

# 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. H<sub>2</sub>O, and 10:1 rangeability
- Ceramic capacitive sensor
- Low maintenance
- Fully submersible IP68 / NEMA 6P
- Reverse polarity protection
- Dedicated marine version



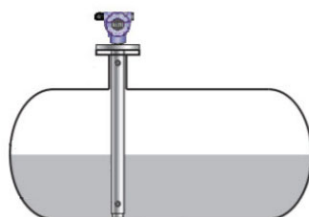
### Series Overview

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 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



### 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

### How can we help you?

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

**+44 (0) 1252 729140**

**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.

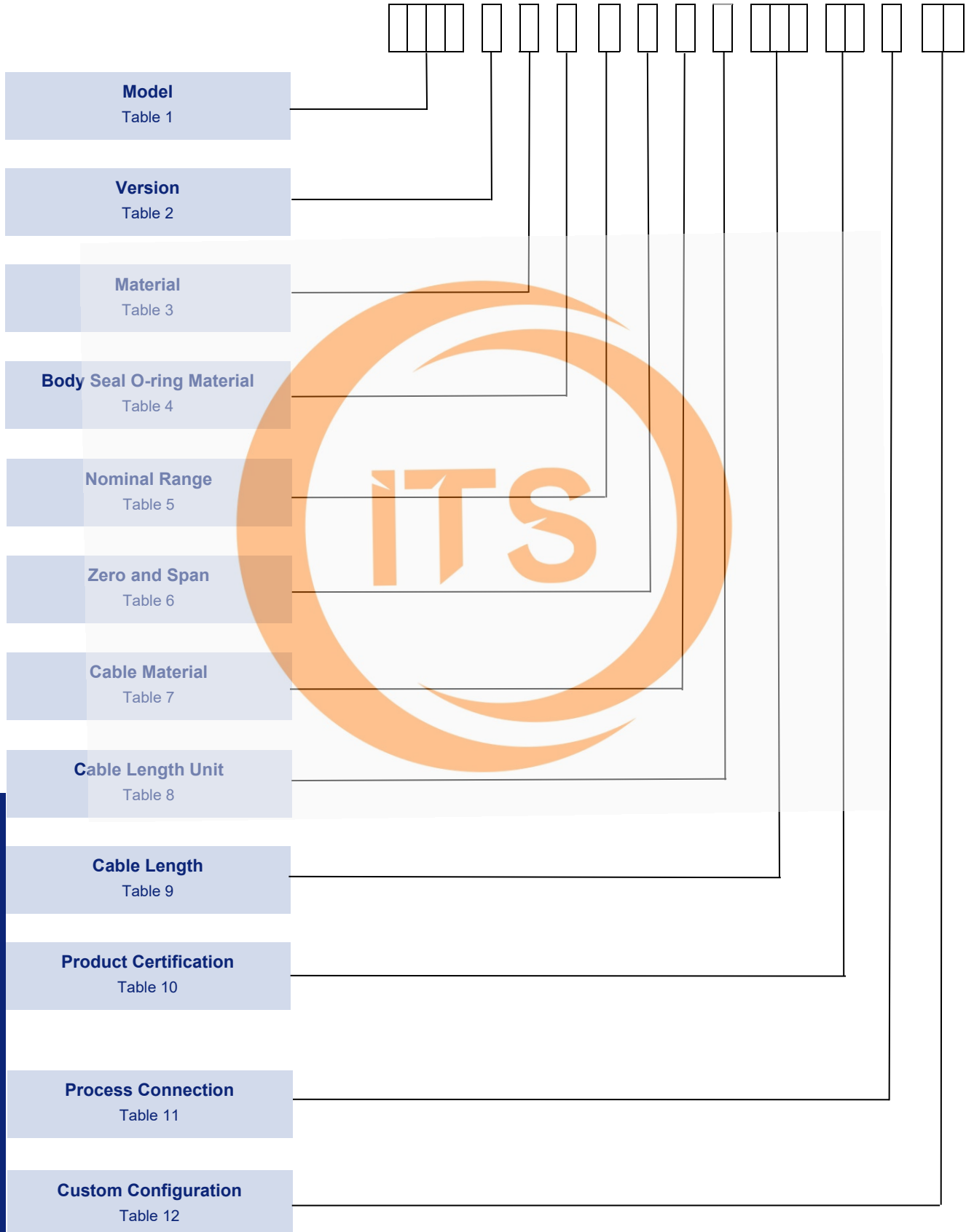


TABLE 1

## Version

[illegible]

