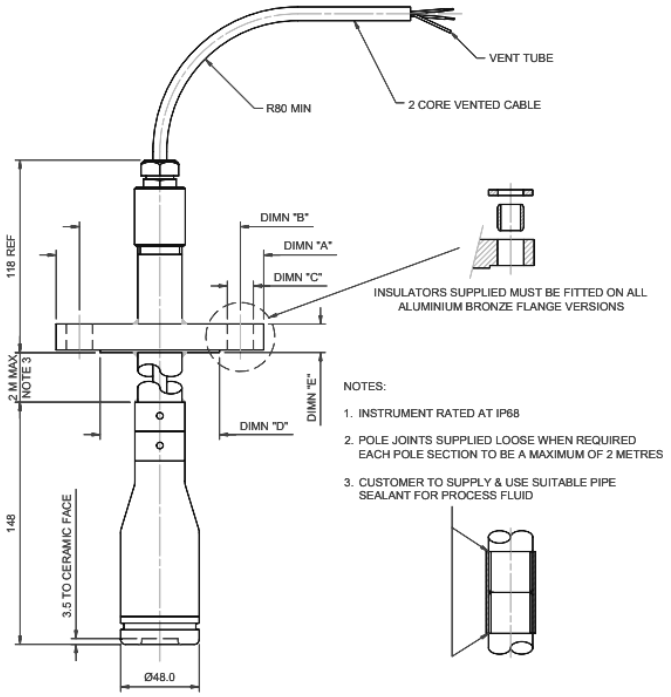
Dimensions

WEIGHT

Model	Weight
9710 (sensor only)	0.7 kg / 1.54 lbs
Bellows Enclosure Polyester (p/n 71411/773) IP67 Grey (RAL 7001)	1.2 kg
Enclosure Polyester (p/n 9710/077/01) Grey (RAL 7001)	0.7 kg
Vented Cable in air (water)	71 (16) kg/km

Total weight varies with different cable length

FLANGE TYPE	DIM'N A	DIM'N B	DIM'N C	DIM'N D	DIM'N E
DN40 PN40 DIN2635	Ø150.0	110.0 PCD	4 X Ø18.0	Ø88.0	18.0
DN50 PN40 DIN2635	Ø165.0	125.0 PCD	4 X Ø18.0	Ø102.0	20.0
DN80 PN40 DIN2635	Ø200.0	160.0 PCD	8 X Ø18.0	Ø138.0	24.0
2" ANSI B16.5 CLASS 150lb	Ø152.0	120.6 PCD	4 x Ø19.0	Ø92.0	19.0
3" ANSI B16.5 CLASS 150lb	Ø190.0	152.4 PCD	4 x Ø19.0	Ø127.0	24.0



Installation

The 9700 is available in both submersible versions and externally mounted (floodable) versions.
The housing contains the capacitive ceramic sensor and the electronics circuit board, all the components needed to produce an accurate and reliable measurement of the process. The glanding system used with the submersible versions ensures absolute integrity of the IP68 / NEMA 6P rating. IP68 / NEMA 6P units are generally factory fitted with the required length of vented cable fitted.

Technical Data

Metrological Parameters

Accuracy ±0.1% of calibrated span (includes effects of linearity, hysteresis and repeatability)

Stability ± 0.1% Upper Range Limit (URL) per 6 months

Temperature Effect ±0.015% Upper Range Limit (URL) per °C / °F (over ambient temp. range)

Response time ~60mS (~10mS with link1 removed) or a 63% response to pressure change and 150mS for a 90% response to pressure change

Load resistance

R = 50 x (supply voltage -10V) Ω

$$R\ [\Omega] \leq \frac{U_{sup}\ [V] - 10V}{0.0225A}$$

Electrical parameters

Power supply 10-30V d.c.

Output signal Two-wire, 4-20mA

Operating conditions

Operating temperature range (ambient temp.)

-20 to + 90°C (-20 to +80°C Ex ia)

-Process medium temperature range
-20 to + 60 °C / -4 to +140 °F

Measuring range
Up to 200 m / 656 ft. H20

Overrange limit
See table 5

Span adjustment
+10 to +100% of Upper Range Limit (URL

Materials

Wetted parts Sensor Ceramic

Sensor housing 316 Stainless steel, Aluminium bronze

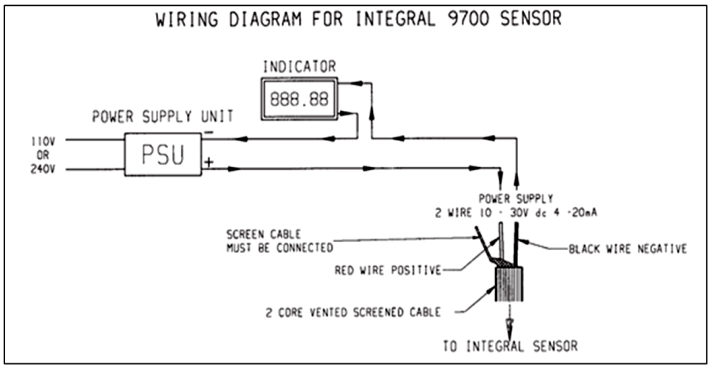
Seal rings Fluorocarbon (FPM/FKM), Nitrile

Cable Polyurethane Fluorinated Ethylene Polypropylene (FEP)

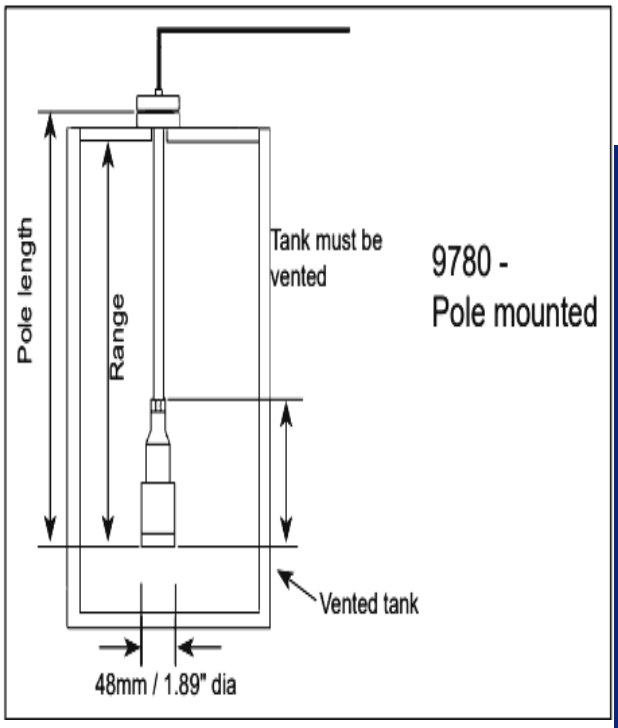
Pole 316 Stainless Steel pole supplied with 316 Stainless Steel Housing option Copper Nickel pole supplied Aluminium Bronze Housing option

Ingress protection IP68 / NEMA 6P (200 m / 656 ft. H20)

Electrical diagrams



Mounting Option



Technical **Datasheet**

delta-mobrey

9700 Series Analogue Transmitter
Submersible Hydrostatic Level Transmitters
Model: 9720 - Clamped, cable suspended

C US

Key **Features**

- Two-wire 24 Vdc loop-powered
- 4 to 20 mA
- Accuracy ± 0.1% of calibrated span
- Ranges up to 200 m / 656 ft. H20, and 10:1 rangeability
- Ceramic capacitive sensor
- Low maintenance
- Fully submersible IP68 / NEMA 6P
- Reverse polarity protection
- Dedicated marine version

Product **applications**

The 9720 Transmitter is suitable for a wide range of applications in:

- Water Treatment
- Power
- Marine Market

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

- Corrosive atmospheres
- Resistant to chemical attack

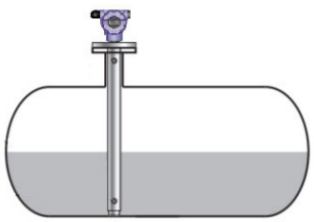
Series Overview

The 9700 Series range of tank level transmitters from Delta-Mobrey provide an accurate level measurement solution where in-tank problems such as foaming, vapor layers, and temperature gradients makes difficult the use of other instrumentation. Each transmitter version gives a high performance, has good long term stability, and is virtually maintenance free. Ceramic Capacitive Sensor (CCS) provides a “flush” diaphragm, avoiding the risks of sensor clogging. The sensor works like a capacitor with electrode surfaces on the inside comprising one measuring and one reference capacitor. The surfaces of the capacitors are gold-plated and linked to ASIC electronics. These electronics generate a signal proportional to the applied pressure, which is sent to the 4–20 mA signal conditioner

Other products

Other products we can offer:

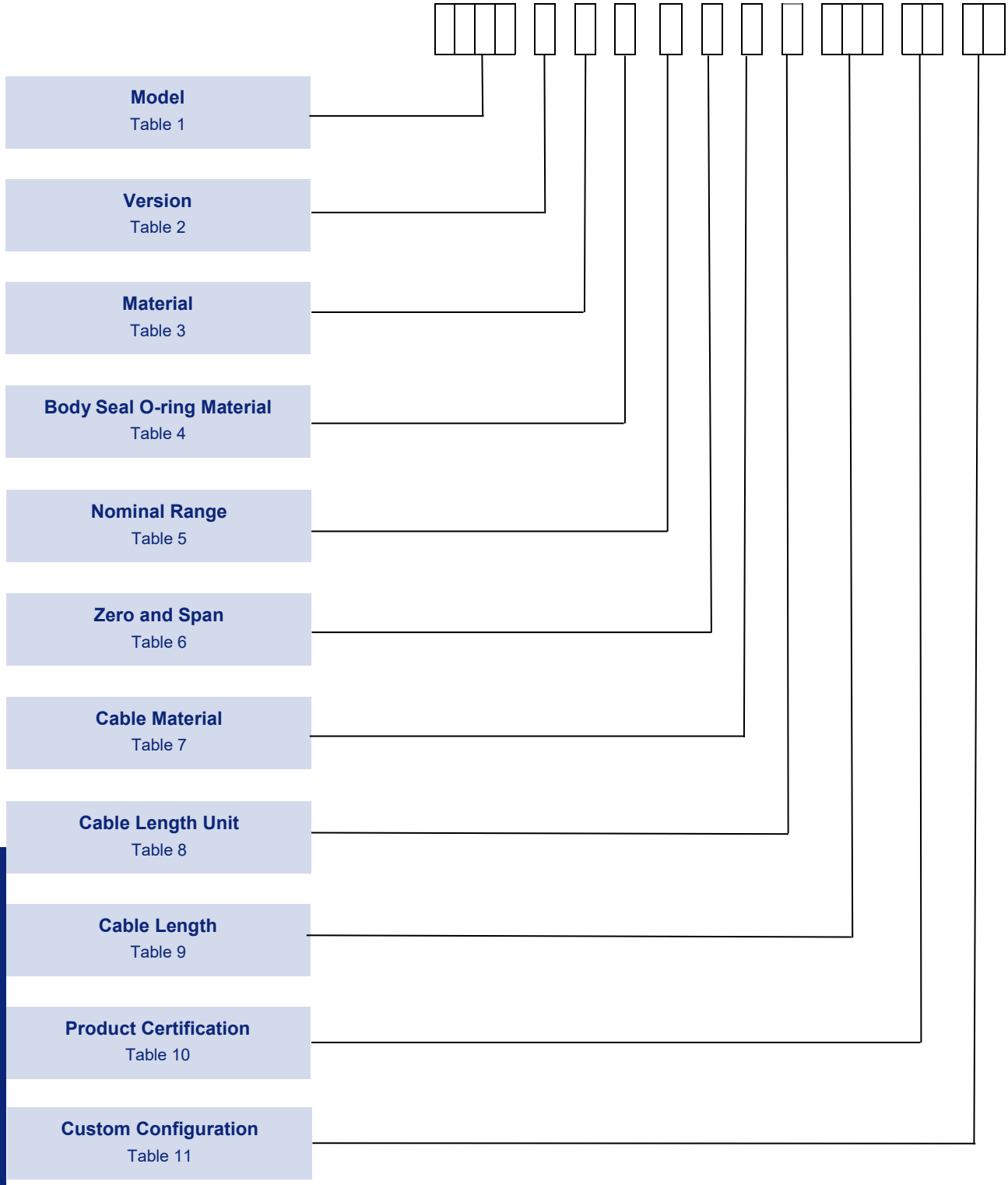
- MLT100 Smart Hart Displacer Level Transmitter
- DMSP900SH Hart Transmitters Ultrasonic Transmitters
- D45 SMART Level probe for pressurised tanks



9700-Series
Model: 9720

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.



Model

TABLE 1

	Code
Clamped Cable Suspended Submersible Hydrostatic Level Transmitter	**9720**

Version

TABLE 2

	Code
Commercial	**C**
Marine Approval	**M**

Material

TABLE 3

	Code
Stainless Steal 316	**S**
Aluminum Bronze	**A**

Note 1: purchaser's to verify the compatibility of material with process conditions (such as all chemical components, temperature, pressure, flow rate, abrasives, contaminants, etc.). Special construction to meet particular process conditions can be evaluated.

Note 2: The ceramic sensor is a "dry cell", meaning that no isolating diaphragm and fill fluid is needed. The process fluid acts directly onto the rugged, corrosion resistant sensor.

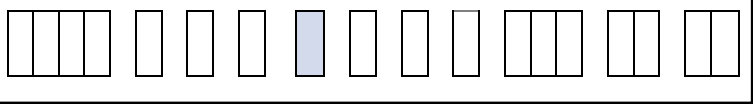
Body Seal O-ring Materiale

TABLE 4

	Code
Fluorocarbon (FPM/FKM)	**1**
Nitrile	**2**

Nominal Range

TABLE 5

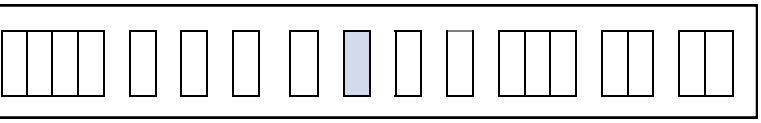


Note: Pmax values are shown in PSI according to Intrinsically Safe CSA approved documentation. In brackets are shown the correspondent limit in ftH2O and mH2O.

	Code	Pmax in psi (*ft H20 / mH20*)
0 to 6.5 ft. (0 to 2 m) H20 depth	**A**	**14.2** (*32 / 10*)
0 to 16.4 ft. (0 to 5 m) H20 depth	**B**	**35.6** (*82 / 25*)
0 to 32.8 ft. (0 to 10 m) H20 depth	**C**	**71.1** (*164 / 50*)
0 to 65.6 ft. (0 to 20 m) H20 depth	**D**	**142.3** (*328 / 100*)
0 to 164 ft. (0 to 50 m) H20 depth	**E**	**142.3** (*328 / 100*)
0 to 328 ft. (0 to 100 m) H20 depth	**F**	**142.3** (*328 / 100*)
0 to 3.3 ft. (0 to 1 m) H20 depth	**G**	**7.1** (*16.4 / 5*)
0 to 11.5 ft. (0 to 3.5 m) H20 depth	**H**	**24.9** (*57.4 / 17.5*)

Zero and Span

TABLE 6

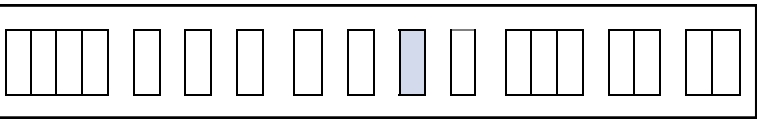


Note: the instrument is fixed range type. Any calibration within the measuring range to be specified at ordering stage.

	Code
Integral (fixed)	**1**

Cable Material

TABLE 7

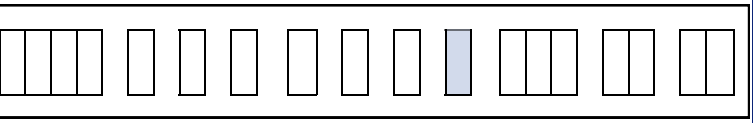


Note: The glanding system used ensures absolute integrity of the IP68 / NEMA 6P rating.
All cable used include venting capillary. For humid environments or sea water applications, bellows must be used (contact Delta Mobrey for details)

	Code
Polyurethane	**P**
Fluorinated ethylene-propylene (F.E.P)	**F**

Cable Length Unit

TABLE 8



	Code
English	**E**
Metric	**M**

Cable Length

TABLE 9

Length	Code	Unit
3 meters	003	M
5 meters	005	M
8 meters	008	M
10 meters	010	M
20 meters	020	M
30 meters / feet	030	M / E
40 meters	040	M
50 meters	050	M
60 meters	060	M
75 meters	075	M
100 meters	100	M
125 meters	125	M
150 meters / feet	150	M/E
200 meters	200	M
9 feet	009	E
15 feet	015	E
24 feet	024	E
60 feet	060	E
90 feet	090	E
120 feet	120	E
225 feet	225	E
300 feet	300	E
375 feet	375	E
450 feet	450	E
600 feet	600	E

Product Certifications

TABLE 10

	Code
Non-certified (non-hazardous area use only)	**NA**
CSA (Canada and USA)	**A6**

Custom Configuration

TABLE 11

	Code
Custom configuration of actual range (customer to specify with order)	C1

Installation

The 9700 is available in both submersible versions and externally mounted (floodable) versions.
The housing contains the capacitive ceramic sensor and the electronics circuit board, all the components needed to produce an accurate and reliable measurement of the process. The glanding system used with the submersible versions ensures absolute integrity of the IP68 / NEMA 6P rating. IP68 / NEMA 6P units are generally factory fitted with the required length of vented cable fitted.

Technical Data

Metrological Parameters

Accuracy ±0.1% of calibrated span (includes effects of linearity, hysteresis and repeatability)

Stability ± 0.1% Upper Range Limit (URL) per 6 months

Temperature Effect ±0.015% Upper Range Limit (URL) per °C / °F (over ambient temp. range)

Response time ~60mS (~10mS with link1 removed) or a 63% response to pressure change and 150mS for a 90% response to pressure change

Load resistance

R = 50 x (supply voltage -10V) Ω $R\ [\Omega] \leq \frac{U_{sup}\ [V] - 10V}{0.0225A}$

Electrical parameters

Power supply 10-30V d.c.

