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EPR5 Paddle Wheel Flow Meter

FineTek

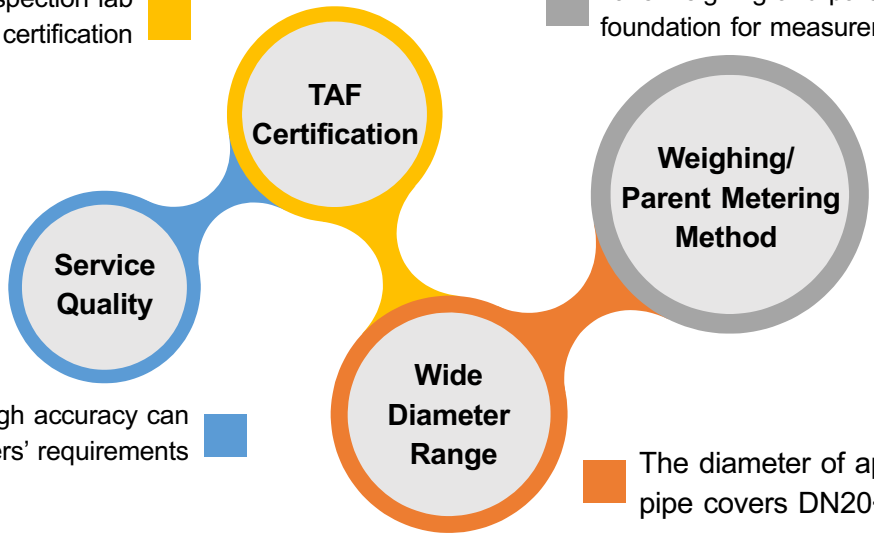
Innovation · Quality · Sharing

FineTek Flow Lab

FineTek is the company who owns a Second Class flow test laboratory in Taiwan. With the most professional R&D team, FineTek develops various high precision flow meters and related parts. Moreover, FineTek is certificated and constantly validated by First Class accreditation organization, the Flow Laboratory of the National Measurement Laboratory, R.O.C (Center for Measurement Standards, ITRI), which is approved to guarantee the accuracy on the flow measurement in each delivery. The TAF flow laboratory of FineTek has been certificated and approved by Taiwan Accreditation Foundation (TAF) and conforms to the regulations of international organizations such as ILAC and APALC. It has the complete ability to conduct uncertainty testing and rating for flow test.

Flow inspection lab with TAF certification

Take weighing and parent metering as the foundation for measurement calibration



High quality and high accuracy can meet the customers' requirements

The diameter of applicable pipe covers DN20~ DN300

FineTek

EPR PADDLE WHEEL FLOW METER

WORKING PRINCIPLE

The Paddle Wheel Flow Meter measures the flow velocity by using the fluidic to drive the blade rotation, and calculates the flow rate based on the flow velocity. ERP5 series flow meter consists of flow transmitter and pipe fitting. The light and compact design allows the user to carry, install and operate it conveniently. The product is calibrated by professional flow test device, with the accuracy of K value reaching±3%. The measuring range is 0.3 ~10m/s, with high linearity. Display and non-display type are both available. The display type is built-in with accumulated flow storage device.

FEATURES

- Microprocessor-controlled, with complete functions that are easy to operate.
- Analog signal 4-20mA current output or 0-5V voltage output
- With communication interface Rs485.
- Analog output range increased by 10%: 4-21.6mA.
- Simulation test output: 0-24mA.
- Pulse wave output: 2 sets of NPN transistor output.
- Simulation frequency output: 0-300Hz.
- LCM display (Graphic 128x64 Dots).
- Display has built-in cumulative flow FRAM flash memory.
- Quick release design between display and sensor.
- LED to indicate the alarm status.
- Analog output flow rate and flow rate filtering setting: 0-400 segments.
- LED display backlight with three modes: ON/OFF/ACTIVE operations.
- Parameter settings (K factor, pipe diameter, device ID, baudrate).
- Supports Traditional Chinese, Simplified Chinese, English, etc.

APPLICATIONS

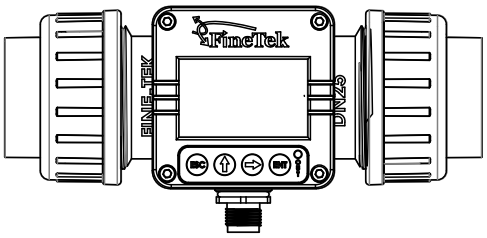
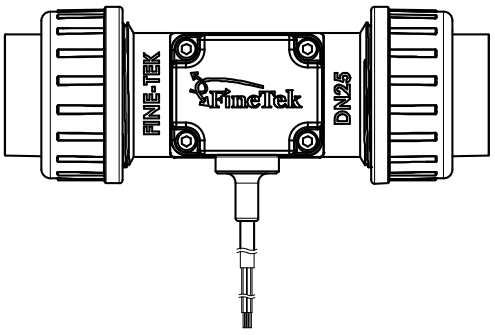
The Paddle Wheel Flow Meter is applicable to neutral or corrosive liquids that are non-granular or non-viscous. It connects with an analog output and pulse output signal to form a monitoring system, which can display instantaneous flow and accumulated flow. Moreover, it can form a control circuit to adjust the valve or operate the switch.

※Iron chips that stick onto the impellers during rotation will affect the measurement and damage the equipment. Iron shavings may be generated during processing or when the pumps are running. A magnetic sieve or filter must be installed upstream at a distance of >15 times the pipe diameter (take into consideration pressure loss too) and cleaned regularly to prevent blocking.

