

Technical Datasheet



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 $\pm 0.1\%$ of calibrated span
- Ranges up to 200 m / 656 ft. H₂O, and 10:1 rangeability
- Ceramic capacitive sensor
- Low maintenance
- Fully submersible IP68 / NEMA 6P
- Reverse polarity protection
- Dedicated marine version



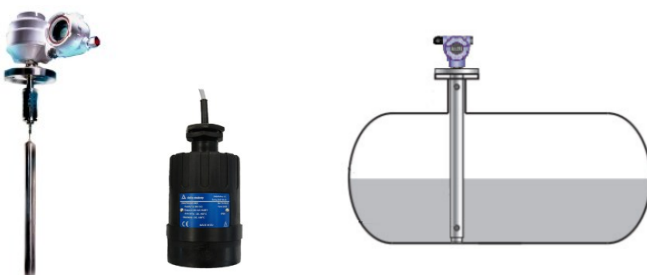
Series Overview

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 within the range delivers 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 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



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 Mobrey Transmitter is suitable for use in:

- Corrosive atmospheres
- Resistant to chemical attack

How can we help you?

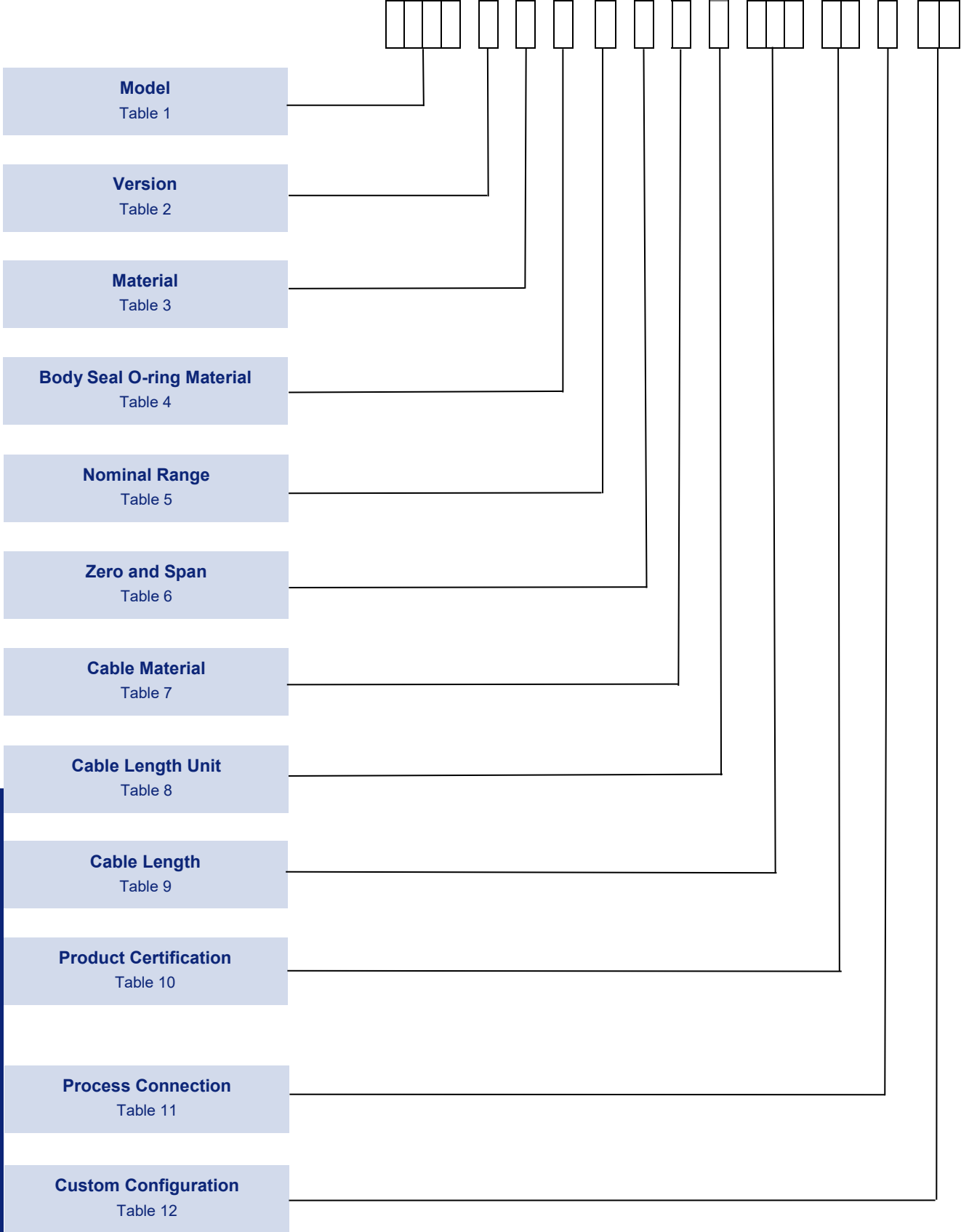
Delta Mobrey offers fast, efficient and knowledgeable support when and where you need it. Please visit our website at www.delta-mobrey.com to find your local support centre or call us on:

+44 (0) 1252 729140

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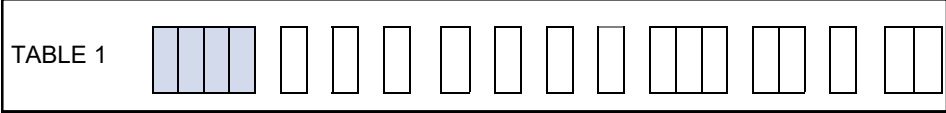
How to order

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



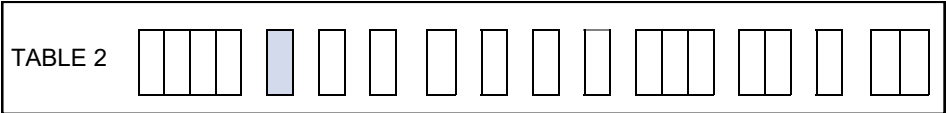
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Model



	Code
Flange Mounted Submersible Hydrostatic Level Transmitter	9790

Version

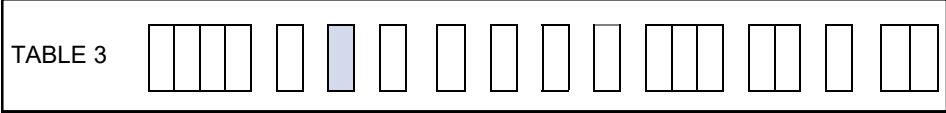


	Code
Commercial	C
Marine Approval	M

Material

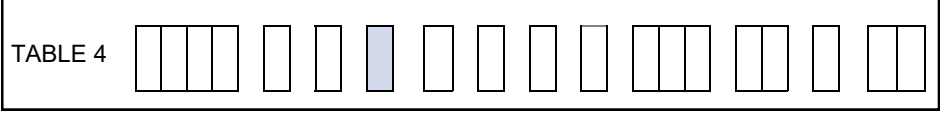
Note 1: purchaser's to verify the compatibility of material with process conditions (such as all chemical components, temperature, pressure, flow rate, abrasives, contaminants, etc.). Special construction to meet particular process conditions can be evaluated.

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 Steel 316	S
Aluminum Bronze	A

**Body Seal
O-ring Material**

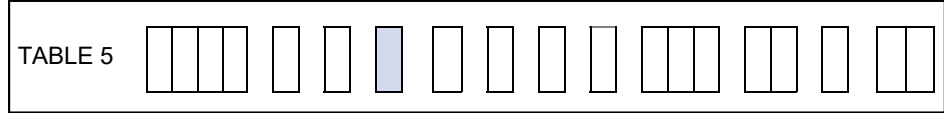


	Code
Fluorocarbon (FPM/FKM)	1
Nitrile	2

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Nominal Range

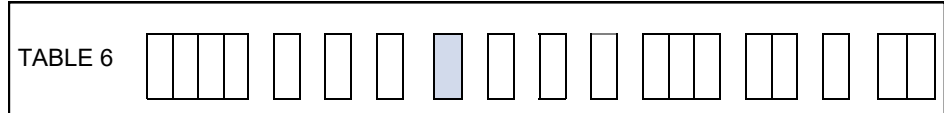
Note: Pmax values are shown in PSI according to Intrinsically Safe CSA approved documentation. In brackets are shown the correspondent limit in ftH2O and mH2O.