Output signal Two-wire, 4-20mA

Operating conditions

Operating temperature range (ambient temp.)

-20 to + 90°C (-20 to +80°C Ex ia)

-Process medium temperature range
-20 to + 60 °C / -4 to +140 °F

Measuring range
Up to 200 m / 656 ft. H20

Overrange limit
See table 5

Span adjustment
+10 to +100% of Upper Range Limit (URL

Materials

Wetted parts Sensor Ceramic

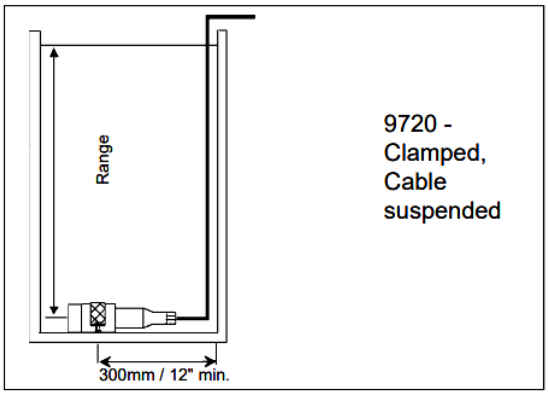
Sensor housing 316 Stainless steel, Aluminium bronze

Seal rings Fluorocarbon (FPM/FKM), Nitrile

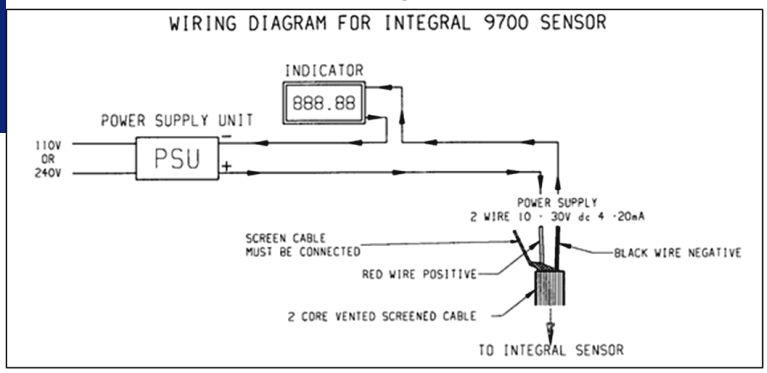
Cable Polyurethane Fluorinated Ethylyene Polypropylene (FEP)

Ingress protection IP68 / NEMA 6P (200 m / 656 ft. H20)

Mounting Option



Electrical diagrams



9700-Series
Model: 9720

Approvals

NORTH AMERICA CERTIFICATION

Hazardous area certification (CSA Nr.176418)

CSA (Canada and USA) CL I, Div 1, Groups C and D

CL II, Div 1, Groups E, F and G

CL III

Ex ia IIB T4

AEx ia IIB T4

EUROPEAN DIRECTIVE

EMC Directive 2014/30/EU

Conformity assessment procedure: module A

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

Marine approvals

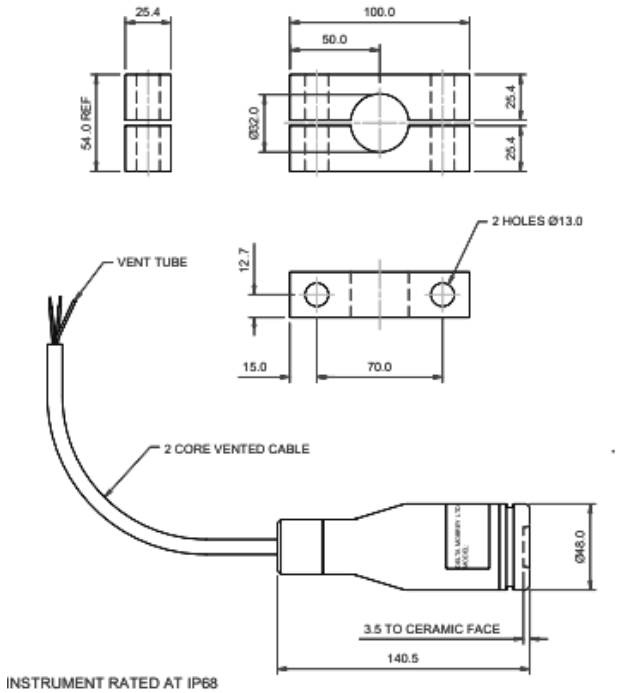
Lloyds Register	Certificate Nr. 98/00014
BV	Certificate Nr. 07173/E0 BV
DNV	Certificate Nr. TAA000002H

Dimensions

WEIGHT

Model	Weight
9710 (sensor only)	0.7 kg / 1.54 lbs
Bellows Enclosure Polyester (p/n 71411/773) IP67 Grey (RAL 7001)	1.2 kg
Enclosure Polyester (p/n 9710/077/01) Grey (RAL 7001)	0.7 kg
Vented Cable in air (water)	71 (16) kg/km

Total weight varies with different cable length



Technical **Datasheet**

delta-mobrey

9700 Series Analogue Transmitter
Submersible Hydrostatic Level Transmitters
Model: 9710 - cable suspended

Key **Features**

- Two-wire 24 Vdc loop-powered
- 4 to 20 mA
- Accuracy ± 0.1% of calibrated span
- Ranges up to 200 m / 656 ft. H20, and 10:1 rangeability
- Ceramic capacitive sensor
- Low maintenance
- Fully submersible IP68 / NEMA 6P
- Reverse polarity protection
- Dedicated marine version

Product **applications**

The 9710 Transmitter is suitable for a wide range of applications in:

- Water Treatment
- Power
- Marine Market

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

- Corrosive atmospheres
- Resistant to chemical attack

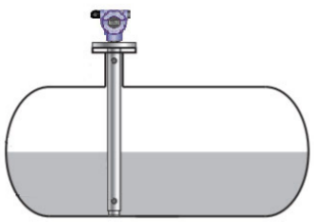
Series Overview

The 9700 Series range of tank level transmitters from Delta-Mobrey provide an accurate level measurement solution where in-tank problems such as foaming, vapor layers, and temperature gradients makes difficult the use of other instrumentation. Each transmitter version gives a high performance, has good long term stability, and is virtually maintenance free. Ceramic Capacitive Sensor (CCS) provides a “flush” diaphragm, avoiding the risks of sensor clogging. The sensor works like a capacitor with electrode surfaces on the inside comprising one measuring and one reference capacitor. The surfaces of the capacitors are gold-plated and linked to ASIC electronics. These electronics generate a signal proportional to the applied pressure, which is sent to the 4–20 mA signal conditioner

Other products

Other products we can offer:

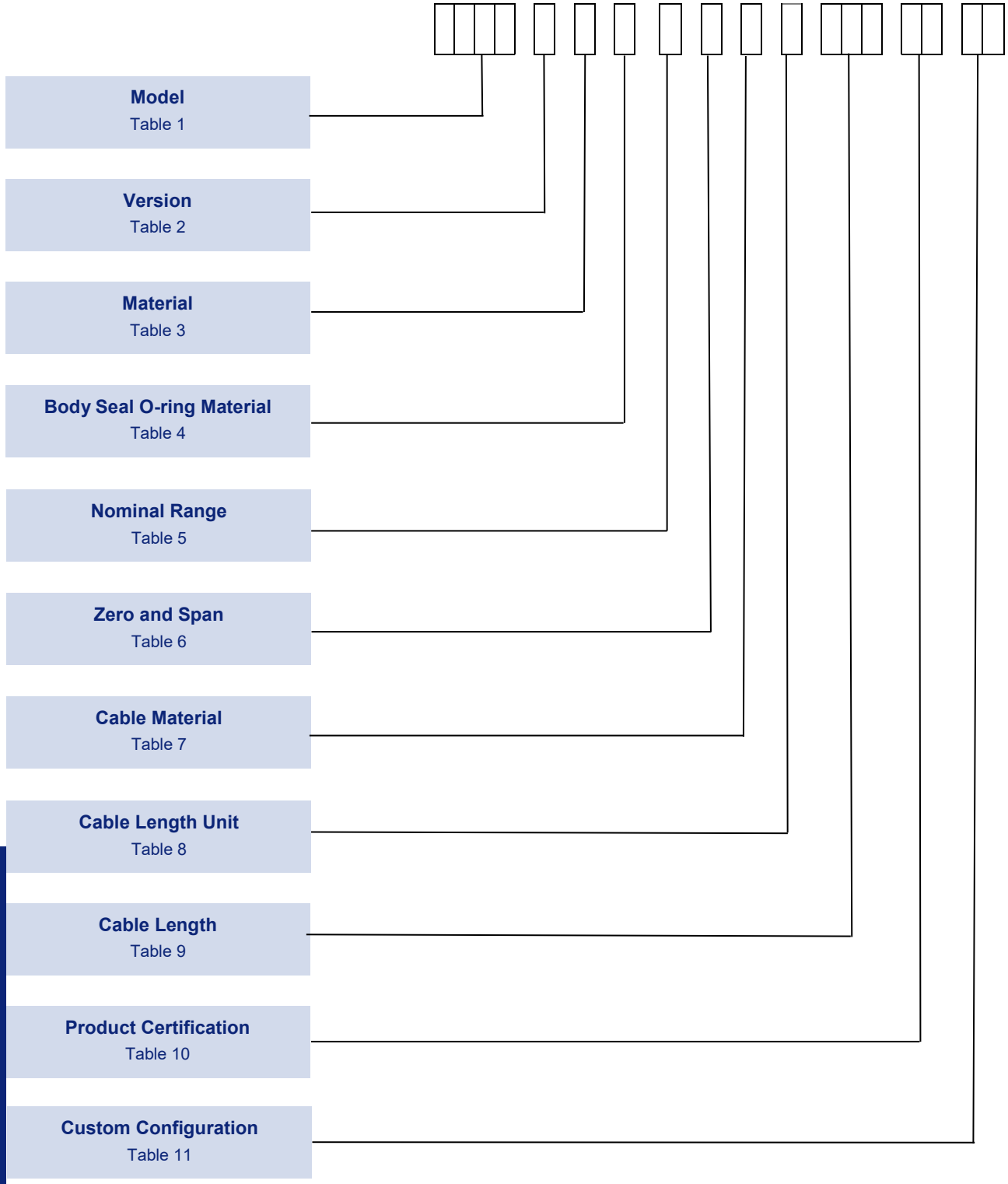
- MLT100 Smart Hart Displacer Level Transmitter
- DMSP900SH Hart Transmitters Ultrasonic Transmitters
- D45 SMART Level probe for pressurised tanks



9700-Series
Model: 9710

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.



Model

TABLE 1

	Code
Cable Suspended Submersible Hydrostatic Level Transmitter	**9710**

Version

TABLE 2

	Code
Commercial	**C**
Marine Approval	**M**

Material

TABLE 3

Note 1: purchaser's to verify the compatibility of material with process conditions (such as all chemical components, temperature, pressure, flow rate, abrasives, contaminants, etc.). Special construction to meet particular process conditions can be evaluated.

Note 2: The ceramic sensor is a "dry cell", meaning that no isolating diaphragm and fill fluid is needed. The process fluid acts directly onto the rugged, corrosion resistant sensor.

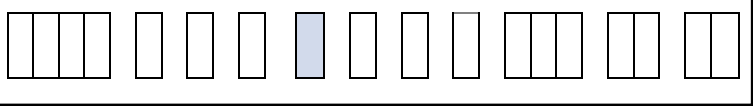
	Code
Stainless Steal 316	**S**
Aluminum Bronze	**A**

Body Seal O-ring Materiale

TABLE 4

	Code
Fluorocarbon (FPM/FKM)	**1**
Nitrile	**2**

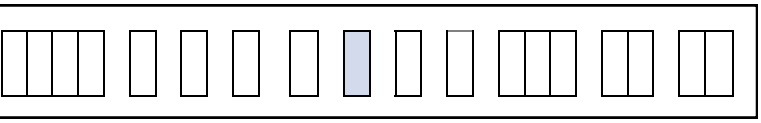
Nominal Range

TABLE 5 

Note: Pmax values are shown in PSI according to Intrinsically Safe CSA approved documentation. In brackets are shown the correspondent limit in ftH2O and mH2O.

	Code	Pmax in psi (*ft H20 / mH20*)
0 to 6.5 ft. (0 to 2 m) H20 depth	**A**	**14.2** (*32 / 10*)
0 to 16.4 ft. (0 to 5 m) H20 depth	**B**	**35.6** (*82 / 25*)
0 to 32.8 ft. (0 to 10 m) H20 depth	**C**	**71.1** (*164 / 50*)
0 to 65.6 ft. (0 to 20 m) H20 depth	**D**	**142.3** (*328 / 100*)
0 to 164 ft. (0 to 50 m) H20 depth	**E**	**142.3** (*328 / 100*)
0 to 328 ft. (0 to 100 m) H20 depth	**F**	**142.3** (*328 / 100*)
0 to 3.3 ft. (0 to 1 m) H20 depth	**G**	**7.1** (*16.4 / 5*)
0 to 11.5 ft. (0 to 3.5 m) H20 depth	**H**	**24.9** (*57.4 / 17.5*)

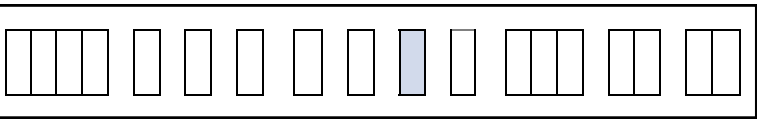
Zero and Span

TABLE 6 

Note: the instrument is fixed range type. Any calibration within the measuring range to be specified at ordering stage.

	Code
Integral (fixed)	**1**

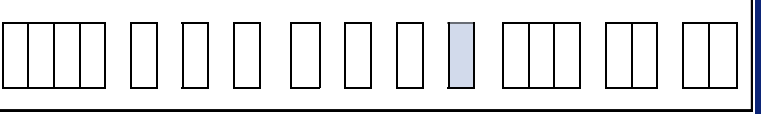
Cable Material

TABLE 7 

Note: The glanding system used ensures absolute integrity of the IP68 / NEMA 6P rating.
All cable used include venting capillary. For humid environments or sea water applications, bellows must be used (contact Delta Mobrey for details)

	Code
Polyurethane	**P**
Fluorinated ethylene-propylene (F.E.P)	**F**

Cable Length Unit

TABLE 8 

	Code
English	**E**
Metric	**M**

Cable Length

TABLE 9

Length	Code	Unit
3 meters	003	M
5 meters	005	M
8 meters	008	M
10 meters	010	M
20 meters	020	M
30 meters / feet	030	M / E
40 meters	040	M
50 meters	050	M
60 meters	060	M
75 meters	075	M
100 meters	100	M
125 meters	125	M
150 meters / feet	150	M/E
200 meters	200	M
9 feet	009	E
15 feet	015	E
24 feet	024	E
60 feet	060	E
90 feet	090	E
120 feet	120	E
225 feet	225	E
300 feet	300	E
375 feet	375	E
450 feet	450	E
600 feet	600	E

Product Certifications

TABLE 10

	Code
Non-certified (non-hazardous area use only)	**NA**
CSA (Canada and USA)	**A6**

Custom Configuration

TABLE 11

	Code
Custom configuration of actual range (customer to specify with order)	C1

Installation

The 9700 is available in both submersible versions and externally mounted (floodable) versions.

The housing contains the capacitive ceramic sensor and the electronics circuit board, all the components needed to produce an accurate and reliable measurement of the process. The glanding system used with the submersible versions ensures absolute integrity of the IP68 / NEMA 6P rating. IP68 / NEMA 6P units are generally factory fitted with the required length of vented cable fitted.

Technical Data

Metrological Parameters

Accuracy ±0.1% of calibrated span (includes effects of linearity, hysteresis and repeatability)

Stability ± 0.1% Upper Range Limit (URL) per 6 months

Temperature Effect ±0.015% Upper Range Limit (URL) per °C / °F (over ambient temp. range)

Response time ~60mS (~10mS with link1 removed) or a 63% response to pressure change and 150mS for a 90% response to pressure change

Load resistance

R = 50 x (supply voltage -10V) Ω $\quad R\ [\Omega] \leq \dfrac{U_{sup}\ [V] - 10V}{0.0225A}$

Electrical parameters

Power supply 10-30V d.c.

Output signal Two-wire, 4-20mA

Operating conditions

Operating temperature range (ambient temp.)