- Food industry
- Beverage industry
- Water treatment industry
- Pharmaceutical industry
- Dyeing industry
- Chemical industry
- PCB wet process control
- Semi-conductor industry

STANDARD SPECIFICATIONS

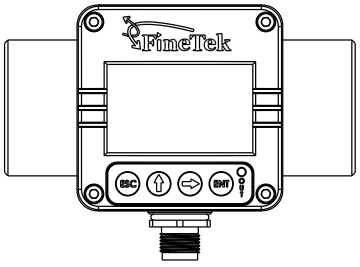
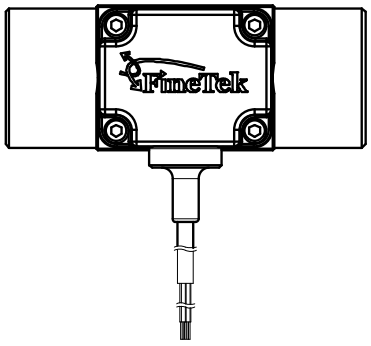
PVC Pipe material & PP Blade

Model Type		
Specification	With display type	Without display type
Applicable pipe diameter	DN15、DN20、DN25、DN40、DN50	
Pipe material	PVC	
Flow velocity range	0.3~10m/s	
Accuracy	Under standard K Factor ±3% F.S. (Flow velocity 6~10m/s reach ±0.5%)	
Repeatability	±0.4%	
Measuring principle	Magnetic sensing	
Viscosity range	300 cSt, max.	
Impurity range	Must be nonmagnetic, 1%ŕ max.(Size of particles 0.5mm max.)	
Process temperature	-15°C~60°C (5°F~140°F)	
Ambient humidity	<80%, no-condensation	
Installation method	Transmitter +T-fitting	
Process pressure	10bar, max.	
IP rating	IP66, the connector shall be inserted and fastened	IP65
Analog output	4~20mA(150Ω max.) or 0~5V(10KΩ min.)	
Pulse output	NPN Pulse output*2 /32Vdc Max	NPN Pulse output*1 /32Vdc Max
Frequency range	0~300Hz	N/A
Display	LCM,128*64 · Backlit	N/A
Power supply voltage	10~32Vdc	
Power consumption	< 1.5VA	
Communication port	RS485,Modbus(Optional)	N/A
Accumulated flow storage device	16K,FRAM	NO

※1st NPN Pulse Output - Rotor Pulse Output
※2nd NPN Pulse Output - You can choose between "Unit Flow Pulse Output," "Accumulated Flow Alarm Output," or "Flow Rate Alarm Output."

STANDARD SPECIFICATIONS

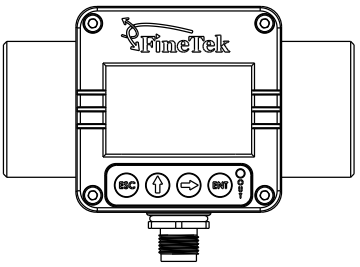
SUS Pipe material & PVDF Blade

Model Type		
Specification	With display type	Without display type
Applicable pipe diameter	DN20、DN25、DN40、DN50	
Pipe material	SUS304、SUS316、SUS316L	
Flow velocity range	0.3~10m/s	
Accuracy	Under standard K Factor ±3% F.S. (Flow velocity 6~10m/s reach ±0.5%)	
Repeatability	±0.4%	
Measuring principle	Magnetic sensing	
Viscosity range	300 cSt，max.	
Impurity range	Must be nonmagnetic, 1%, max.(Size of particles 0.5mm max.)	
Process temperature	-15°C~100°C (5°F~212°F)	
Ambient humidity	<80%, no-condensation	
Installation method	Transmitter +T-fitting	
Process pressure	10bar, max.	
IP rating	IP66, the connector shall be inserted and fastened	IP65
Analog output	4~20mA(150Ω max.) or 0~5V(10KΩ min.)	
Pulse output	NPN Pulse output*2 /32Vdc Max	NPN Pulse output*1 /32Vdc Max
Frequency range	0~300Hz	N/A
Display	LCM,128*64，Backlit	N/A
Power supply voltage	10~32Vdc	
Power consumption	< 1.5VA	
Communication port	RS485,Modbus(Optional)	N/A
Accumulated flow storage device	16K,FRAM	NO

※1st NPN Pulse Output - Rotor Pulse Output
※2nd NPN Pulse Output - You can choose between "Unit Flow Pulse Output," "Accumulated Flow Alarm Output," or "Flow Rate Alarm Output."

