Magnetostrictive Level Transmitter

FineTek
Your Made-To-Order Solutions

PRODUCT INTRODUCTION

EG series Magnetostrictive Level Transmitter is built based on the principle of magnetic field interaction of two different directions, which sends out a signal to determine the exact level of the medium. Therefore, even if there is a power failure and reconnection is needed, it will not affect the previous setting parameters. So there is no reconfiguration involved.

As Magnetostrictive Level Transmitter gives direct signal output, additional output interface is not needed. Application is very accurate and reliable, it will reduce the malfunction of the product. Moreover, due to the durability of the sensing element, minimal maintenance is needed, thus replacement parts inventory is not needed.
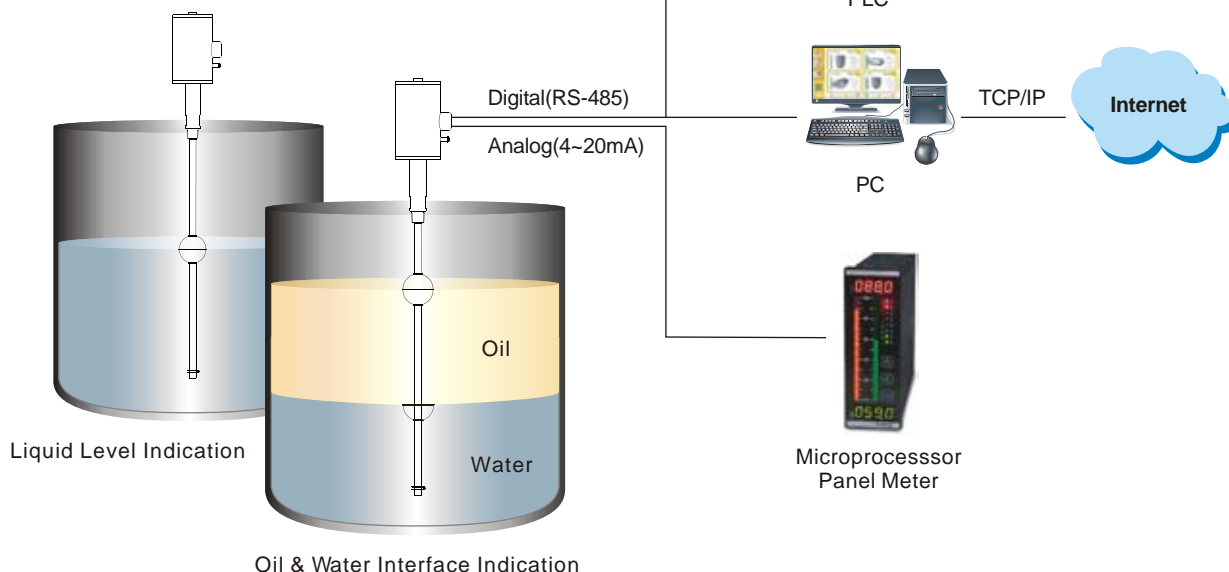
For PC metworking, it enables long distance monitoring of one EG transmitter or multiple EG transmitters through RS485 ModBus communication.

FEATURES

★ Absolute position output, no calibration required after power failure
★ Prompt response time
★ Very stable & reliable
★ Multi output selection
★ Easy installation & no regular maintenance required
★ High resolution & high accuracy
★ Durable structure, dust-proof, withstand high pressure
★ Oil / water dual level indication
★ IP65 protection rating, IP67 for EG3 series
★ Up to 200°C (max.) operation temperature for high temp requirement
★ EG3 is Loop power system, wiring cost saved and easy installation
★ EG37 Ex-proof type for using in hazardous areas

APPLICATION

★ Liquefied Natural Gas medium.
★ Pharmaceutical / beverages
★ Water Dam / Barrier.
★ Water / Wastewater Treatment.
★ Chemical Process.
★ Crude oil / Oil industry.
★ Normal liquid environment.
★ Tooling or alignment position for processing machine.

LMS

PLC

Digital(RS-485)

Analog(4~20mA)

TCP/IP

Internet

PC

Liquid Level Indication

Oil

Water

Microprocesssor Panel Meter

Oil & Water Interface Indication

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OPERATING PRINCIPLE

Magnetostrictive Level Transmitter measures the accurate medeum (D) by calculating the time travel of signal formed by two different magnetic field. One magnetic field comes from the float ball, and the other comes from the current pulse given by the waveguide tube.