	Code	Pmax in psi (ft H2O / mH2O)
0 to 6.5 ft. (0 to 2 m) H2O depth	A	14.2 (32 / 10)
0 to 16.4 ft. (0 to 5 m) H2O depth	B	35.6 (82 / 25)
0 to 32.8 ft. (0 to 10 m) H2O depth	C	71.1 (164 / 50)
0 to 65.6 ft. (0 to 20 m) H2O depth	D	142.3 (328 / 100)
0 to 164 ft. (0 to 50 m) H2O depth	E	142.3 (328 / 100)
0 to 328 ft. (0 to 100 m) H2O depth	F	142.3 (328 / 100)
0 to 3.3 ft. (0 to 1 m) H2O depth	G	7.1 (16.4 / 5)
0 to 11.5 ft. (0 to 3.5 m) H2O depth	H	24.9 (57.4 / 17.5)

Zero and Span

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

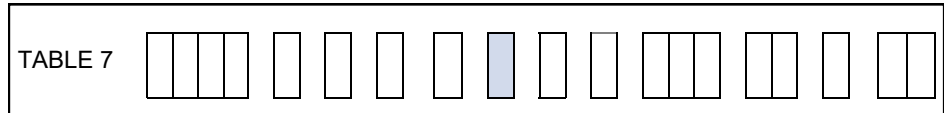


	Code
Integral (fixed)	1

Cable Material

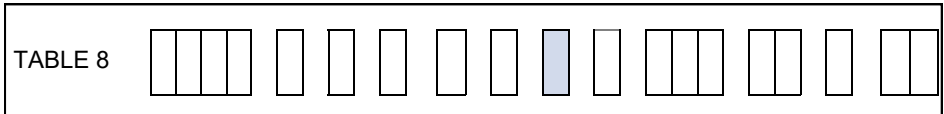
Note: The glanding system used ensures absolute integrity of the IP68 / NEMA 6P rating.

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

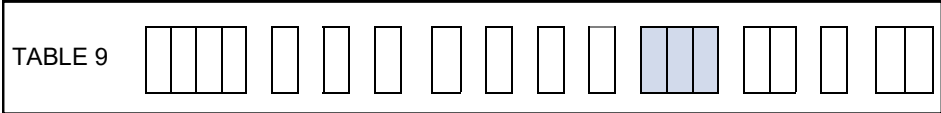
Cable Length Unit



	Code
English	E
Metric	M

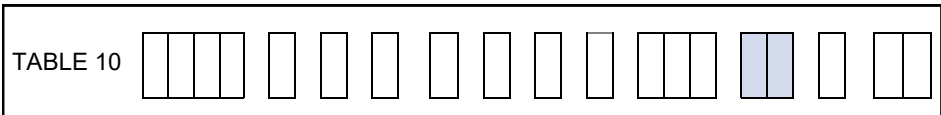
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Cable Length



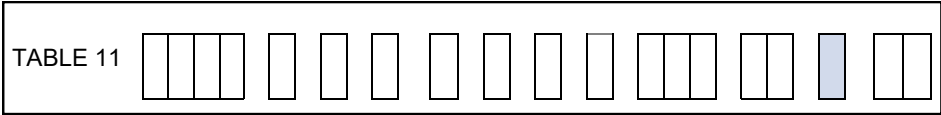
Length	Code	Unit
3 meters	003	M
5 meters	005	M
8 meters	008	M
10 meters	010	M
20 meters	020	M
30 meters / feet	030	M / E
40 meters	040	M
50 meters	050	M
60 meters	060	M
75 meters	075	M
100 meters	100	M
125 meters	125	M
150 meters / feet	150	M/E
200 meters	200	M
9 feet	009	E
15 feet	015	E
24 feet	024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