STANDARD SPECIFICATIONS

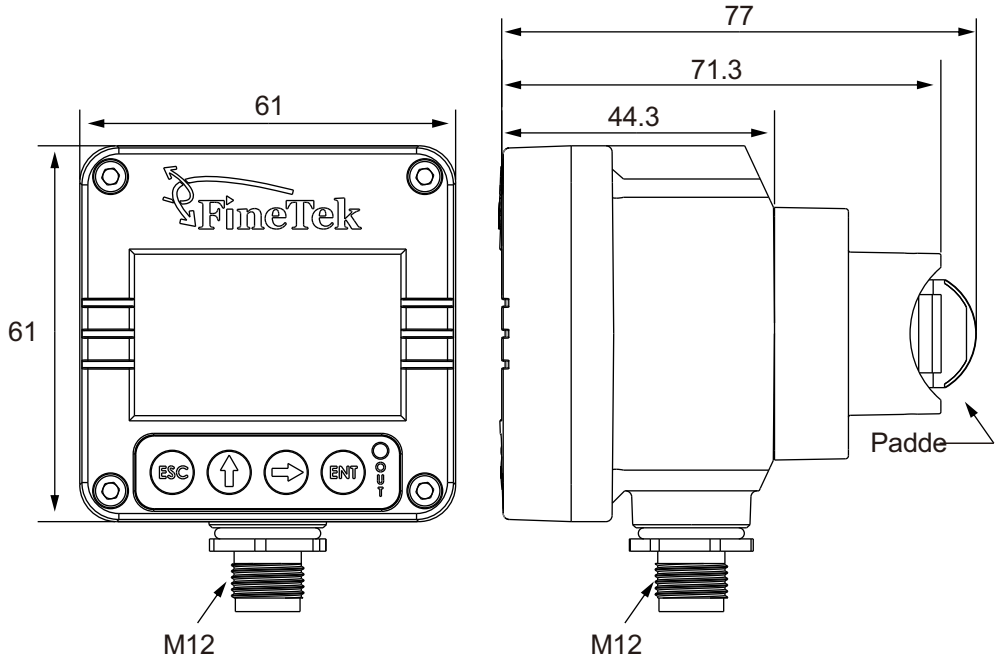
SUS Pipe material & SUS316 Blade

Model Type	
Specification	With display type
Applicable pipe diameter	DN25、DN40
Pipe material	SUS304、SUS316、SUS316L
Flow velocity range	0.5~8m/s
Accuracy	standard K Factor ±3% F.S.
Repeatability	±0.4%
Measuring principle	Magnetic sensing
Viscosity range	300 cSt，max.
Impurity range	Must be nonmagnetic, 1%, max. (Size of particles 0.5mm max.)
Process temperature	-15°C~100°C (5°F~212°F)
Ambient humidity	<80%, no-condensation
Installation method	Transmitter +T-fitting
Process pressure	10bar, max.
IP rating	IP66, the connector shall be inserted and fastened
Analog output	4~20mA(150Ω max.) or 0~5V(10KΩ min.)
Pulse output	NPN Pulse output*2 /32Vdc Max
Frequency range	0~300Hz
Display	LCM,128*64，Backlit
Power supply voltage	10~32Vdc
Power consumption	< 1.5VA
Communication port	RS485,Modbus(Optional)
Accumulated flow storage device	16K,FRAM

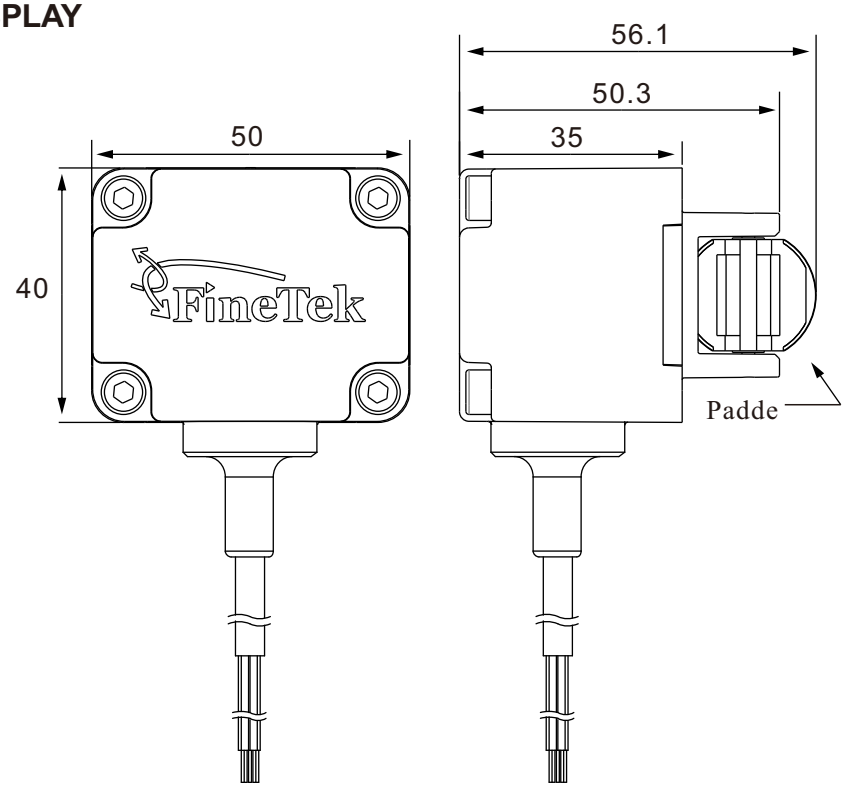
※1st NPN Pulse Output - Rotor Pulse Output
※2nd NPN Pulse Output - You can choose between "Unit Flow Pulse Output," "Accumulated Flow Alarm Output," or "Flow Rate Alarm Output."

DIMENSIONS

WITH DISPLAY

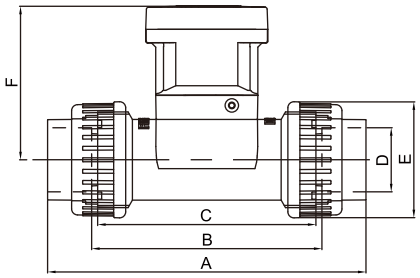


WITHOUT DISPLAY



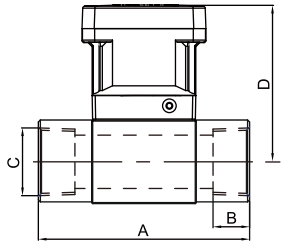
DIMENSIONS

WITH DISPLAY (ENGINEERING PLASTICS)



Diameter-DN (mm)	Pipe standards	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)
15	DIN/ISO ASTM JIS	128	96	90	20 21.3 18.4	43	79.1
20	DIN/ISO ASTM JIS CNS 4053-1	144	106	100	25 26.7 26.45 26	53	76.3
25	DIN/ISO ASTM JIS	159	115	109	32 33.4 32.55	58	77
40	DIN/ISO ASTM JIS	189	125	119	50 48.3 48.7	83	83.9
50	DIN/ISO ASTM JIS CNS 4053-1	216	140	130	63 60.3 60.8 60	103	90

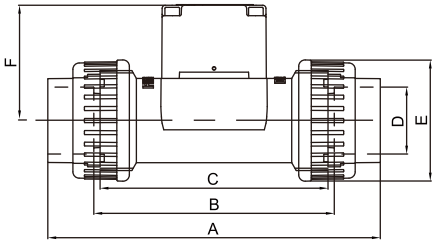
WITH DISPLAY (STAINLESS STEEL)



Diameter-DN (mm)	A (mm)	B (mm)	C (mm)	D (mm)
20	94	17 18.3 18.3	PF 3/4” PT 3/4” NPT 3/4”	77
25	104	23 18 18	PF 1” PT 1” NPT 1”	77
40	129	23 22 22	PF 1-1/2” PT 1-1/2” NPT 1-1/2”	83.4
50	148.5	27.5 24 24	PF 2” PT 2” NPT 2”	90

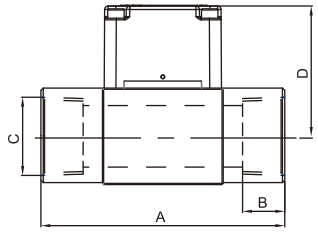
DIMENSIONS

WITHOUT DISPLAY (ENGINEERING PLASTICS)