-20 to + 90°C (-20 to +80°C Ex ia)

-Process medium temperature range
-20 to + 60 °C / -4 to +140 °F

Measuring range
Up to 200 m / 656 ft. H20

Overrange limit
see table 5

Span adjustment
+10 to +100% of Upper Range Limit (URL

Materials

Wetted parts Sensor Ceramic

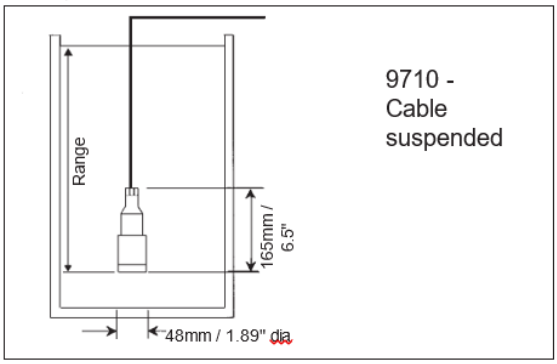
Sensor housing 316 Stainless steel, Aluminium bronze

Seal rings Fluorocarbon (FPM/FKM), Nitrile

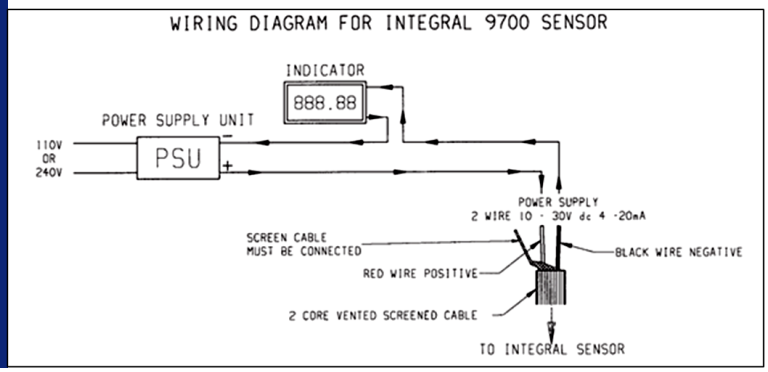
Cable Polyurethane Fluorinated Ethylyene Polypropylene (FEP)

Ingress protection IP68 / NEMA 6P (200 m / 656 ft. H20)

Mounting Option



Electrical diagrams



Approvals

NORTH AMERICA CERTIFICATION

Hazardous area certification (CSA Nr.176418)

CSA (Canada and USA) CL I, Div 1, Groups C and D
CL II, Div 1, Groups E, F and G
CL III
Ex ia IIB T4
AEx ia IIB T4

EUROPEAN DIRECTIVE

EMC Directive 2014/30/EU

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

Marine approvals

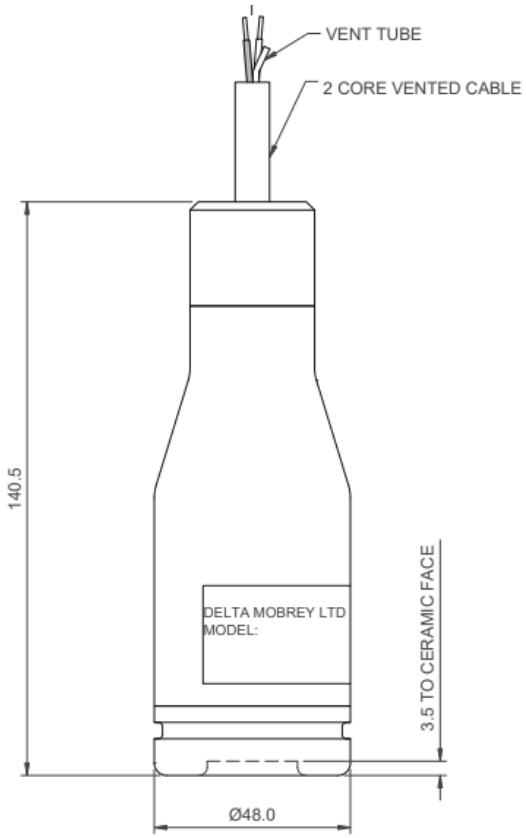
Lloyds Register	Certificate Nr. 98/00014
BV	Certificate Nr. 07173/E0 BV
DNV	Certificate Nr. TAA000002H

Dimensions

WEIGHT

Model	Weight
9710 (sensor only)	0.7 kg / 1.54 lbs
Bellows Enclosure Polyester (p/n 71411/773) IP67 Grey (RAL 7001)	1.2 kg
Enclosure Polyester (p/n 9710/077/01) Grey (RAL 7001)	0.7 kg
Vented Cable in air (water)	71 (16) kg/km

Total weight varies with different cable length



Product Data Sheet
March 2020
IP119, Rev CB

Mobrey MLT100

Displacer Level Transmitter

- Level, contents or interface measurement transmitter
- Direct or external chamber mounting
- Two-wire 24 Vdc loop-powered
- 4–20 mA HART® output
- ATEX Intrinsically safe and explosion-proof certified versions

delta-mobrey

Overview of the Mobrey MLT100

Mobrey MLT100 Transmitter With Optional Display Fitted

Mobrey MLT100 Transmitter in a Side-and-bottom Chamber

The Mobrey MLT100 Level Transmitter is one of the most advanced displacer based devices on the market, coupling the time proven buoyancy principle with state of the art electronics in an instrument of high reliability and stability.

Special care has been taken in design to ensure a small mounting envelope is maintained, resulting in reduced weight and associated savings in mounting.

The displacer element is made to length for each order, and is suspended below the head on a stable spring arrangement which is designed to minimise friction effects and improve performance.

The transmitter can be mounted directly into a vessel or may be externally mounted in a chamber to allow isolation for planned maintenance or in-situ calibration checks.

Operation

The 4–20 mA output from the head is proportional to the level or contents in the vessel, or may be set to follow an interface. The transmitter supports the HART protocol, which is superimposed on the 4–20 mA signal.

Changes of liquid level in the vessel cause the displacer element, which is supported on a spring, to rise or fall. A core, located in the pressure tube of the head, is connected to the displacer and moves linearly up and down with the element. Around the outside of the pressure tube in the head is a Linear Variable Differential Transformer (LVDT), the output of which is proportional to the position of the core. The pressure tube is made of stainless steel and is welded to the union which connects the head to the process pressure and temperature.

The user can operate the transmitter without digital communications, or can take advantage of the many features of HART such as remote calibration, re-ranging, on-line diagnostics, and multidrop installations.

Features

- Two-wire 24 Vdc loop-powered
- 4–20 mA output
- Unique ‘Caliplug’ for local configuration and calibration
- HART communications
- EExd or EExia certification
- Simple local or remote calibration
- Non-interactive Zero and Span
- High temperature remote electronics option (available to special order)
- Optional display for local indication of measurement
- Range of wetside materials

Contents

Benefits

- Low maintenance
- Simple installation
- Local or remote calibration

Typical applications

- Knock-out pots
- Condensate drums
- Separators
- Flash vessels
- Storage vessels
- Receiver tanks

Operating wetside temperatures are –60 to 320 °C at pressures between full vacuum and 200 bar. Remote electronics models available to special order for high temperature and nuclear applications.

Most liquids can be measured, with wetted materials chosen to suit. The liquid SG range is from 0.5 to 1.5, and interfaces with as low an SG difference of 0.1 are also practical.

The displacer length is dictated by the operating range requested, and the diameter and weight are factory calculated to ensure the correct operating movement of the core in the head. The longest standard operating range is 3000 mm.

Special features

Health-check LED

Each transmitter is fitted with a visible LED which flashes once every 3 seconds to show the instrument is healthy and working.

Field adjustments

The transmitter is set up by Delta Mobrey to operate in the conditions advised at the time of order, and the displacer element dimensions are chosen to suit.

Local Calibration (Without a Field Communicator)

Fine-tune adjustments on-site may be made with the instrument in an empty vessel at 20 °C, which ensures correct readings at operating conditions.

Several adjustments can be made using the unique “Mobrey Magnetic Scroller” (MMS) and the “Caliplug”.
The MMS is a calibration tool with a magnetic tip, and is used on this and other Delta Mobrey instruments to access and adjust certain operating parameters.

The MLT100 is fitted with a calibration plug (Caliplug) which contains docking ports for the MMS along with a heartbeat LED. The adjustments which may be made are setting the 4 mA and 20 mA points, and damping.

Remote calibration
(*not necessary for standard 4–20 mA operation*)

Ranging can be carried out remotely using a Field Communicator to establish digital communications and set the 4 and 20mA points electronically without the need for changing the liquid level. All the remaining operating, diagnostic, and Process Value (PV) data is also available using a Field Communicator.

Local indication display (optional)

The optional multi-function LCD indicator is housed in a cast aluminum Exd enclosure, and finished in a two-pack epoxy white paint. The 2-line LCD display can be programmed to show the output in %, engineering units, and other operating parameters by using a Field Communicator.

Mobrey MLT100 Transmitter Ordering

The following information must be supplied at time of order:

- Operating pressure, temperature, specific gravities (upper and lower), and viscosity
- Liquid and nature of vapour (condensing or non-condensing)
- Maximum or design pressures and temperatures
- Ambient temperature and local environmental conditions
- Operating range (taken as the process connection centres unless otherwise stated)
- Mounting arrangement and specific construction materials required.
  (If a chamber is required, please specify all relevant dimensions. Non-standard configurations may be made to special order)
- Any options: Display, chamber connections or vent/drain, special paint, inspection and NDT requirements, or other

Table 1. Mobrey MLT100 ordering information

Model	Product Description
LT	Mobrey level transmitter
Flange Material	
C	Carbon steel
S	Stainless steel
N	No flange (1-in. NPT connection)
Flange Mounting	
60	3-in. ASME B16.5 Class 150 Raised Face (RF)
61	3-in. ASME B16.5 Class 300 Raised Face (RF)
62	3-in. ASME B16.5 Class 600 Raised Face (RF)
63	3-in. ASME B16.5 Class 900 Raised Face (RF)
64	3-in. ASME B16.5 Class 1500 Ring Type Joint (RTJ)
65	4-in. ASME B16.5 Class 150 Raised Face (RF)
66	4-in. ASME B16.5 Class 300 Raised Face (RF)
67	4-in. ASME B16.5 Class 600 Raised Face (RF)
68	4-in. ASME B16.5 Class 900 Raised Face (RF)
69	4-in. ASME B16.5 Class 1500 Ring Type Joint (RTJ)
71	DN80 PN16
72	DN80 PN25
73	DN80 PN40
76	DN100 PN16
77	DN100 PN25
78	DN100 PN40
00	No flange (1-in. NPT connection)
Enclosure	
TS	IP66 enclosure certified EExia for Intrinsic Safety (IS) use, Cast Iron, white epoxy painted.
TF	IP66 Flameproof enclosure certified EExd for hazardous area use, Cast Iron, white epoxy painted
TR	IP66 enclosure certified EExd with electronics in a remote IP66 aluminium enclosure. Note: Remote electronics must be in the non-hazardous area.
TX	IP66 enclosure certified EExia for Intrinsic Safety (IS) use, 316 stainless steel.
Pressure Tube Type – *Select Type A or B using* Figure 1 on page 6	
A	Standard (up to 224 °C condensing)
B	High temperature (224 °C to 277 °C condensing; 320 °C non-condensing, remote electronics to 320 °C condensing)
Display	
D	Display
N	No display

Table 1. Mobrey MLT100 ordering information

Spring	
*	The code for the spring will be selected by Delta Mobrey at time of ordering
Displacer	
*	The code for the displacer will be selected by Delta Mobrey at time of ordering
Chamber Type and Orientation	
A	No chamber
B	Side/bottom, no vent
C	Side/bottom, 1/2-in. NPT vent
D	Side/bottom, 3/4-in, NPT vent
F	Side/bottom, 3/4-in, flanged vent
G	Side/side, no vent, 1/2-in. NPT drain
H	Side/side, no vent, 3/4-in. NPT drain
J	Side/side, no vent, 1-in. NPT drain
K	Side/side, 1/2-in. NPT drain and vent
L	Side/side, 3/4-in NPT drain and vent
M	Side/side, 1-in. NPT drain and vent
N	Side/side, no vent, 3/4-in. drain
P	Side/side, 3/4-in. NPT vent, 3/4-in. flanged drain
Q	Side/side, 3/4-in. flanged drain and vent
Chamber Process Connections	
01	Screwed 1-in. NPT
00	No Chamber
11	1-in. ASME B16.5 Class 150 Raised Face (RF) flange
12	1-in. ASME B16.5 Class 300 Raised Face (RF) flange
13	1-in. ASME B16.5 Class 600 Raised Face (RF) flange
14	1-in. ASME B16.5 Class 900 Raised Face (RF) flange
18	1-in. ASME B16.5 Class 1500 Ring Type Joint (RTJ) flange
15	DN25 PN16
16	DN25 PN25
17	DN25 PN40
21	1 1/2-in. ASME B16.5 Class 150 Raised Face (RF) flange
22	1 1/2-in. ASME B16.5 Class 300 Raised Face (RF) flange
23	1 1/2-in. ASME B16.5 Class 600 Raised Face (RF) flange
24	1 1/2-in. ASME B16.5 Class 900 Raised Face (RF) flange
28	1 1/2-in. ASME B16.5 Class 1500 Ring Type Joint (RTJ) flange
25	DN40 PN16
26	DN40 PN25
27	DN40 PN40
31	2-in. ASME B16.5 Class 150 Raised Face (RF) flange
32	2-in. ASME B16.5 Class 300 Raised Face (RF) flange
33	2-in. ASME B16.5 Class 600 Raised Face (RF) flange
34	2-in. ASME B16.5 Class 900 Raised Face (RF) flange
38	2-in. ASME B16.5 Class 150 Raised Face (RF) flange
35	DN50 PN16
36	DN50 PN25
37	DN50 PN40
Options (Factory Defined)	
00	None
**	The code for non-standard options will be allocated at time of ordering i.e. AQ for Seal welded union/flange and M20 conduit
Typical Model Number: LT C 61 TS A D * * B 11 00	

Specifications

Output

- 4–20 mA / HART digital

Range

- 11.8 to 118 in. / 300 to 3000 mm (to order)

Maximum operating pressure

- 2900 psi (200 bar)

Minimum operating pressure

- Full vacuum

Specific gravity range

- Standard: 0.5 to 1.5
- Interface: 0.1 difference

Maximum operating temperatures

- 530 °C (277 °C) condensing
- 608 °F (320 °C) non-condensing
- 608 °F (320 °C) condensing with remote electronics

Minimum operating temperature

- –76 °F (–60 °C)

Ambient temperature

- –40 to 176 °F / –40 to 80 °C (subject to process temperature)

Accuracy

- < ±1% of output span

Repeatability

- ±0.2% of output span

Linearity

- 0.2% of output span

Resolution

- 0.1% of output span

Hysteresis

- 0.3% of output span

Power supply

- 12 to 40 Vdc loop-powered

Power consumption

- 21 mA / 40 V: 840 mW maximum

Pressure Tube Types A and B

- See "Graphs for selecting a pressure tube type" on page 6

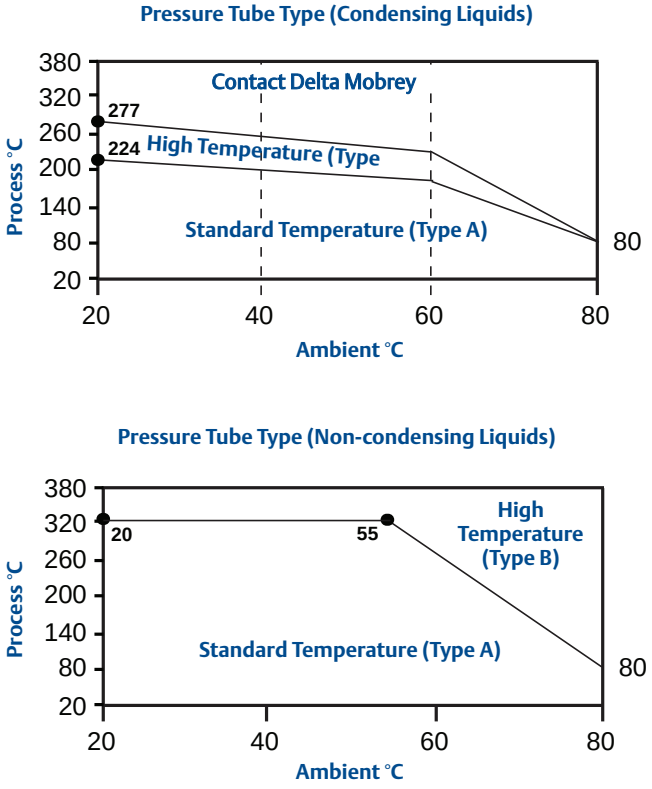
Materials of Construction

- The transmitter head is manufactured from cast iron with a paint finish of two-pack Epoxy white paint suitable for offshore/coastal use. It is weatherproof to IP66 / IP67 ratings.
- Wetted parts are made from stainless steel, including the element, trim, and pressure tube, except for the spring which is manufactured from a specialist corrosion resistant spring material, NIMONIC, chosen for it's stability and repeatability under changing process conditions.

Optional Chamber

- The material used is either as specified on the order or selected by Delta Mobrey to suit the application. Only certified materials are used, and welding is qualified to ASME IX, BS EN 287, and EN ISO 15614-1. All pressure retaining parts are hydrostatically pressure tested to a minimum of 1.5 times working pressures. NDT including radiography and dye penetrant testing is available when specified at time of ordering. Inspection by customers or their appointed agents is welcome provided that this is requested at time of ordering.
- Option:
  Wetside materials in Alloy C276 (UNS N10276), Alloy 625 (UNS N06625), and others on request
- Option:
  compliance with NACE MR-01-75 for sour service duty

Figure 1. Graphs for selecting a pressure tube type



Dimensions

Figure 2. MLT100 with Optional Display

Note: Dimensions are in mm.

