Product Data Sheet
February 2015
IP0078, Rev DB

Mobrey 9700 Transmitter

Submersible Hydrostatic Level Transmitters

- Hydrostatic electronic level transmitters
- Factory sealed and tested for submersed duty
- 4–20 mA output signal proportional to level
- Flush mounted ceramic sensor
- Good long term stability
- Ideal for industrial or marine applications
- Wide range of mounting options
- Low cost installation
- Readouts for control room or plant mounting

mobrey

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Reliable Performance...In Challenging Applications

Mobrey 9710 Transmitter

Mobrey 9720 Transmitter

Mobrey 9780 Transmitter

Mobrey 9790 Transmitter

Mobrey 9700 Series transmitters

The 9700 Series range of tank level transmitters from Mobrey provide the measurement solution where in-tank problems such as foaming, vapor layers, and temperature gradients prohibit the use of other instrumentation.

The 9700 Series transmitter is designed to perform in the extreme conditions of today's industrial measurement applications.

Transmitters are available in both submersible and externally mounted (floodable) versions. Each transmitter version gives a high performance, has good long term stability, and is virtually maintenance free. A ceramic sensor ensures precise and reliable measurement with an accuracy of better than 0.1%.

Operation

At the heart is a Ceramic Capacitive Sensor (CCS). This pressure sensor provides a "flush" diaphragm, avoiding the risks of sensor clogging and ensures an extremely low hysteresis, minimal output drift, and high repeatability.

The sensor is manufactured using an aluminium oxide ceramic and provides outstanding resistance to chemical attack. The measuring range is determined by the ceramic thickness, which is precisely controlled during the manufacturing process. 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.

Contents

Features

- Two-wire 24 Vdc loop-powered
- 4 to 20 mA
- Accuracy ± 0.1% of calibrated span
- Ranges up to 200 m / 656 ft. H_20, and 10:1 rangeability
- Ceramic capacitive sensor
- Low maintenance
- Fully submersible IP68 / NEMA 6P
- Reverse polarity protection
- Dedicated marine version

Benefits

- Unaffected by difficult ullage conditions
- Stable readings under adverse conditions

Special features

Accuracy better than ±0.1% of calibrated span

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.

The 9700 Series provides an accuracy of better than ±0.1% of calibrated span and good long term stability.

Protected from aggressive environments/processes

The 9700 Series withstands the harshest of environments and processes. Its rugged ceramic sensor is inherently capable of withstanding attack from most chemicals.

Glanding system

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 a length of vented cable.

Mounting options

The 9700 Series is available in various mounting configurations, all are rated IP68.

- 9710 – Cable suspended
- 9720 – Clamped, cable suspended
- 9780 – Pole mounted
- 9790 – Flanged

Bellows

For humid environments or sea water applications, bellows must be used (contact Rosemount Measurement for details).

Mobrey 9710 Hydrostatic Level Transmitter Ordering

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment.
See page 12 for more information on Material Selections.

Table 1. Mobrey 9710 ordering information

★The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

Model	Product Description		
9710	Cable Suspended Submersible Hydrostatic Level Transmitter		
Version			
Standard			**Standard**
C	Commercial		★
M	Marine approval		★
Material of Sensor			
Standard			**Standard**
S	Stainless steel 316		★
A	Aluminum bronze		★
Body Seal O-ring Material			
Standard			**Standard**
1	Fluorocarbon (FPM/FKM)		★
2	Nitrile		★
Nominal Range			
Standard			**Standard**
A	0 to 6.5 ft. (0 to 2 m) H_20 depth		★
B	0 to 16.4 ft. (0 to 5 m) H_20 depth		★
C	0 to 32.8 ft. (0 to 10 m) H_20 depth		★
D	0 to 65.6 ft. (0 to 20 m) H_20 depth		★
E	0 to 164 ft. (0 to 50 m) H_20 depth		★
F	0 to 328 ft. (0 to 100 m) H_20 depth		★
G	0 to 3.3 ft. (0 to 1 m) H_20 depth		★
H	0 to 11.5 ft. (0 to 3.5 m) H_20 depth		★
J	0 to 656 ft. (0 to 200 m) H_20 depth		★
Zero and Span			
Standard			**Standard**
1	Integral (fixed)		★
Cable Material			
Standard			**Standard**
P	Polyurethane		★
F	Fluorinated ethylene-propylene (F.E.P)		★
Cable Length Units			
Standard			**Standard**
E	English		★
M	Metric		★
Cable Length		**Metric / English**	
Standard			**Standard**
003	3 meters	M	★
005	5 meters	M	★
008	8 meters	M	★
010	10 meters	M	★
020	20 meters	M	★
030	30 meters / feet	M / E	★
040	40 meters	M	★