Diameter-DN (mm)	Pipe standards	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)
15	DIN/ISO ASTM JIS	128	96	90	20 21.3 18.4	43	48.4
20	DIN/ISO ASTM JIS CNS 4053-1	144	106	100	25 26.7 26.45 26	53	54.8
25	DIN/ISO ASTM JIS	159	115	109	32 33.4 32.55	58	55.2
40	DIN/ISO ASTM JIS	189	125	119	50 48.3 48.7	83	62
50	DIN/ISO ASTM JIS CNS 4053-1	216	140	130	63 60.3 60.8 60	103	68.5

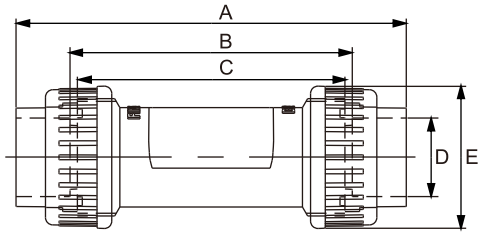
WITHOUT DISPLAY (STAINLESS STEEL)



Diameter-DN (mm)	A (mm)	B (mm)	C (mm)	D (mm)
20	94	17 18.3 18.3	PF 3/4” PT 3/4” NPT 3/4”	55
25	104	23 18 18	PF 1” PT 1” NPT 1”	55.6
40	129	23 22 22	PF 1-1/2” PT 1-1/2” NPT 1-1/2”	62
50	148.5	27.5 24 24	PF 2” PT 2” NPT 2”	69

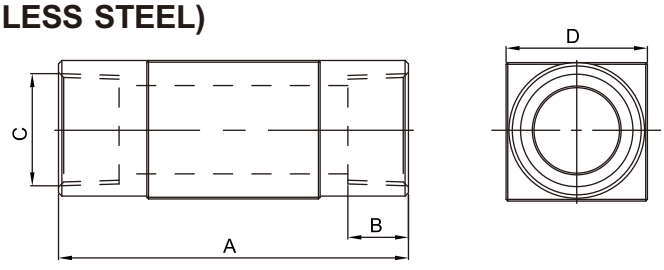
DIMENSIONS

T-FITTING(ENGINEERING PLASTICS)



Diameter-DN (mm)	Pipe standards	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
15	DIN/ISO ASTM JIS	128	96	90	20 21.3 18.4	43
20	DIN/ISO ASTM JIS CNS 4053-1	144	106	100	25 26.7 26.45 26	53
25	DIN/ISO ASTM JIS	159	115	109	32 33.4 32.55	58
40	DIN/ISO ASTM JIS	189	125	119	50 48.3 48.7	83
50	DIN/ISO ASTM JIS CNS 4053-1	216	140	130	63 60.3 60.8 60	103

T-FITTING (STAINLESS STEEL)



Diameter-DN (mm)	A (mm)	B (mm)	C (mm)	D (mm)
20	94	17 18.3 18.3	PF 3/4” PT 3/4” NPT 3/4”	42
25	104	23 18 18	PF 1” PT 1” NPT 1”	55.6
40	129	23 22 22	PF 1-1/2” PT 1-1/2” NPT 1-1/2”	62
50	148.5	27.5 24 24	PF 2” PT 2” NPT 2”	72

TECHNICAL PARAMETER

SELECTING FLOW AND PIPE DIAMETER

Plastic Blade

Material	Pipe diameter (mm)	Flow Range (m^3/h)	
		Flow velocity 0.3m/s (min)	Flow velocity 10m/s (max)
PVC Pipe material & PP Blade	15	0.19	6.36
	20	0.34	11.31
	25	0.53	17.67
	40	1.35	45.23
	50	2.12	70.68
SUS Pipe material & PVDF Blade	20	0.34	11.31
	25	0.53	17.67
	40	1.35	45.23
	50	2.12	70.68

Stainless Blade

Material	Pipe diameter (mm)	Flow Range (m^3/h)	
		Flow velocity 0.5m/s (min)	Flow velocity 8m/s (max)
SUS Pipe material & SUS316 Blade	25	0.89	14.13
	40	2.27	36.18

RELATIONSHIP BETWEEN K VALUE AND FITTING DIAMETER :

With Display

Material	Connection & Standard Type	K Factor (Pulse/Liter)				
		DN15	DN20	DN25	DN40	DN50
PVC Pipe material & PP Blade	DIN/ISO	114.8	74.5	50.5	16.58	9.7
	ASTM	114.8	74.5	50.5	16.58	9.7
	JIS	114.8	74.5	50.5	16.58	9.7
	CNS 4053-1	— — —	74.5	— — —	— — —	9.7
SUS Pipe material & PVDF Blade	Thread PF	114.8	74.5	50.5	16.58	9.7
	Thread PT	114.8	74.5	50.5	16.58	9.7
	Thread NPT	114.8	74.5	50.5	16.58	9.7
SUS Pipe material & SUS316 Blade	Thread PF	— — —	— — —	58	16.25	8.8
	Thread PT	— — —	— — —	58	16.25	8.8
	Thread NPT	— — —	— — —	58	16.25	8.8

※ US: GL (Gallon) K factor = Pulse/Liter × 3.785; UK: GL (Gallon) K factor = Pulse/Liter × 4.546.