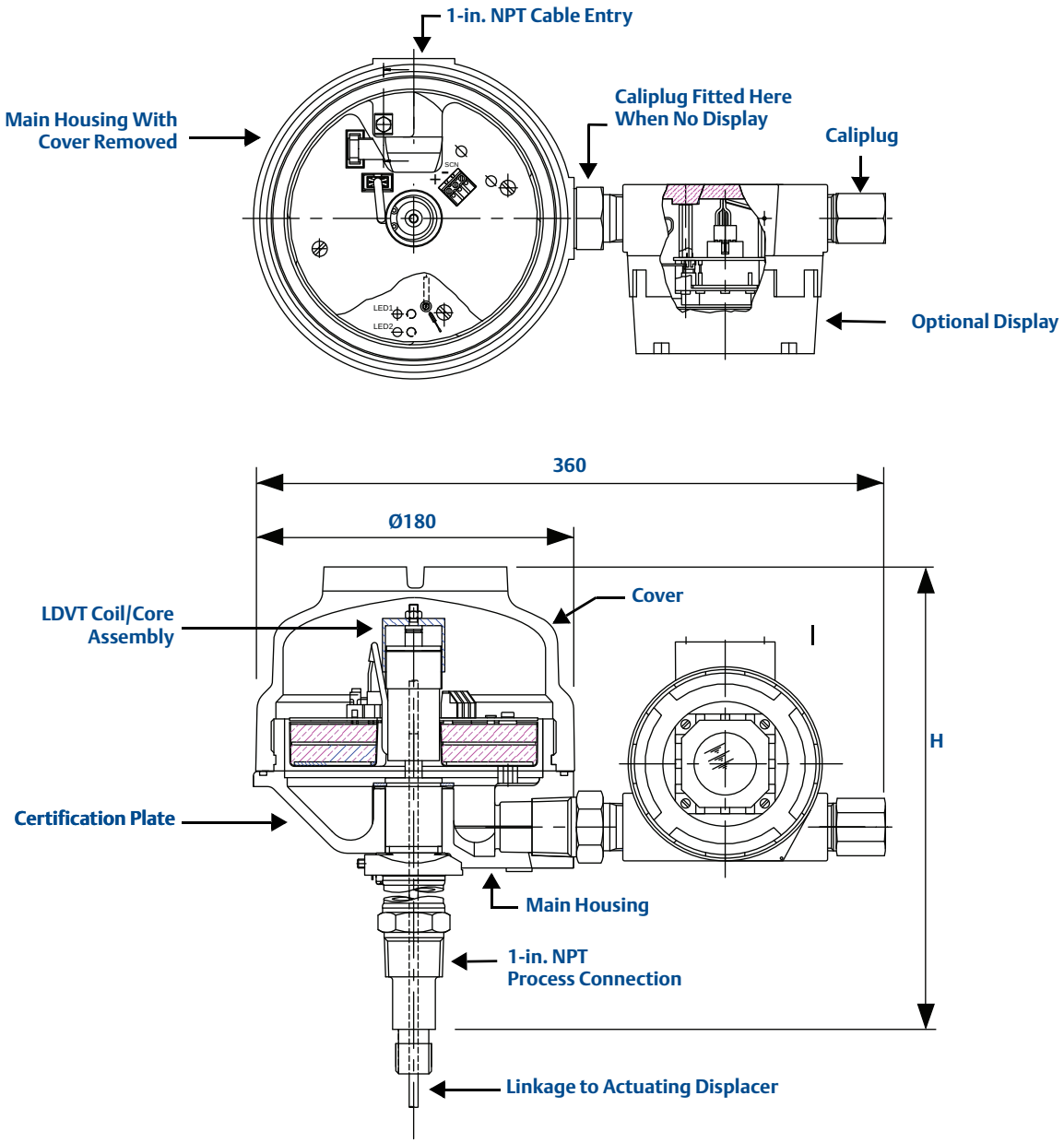


Table 2. Head height dimension H

Head Height	H
Pressure Tube A	200 mm
Pressure Tube B	422 mm
Note: allow an extra 90 mm for cover removal	

Product Certifications

Approved manufacturing location

Delta Mobrey Limited, Slough, United Kingdom

European directive information

ATEX Directive

- The MLT100 complies with the ATEX directive

Pressure Equipment Directive (PED)

- The MLT100 complies with the PED directive

Electro Magnetic Compatibility (EMC) Directive

- EN 61326-1:2013, EN 61326-2.3:2013

Hazardous locations certifications

ATEX intrinsically safe approval (enclosure code TS only)

Certificate number: Sira 03ATEX2153X
II 1 G
II 1 D (T90 °C)
EEx ia IIC T5 (T_a = –40 to 40 °C)
EEx ia IIC T4 (T_a = –40 to 80 °C)
Input parameters:
U_i = 28 Vdc, I_i = 93 mA, P_i = 0.66 W, C_i = 48 nF, L_i = 0.22 mH
Output parameters
(at the programming/calibration connector):
U_o = 18 Vdc, I_o= 93 mA, P_o = 0.44 W, C_o = 0.309 µF, L_o = 4.2 mH

ATEX intrinsically safe approval (enclosure code TX only)

Certificate number: Sira 04ATEX2206X
II 1 G
EEx ia IIC T5 (T_a = –40 to 40 °C)
EEx ia IIC T4 (T_a = –40 to 80 °C)
Input parameters:
U_i = 28 Vdc, I_i = 93 mA, P_i = 0.66 W, C_i = 48 nF, L_i = 0.22 mH
Output parameters
(at the programming/calibration connector):
U_o = 18 Vdc, I_o= 93 mA, P_o = 0.44 W, C_o = 0.309 µF, L_o = 4.2 mH

ATEX EEx ia special conditions for safe use

1. The enclosure may be manufactured from alloys containing light metals. In rare cases, ignition sources due to impact and friction sparks could occur. This shall be considered when the equipment is installed in locations that specifically require group II, category 1G equipment.

ATEX flameproof approval (enclosure codes TF and TR only)

Certificate number: Sira 03ATEX1190X
II 1/2 G
II 1/2 D (T85 °C)
EEx d IIC T6 (T_a = –40 to 75°C)

ATEX EEx d special conditions for safe use:

1. The enclosure must not be opened when a flammable atmosphere is present, even when the equipment has been electrically isolated.
2. The partition wall may not be stainless steel (see page 7), therefore the MLT100 shall not be subjected to environmental stresses that might adversely affect the partition wall.
3. The float or mounting flange may be a non-metallic material. The user must ensure suitability for the application and not ignition capable due to electrostatic charging. Do not rub with a dry cloth.

Technical **Datasheet**

delta-mobrey

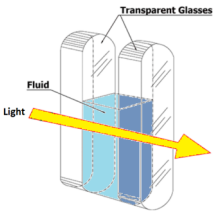
LEVEL GAUGE
Welded type
Models: WLG

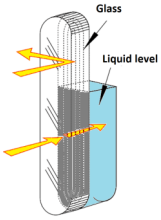
Key **Features**

- Easy and compact.
- Suitable for flat or angled surfaces.
- Easy and cost effective construction.
- A borosilicate crystal type.
- Suitable for saturated steam, hot water, aggressive fluids.

Series **Overview**

The welded type gauge, could be either a Reflex type or a Transparent type. The main difference is the type of crystal used. In the transparent type, the fluid is contained between two glasses. Both crystals have a smooth surface. When the light passes through the back, the transparent crystal illuminates the chamber between two glasses, the level is clearly visible.





In the reflex type, fluid is contained between two crystals with both smooth surfaces. The level is very easy to observe because the fluid in its liquid phase absorbs the light and making it appear dark. The upper part with air or gas, reflects the light and has a clear colour.

To make the level gauge good for aggressive fluids or steam, a protective mica sheet can be installed between the fluid and the glass.

Product **applications**

Our Level Gauges are suitable for a wide range of applications in:

- Oil & Gas
- Chemical
- Petrochemical
- Refining
- Power

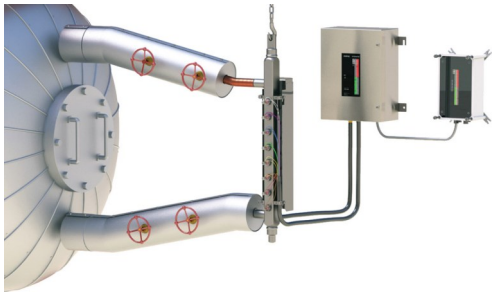
The choice of options ensures that the Transparent type level gauge series is suitable for use in:

- Boilers
- High pressure and temperature conditions
- Chemical aggressive media

Other products

Other products we can offer include:

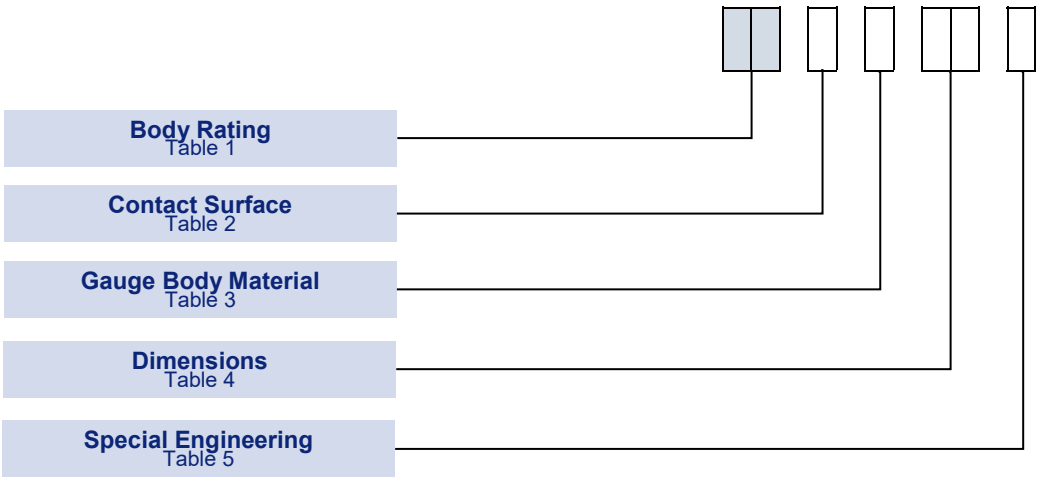
- Conductive type, Hydrastep level control
- Transparent type level gauge



Welded Transparent Type Level Gauge
Models: WLG

How to order

Gauges can be configured by selecting codes representing the desired features from the tables that follow. The chart below, describes how the model code is built up. For assistance in configuring a switch that best suits your needs, please contact your local sales office.



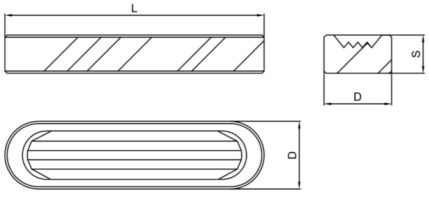
NOTE: *The non-standard option code is shown by "X" in the part number. Should you require any clarification on this codes please contact your local sales office.*

TO ENQUIRE ABOUT A QUOTATION FOR A LEVEL GAUGE, PLEASE ALSO SPECIFY:

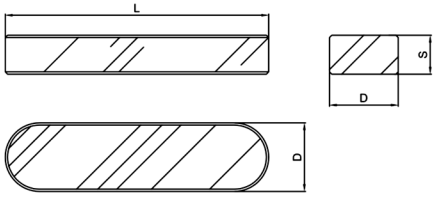
- ***TYPE OF FLUID***
- ***OPERARTING CONDITION (PRESSURE AND TEMPERATURE)***
- ***REQUIRED RADIUS FOR ANGLED CONTACT SURFACE***
- ***MATERIAL OF CONSTRUCTION***

Welded Transparent Type Level Gauge
Models: WLG

REFLEX TYPE CRYSTAL



TRANSPARENT TYPE CRYSTAL



Technical Specification

Crystal

Resistance to pressure:	200 bar (limited to body rating)
Resistance to temperature:	300 ^{0}C (limited to body rating)
Glass dimension:	30mm
Reference Standards:	DIN 7081 ; TGL 7210 ; BS 3463
Expansion coefficient:	acc. to DIN 52328
Chilling strength:	acc. to DIN ISO 718
Hydrolytic resistance:	acc. to DIN ISO 719
Hydrolytic acid resistance:	acc. to ISO 1776
Alkali resistance:	acc. to DIN ISO 695

Body Material of Gauge:
See table on drawing page:
Dimension of the gauge:
See drawing page
Body Material of upper/lower cock

	PN40			PN64		
dim.	*L*	*D*	*S*	*L*	*D*	*S*
11	115	30	17	115	34	17
12	140	30	17	140	34	17
13	165	30	17	165	34	17
14	190	30	17	190	34	17
15	220	30	17	220	34	17
16	250	30	17	250	34	17
17	280	30	17	280	34	17
18	320	30	17	320	34	17
19	340	30	17	340	34	17

Body Rating

TABLE 1

Description	Code
Welded Transparent type Rating PN64	**LT**
Welded Transparent type Rating PN100	**MT**
Welded Transparent type Rating PN120	**NT**
Welded Reflex type Rating PN64	**LR**
Welded Reflex type Rating PN100	**MR**
Welded Reflext type Rating PN120	**NR**

Contact Surface

TABLE 2

NOTE:
Consider the construction
See table on drawings.

Description	Code
Flat surface For direct mount on flat surface	**X**
Angled surface For direct mount on angled surface	**Y**

Gauge Body Material

TABLE 3

NOTE:
Consider the construction
See table on drawings.

Description	Code
Carbon steel Body material in Carbon Steel.	**A**
Stainless Steel Body material in Stainless Steel.	**B**
Non standard Material	**X**

Dimensions

TABLE 4

NOTE:
Refer to the drawings for all dimensions and visible length

Description	Code
Dimension code as shown in drawings (in mm)	**XX**

Special Engineering

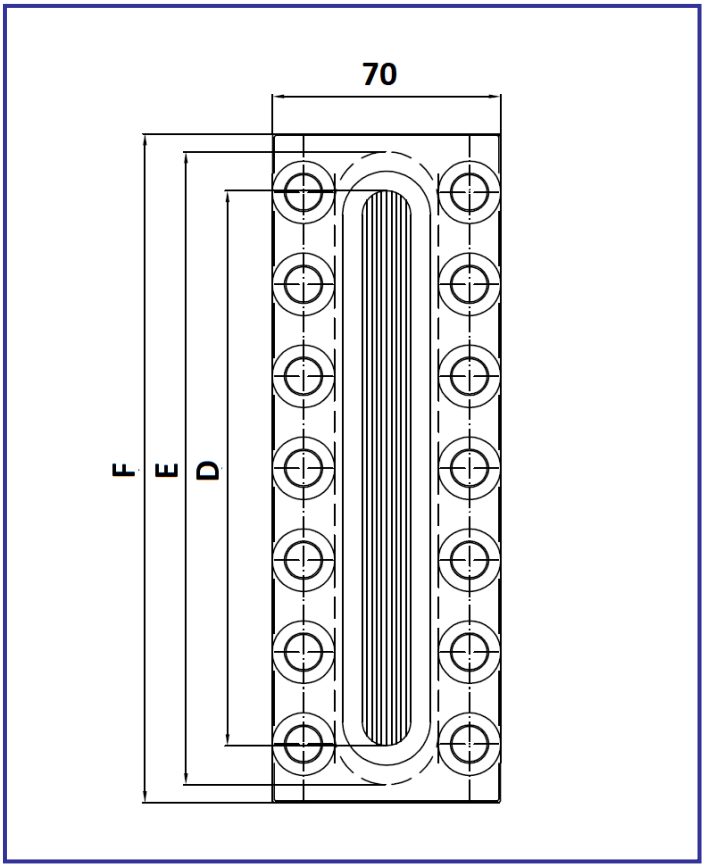
TABLE 5

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

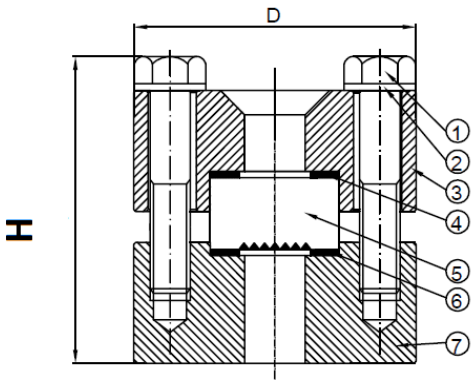
Description	Code
Please consult our sales engineering for special requirements	**TBA**

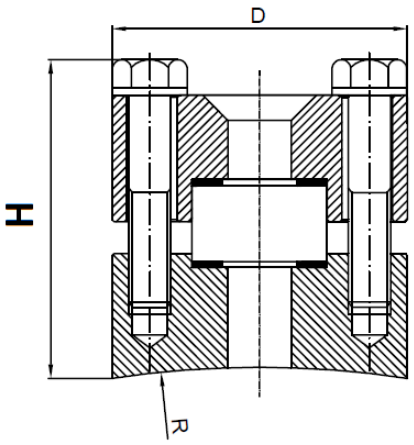
Dimensions

All dimensions mm (inches)



Dim. code	F +/-1	D +2 / 0	E	H
11	128	91	115	75
12	153	116	140	75
13	178	141	165	75
14	203	166	190	75
15	233	196	220	75
16	263	226	250	75
17	293	256	280	75
18	333	296	320	75
19	353	313	340	75
24	406	367	190	75
25	466	427	220	75
26	526	489	250	75
27	586	549	280	75
28	666	628	320	75
29	706	668	340	75
36	789	751	250	75
37	879	841	280	75
38	999	961	320	75





		A	B
1	Bolts	**Zinced Carbon Steel**	**Zinced Carbon Steel**
2	Ring	**Zinced Steel**	**Zinced Steel**
3	Cover	**Zinced Carbon Steel**	**Zinced Carbon Steel**
4	Upper gasket	**Asbestos free**	**Asbestos free**
5	Glass	**Borosilicate**	**Borosilicate**
6	Lower gasket	**Graphite**	**Graphite**
7	Body	**Carbon Steel**	**Stainless Steel**

Welded Transparent Type Level Gauge
Models: WLG

ISO9001
FM00720

Technical **Datasheet**

delta-mobrey

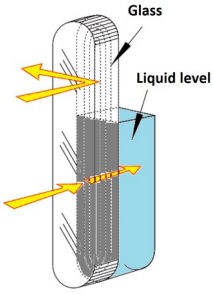
LEVEL GAUGE
Reflex type
Models: RLG

Key **Features**

- High reliability for use on steam and process applications.
- Supplied complete with shut off valves.
- Handle position left or right.
- Easy and cost effective construction.
- A borosilicate crystal type.
- Suitable for saturated steam, hot water, aggressive fluids.

Series **Overview**

In this kind of level gauge, the fluid is contained and is visible between two crystals both with smooth surfaces. The level is observed in a very easy way, because the fluid is in its liquid phase, light is absorbed making it appear dark. The upper part with air or gas, reflects the light, giving it a clear colour.



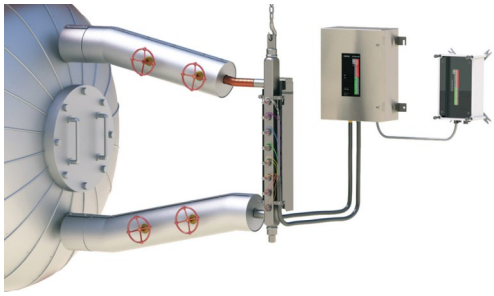
This kind of crystal makes the level gauge good for aggressive fluids or steam, a protective mica sheet can be installed between the fluid and the glass.

The biggest advantage for this type of gauge is for easy reading of boiling liquids. This is because of the larger volume of the liquid chamber and the manual adjustment of isolation valve at the input of the media entering in the chamber. This reduces the bubbling and allows a correct reading of the level.