Table 1. Mobrey 9710 ordering information

★The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

050	50 meters	M	★
060	60 meters	M	★
075	75 meters	M	★
100	100 meters	M	★
125	125 meters	M	★
150	150 meters / feet	M / E	★
200	200 meters	M	★
009	9 feet	E	★
015	15 feet	E	★
024	24 feet	E	★
060	60 feet	E	★
090	90 feet	E	★
120	120 feet	E	★
225	225 feet	E	★
300	300 feet	E	★
375	375 feet	E	★
450	450 feet	E	★
600	600 feet	E	★
Product Certifications			
Standard			**Standard**
NA	Non-certified (non-hazardous area use only)		★
A6	CSA (Canada and USA)		★
Typical Model Number: 9710 C S 1 A 1 P M 003 NA			

Options (add to end of model number)

Custom Configuration		
Expanded		
C1	Custom configuration of actual range (customer to specify with order)	
Example Model Number: 9710 C S 1 A 1 P M 003 NA C1		

Mobrey 9720 Hydrostatic Level Transmitter Ordering

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment.
See page 12 for more information on Material Selections.

Table 2. Mobrey 9720 ordering information

★The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

Model	Product Description		
9720	Clamped Cable Suspended Submersible Hydrostatic Level Transmitter		
Version			
Standard			**Standard**
C	Commercial		★
M	Marine approval		★
Material of Sensor			
Standard			**Standard**
S	Stainless steel 316		★
A	Aluminum bronze		★
Body Seal O-ring Material			
Standard			**Standard**
1	Fluorocarbon (FPM/FKM)		★
2	Nitrile		★
Nominal Range			
Standard			**Standard**
A	0 to 6.5 ft. (0 to 2 m) H_20 depth		★
B	0 to 16.4 ft. (0 to 5 m) H_20 depth		★
C	0 to 32.8 ft. (0 to 10 m) H_20 depth		★
D	0 to 65.6 ft. (0 to 20 m) H_20 depth		★
E	0 to 164 ft. (0 to 50 m) H_20 depth		★
F	0 to 328 ft. (0 to 100 m) H_20 depth		★
G	0 to 3.3 ft. (0 to 1 m) H_20 depth		★
H	0 to 11.5 ft. (0 to 3.5 m) H_20 depth		★
J	0 to 656 ft. (0 to 200 m) H_20 depth		★
Zero and Span			
Standard			**Standard**
1	Integral (fixed)		★
Cable Material			
Standard			**Standard**
P	Polyurethane		★
F	Fluorinated ethylene-propylene (F.E.P)		★
Cable Length Units			
Standard			**Standard**
E	English		★
M	Metric		★
Cable Length		**Metric / English**	
Standard			**Standard**
003	3 meters	M	★
005	5 meters	M	★
008	8 meters	M	★
010	10 meters	M	★
020	20 meters	M	★
030	30 meters / feet	M / E	★
040	40 meters	M	★
050	50 meters	M	★
060	60 meters	M	★
075	75 meters	M	★

Table 2. Mobrey 9720 ordering information

★The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

100	100 meters	M	★
125	125 meters	M	★
150	150 meters / feet	M / E	★
200	200 meters	M	★
009	9 feet	E	★
015	15 feet	E	★
024	24 feet	E	★
060	60 feet	E	★
090	90 feet	E	★
120	120 feet	E	★
225	225 feet	E	★
300	300 feet	E	★
375	375 feet	E	★
450	450 feet	E	★
600	600 feet	E	★
Product Certifications			
Standard			**Standard**
NA	Non-certified (non-hazardous area use only)		★
A6	CSA (Canada and USA)		★
Typical Model Number: 9720 C S 1 A 1 P M 003 NA			

Options (add to end of model number)

Custom Configuration		
Expanded		
C1	Custom configuration of actual range (customer to specify with order)	
Example Model Number: 9720 C S 1 A 1 P M 003 NA C1		

Mobrey 9780 Hydrostatic Level Transmitter Ordering

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 12 for more information on Material Selections.