When the pulse signal is reversed back to the waveguide coil, the transmitter will calculate the float ball (liquid level) based on the time interval and travel speed the pulse signal between the two magnet field.
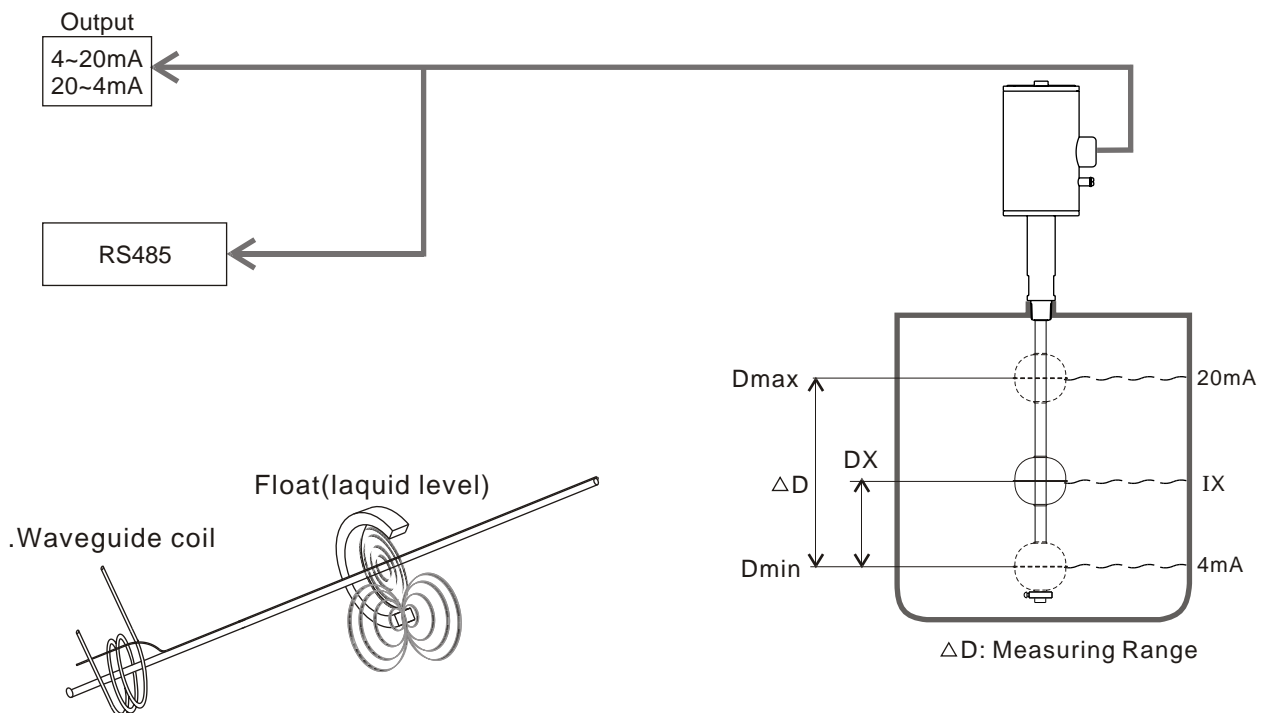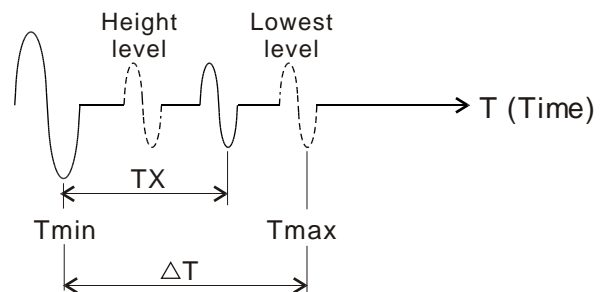
This action is continuous and timely. The change of float position will be detected promptly with absolute signal output.