Other products

Other products in the series include:

- Conductive type, Hydrastep level control
- Glass type level gauge



Product **applications**

Our Level Gauges are suitable for a wide range of applications in:

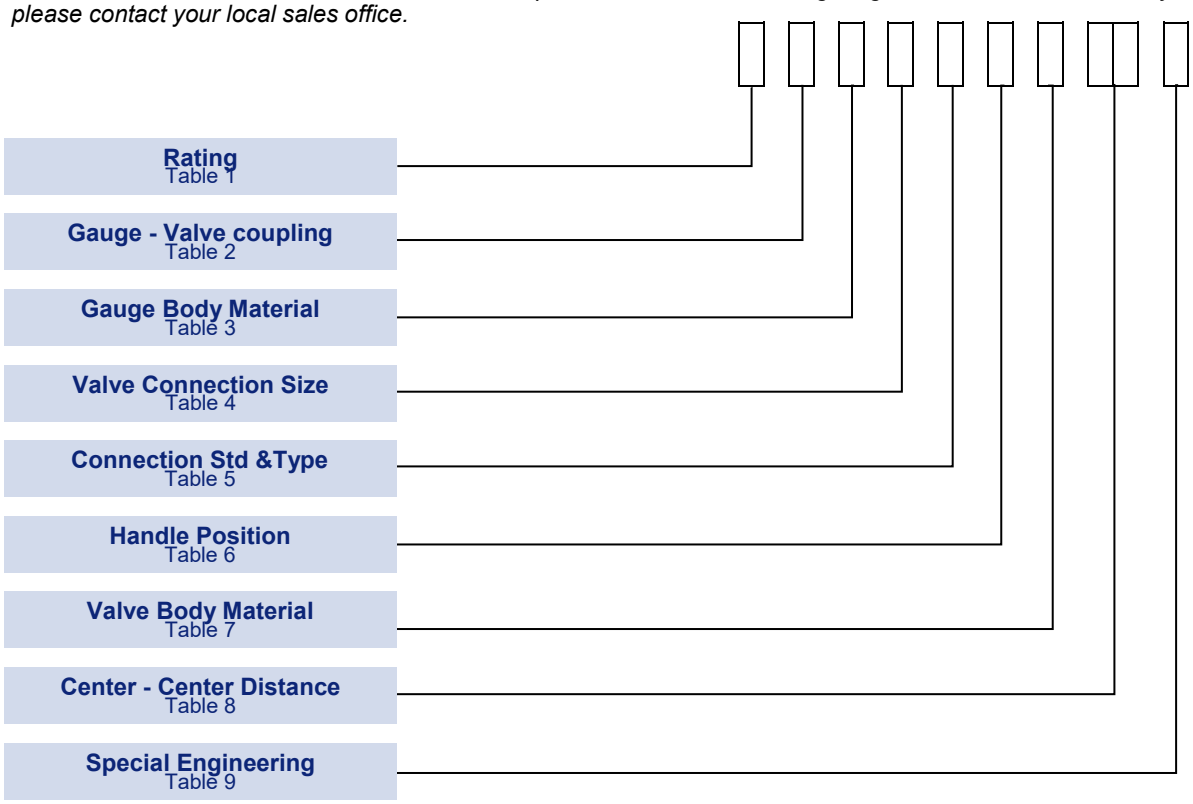
- Oil & Gas
- Chemical
- Petrochemical
- Refining
- Power

The choice of options ensures that the Reflex type level gauges series is suitable for use in:

- Boilers
- Resistant to chemical attack

How to order

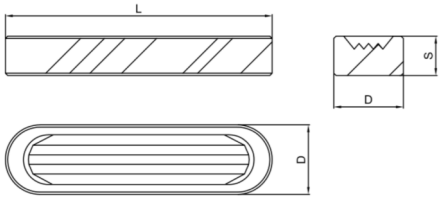
Gauges can be configured by selecting codes representing the desired features from the tables that follow. The chart below, describes how the model code is built up. For assistance in configuring a switch that best suits your needs, please contact your local sales office.



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.*

TO ENQUIRE ABOUT A QUOTATION FOR A LEVEL GAUGE, PLEASE SPECIFY:

- ***TYPE OF FLUID***
- ***OPERARTING CONDITION (PRESSURE AND TEMPERATURE)***
- ***REQUIRED FLANGE FACE FINISHING (RF/FF/RTJ)***
- ***MATERIAL OF CONSTRUCTION***



Reflex Type Level Gauge
Models: RLG

Technical Specification

Crystal

Resistance to pressure :	200 bar
Resistance to temperature :	300 ^{0}C
Reference Standards:	DIN 7081 ; TGL 7210 ; BS 3463
Expansion coefficient:	acc. to DIN 52328
Chilling strength:	acc. to DIN ISO 718
Hydrolytic resistance:	acc. to DIN ISO 719
Hydrolytic acid resistance:	acc. to ISO 1776
Alkali resistance:	acc. to DIN ISO 695

Body Material of Gauge:
See table on drawing page:
Dimension of the gauge:
See drawing page

Body Material of upper/lower cock

	PN40			PN64		
dim.	***L***	***D***	***S***	***L***	***D***	***S***
11	115	30	17	115	34	17
12	140	30	17	140	34	17
13	165	30	17	165	34	17
14	190	30	17	190	34	17
15	220	30	17	220	34	17
16	250	30	17	250	34	17
17	280	30	17	280	34	17
18	320	30	17	320	34	17
19	340	30	17	340	34	17

Body Rating

TABLE 1

Description	Code
Reflex type Rating PN40	**K**
Reflex type Rating PN64	**L**
Reflex type Rating PN100	**M**

Gauge-Valve Coupling

TABLE 2

NOTE:
Consider the construction
See table on drawings.

Description	Code
Type of connection between valves and gauge With end tubes and stuffing boxes	**B**
Type of connection between valves and gauge With screwed nipples	**A**

Gauge Body Material

TABLE 3

NOTE:
Consider the construction
See table on drawings.

Description	Code
Carbon steel Body material in Carbon Steel.	**H**
Stainless Steel Body material in Stainless Steel.	**B**
Non standard Material	**X**

Valve Connection Size

TABLE 4

NOTE:
Construction and dimensions of the connection ANSI or DIN is defined by the rating of the valve.
See table 5.

Description	Code
½" to ANSI B 16.5	**D**
¾ " to ANSI B 16.5 or DN20 to BS4504	**E**
1" to ANSI B 16.5 or DN25 to BS4504	**F**
1 ½ "to ANSI B 16.5 or DN40 to BS4504	**H**
2" to ANSI B 16.5 or DN50 to BS4504	**K**

Connection Std &Type

TABLE 5

NOTE :
Standard flange finishing is **RF** up to 600 lbs and **RTJ** for 900 & 1500 lbs. Different mix or FF finishing are available but on request as SPECIAL ENGINEERING

Description	Code
150 lbs.	**A**
300 lbs.	**B**
600 lbs.	**C**
900 lbs.	**D**
1500 lbs.	**E**
PN6	**G**
PN40	**K**
PN64	**L**
PN100	**M**
NPT MALE	**N**
NPT FEMALE	**O**
BSP MALE	**P**
BSP FEMALE	**Q**
SOCKET WELD	**R**
NON STANDARD	**X**

Handle Position

TABLE 6

NOTE:
The handle of the valves can be settled to operate on the left or on the right.

	Code
Level cock Handle Position Right handle position.	**1**
Level cock Handle Position Left handle position.	**2**

Valve Body Material

TABLE 7

NOTE:
See drawing for the breakdown material of the cock valve.

Description	Code
Carbon Steel	**H**
Stainless Steel	**B**
Non standard	**X**

Center - Center Distance

TABLE 8

NOTE:
Refer to the drawings for all dimensions and visible length.

Description	Code
Center - Center Distance code Ax/Ay as shown in drawings	**XX**

Special Engineering

TABLE 9

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

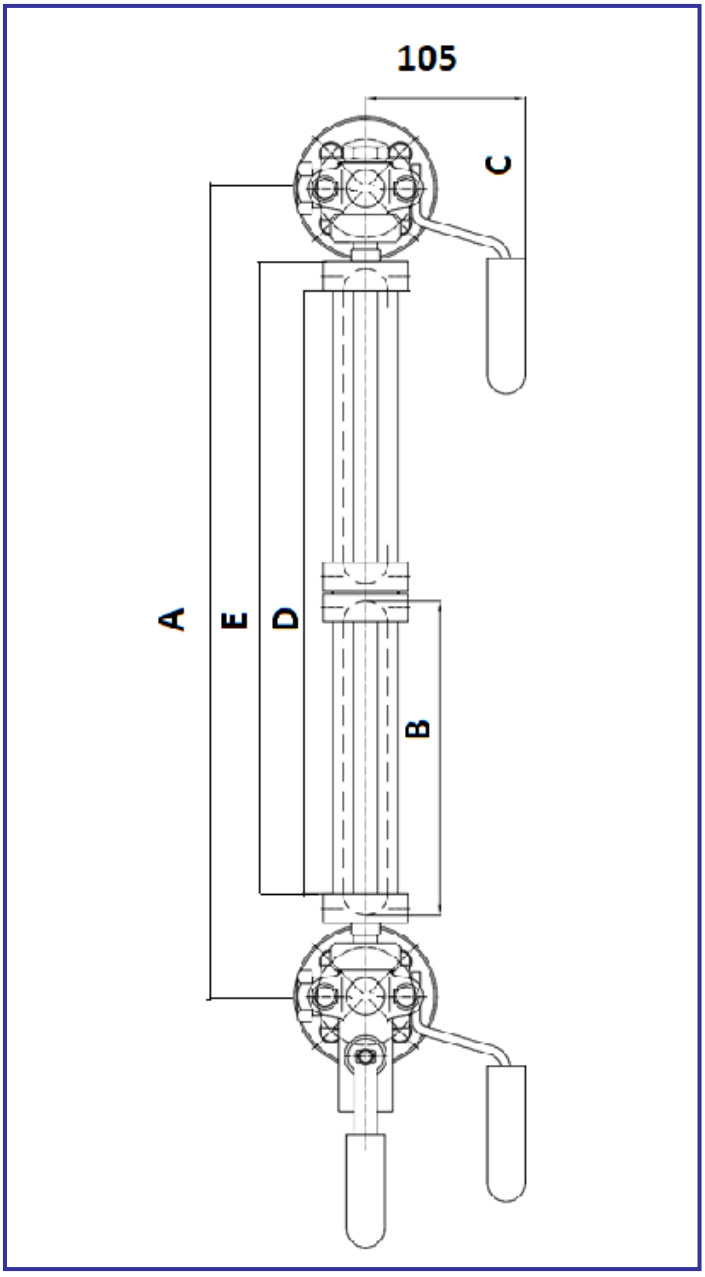
Description	Code
Please consult our sales engineering for special requirements	**TBA**

Dimensions

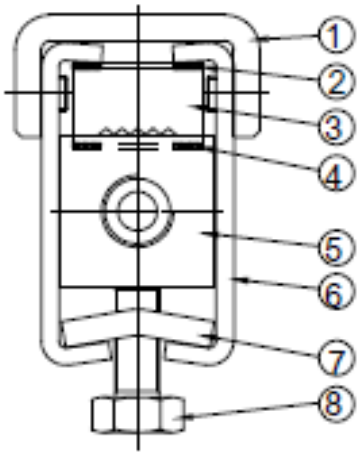
All dimensions mm

RATING PN40 = code K

Ax= center-center distance with end tubes and stuffing boxes.
Ay= center-center distance with threaded nipples



Dim. code	A_B min.	A_A min.	E	D +2 / 0	B
13	285	246	178	141	165
14	310	271	203	166	190
15	340	301	233	196	220
16	370	331	263	226	250
17	400	361	293	256	280
18	440	401	333	296	320
19	460	421	353	313	340
24	515	474	406	367	190
25	575	534	466	427	220
26	635	594	526	489	250
27	695	654	586	549	280
28	775	734	666	628	320
29	815	774	706	668	340
36	900	857	789	751	250
37	990	947	879	841	280
38	1110	1067	999	961	320
39	1170	1127	1059	1021	340
47	1285	1240	1172	1134	280
48	1445	1400	1332	1294	320
49	1525	1480	1412	1374	340
57	1580	1533	1465	1427	280
58	1780	1733	1665	1627	320
59	1880	1833	1765	1727	340
68	2115	2066	1998	1960	320
69	2235	2186	2118	2080	340
79	2590	2539	2471	2433	340



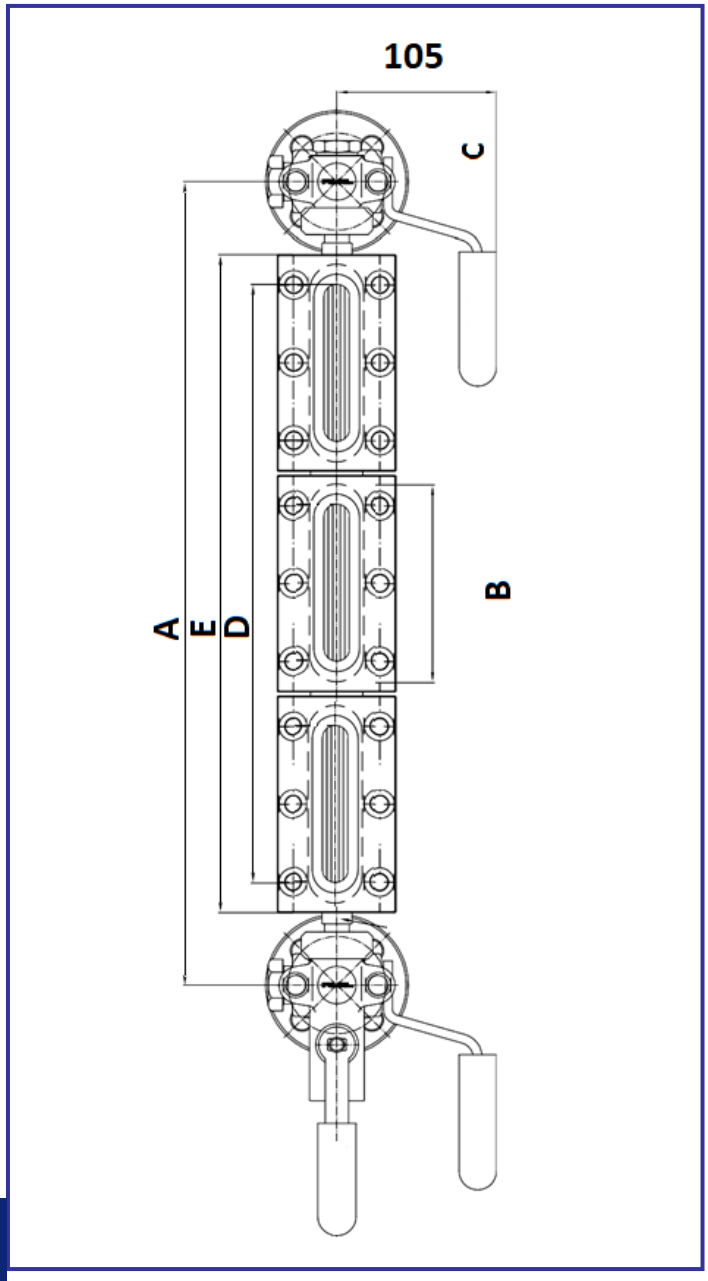
		A	B
1	Safety clamps	**Carbon Steel**	**Carbon steel**
2	Upper gasket	**Asbestos free**	**Asbestos free**
3	Reflex Glass	**Borosilicate**	**Borosilicate**
4	Lower gasket	**Graphite**	**Graphite**
5	Level body	**Carbon Steel**	**Carbon Steel**
6	Cover plate	**Carbon Steel**	**Carbon Steel**
7	Tightening bolts	**Carbon Steel**	**Carbon Steel**
8	Bolts	**Grade 8.8 Zinc**	**Grade 8.8 Zinc**
9	Nipples Up/Low	**Stainless Steel**	**Stainless Steel**

Dimensions

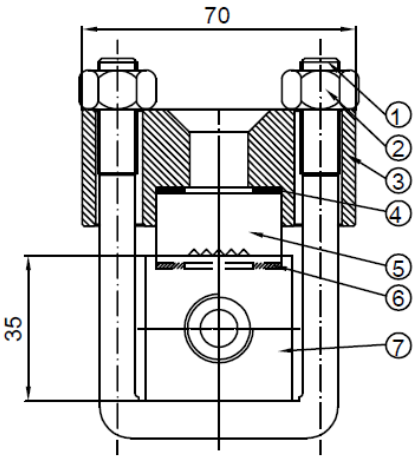
All dimensions mm

RATING PN64 = code L

Ax= center-center distance with end tubes and stuffing boxes.
Ay= center-center distance with threaded nipples.