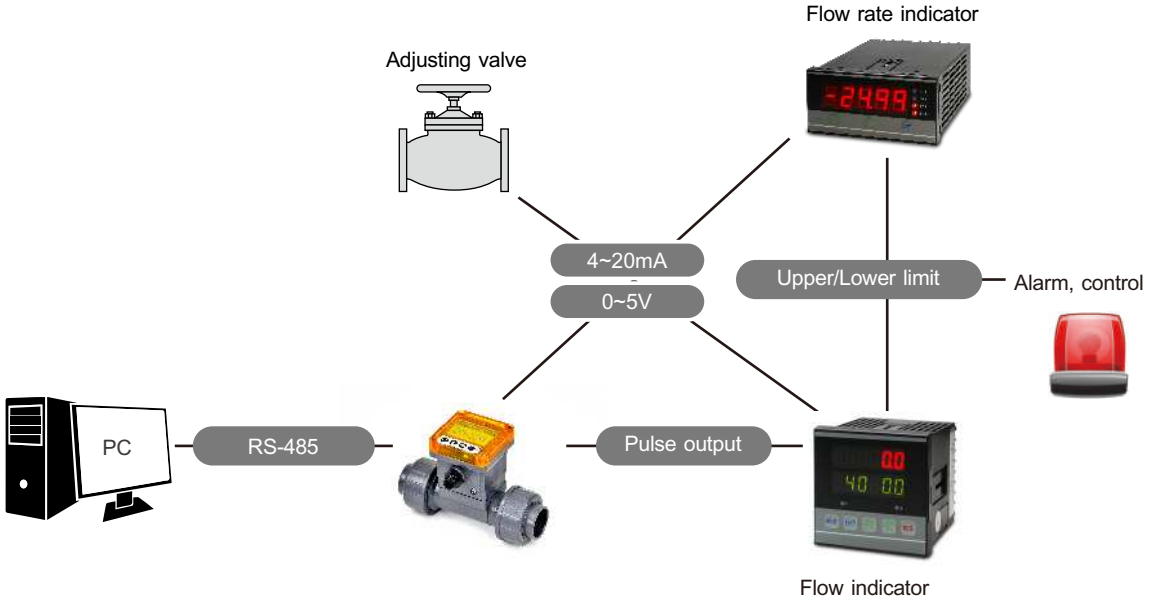
TECHNICAL PARAMETER

Without Display

Material	Connection & Standard Type	K Factor (Pulse/Liter)				
		DN15	DN20	DN25	DN40	DN50
PVC Pipe material & PP Blade	DIN/ISO	105.8	60.5	35.4	11.05	6.84
	ASTM	105.8	60.5	35.4	11.05	6.84
	JIS	105.8	60.5	35.4	11.05	6.84
	CNS 4053-1	— — —	60.5	— — —	— — —	6.84
SUS Pipe material & PVDF Blade	Thread PF	105.8	60.5	35.4	11.05	6.84
	Thread PT	105.8	60.5	35.4	11.05	6.84
	Thread NPT	105.8	60.5	35.4	11.05	6.84

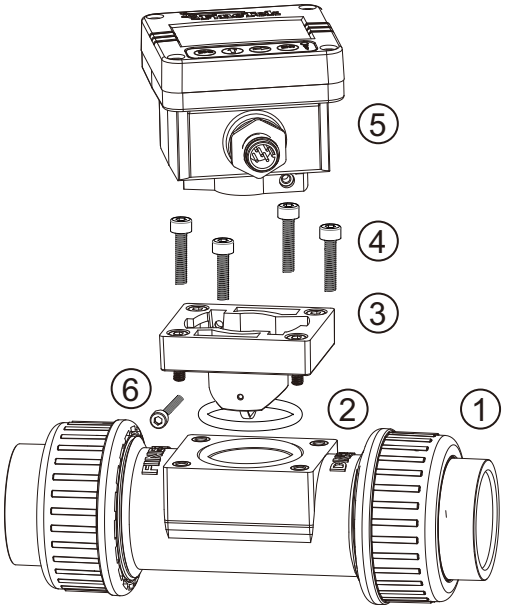
※ US: GL (Gallon) K factor = Pulse/Liter × 3.785; UK: GL (Gallon) K factor = Pulse/Liter × 4.546.

CONTROL SYSTEM DIAGRAM



TRANSMITTER INSTALLATION

WITH DISPLAY

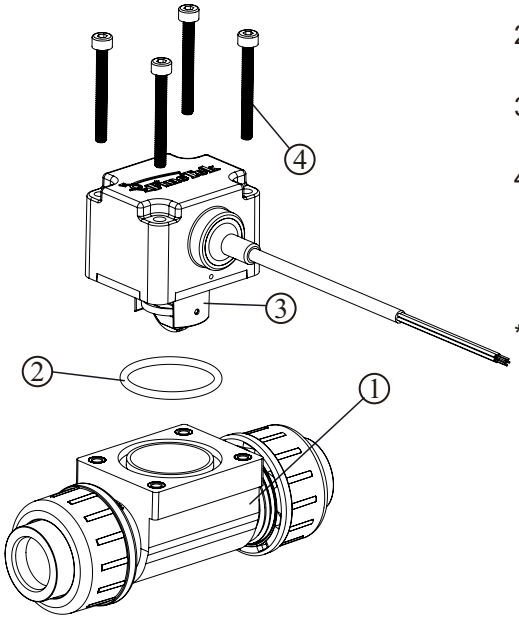


Installation steps

1. Flow meter T-fitting.
2. Install the O-ring into the sealing groove and let it expand naturally.
3. Pass the film seat, facing downward, through the hole and the O-ring.
4. Install the screw X4; fasten them evenly and flatly.
   *Locking torque:
   Plastic blade = 8~10kgf-cm (0.784~0.98N.m) SUS blade = 10~12kgf-cm (0.98~1.176N.m)
5. Point the M12 joint of the display towards yourself and insert into the recess at the precise angle. Attach flatly and turn clockwise till the edges are aligned.
6. Fasten 1 positioning screw and tighten it.
   * Locking torque = 6~8kgf-cm (0.588~0.784N.m)

*Note: Perform Steps 1~6 for installation of the entire machine. If only the meter head is installed, please perform Steps 5 and 6.
Please install the screw locking torque in accordance with the prescribed range.