## Material

TABLE 3

	<b>Code</b>
Stainless Steel 316	<b>S</b>
Aluminum Bronze	<b>A</b>

## Body Seal O-ring Material

[illegible]

9700 - Series  
Model: 9790



## 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

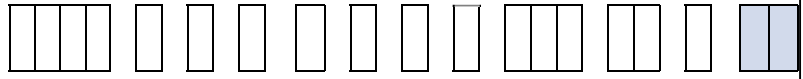
## Process Connection

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	

## 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)

#### Electrical parameters

##### Power supply

10-30V d.c.

##### Output signal

Two-wire, 4-20mA

#### 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

$R = 50 \times (\text{supply voltage} - 10V) \Omega$

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

#### 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. H2O)

### 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. H2O

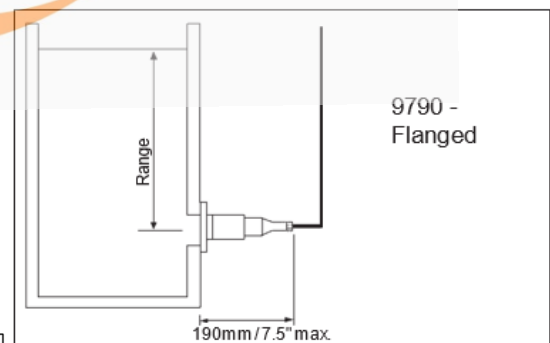
#### Overrange limit

5 x range up to a max 600 m / 1968 ft. H2O

#### Span adjustment

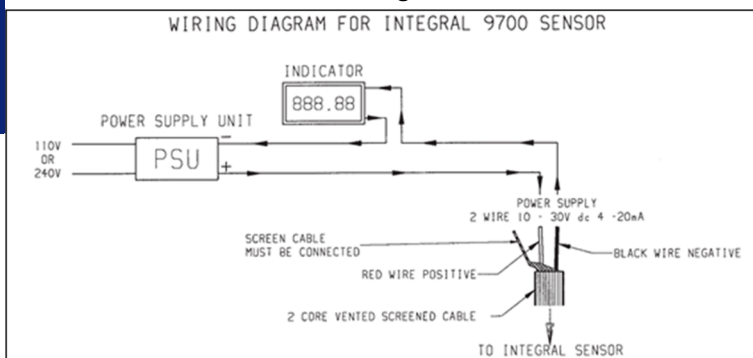
+10 to +100% of Upper Range Limit (URL)

### Mounting Option



### Electrical diagrams

WIRING DIAGRAM FOR INTEGRAL 9700 SENSOR



## 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

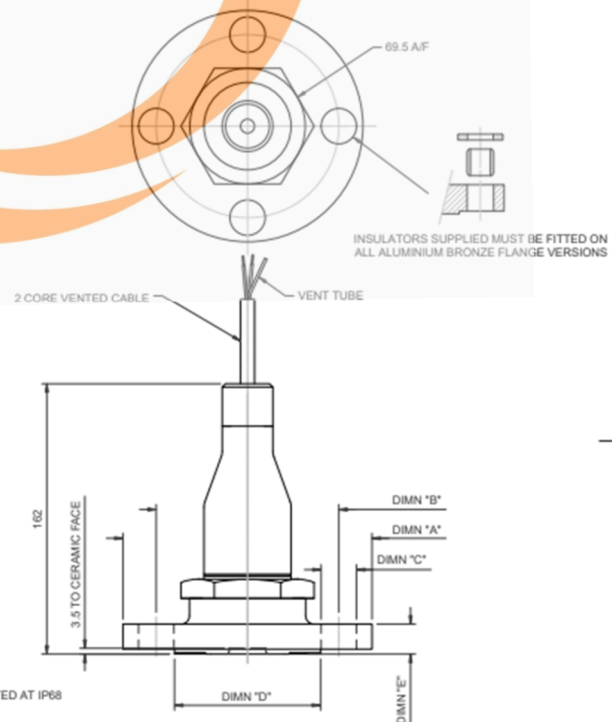
## Dimensions

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
DN60 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	0.7 kg
Vented Cable in air (water)	71 (16) kg/km

Total weight varies with different cable length



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9700-Series

Model: 9790