Dim. code	A_B min.	A_A min.	E	D +2 / 0	B
11	235	190	128	91	115
12	260	221	153	116	140
13	285	246	178	141	165
14	310	271	203	166	190
15	340	301	233	196	220
16	370	331	263	226	250
17	400	361	293	256	280
18	440	401	333	296	320
19	460	421	353	313	340
24	515	474	406	367	190
25	575	534	466	427	220
26	635	594	526	489	250
27	695	654	586	549	280
28	775	734	666	628	320
29	815	774	706	668	340
36	900	857	789	751	250
37	990	947	879	841	280
38	1110	1067	999	961	320
39	1170	1127	1059	1021	340
47	1285	1240	1172	1134	280
48	1445	1400	1332	1294	320
49	1525	1480	1412	1374	340
57	1580	1533	1465	1427	280
58	1780	1733	1665	1627	320
59	1880	1833	1765	1727	340
68	2115	2066	1998	1960	320
69	2235	2186	2118	2080	340
79	2590	2539	2471	2433	340



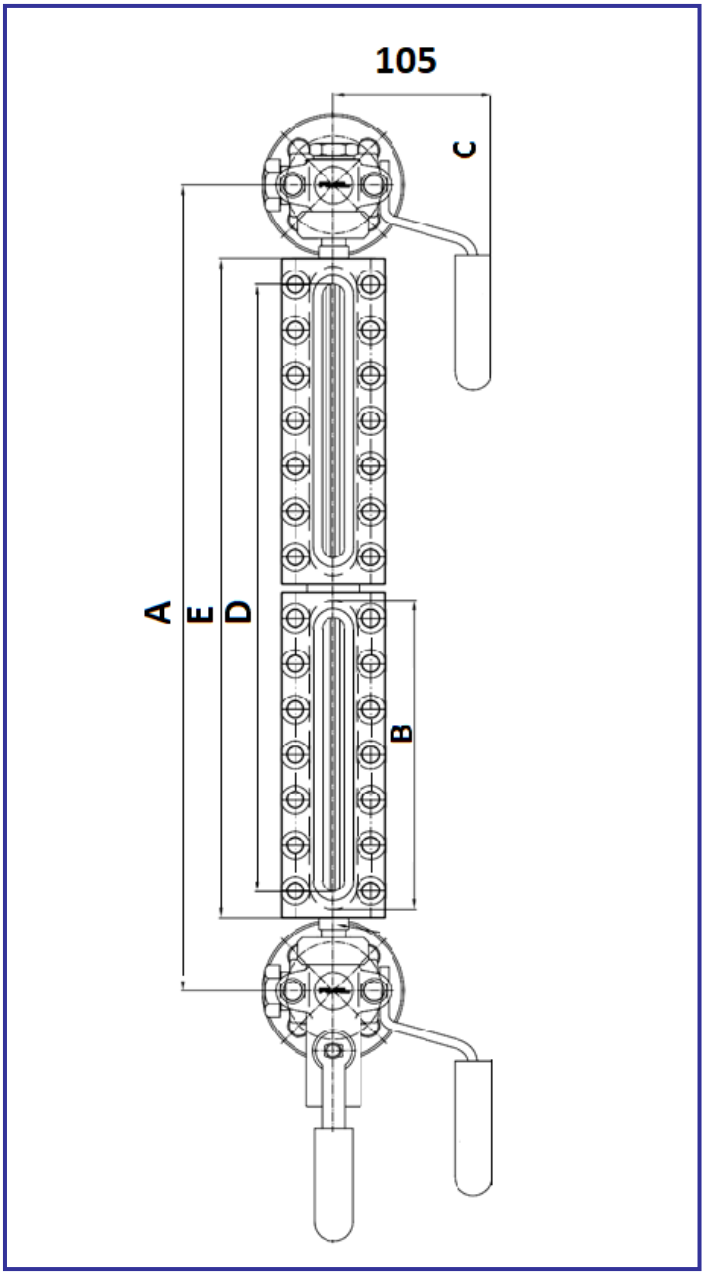
		A	B
1	Bolts	**ASTM A193 B7**	**ASTM A193 B7**
2	Nut	**ASTM A194 2H**	**ASTM A194 2H**
3	Cover	**Carbon Steel**	**Carbon Steel**
4	Upper gasket	**Asbestos free**	**Asbestos free**
5	Reflex Glass	**Borosilicate**	**Borosilicate**
6	Lower gasket	**Graphite**	**Graphite**
7	Level Body	**Carbon Steel**	**Stainless Steel**
8	Nipples	**Stainless Steel**	**Stainless Steel**

Dimensions

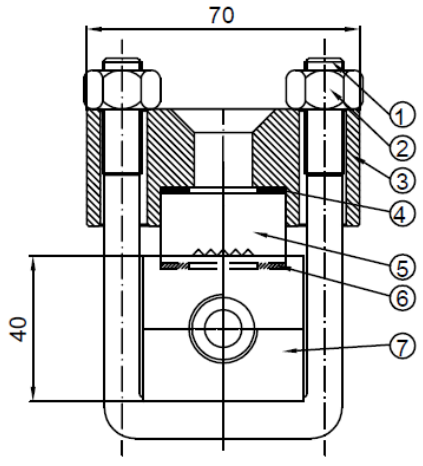
All dimensions mm

RATING PN100 = code M

Ax= center-center distance with end tubes and stuffing boxes.
Ay= center-center distance with threaded nipples



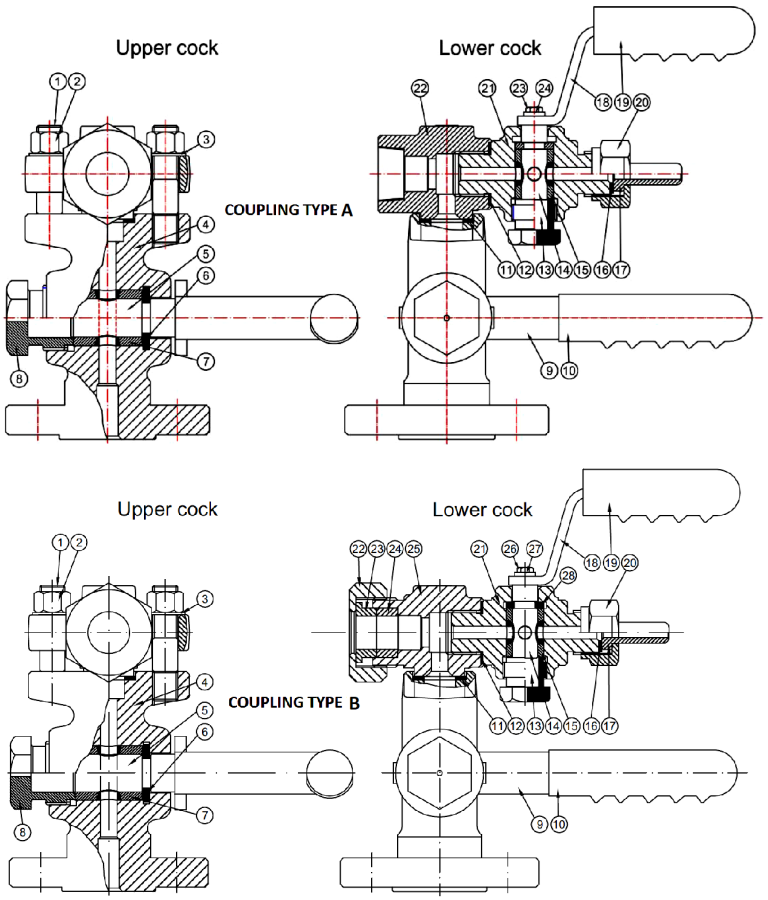
Dim. code	A_B min.	A_A min.	E	D +2 / 0	B
11	235	196	128	91	115
12	260	221	153	116	140
13	285	246	178	141	165
14	310	271	203	166	190
15	340	301	233	196	220
16	370	331	263	226	250
17	400	361	293	256	280
18	440	401	333	296	320
19	460	421	353	313	340
24	515	474	406	367	190
25	575	534	466	427	220
26	635	594	526	489	250
27	695	654	586	549	280
28	775	734	666	628	320
29	815	774	706	668	340
36	900	857	789	751	250
37	990	947	879	841	280
38	1110	1067	999	961	320
39	1170	1127	1059	1021	340
47	1285	1240	1172	1134	280
48	1445	1400	1332	1294	320
49	1525	1480	1412	1374	340
57	1580	1533	1465	1427	280
58	1780	1733	1665	1627	320
59	1880	1833	1765	1727	340
68	2115	2066	1998	1960	320
69	2235	2186	2118	2080	340
79	2590	2539	2471	2433	340



		A	B
1	Bolts	**ASTM A193 B7**	**ASTM A193 B7**
2	Nut	**ASTM A194 2H**	**ASTM A194 2H**
3	Cover	**Carbon Steel**	**Carbon Steel**
4	Upper gasket	**Asbestos free**	**Asbestos free**
5	Reflex Glass	**Borosilicate**	**Borosilicate**
6	Lower gasket	**Graphite**	**Graphite**
7	Level Body	**Carbon Steel**	**Stainless Steel**
8	Nipples	**Stainless Steel**	**Stainless Steel**

Dimensions

All dimensions mm (inches)



	COUPLING TYPE B	A	B
1	Bolts	ASTM A193 B7	ASTM A193 B8
2	Nut	ASTM A194 2H	DIN938 Gr.8
3	Washer	UNI 6592	F316L
4	Body	ASTM A105N	F316L
5	Plug F18	A316	A316
6	Ring F18	A316	A316
7	Packing Sleeves F18	Graphite	Grafite / Graphite
8	Stuffing box F18	Carbon Steel	ACC. INOX / S.steel
9	Big cock handle	Carbon Steel	Acc/C / C.steel
10	Big Cover Handle	Nylon 66	Nylon 66
11	Jooint Ring	Asbestos Free	Asbestos Free
12	Ring Thickness	A316	A316
13	Stuffing box F12	Carbon Steel	Stainless Steel
14	Plug F12	A316	A316
15	Packing Sleeves F12	Graphite	Graphite
16	Gasket	Asbestos Free	Asbestos Free
17	Connection pype	Carbon Steel	S.Steel
18	Little cock handle	Carbon Steel	Carbon Steel
19	Little cover handle	Nylon 66	Nylon 66
20	Draincock cover	Carbon Steel	ACC. INOX / S.steel
21	Drain cock	ASTM A105N	F316
22	Stuffing Box body	ASTM A105N	F316
23	Cap Screw	UNI 5739	UNI 5739
24	Washer	UNI 6592	UNI 6592

	COUPLING TYPE A	A	B
1	Bolts	ASTM A193 B7	ASTM A193 B8
2	Nut	ASTM A194 2H	DIN938 Gr.8
3	Washer	UNI 6592	F316L
4	Body	ASTM A105N	F316L
5	Plug F18	A316	A316
6	Ring F18	A316	A316
7	Packing Sleeves F18	Graphite	Grafite / Graphite
8	Stuffing box F18	Carbon Steel	ACC. INOX / S.steel
9	Big cock handle	ASTM A 105	Acc/C / C.steel
10	Big Cover Handle	Nylon 66	Nylon 66
11	Spirometallic	F316 / Graphite	F316 / Graphite
12	Ring Thickness	A316	A316
13	Stuffing box F12	Carbon Steel	Stainless Steel
14	Plug F12	A316	A316
15	Packing Sleeves F12	Graphite	Graphite
16	Gasket	Graphite	Graphite
17	Connection Type	Carbon Steel	S.Steel
18	Little cock handle	Carbon Steel	S.Steel
19	Little cover handle	Nylon 66	Nylon 66
20	Draincock cover	Carbon Steel	ACC. INOX / S.steel
21	Drain cock	ASTM A105N	F316
22	Connections cover	Carbon Steel	S.Steel
23	Stuffing box ring	Carbon Steel	S.Steel
24	Packing Sleeves F18	Graphite	Graphite
25	Stuffing bix body	ASTM A105N	F316
26	Cap screw	UNI 5739	UNI 5739
27	Washer	UNI 6592	UNI 6592
28	Ring F12	A316	A316

Technical **Datasheet**

delta-mobrey

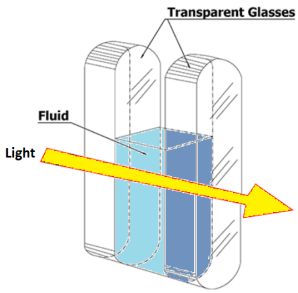
LEVEL GAUGE
Transparent type
Models: TLG

Key **Features**

- High reliability for use on steam and process applications.
- Complete shut off valves supplied.
- Handle position left or right.
- Easy and cost effective construction.
- A borosilicate crystal type.
- Suitable for saturated steam, hot water and aggressive fluids.

Series **Overview**

In this kind of level gauge, the fluid is contained between two glasses. Both crystals have a smooth surface. When the light passes through the back, the transparent crystal illuminates the chamber between two glasses, the level is clearly visible.



An illuminator can be added on the back, to facilitate the visibility of the level in a dim lit place or at night.

This kind of crystal makes the level gauge good for aggressive fluids or steam, a protective mica sheet can be installed between the fluid and the glass.

Product **applications**

Our Level Gauges are suitable for a wide range of applications in:

- Oil & Gas
- Chemical
- Petrochemical
- Refining
- Power

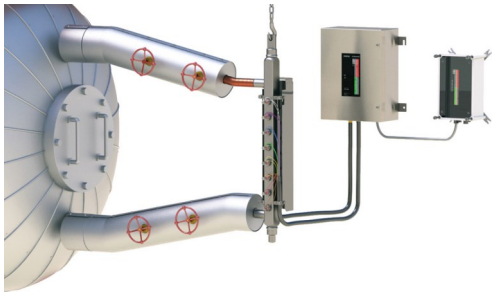
The choice of options ensures that the Transparent type level gauge series is suitable for use in:

- Boilers
- High pressure and temperature conditions
- Chemical aggressive media

Other products

Other products in the series include:

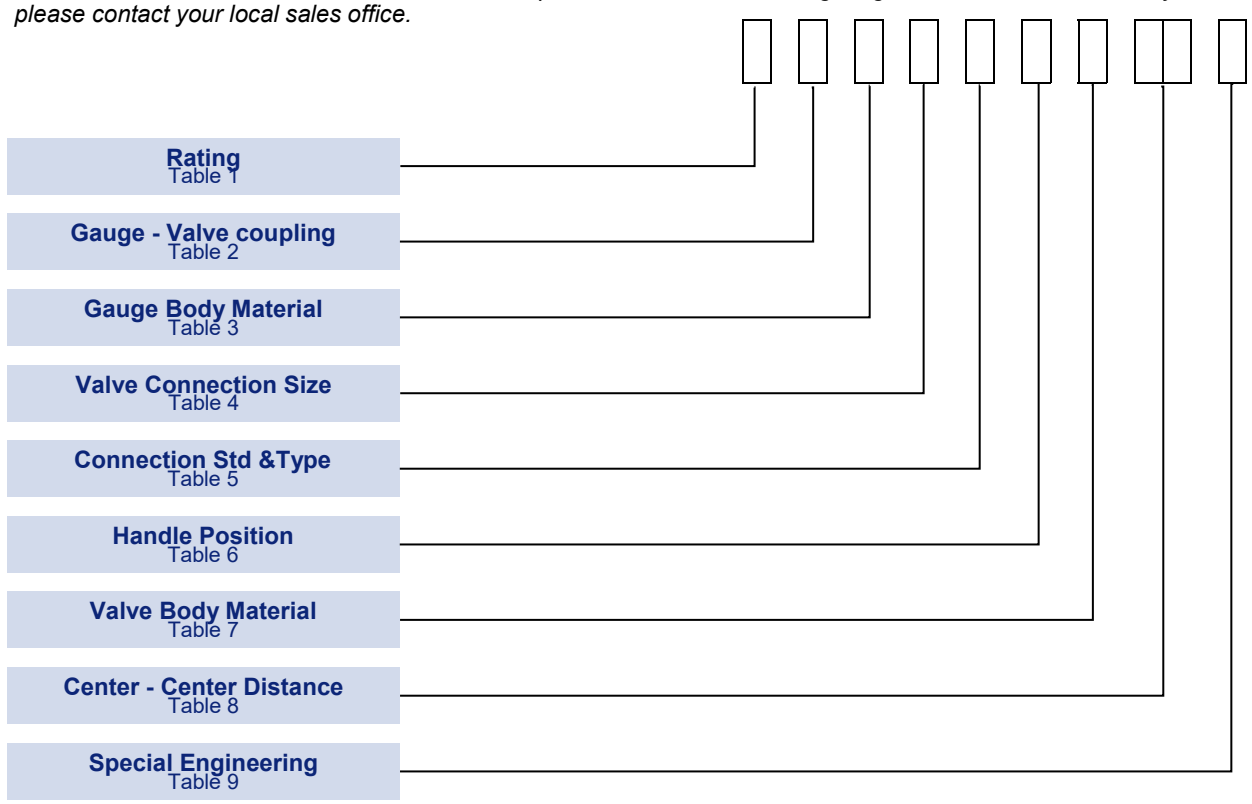
- Conductive type, Hydrastep level control
- Glass type level gauge



Transparent Type Level Gauge
Models: TLG

How to order

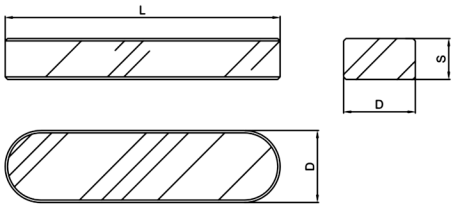
Gauges can be configured by selecting codes representing the desired features from the tables that follow. The chart below, describes how the model code is built up. For assistance in configuring a switch that best suits your needs, please contact your local sales office.



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.*

TO ENQUIRE ABOUT A QUOTATION FOR A LEVEL GAUGE, PLEASE SPECIFY:

- ***TYPE OF FLUID***
- ***OPERARTING CONDITION (PRESSURE AND TEMPERATURE)***
- ***REQUIRED FLANGE FACE FINISHING (RF/FF/RTJ)***
- ***MATERIAL OF CONSTRUCTION***



Technical Specification

Crystal

Resistance to pressure :	200 bar
Resistance to temperature :	300 ^{0}C
Glass dimension:	30mm
Reference Standards:	DIN 7081 ; TGL 7210 ; BS 3463
Expansion coefficient:	acc. to DIN 52328
Chilling strength:	acc. to DIN ISO 718
Hydrolytic resistance:	acc. to DIN ISO 719
Hydrolytic acid resistance:	acc. to ISO 1776
Alkali resistance:	acc. to DIN ISO 695

Body Material of Gauge:
See table on drawing page:
Dimension of the gauge:
See drawing page
Body Material of upper/lower cock

	PN40			PN64		
dim.	***L***	***D***	***S***	***L***	***D***	***S***
11	115	30	17	115	34	17
12	140	30	17	140	34	17
13	165	30	17	165	34	17
14	190	30	17	190	34	17
15	220	30	17	220	34	17
16	250	30	17	250	34	17
17	280	30	17	280	34	17
18	320	30	17	320	34	17
19	340	30	17	340	34	17

Body Rating

TABLE 1

Description	Code
Transparent type Rating PN40	**K**
Transparent type Rating PN64	**L**

Gauge-Valve Coupling

TABLE 2

NOTE:
Consider the construction
See the table on drawings.

Description	Code
Type of connection between valves and gauge With end tubes and stuffing boxes .	**B**
Type of connection between valves and gauge With screwed nipples	**A**

Gauge Body Material

TABLE 3

NOTE:
Consider the construction
See the table on drawings.

Description	Code
Carbon steel Body material in Carbon Steel.	**H**
Stainless Steel Body material in Stainless Steel.	**B**
Non standard Material	**X**

Valve Connection Size

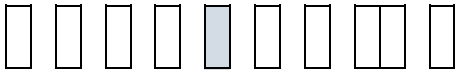
TABLE 4

NOTE:
Construction and dimensions of the connection ANSI or DIN is defined by the rating of the valve..
See table 5.