CONVERSION FORMULA

The relation of   D & 4~20mA output

$$\frac{IX-4}{(20-4)mA} = \frac{DT-TX}{\triangle T} = \frac{DX}{\triangle D}$$

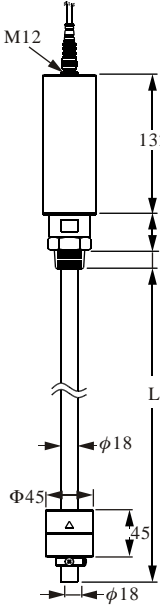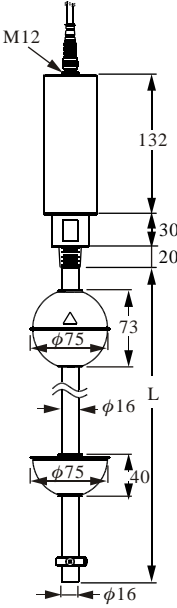$$\Rightarrow IX = \frac{16DX}{\triangle D} + 4mA \quad \text{(The relative current)}$$

△D: Measuring Range

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SPECIFICATIONS STANDARD (2 Wire)

Dimensions (Unit: mm)		
Model No.	EG311 (Standard Type)	EG31B(High Temp Type)
Measuring Range	50~5500mm	50~5500mm
Non-Linearity	$\pm$0.05% F.S. or $\pm$1.0mm (whichever is greater)	$\pm$0.05% F.S. or $\pm$1.0mm (whichever is greater)
Repeatability	$\pm$0.01% F.S. or $\pm$0.5mm (whichever is greater)	$\pm$0.01% F.S. or $\pm$0.5mm (whichever is greater)
Temp. Coefficient	$\pm$100 ppm/°C	$\pm$150 ppm/°C
Operation Pressure	30 BAR(Max.)	30 BAR(Max.)
Ambient Temp.	-10°C ~ 55°C	-10°C ~ 55°C
Operation Temp.	-20°C ~ 125°C	-20°C ~ 200°C
Temp. Accuracy	$\pm$1.5°C	$\pm$1.5°C
Output	4~20mA/ 2 Wire	4~20mA/ 2 Wire
Max Load	300W	300W
Digital Output	RS485	RS485
Power Supply	Loop power 24Vdc $\pm$10%	Loop power 24Vdc $\pm$10%
Housing Material	SUS304 (SUS316 option)	SUS304 (SUS316 option)
Connection	1/2"PT	1/2"PT
Wetted Material	SUS304	SUS304
Enclosure	IP67 (IEC 60529)	IP67 (IEC 60529)

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EXPLOSION PROOF TYPE (2 Wire)

NEPSI PROOF No.GYB101836X Ex ia IIB T2~T6

Dimensions (Unit: mm)	(EG374 diagram)	(EG371 diagram)

Model No.	EG374 (Anti-Corrosion Type)	EG371 (Double Float Type)
Measuring Range	50~5500mm	50~5500mm
Non-Linearity	±0.05% F.S. or ±1.0mm (whichever is greater)	±0.05% F.S. or ±1.0mm (whichever is greater)
Repeatability	±0.01% F.S. or ±0.5mm (whichever is greater)	±0.01% F.S. or ±0.5mm (whichever is greater)
Temp. Coefficient	±100 ppm/°C	±150 ppm/°C
Operation Pressure	5 BAR(Max.)	30 BAR(Max.)
Ambient Temp.	-10°C ~ 55°C	-10°C ~ 55°C
Operation Temp.	-20°C ~ 80°C	-20°C ~ 125°C
Temp. Accuracy	±1.5°C	±1.5°C
Output	4~20mA/ 2 Wire	4~20mA/ 2 Wire
Max Load	300W	300W
Digital Output	RS485	RS485
Power Supply	Loop power 24Vdc ±10%	Loop power 24Vdc ±10%
Housing Material	SUS304 (SUS316 option)	SUS304 (SUS316 option)
Connection	3/4"PT	1/2"PT
Wetted Material	PP	SUS304
Enclosure	IP67 (IEC 60529)	IP67 (IEC 60529)

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EXPLOSION PROOF TYPE (2 Wire)