WITHOUT DISPLAY



Installation steps

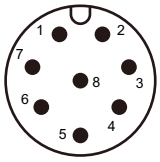
1. Flowmeter T-tube.
2. Install the O-ring into the sealing groove and let it expand naturally.
3. Pass the transmitter blade, facing downwards, through the hole and the O-ring and attach it flatly and in alignment.
4. Install 4x screws; fasten them evenly and flatly.
   *Locking torque:
   Plastic blade = 8~10kgf-cm (0.784~0.98N.m)
   SUS blade = 10~12kgf-cm (0.98~1.176N.m)

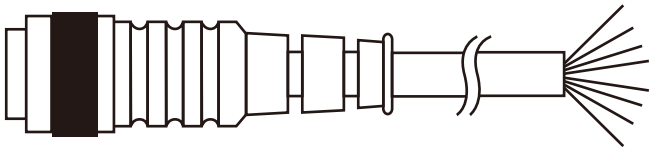
*Note: Please install the screw locking torque in accordance with the prescribed range

WITH DISPLAY

M12 CONNECTOR

Connector socket Plug Cable





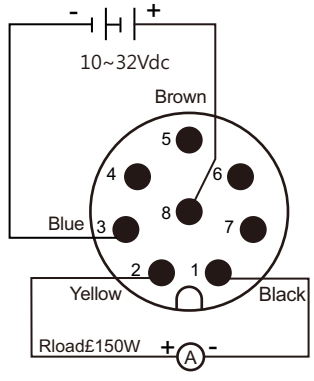
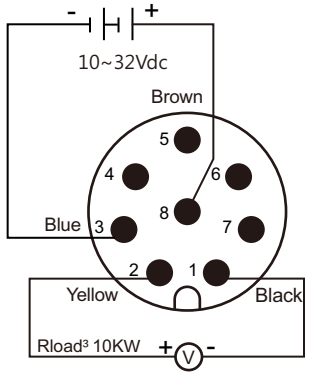
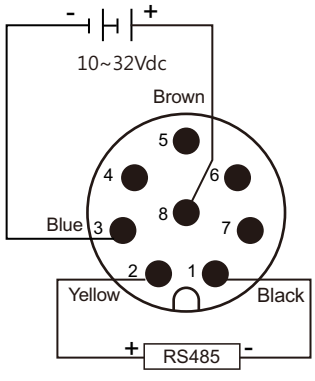
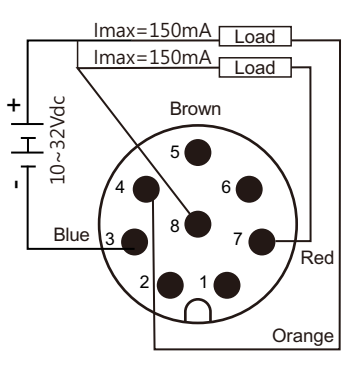
The colors of the cables and the pins of the M12 connecting socket are as shown in the table:

Cable No..	Function	Cable Color
1	Analog output 4~20mA - or analog output 0~5V - or communication output RS485 -	Black
2	Analog output 4~20mA + or analog output 0~5V + or communication output RS485 +	Yellow
3	Power input DC 0V -	Blue
4	Pulse Out 1	Orange
5	--	Green
6	--	Purple
7	Pulse Out 2	Red
8	Power input DC 10~32V +	Brown

※Pulse out1: Orange line: “rotor pulse output”

※Pulse out2: For the red line, “unit flow pulse output,” “accumulated flow alarm output” or “flow rate alarm output” can be selected.

WIRING

Analog output 4~20mA	Analog output 0~5V	Communication output RS485	Pulse out
			

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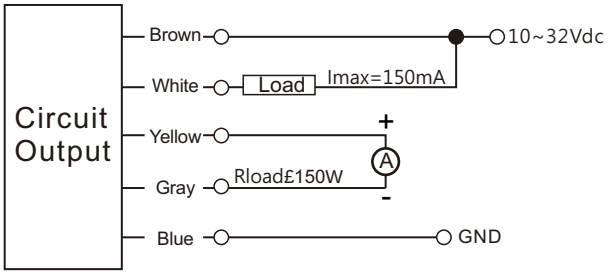
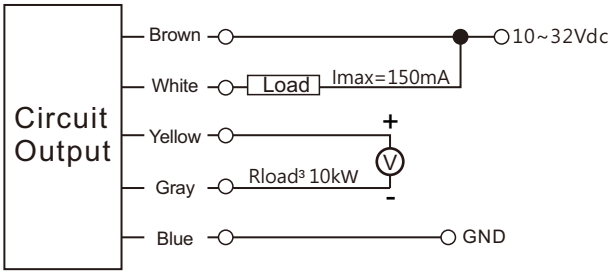
WITHOUT DISPLAY

The colors of cables are defined as shown in the table:

Cable No.	Function	Cable Color
1	Power input DC 10~32V +	Brown
2	Power input DC 0 V -	Blue
3	Analog output 4~20mA + or analog output 0~5V +	Yellow
4	Analog output 4~20mA - or analog output 0~5V -	Gray
5	Pulse Out	White