Description	Code
½" to ANSI B 16.5	**D**
¾ " to ANSI B 16.5 or DN20 to BS4504	**E**
1" to ANSI B 16.5 or DN25 to BS4504	**F**
1 ½ "to ANSI B 16.5 or DN40 to BS4504	**H**
2" to ANSI B 16.5 or DN50 to BS4504	**K**

Connection Std &Type

TABLE 5

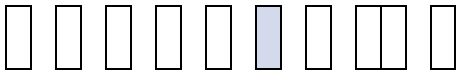


NOTE :
Standard flange finishing is **RF** up to 600 lbs and **RTJ** for 900 & 1500 lbs. Different mix or FF finishing are available but on request as SPECIAL ENGINEERING

Description	Code
150 lbs.	**A**
300 lbs.	**B**
PN6	**G**
PN40	**K**
PN64	**L**
NPT MALE	**N**
NPT FEMALE	**O**
BSP MALE	**P**
BSP FEMALE	**Q**
SOCKET WELD	**R**
NON STANDARD	**X**

Handle Position

TABLE 6

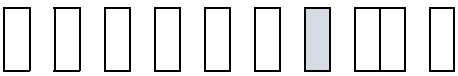


NOTE:
The handle of the valves can be settled to operate on the left or on the right.

	Code
Level cock Handle Position Right handle position.	**1**
Level cock Handle Position Left handle position.	**2**

Valve Body Material

TABLE 7

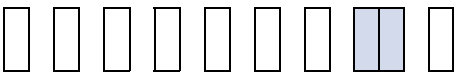


NOTE:
See drawing for the breakdown material of the cock valve.

Description	Code
Carbon Steel	**H**
Stainless Steel	**B**
Non standard	**X**

Center - Center Distance

TABLE 8

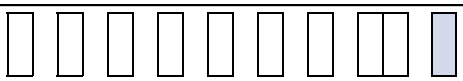


NOTE:
Refer to the drawings for all dimensions and visible length

Description	Code
Centre - Centre Distance code Ax/Ay as shown in drawings	**XX**

Special Engineering

TABLE 9



NOTE:
Last digits of model code only used when special engineering is required.
Select the type of illuminator required 1,2 or 3 according to the power supply available on site.

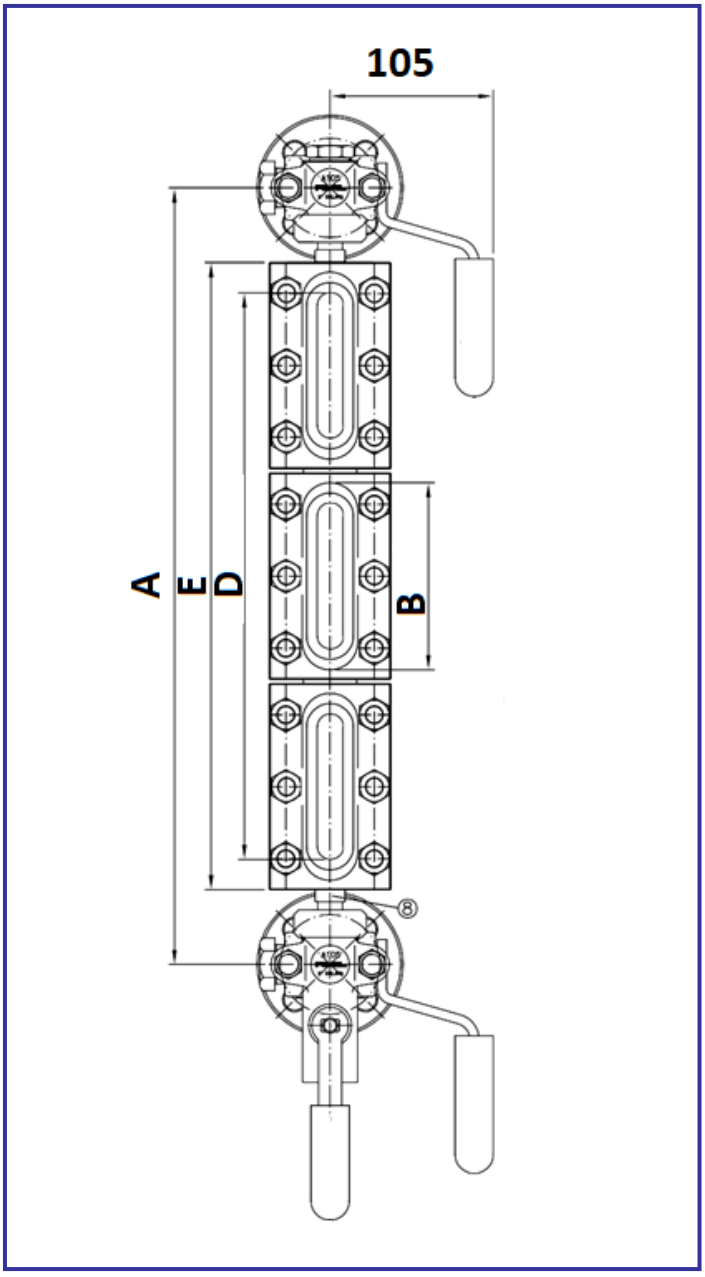
Description	Code
Illuminator 1 or 2 or 3 (see drawing, not manufactured by DELTA)	**X**
Please consult our sales engineering for special requirements	**TBA**

Dimensions

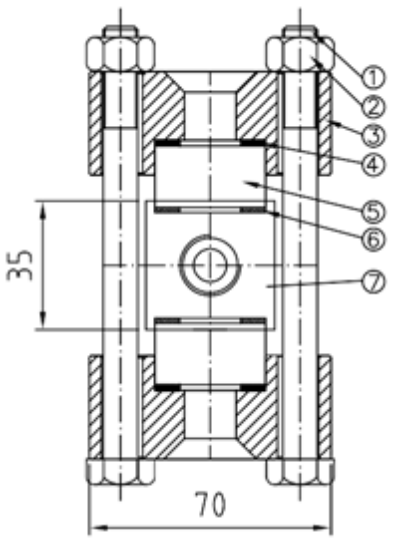
All dimensions mm

RATING PN40 = code K

Ax= center-center distance with end tubes and stuffing boxes.
Ay= center-center distance with threaded nipples



Dim. code	A_B min.	A_A min.	E	D +2 / 0	B
11	235	196	128	115	115
12	260	221	153	116	140
13	285	246	178	141	165
14	310	271	203	166	190
15	340	301	233	196	220
16	370	331	263	226	250
17	400	361	293	256	280
18	440	401	333	296	320
19	460	421	353	313	340
24	515	474	406	367	190
25	575	534	466	427	220
26	635	594	526	489	250
27	695	654	586	549	280
28	775	734	666	628	320
29	815	774	706	668	340
36	900	857	789	751	250
37	990	947	879	841	280
38	1110	1067	999	961	320
39	1170	1127	1059	1021	340
47	1285	1240	1172	1134	280
48	1445	1400	1332	1294	320
49	1525	1480	1412	1374	340
57	1580	1533	1465	1427	280
58	1780	1733	1665	1627	320
59	1880	1833	1765	1727	340
68	2115	2066	1998	1960	320
69	2235	2186	2118	2080	340
79	2590	2539	2471	2433	340



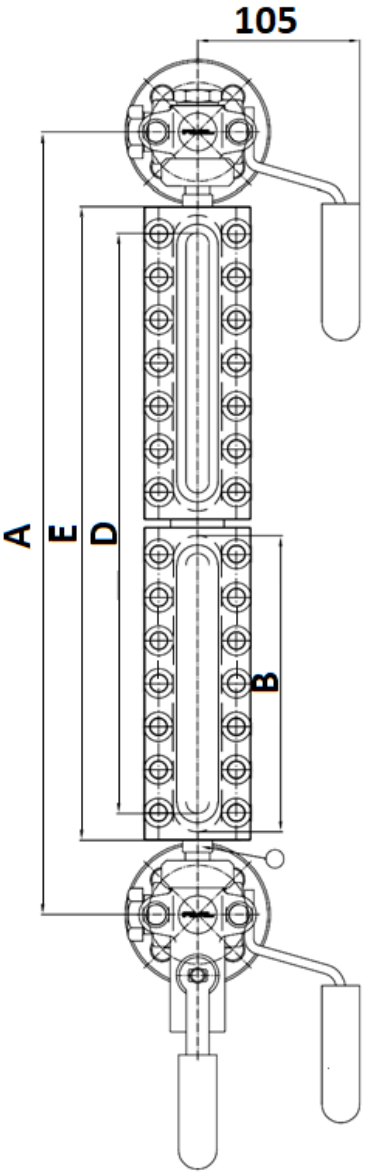
		A	B
1	Bolts	**B7**	**B7**
2	Nuts	**2H**	**2H**
3	Cover	**Carbon Steel**	**Carbon steel**
4	Upper gasket	**Asbestos free**	**Gasbestos free**
5	Glass	**Borosilicate**	**Borosilicate**
6	Lower gasket	**Graphite**	**Graphite**
7	Body	**Carbon Steel**	**Stainless Steel**
8	Nipples Up/Low	**Stainless Steel**	**Stainless Steel**

Dimensions

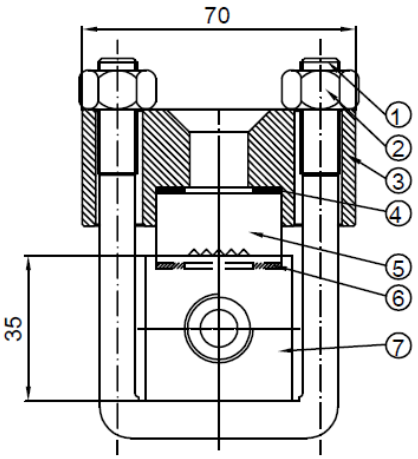
All dimensions mm

RATING PN64 = code L

Ax= center-center distance with end tubes and stuffing boxes.
Ay= center-center distance with threaded nipples



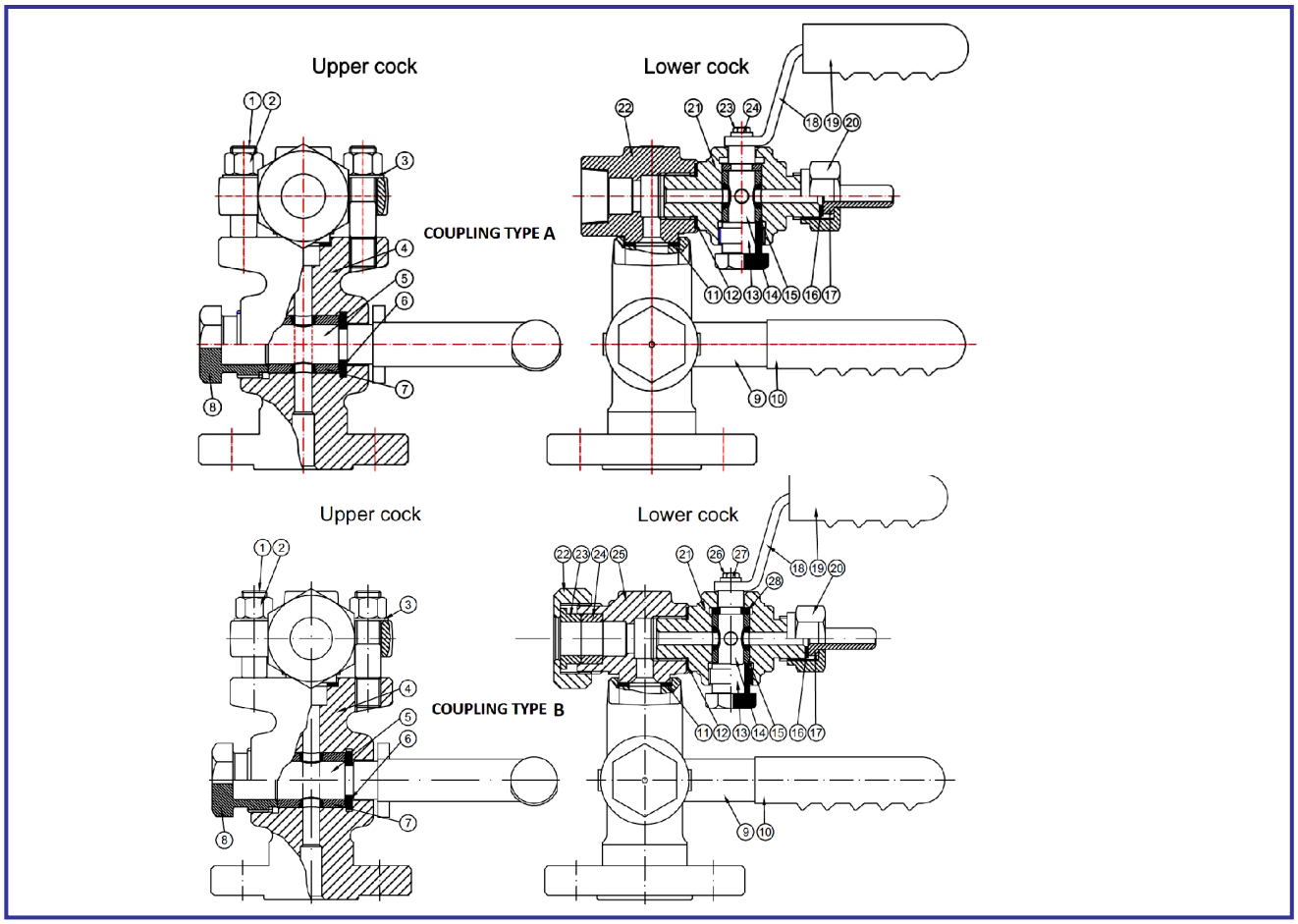
Dim. code	A_B min.	A_A min.	E	D +2 / 0	B
11	235	190	128	91	115
12	260	221	153	116	140
13	285	246	178	141	165
14	310	271	203	166	190
15	340	301	233	196	220
16	370	331	263	226	250
17	400	361	293	256	280
18	440	401	333	296	320
19	460	421	353	313	340
24	515	474	406	367	190
25	575	534	466	427	220
26	635	594	526	489	250
27	695	654	586	549	280
28	775	734	666	628	320
29	815	774	706	668	340
36	900	857	789	751	250
37	990	947	879	841	280
38	1110	1067	999	961	320
39	1170	1127	1059	1021	340
47	1285	1240	1172	1134	280
48	1445	1400	1332	1294	320
49	1525	1480	1412	1374	340
57	1580	1533	1465	1427	280
58	1780	1733	1665	1627	320
59	1880	1833	1765	1727	340
68	2115	2066	1998	1960	320
69	2235	2186	2118	2080	340
79	2590	2539	2471	2433	340



		A	B
1	Bolts	**ASTM A193 B7**	**ASTM A193 B7**
2	Nut	**ASTM A194 2H**	**ASTM A194 2H**
3	Cover	**Carbon Steel**	**Carbon Steel**
4	Upper gasket	**Asbestos free**	**Asbestos free**
5	Reflex Glass	**Borosilicate**	**Borosilicate**
6	Lower gasket	**Graphite**	**Graphite**
7	Level Body	**Carbon Steel**	**Stainless Steel**
8	Nipples	**Stainless Steel**	**Stainless Steel**

Dimensions

All dimensions mm (inches)



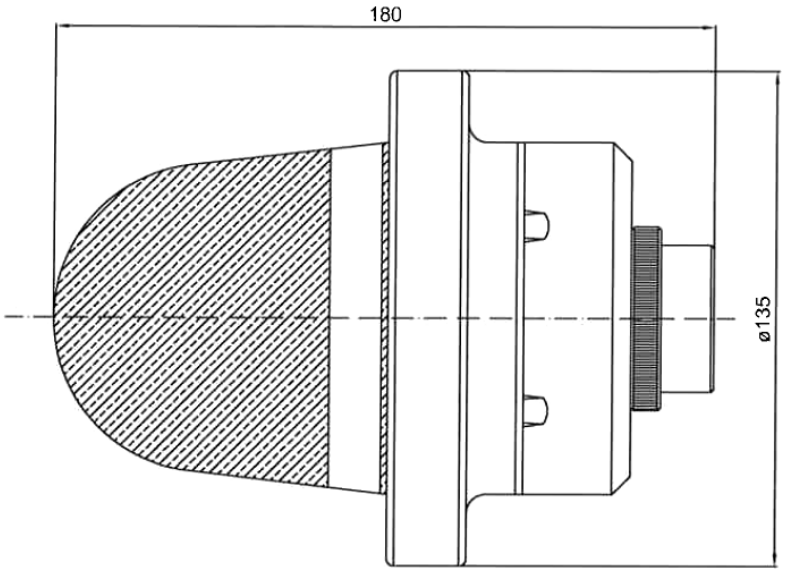
	COUPLING TYPE B	A	B
1	Bolts	ASTM A193 B7	ASTM A193 B8
2	Nut	ASTM A194 2H	DIN938 Gr.8
3	Washer	UNI 6592	F316L
4	Body	ASTM A105N	F316L
5	Plug F18	A316	A316
6	Ring F18	A316	A316
7	Packing Sleeves F18	Graphite	Grafite / Graphite
8	Stuffing box F18	Carbon Steel	ACC. INOX / S.steel
9	Big cock handle	Carbon Steel	Acc/C / C.steel
10	Big Cover Handle	Nylon 66	Nylon 66
11	Jooint Ring	Asbestos Free	Asbestos Free
12	Ring Thickness	A316	A316
13	Stuffing box F12	Carbon Steel	Stainless Steel
14	Plug F12	A316	A316
15	Packing Sleeves F12	Graphite	Graphite
16	Gasket	Asbestos Free	Asbestos Free
17	Connection pype	Carbon Steel	S.Steel
18	Little cock handle	Carbon Steel	Carbon Steel
19	Little cover handle	Nylon 66	Nylon 66
20	Draincock cover	Carbon Steel	ACC. INOX / S.steel
21	Drain cock	ASTM A105N	F316
22	Stuffing Box body	ASTM A105N	F316
23	Cap Screw	UNI 5739	UNI 5739
24	Washer	UNI 6592	UNI 6592

	COUPLING TYPE A	A	B
1	Bolts	ASTM A193 B7	ASTM A193 B8
2	Nut	ASTM A194 2H	DIN938 Gr.8
3	Washer	UNI 6592	F316L
4	Body	ASTM A105N	F316L
5	Plug F18	A316	A316
6	Ring F18	A316	A316
7	Packing Sleeves F18	Graphite	Grafite / Graphite
8	Stuffing box F18	Carbon Steel	ACC. INOX / S.steel
9	Big cock handle	ASTM A 105	Acc/C / C.steel
10	Big Cover Handle	Nylon 66	Nylon 66
11	Spirometallic	F316 / Graphite	F316 / Graphite
12	Ring Thickness	A316	A316
13	Stuffing box F12	Carbon Steel	Stainless Steel
14	Plug F12	A316	A316
15	Packing Sleeves F12	Graphite	Graphite
16	Gasket	Graphite	Graphite
17	Connection Type	Carbon Steel	S.Steel
18	Little cock handle	Carbon Steel	S.Steel
19	Little cover handle	Nylon 66	Nylon 66
20	Draincock cover	Carbon Steel	ACC. INOX / S.steel
21	Drain cock	ASTM A105N	F316
22	Connections cover	Carbon Steel	S.Steel
23	Stuffing box ring	Carbon Steel	S.Steel
24	Packing Sleeves F18	Graphite	Graphite
25	Stuffing bix body	ASTM A105N	F316
26	Cap screw	UNI 5739	UNI 5739
27	Washer	UNI 6592	UNI 6592
28	Ring F12	A316	A316

Dimensions

Special request : Illuminator 1 or 2 or 3

All dimensions mm (inches)



TYPE OF ILLUMIMATOR	1	2	3
Voltage	**12/24 Vdc**	**125 Vac**	**230Vac**
Current rating	**90-130 mA**	**15 mA**	**20 mA**
Frequency		**50/60 Hz**	**50/60 Hz**
Power consumption	**2 W**	**1.6 W**	**4.5 W**
Lamp power	**6 J**	**6 J**	**6 J**
Type of Service	**Continuous**	**Continuous**	**Continuous**
Cable Entry	**3/4" GK**	**3/4" GK**	**3/4" GK**
ATEX certification	**INERIS 01ATEX0068X**	**INERIS 01ATEX0068X**	**INERIS 01ATEX0068X**
Body & Cover material	**Aluminum**	**Aluminum**	**Aluminum**
Transparent—Glass	**Glass**	**Glass**	**Glass**

Technical **Datasheet**

delta-mobrey

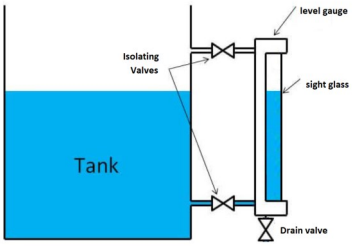
LEVEL GAUGE
Glass tube type
Models: GLG

Key **Features**

- Simple and reliable for use on steam and process applications.
- Supplied complete with shut off valves.
- Handle positions left or right.
- Easy and cheap solutions.
- A borosilicate crystal type.
- Suitable for clear liquids and water.