Dimensions (Unit: mm)		
Model No.	**EG371 (Ex-proof Type)**	**EG37A (Ex-proof High Temp. Type)**
Measuring Range	50~5500mm	50~5500mm
Non-Linearity	±0.05% F.S. or ±1.0mm (whichever is greater)	±0.05% F.S. or ±1.0mm (whichever is greater)
Repeatability	±0.01% F.S. or ±0.5mm (whichever is greater)	±0.01% F.S. or ±0.5mm (whichever is greater)
Temp. Coefficient	±100 ppm/°C	±150 ppm/°C
Operation Pressure	30 BAR(Max.)	30 BAR(Max.)
Ambient Temp.	-10°C ~ 55°C	-10°C ~ 55°C
Operation Temp.	-20°C ~ 125°C	-20°C ~ 200°C
Temp. Accuracy	±1.5°C	±1.5°C
Output	4~20mA/ 2 Wire	4~20mA/ 2 Wire
Max Load	300W	300W
Digital Output	RS485	RS485
Power Supply	Loop power 24Vdc ±10%	Loop power 24Vdc ±10%
Housing Material	SUS304 (SUS316 option)	SUS304 (SUS316 option)
Connection	1/2"PT	1/2"PT
Wetted Material	SUS304	SUS304
Enclosure	IP67 (IEC 60529)	IP67 (IEC 60529)

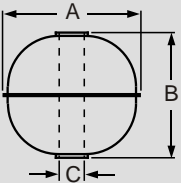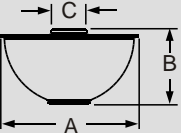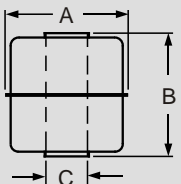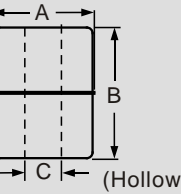※ **Comply with safety barrier of Ex ia rating is essential for using in hazardous areas.**

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HOUSING OPTION

	1 Top conduit	2 Side conduit	3 Top conduit with handle
EG3 Series (2 wire)	M12 / 154 / φ50	M12 / 154 / φ50	M12 / 154 / φ50

	1 Top conduit	2 Side conduit	3 Top conduit with handle
EG37 Series explosion-proof (2 wire)	M12 / 132 / φ50	M12 / 132 / φ50	M12 / 132 / φ50

※ **Standard cable length 1M will be equipped.(Explosion proof type will not be equipped with cable)**
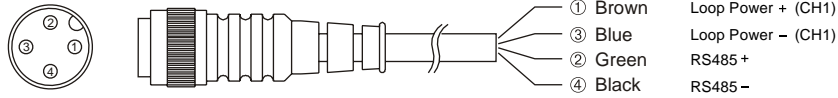
FLOAT SPECIFICATION

Model	Type	Dimensions (ϕA x B x ϕC mm)	S.G.	Max. Pressure (kg/cm²)	Material	Tube Size
	S5	75x73x20.5	E>0.6	30	SUS 304 / 316	ϕ16
	S4	52x52x15	E>0.75	30	SUS 316	ϕ12.7
	SD	52x52x15	E>0.9	30	SUS 316	ϕ12.7
	S0	75x40x20.5	E>0.9	20	SUS 304 / 316	ϕ16
	S3	45x55x15	E>0.7	12	SUS 316	ϕ12.7
	SC	45x55x15	E>0.9	12	SUS 316	ϕ12.7
	F3	45x45x20	E>0.55	5	PP in Grey	ϕ18 (coating)
	FC	45x45x20	E>0.9	5	PP in Grey	ϕ18 (coating)
	P3	48x45x18.5	E>0.6	5	PP in Black	ϕ17.2 (coating)
	PC	48x45x18.5	E>0.9	5	PP in Black	ϕ17.2 (coating)

WIRING INSTRUCTION

WIRING INSTRUCTION (EG3)

1. Single / Double float +RS485   Loop Power 24Vdc ± 10%

① Brown	Loop Power + (CH1)
③ Blue	Loop Power − (CH1)
② Green	RS485 +
④ Black	RS485 −

2. Double float + Dual current output   Loop Power 24Vdc ± 10%

| ① Brown | Loop Power + (CH1) |
③ Blue	Loop Power − (CH1)
② Green	Analog Output 2 + (CH2)
④ Black	Analog Output 2 − (CH2)
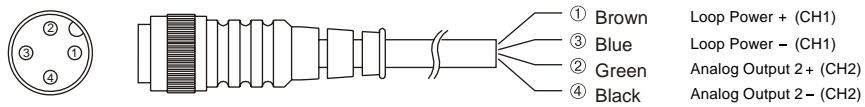
MEASURING RANGE & STEM LENGTH TO BE ORDERED:

Please refer below diagram for actual length of stem and the measurable length of the stem:

EG3: Order length (L)= Actual measurable length (X)+Length of float+Blanking zone (end)
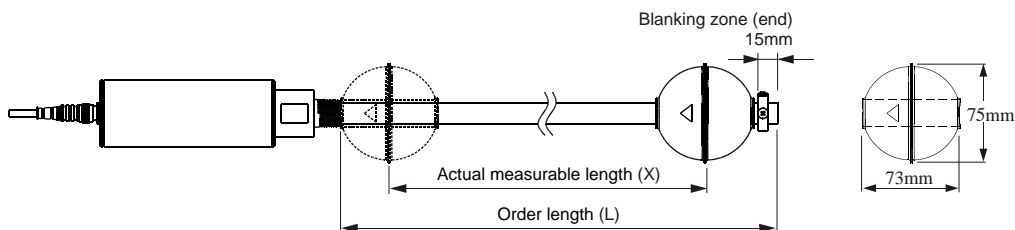
(2m above)= X+52+15= 67+X(mm)

(2m below)= X+73+15= 88+X(mm)

Blanking zone (end)
15mm

Actual measurable length (X)

Order length (L)

52mm
(75mm)
52mm
(73mm)
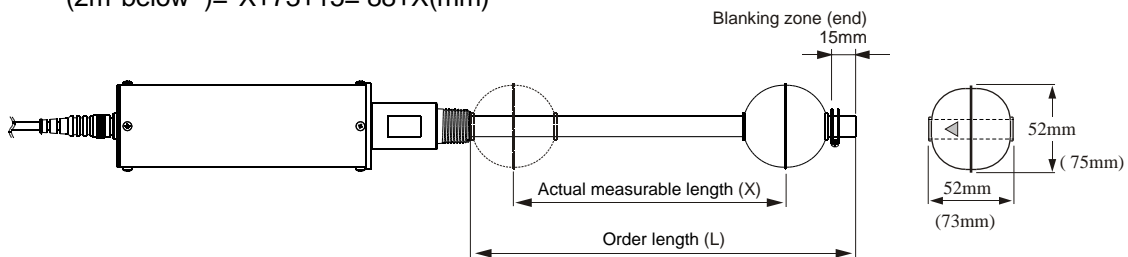
EG37: Order length (L)= Actual measurable length (X)+Length of float+Blanking zone (end)

= X+73+15= 88+X(mm)

Blanking zone (end)
15mm

Actual measurable length (X)

Order length (L)

75mm
73mm

INSTALLATION RECOMMENDATION

1. Loop Power 24Vdc±10% (EG3 series)
2. The product is calibrated before shipment. It is not recommended to change measuring range by users.
3. If the float is taken off, please re-install the float by the same direction (mark on the float has to be toward the product enclosure).
4. Please do not bend the stem to ensure measurement accuracy and performance.
5. Please do not change magnetic float to avoid effect on measurement accuracy.
6. User can install the product directly without having to take off the float, when connection hole at site is bigger than float diameter.
7. Please take off the float before installation, when connection hole at site is smaller than float diameter. Please install the float by specific direction (mark on the float has to be toward the product enclosure).
8. The stopper has to be fixed well on the stem score.
9. Please do not drop the magnetic float, to avoid magnet breakage inside the float.
10. Do not pressure the product with heavy weight, to bend the stem. If the stem is bent and can not work, please send back to us for calibration.
11. Package by bubble bag or foam is necessary to ensure safety during transportation.
12. Please do not open the product enclosure to assure measurement accuracy.

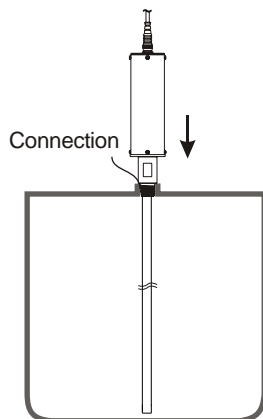## INSTALLATION METHOD IF THE FLOAT HAS TO BE TAKEN OFF BEFORE INSTALLATION:

Step 1:
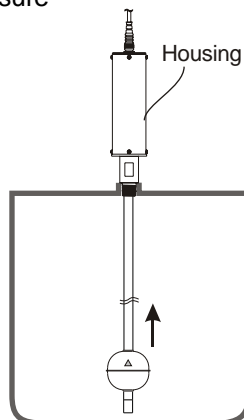Loose the stopper at stem end

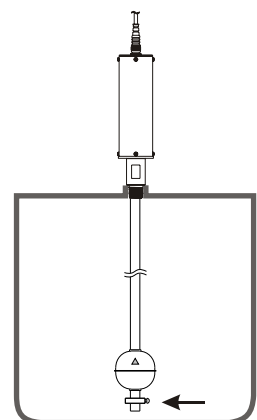Ring clip
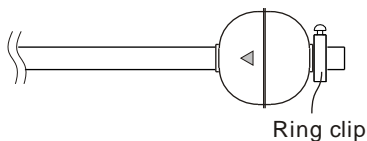
Step 2:
Take off the float
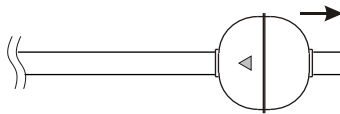
Step 3:
Install the product itself into the tank, and screw the connection well

Connection

Step 4:
Put back the float onto the stem by specific direction mark on the float has to be toward product enclosure

Housing

Step 5:
Screw the stopper well on the stem score

ORDER INFORMATION (2 Wire)

E G 3 [7] [1] [B][Q] [ ][ ] — [ ][ ][ ][ ] — [ ][ ][ ]

Model

1: Standard   7: Intrinsically Safe

Hosuing

Standard (-20~125℃)   High Temp. (-20~200℃)
1: Top conduit   A: Top conduit
2: Side conduit   B: Side conduit
3: Top conduit of steel wire cable   C: Top conduit with handle

Anti-corrosion (-20~80℃)
4: Top conduit with coated   (※options 4, 5, 6 only for EG37)
5: Side conduit with coated
6: Top conduit of steel wire cable
   with coated

Connection BQ: 1/2"PT (std.)

3---1-1/4"(32A)	I---4"(100A)	M---5kg/cm²	W---PN 10	Q---PT
B---1/2"(15A)	J---5"(125A)	N---10kg/cm²	X---PN 16	R---PF
C---3/4"(20A)	K---6"(150A)	O---150 Lbs	Y---PN 25	T---BSP
D---1"(25A)	S---Others	P---300 Lbs	Z---PN 40	U---NPT
E---1-1/2"(40A)				V---GAS
F---2"(50A)				S---Others
G---2-1/2"(65A)				
H---3"(80A)				

※ If installing directly(without removing float)
  ,the dimension of connection must be
  bigger than the float diameter.

Float 1 ── Please see chart below

Float 2 ── Please see chart below

Code	Dimension	Material	S.G.	Code	Dimension	Material	S.G.
S5	ϕ75x73xID20.5	SUS304/316	0.6	F3	ϕ45x45xID20	PP/Grey	0.55
S0	ϕ75x40xID20.5	SUS304/316	0.9	FC	ϕ45x45xID20	PP/Grey	0.9
S4	ϕ52x52xID15	SUS316	0.75	P3	ϕ48x45xID18.5	PP/Black	0.6
SD	ϕ52x52xID15	SUS316	0.9	PC	ϕ48x45xID18.5	PP/Black	0.9
S3	ϕ45x55xID15	SUS316	0.7	SS	Special Specification		
SC	ϕ45x55xID15	SUS316	0.9	00	No Float		

※ Probe diameter must be smaller than inside diameter of the float.

Analog Output 1 & Direction

A: 4~20mA (Bottom~Top)   B: 4~20mA (Top~Bottom)

※ 4~20mA output direction can be selected.

Analog Output 2 for Type

A: 4~20mA ※When A is chosen, extra +24V power supply is required, which is different from the loop power.
B: RS485
C: Rs485 + Thermal sensor ※ Thermal sensor, be embedded in bottom of probe.
0 : None

Probe

S: SUS304: ϕ12.7, If coated PP, ϕ17.2   E: SUS316L: ϕ12.7
L : SUS304: ϕ16, If coated PP, ϕ18.0   F: SUS316L: ϕ16
C: SUS316: ϕ12.7   ※ If measuring range over 2000mm, stem ϕ16 is recommended, to reduce
D: SUS316: ϕ16   risks during installation and transportation.

Measuring Range

05: 50~500mm   10: 510~1000mm   15: 1010~1500mm   20: 1510~2000mm
25: 2010~2500mm   30: 2510~3000mm   35: 3010~3500mm   40: 3510~4000mm
45: 4010~4500mm   50: 4510~5000mm   55: 5010~5500mm

※ Probe length=Measuring range+(Single Float Height+15mm)
   Ex: 500mm(Measurement)+(73mm(S5 Float Height)+15mm)=588mm(Probe length)

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