Table 3. Mobrey 9780 ordering information

All Mobrey 7980 instruments are manufactured as made-to-order items. Contact Rosemount Measurement for delivery lead times.

Model	Product Description		
9780	Pole Mounted Submersible Hydrostatic Level Transmitter		
Version			
C	Commercial		
M	Marine approval		
Material of Sensor and Pole			
S	Stainless steel 316		
A	Aluminum bronze		
Body Seal O-ring Material			
1	Fluorocarbon (FPM/FKM)		
2	Nitrile		
Nominal Range			
A	0 to 6.5 ft. (0 to 2 m) H_20 depth		
B	0 to 16.4 ft. (0 to 5 m) H_20 depth		
C	0 to 32.8 ft. (0 to 10 m) H_20 depth		
G	0 to 3.3 ft. (0 to 1 m) H_20 depth		
H	0 to 11.5 ft. (0 to 3.5 m) H_20 depth		
Zero and Span			
1	Integral (Fixed)		
Cable Material			
P	Polyurethane		
F	Fluorinated ethylene-propylene (F.E.P)		
Cable Length Units			
E	English		
M	Metric		
Cable Length		**Metric / English**	
003	3 meters	M	
005	5 meters	M	
008	8 meters	M	
010	10 meters	M	
020	20 meters	M	
030	30 meters / feet	M / E	
040	40 meters	M	
050	50 meters	M	
060	60 meters	M	
075	75 meters	M	
100	100 meters	M	
125	125 meters	M	
150	150 meters / feet	M / E	
200	200 meters	M	
009	9 feet	E	
015	15 feet	E	
024	24 feet	E	
060	60 feet	E	
090	90 feet	E	
120	120 feet	E	

Table 3. Mobrey 9780 ordering information

All Mobrey 7980 instruments are manufactured as made-to-order items. Contact Rosemount Measurement for delivery lead times.

225	225 feet	E	
300	300 feet	E	
375	375 feet	E	
450	450 feet	E	
600	600 feet	E	
Product Certifications			
NA	Non-certified (non-hazardous area use only)		
A6	CSA (Canada and USA)		
Process Connection			
B	Fixed flange, DN40 PN40 (DIN 2635)		
C	Fixed flange, DN50 PN40 (DIN 2635)		
D	Fixed flange, DN80 PN40 (DIN 2635)		
F	Fixed flange, 2-in. ASME B16.5 Class 150		
G	Fixed flange, 3-in. ASME B16.5 Class 150		
Overall Length Units			
E	English		
M	Metric		
Overall Length			
xxxx	mm or inches, depending on overall length units		
Typical Model Number: 9780 M S 1 C 1 P E 009 NA C E 300			

Options (add to end of model number)

Custom Configuration	
Expanded	
C1	Custom configuration of actual range (customer to specify with order)
Example Model Number: 9780 M S 1 C 1 P E 009 NA C E 300 C1	

Mobrey 9790 Hydrostatic Level Transmitter Ordering

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 12 for more information on Material Selections.

Table 4. Mobrey 9790 ordering information

★The Standard offering represents the most common options. The starred options (★) should be selected for best delivery. The Expanded offering is subject to additional delivery lead time.

Model	Product Description		
9790	Flange Mounted Submersible Hydrostatic Level Transmitter		
Version			
Standard			**Standard**
C	Commercial		★
M	Marine approval		★
Sensor and Flange Material			
Standard			**Standard**
S	Stainless steel 316		★
A	Aluminum bronze		★
Body Seal O-ring Material			
Standard			**Standard**
1	Fluorocarbon (FPM/FKM)		★
2	Nitrile		★
Nominal Range			
Standard			**Standard**
A	0 to 6.5 ft. (0 to 2 m) H_20 depth		★
B	0 to 16.4 ft. (0 to 5 m) H_20 depth		★
C	0 to 32.8 ft. (0 to 10 m) H_20 depth		★
D	0 to 65.6 ft. (0 to 20 m) H_20 depth		★
E	0 to 164 ft. (0 to 50 m) H_20 depth		★
F	0 to 328 ft. (0 to 100 m) H_20 depth		★
G	0 to 3.3 ft. (0 to 1 m) H_20 depth		★
H	0 to 11.5 ft. (0 to 3.5 m) H_20 depth		★
J	0 to 656 ft. (0 to 200 m) H_20 depth		★
Zero and Span			
Standard			**Standard**
1	Integral (Fixed)		★
Cable Material			
Standard			**Standard**
P	Polyurethane		★
F	Fluorinated ethylene-propylene (F.E.P)		★
Cable Length Units			
Standard			**Standard**
E	English		★
M	Metric		★
Cable Length		**Metric / English**	
Standard			**Standard**
003	3 meters	M	★
005	5 meters	M	★
008	8 meters	M	★
010	10 meters	M	★
020	20 meters	M	★
030	30 meters / feet	M / E	★
040	40 meters	M	★