Series **Overview**

Glass tube type level gauge, is the simplest device to read a level inside a tank. It work as a window enabling operator to observe processes inside tanks, pipes, reactors or vessels. The type of glass used in the manufacturing of our sight glasses is borosilicate glass, and the valves body could be either made from carbon Steel or Stainless Steel.



This kind of crystal makes the level gauge good for aggressive fluids or steam, since protective a mica sheet can be installed between the fluid and the glass. The biggest advantage of this type of gauge is the very low cost and the isolating valves allowing easy maintenance.

Product **applications**

Our Level Gauges are suitable for a wide range of applications in:

- Oil & Gas
- Chemical
- Petrochemical
- Refining
- Power

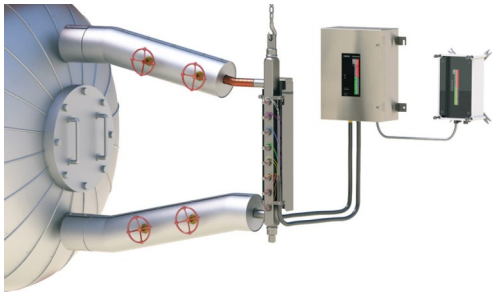
The choice of options ensures that the Glass type level gauges series is suitable for use in:

- Boilers
- Resistant to chemical attack

Other products

Other products in the series include:

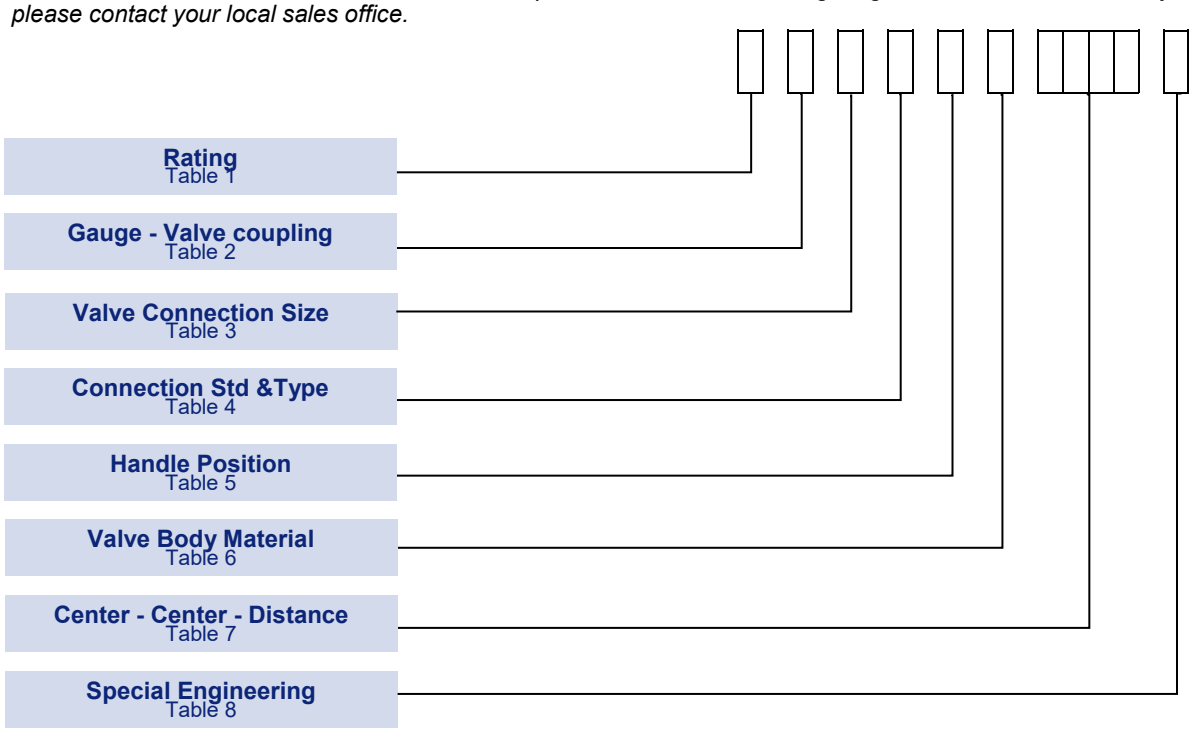
- Conductive type, Hydrastep level control
- Reflex level gauge



Glass Type Level Gauge
Models: GLG

How to order

Gauges can be configured by selecting codes representing the desired features from the tables that follow. The chart below, describes how the model code is built up. For assistance in configuring a switch that best suits your needs, please contact your local sales office.



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.*

TO ENQUIRE ABOUT A QUOTATION FOR A LEVEL GAUGE, PLEASE SPECIFY:

- ***TYPE OF FLUID***
- ***OPERARTING CONDITION (PRESSURE AND TEMPERATURE)***
- ***REQUIRED FLANGE FACE FINISHING (RF/FF/RTJ)***
- ***MATERIAL OF CONSTRUCTION***

Technical Specification

Crystal

Resistance to pressure :	200 bar
Resistance to temperature :	300 ^{0}C
Reference Standards:	DIN 7081 ; TGL 7210 ; BS 3463
Expansion coefficient:	acc. to DIN 52328
Chilling strength:	acc. to DIN ISO 718
Hydrolytic resistance:	acc. to DIN ISO 719
Hydrolytic acid resistance:	acc. to ISO 1776
Alkali resistance:	acc. to DIN ISO 695

Dimension of the gauge:

See drawing.

Note : Max Center-Center distance for single glass tube = 3000mm

For higher distance, multiple tubes are used, fitted with middle connection

Body Material of upper/lower cock

See table on drawing page:

Body Rating

TABLE 1

Description	Code
Glass tube type Rating PN40	**K**

Gauge-Valve Coupling

TABLE 2

NOTE:
Consider the construction
See table on drawings.

Description	Code
Type of connection between valves and gauge With end tubes and stuffing boxes.	**B**

Valve Connection Size

TABLE 3

NOTE:
Construction and dimensions of the connection ANSI or DIN is defined by the rating of the valve.
See table 5.

Description	Code
½" to ANSI B 16.5	**D**
¾ " to ANSI B 16.5 or DN20 to BS4504	**E**
1" to ANSI B 16.5 or DN25 to BS4504	**F**

Connection Std &Type

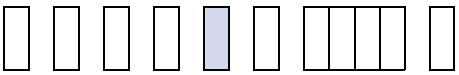
TABLE 4

NOTE:
Standard flange finishing is **RF.**
Different mix or FF finishing are available but on request as SPECIAL ENGINEERING

Description	Code
150 lbs.	**A**
PN6	**G**
PN16	**H**
PN40	**K**
NPT MALE	**N**
NPT FEMALE	**O**
BSP MALE	**P**
BSP FEMALE	**Q**
SOCKET WELD	**R**
NON STANDARD	**X**

Handle Position

TABLE 5

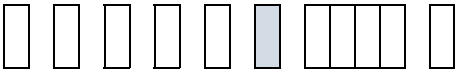


NOTE:
The handle of the valves can be settled to operate on the left or on the right.

	Code
Level cock Handle Position Right handle position.	**1**
Level cock Handle Position Left handle position.	**2**

Valve Body Material

TABLE 6

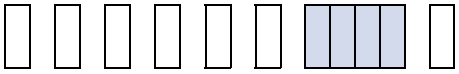


NOTE:
See drawing for the breakdown material of the cock valve.

Description	Code
Carbon Steel	**H**
Stainless Steel	**B**
Non standard	**X**

Center - Center Distance

TABLE 7

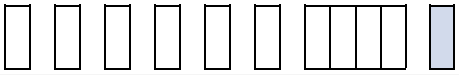


NOTE:
Refer to the drawings for all dimensions and visible length

Description	Code
Center - Center Distance Ax/Ay as shown in drawings (in mm)	**XXXX**

Special Engineering

TABLE 8



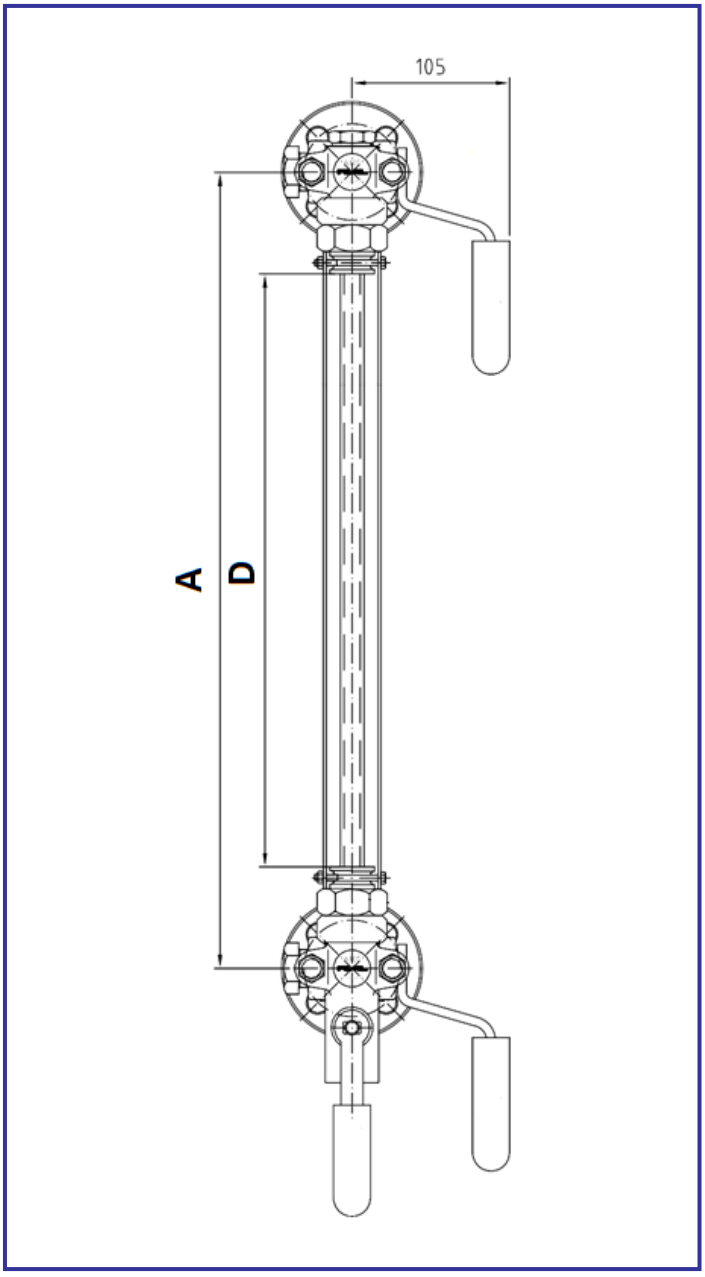
NOTE:
Last 4 digits of model code are only used when special engineering is required.

Description	Code
Bolt & Nuts In Stainless Steel B8/A4	
Please consult our sales engineering for special requirements	**TBA**

Dimensions

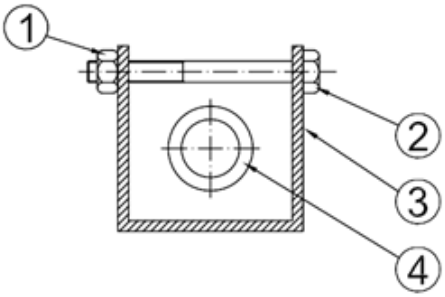
RATING PN10 = code H

All dimensions mm (inches)



Ax= center-center distance with end tubes and stuffing boxes.

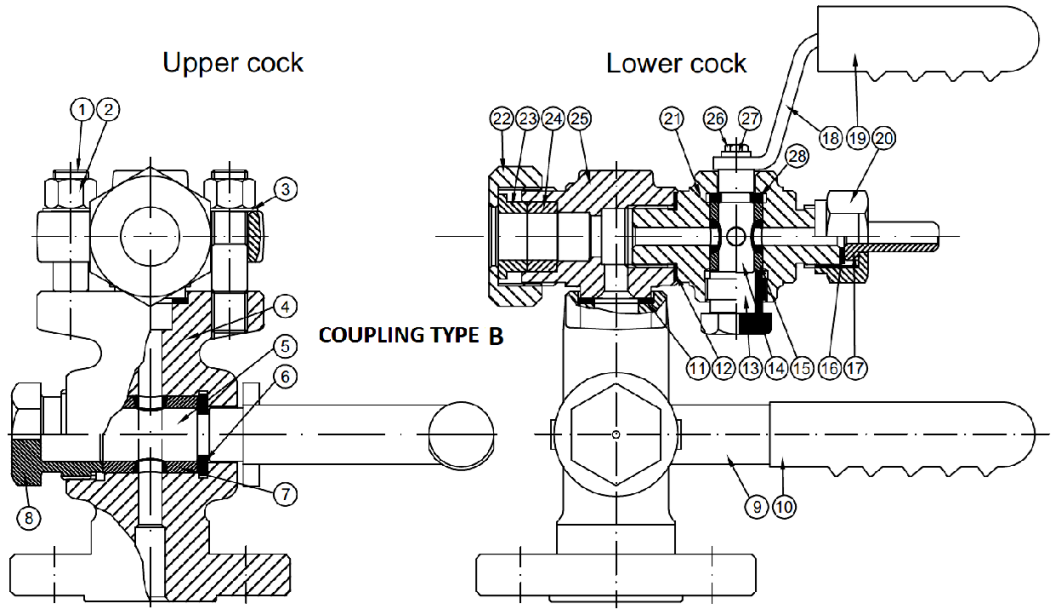
A_B (3000mm single tube)	D
Any lenght	Ax-20mm
Glass dimensions	Diam16x2.5mm



		A	B
1	Nut	**ASTM A194 2H**	**Carbon steel**
2	Bolt	**ISO 898-1 8.8**	**Asbestos free**
3	Protection tube	**Zinced Iron**	**Borosilicate**
4	Glass Tube	**Borosilicate**	**Graphite**
5	Gasket Glass/Valve	**Rubber**	**Carbon Steel**

Dimensions

All dimensions mm (inches)



		A	B
1	Bolts	**ASTM A193 B7**	**ASTM A193 B8**
2	Nut	**ASTM A194 2H**	**DIN938 Gr.8**
3	Washer	**UNI 6592**	**F316L**
4	Body	**ASTM A105N**	**F316L**
5	Plug F18	**A316**	**A316**
6	Ring F18	**A316**	**A316**
7	Packing Sleeves F18	**Graphite**	**Grafite / Graphite**
8	Stuffing box F18	**ASTM A 105**	**ACC. INOX / S.steel**
9	Big cock handle	**ASTM A 105**	**Acc/C / C.steel**
10	Big Cover Handle	**Nylon 66**	**Nylon 66**
11	Spirometallic	**F316 / Graphite**	**F316 / Graphite**
12	Ring Thickness	**A316**	**A316**
13	Stuffing box F12	**ASTM A 105**	**Stainless Steel**
14	Plug F12	**A316**	**A316**
15	Packing Sleeves F12	**Graphite**	**Graphite**
16	Gasket	**Graphite**	**Graphite**
17	Connection Type	**ASTM A 105**	**S.Steel**
18	Little cock handle	**ASTM A 105**	**S.Steel**
19	Little cover handle	**Nylon 66**	**Nylon 66**
20	Draincock cover	**ASTM A 105**	**ACC. INOX / S.steel**
21	Drain cock	**ASTM A105N**	**F316**
22	Connections cover	**ASTM A 105**	**S.Steel**
23	Stuffing box ring	**ASTM A 105**	**S.Steel**
24	Packing Sleeves F18	**Graphite**	**Graphite**
25	Stuffing bix body	**ASTM A105N**	**F316**
26	Cap screw	**UNI 5739**	**UNI 5739**
27	Washer	**UNI 6592**	**UNI 6592**
28	Ring F12	**A316**	**A316**

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