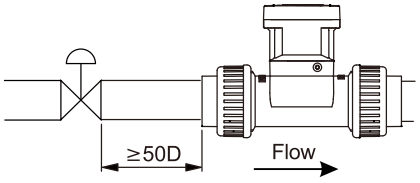
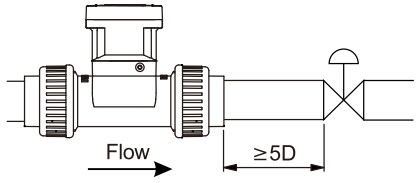
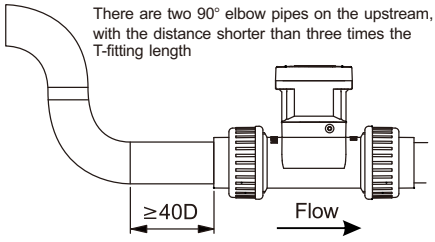
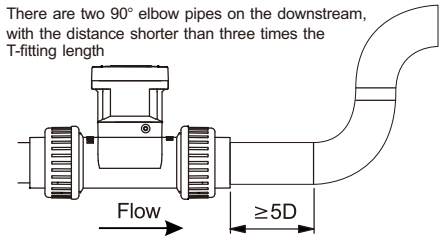
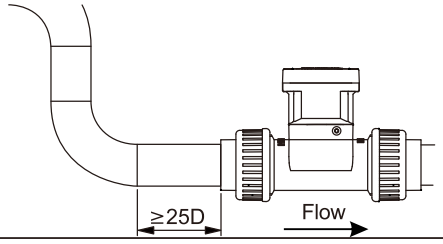
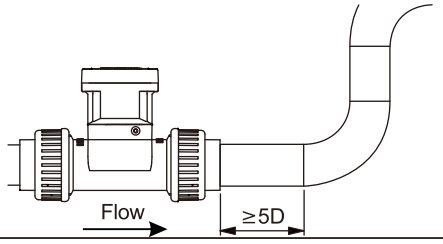
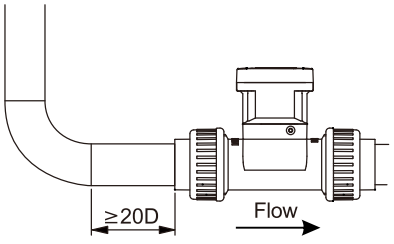
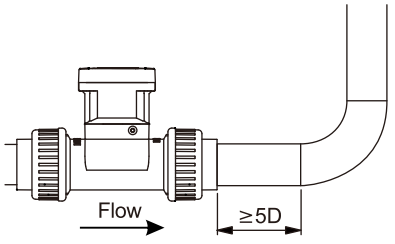
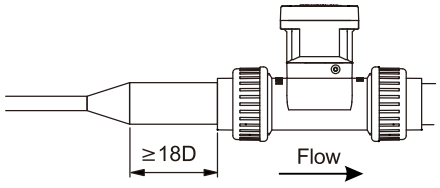
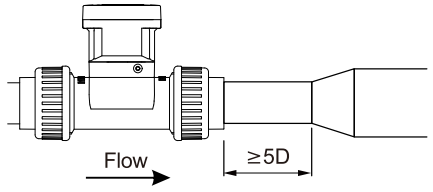
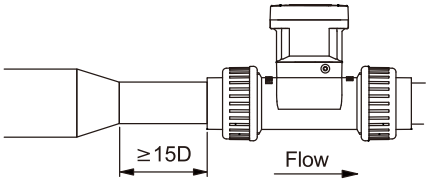
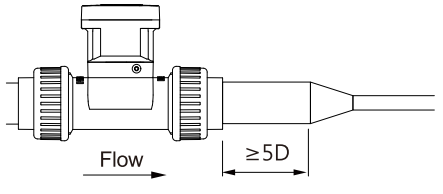
※Pulse out: White line: rotor pulse output

WIRING

Analog output 4~20mA	Analog output 0~5V
	

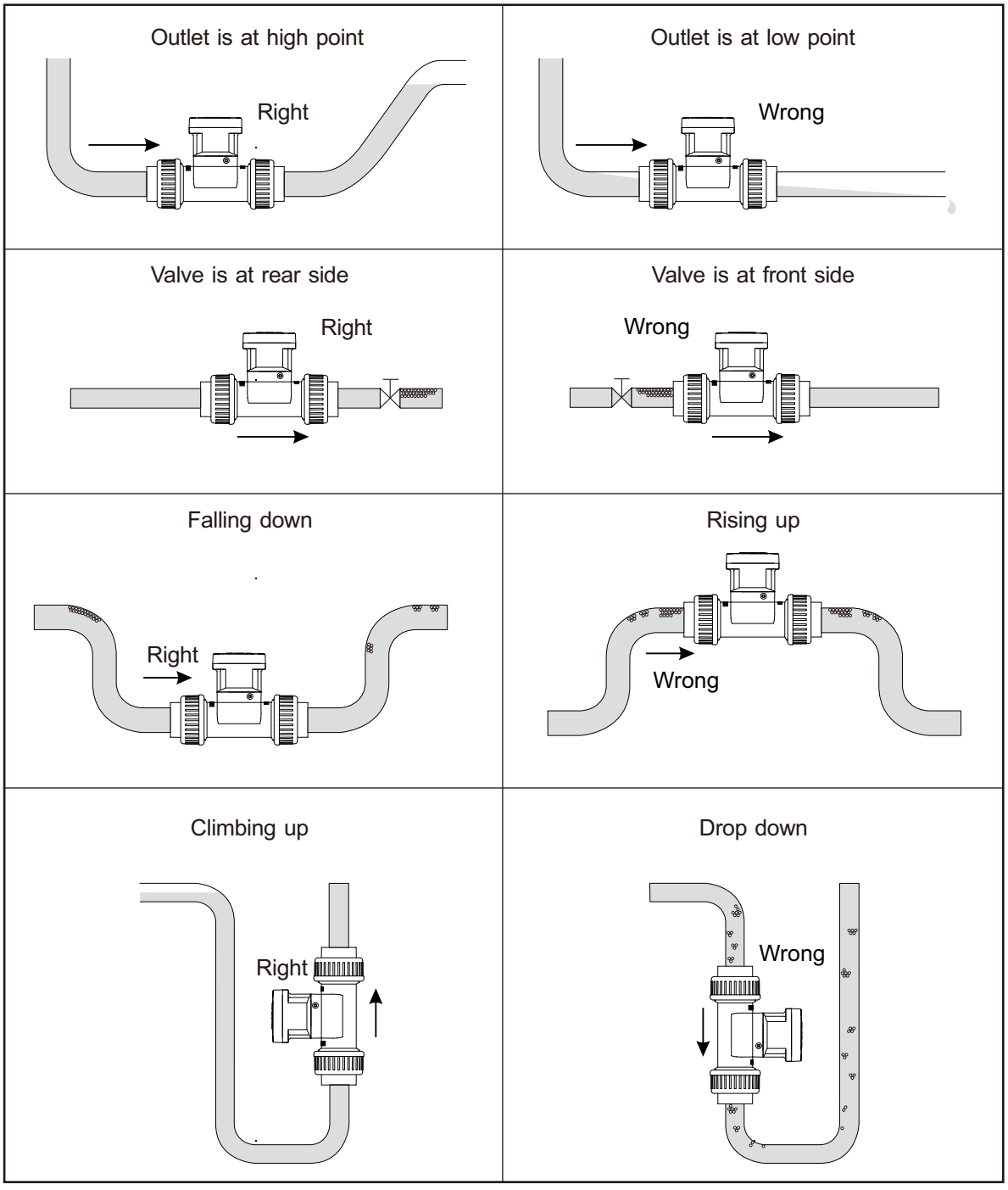
REQUIREMENTS FOR STRAIGHT PIPE SECTION

The straight pipe must be long enough on the upstream side and downstream side where the flow meter is installed. This can obtain an evenly distributed and stable flow field so as to guarantee the measuring accuracy. When installing the flow meter, please choose optimal distance based on the pipe dimension and field environment. Generally, the longer the section of the straight pipe is, the better. The table below lists the minimum distance based on the times of D(D=pipe diameter).