Table 4. Mobrey 9790 ordering information

★The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

050	50 meters	M	★
060	60 meters	M	★
075	75 meters	M	★
100	100 meters	M	★
125	125 meters	M	★
150	150 meters / feet	M / E	★
200	200 meters	M	★
009	9 feet	E	★
015	15 feet	E	★
024	24 feet	E	★
060	60 feet	E	★
090	90 feet	E	★
120	120 feet	E	★
225	225 feet	E	★
300	300 feet	E	★
375	375 feet	E	★
450	450 feet	E	★
600	600 feet	E	★
Product Certifications			
Standard			**Standard**
NA	Non-certified (non-hazardous area use only)		★
A6	CSA (Canada and USA)		★
Process Connection			
Standard			**Standard**
A	Slip-on flange, DN25 PN40 (DIN 2635)		★
B	Fixed flange, DN40 PN40 (DIN 2635)		★
C	Fixed flange, DN50 PN40 (DIN 2635)		★
D	Fixed flange, DN80 PN40 (DIN 2635)		★
E	Slip-on flange, 1-in. ASME B16.5 Class 150		★
F	Fixed flange, 2-in. ASME B16.5 Class 150		★
G	Fixed flange, 3-in. ASME B16.5 Class 150		★
Typical Model Number: 9790 M S 1 A 1 P E 009 NA F			

Options (add to end of model number)

Custom Configuration		
Expanded		
C1	Custom configuration of actual range (customer to specify with order)	
Example Model Number: 9790 M S 1 A 1 P E 009 NA F C1		

Specifications for 9710, 9720, 9780, and 9790

Functional

Output signal
Two-wire, 4–20 mA

Power supply
10 to 30 Vdc

Load resistance
R=50 x (supply voltage - 10V) Ù

Measuring range
Up to 200 m / 656 ft. H_20

Overrange limit
5 x range up to a max 600 m / 1968 ft. H_20

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

Process temperature limit
9710, 9720, 9780: -20 to + 60 °C / -4 to +140 °F
9790: -20 to + 90°C (80 °C Ex ia)

Ambient temp. limits
-20 to +60 °C

Humidity limits
0 to 100% RH when terminated using a remote bellows box (contact Rosemount Measurement for details).

Hazardous area certification
See "Product Certifications" on page 13

Performance

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)

Physical

Cable entry
Glanding system supplied with required length of vented cable

Materials selection
Emerson provides a variety of products with various product options and configurations including materials of construction that can be expected to perform well in a wide range of applications. The product information presented is intended as a guide for the purchaser to make an appropriate selection for the application. It is the purchaser's sole responsibility to make a careful analysis of all process parameters (such as all chemical components, temperature, pressure, flow rate, abrasives, contaminants, etc.), when specifying product, materials, options and components for the particular application.

Emerson Process Management is not in a position to evaluate or guarantee the compatibility of the process fluid or other process parameters with the product, options, configuration or materials of construction selected.

Wetted parts

Sensor
Ceramic

Sensor housing
316 Stainless steel, Aluminium bronze

Seal rings
Fluorocarbon (FPM/FKM), Nitrile

Cable
Polyurethane
Fluorinated Ethylyene Polypropylene (FEP)

Pole (9780 only)
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. H_20)

Approximate weight
0.7 Kg / 1.54 lbs (sensor only)

Product Certifications

Hazardous area certification

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

Marine approvals

- Lloyds Register
- American Bureau of Shipping
- Korean Register
- Germanisher Lloyd
- DNV
- RINA

Emerson Process Management
Rosemount Measurement Ltd.
158 Edinbugh Avenue,
Slough, Berks., SL1 4UE, UK
Tel +44 (0)1753 756600
Fax +44 (0)1753 823589
www.emersonprocess.com

Emerson Process Management
Rosemount Inc.
8200 Market Boulevard
Chanhassen MN 55317 USA
Tel (USA) 1 800 999 9307
Tel (International) +1 952 906 8888
Fax +1 952 906 8889

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