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

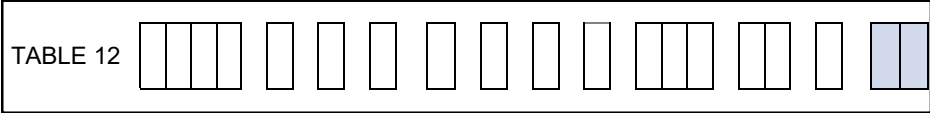
Process Connection



	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

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Custom Configuration



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

Electrical parameters

Power supply	10-30V d.c.
Output signal	Two-wire, 4-20mA

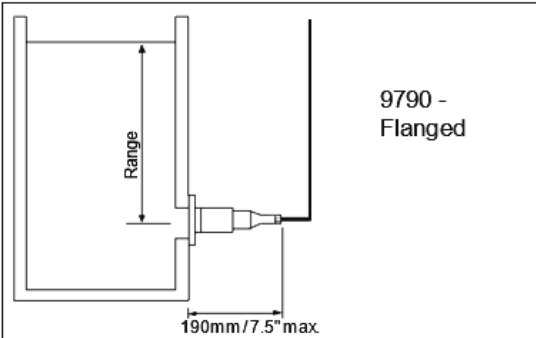
Materials

- Wetted parts** Sensor Ceramic
- Sensor housing** 316 Stainless steel, Aluminium bronze
- Seal rings** Fluorocarbon (FPM/FKM), Nitrile
- Cable** Polyurethane Fluorinated Ethylene Polypropylene (FEP)
- Ingress protection** IP68 / NEMA 6P (200 m / 656 ft. H20)

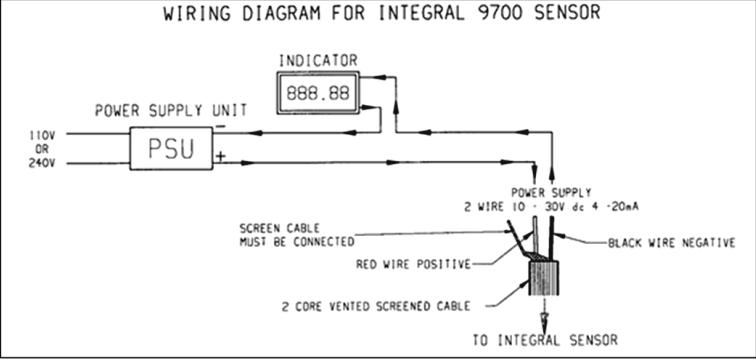
Operating conditions

- 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



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Approvals



NORTH AMERICA CERTIFICATION

Hazardous area certification (CSA Nr.80238981)

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

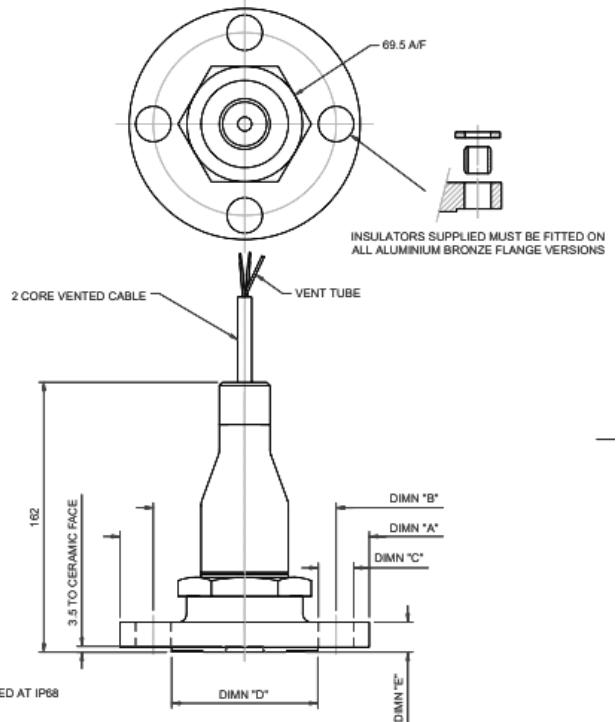
Dimensions

FLANGE TYPE	DIMN A	DIMN B	DIMN C	DIMN D	DIMN 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 150B	Ø152.0	120.6 PCD	4 x Ø19.0	Ø92.0	19.0
3" ANSI B16.5 CLASS 150B	Ø190.0	152.4 PCD	4 x Ø19.0	Ø127.0	24.0

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



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

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