Type	Length of Straight Pipe on the Upstream Side	Length of Straight Pipe on the Downstream Side
Regulating valve		
Keep the two elbow pipes close		
Dual elbow pipes		
Single elbow pipe		
Diverging pipe		
Convergin pipe		

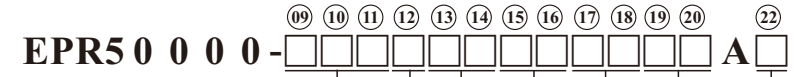
INSTALLATION REQUIREMENTS

The flow meter can be installed on a horizontal or vertical pipe, but the requirements below must be followed:
1. The flow meter must be in horizontal or vertical pipe.
2. Ensure the flow meter to keep a full pipe.
3. No air bulb or hole should be generated when getting close to the T-fitting area of the flow meter during the measurement. It will affect the accuracy of the flow measurement.



*Note:
1. When installing the flow meter on the horizontal pipe, the sensor blade must face downward.
2. Appropriate material should be selected, and the specifications on pressure and temperature should be followed.
3. Moreover, appropriate pipe diameter should be chosen based on the flow/velocity/diameter.

ORDER INFORMATION



⑨⑩⑪ Pipe diameter

015: DN15(1/2")(Applicable only to PVC fittings)
020: DN20(3/4")
025: DN25(1")
040: DN40(1-1/2")
050: DN50(2")

⑫ Display model

A: Without display
B: LCM display

⑬⑭ Pipe material

MA: SUS 304
MB: SUS 316
MC: SUS 316L
23: PVC

⑮⑯ T-fitting standard

(When the pipe material is SUS, please choose ”00”)

00: None
AA: JIS
AB: ISO
AC: ASTM
AD: DIN
BA:CNS(Pipe diameter 020, 040 only)

} (Only available for PVC)(Pipe material)

⑰⑱ T-fitting standard connection type

(When the pipe material is PVC, please choose ”00”)

00: None
02: PT female
04: PF female
08: NPT female

} (Only available for SUS)(Pipe material)

⑲⑳ Blade material

MA: SUS304(100℃)
MB: SUS 316 (100℃)
MC: SUS316L(100℃)
18: PP (60°C)
24: PVDF (100°C)

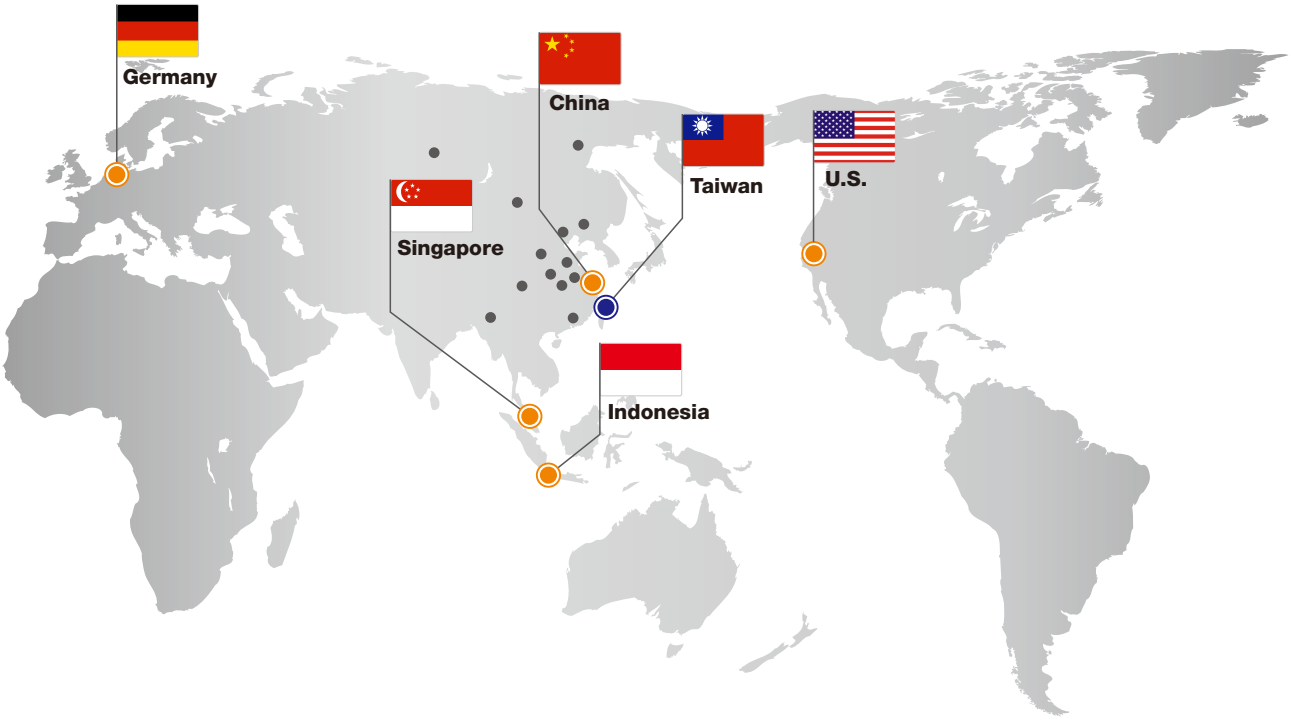
㉒ Output

C: 4~20mA,Pulse output*2
D: 0~5V,Pulse output*2
E: RS-485,Pulse output*2
F: 4~20mA,Pulse output*1
G: 0~5V,Pulse output*1

Note: Only C, D and E can be selected when there is a display.
Only F and G can be selected when there is no display.

APPLICATION DEMO

Global Network



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