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Flu-tech co.,ltd

# Paddle Wheel Flow Meter

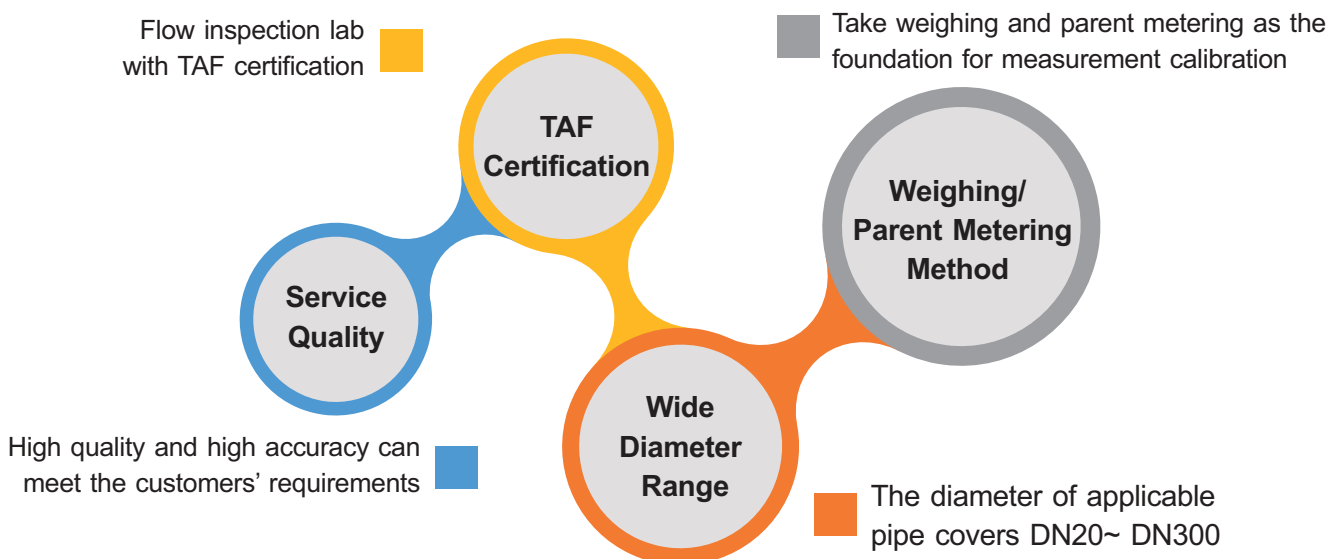


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# FineTek Flow Lab



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.





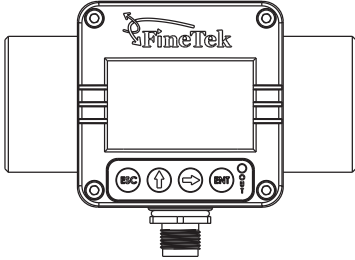
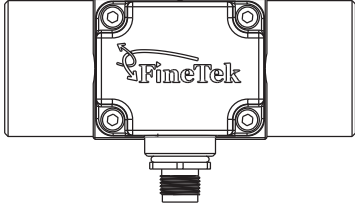
# STANDARD SPECIFICATIONS

## PVC Pipe material & PP Blade

Model Type			
Specification	Intelligent All-in-one model	Flow transmitter model	Pulse output model
Applicable pipe diameter	DN20 \ DN25 \ DN40 \ DN50		
Pipe material	PVC		
Flow velocity range	0.3~10m/s		
Accuracy	Under standard K Factor $\pm 3\%$ F.S. (Flow velocity 6~10m/s reach $\pm 0.5\%$ )		
Repeatability	$\pm 0.4\%$		
Measuring principle	Magnetic		
Viscosity range	300 cSt, max.		
Impurity range	Must be nonmagnetic 1%, max.(Size of particles 0.5mm max.)		
Process temp.	-15°C~60°C(5°F~140°F)		
Ambient humidity	<80%,non-condensing		
Installation method	Transmitter +T-fitting		
Process pressure	10-bar,Max.		
IP rating	IP66, the connector shall be inserted and fastened		
Analog output	4~20mA		N/A
impedance	1300 $\Omega$ , at 36Vdc 1000 $\Omega$ , at 30Vdc 700 $\Omega$ , at 24Vdc 450 $\Omega$ , at 18Vdc 200 $\Omega$ , at 12Vdc		
Pulse output	NPN, PNP 200mA overcurrent protection		
Frequency range	0~300Hz		N/A
Display	LCM,128*64,Backlit		N/A
Power supply voltage	12~36Vdc $\cdot \pm 10\%$		
Power consumption	<1.5VA		
Reverse protection of power supply	YES		
Communication port	RS485,Modbus		N/A
Accumulated flow storage device	16K,FRAM		NO

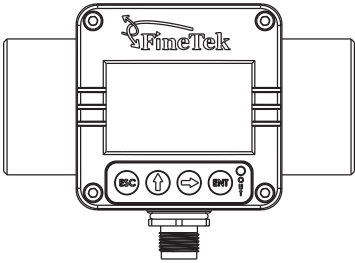
# STANDARD SPECIFICATIONS

## SUS Pipe material & PVDF Blade

Model Type				
Specification	Intelligent All-in-one model		Flow transmitter model	Pulse output model
Applicable pipe diameter	DN20、DN25、DN40、DN50			
Pipe material	SUS304、SUS316、SUS316L			
Flow velocity range	0.3~10m/s			
Accuracy	Under standard K Factor $\pm 3\%$ F.S. (Flow velocity 6~10m/s reach $\pm 0.5\%$ )			
Repeatability	$\pm 0.4\%$			
Measuring principle	Magnetic			
Viscosity range	300 cSt, max.			
Impurity range	Must be nonmagnetic 1%, max.(Size of particles 0.5mm max.)			
Process temp.	-15°C~100°C (5°F~212°F)			
Ambient humidity	<80%,non-condensing			
Installation method	Transmitter +T-fitting			
Process pressure	10-bar,Max.			
IP rating	IP66, the connector shall be inserted and fastened			
Analog output	4~20mA		N/A	
impedance	1300 $\Omega$ , at 36Vdc 1000 $\Omega$ , at 30Vdc 700 $\Omega$ , at 24Vdc 450 $\Omega$ , at 18Vdc 200 $\Omega$ , at 12Vdc			
Pulse output	NPN, PNP 200mA overcurrent protection			
Frequency range	0~300Hz		N/A	
Display	LCM,128*64,Backlit		N/A	
Power supply voltage	12~36Vdc $\cdot \pm 10\%$			
Power consumption	<1.5VA			
Reverse protection of power supply	YES			
Communication port	RS485,Modbus		N/A	
Accumulated flow storage device	16K,FRAM		NO	

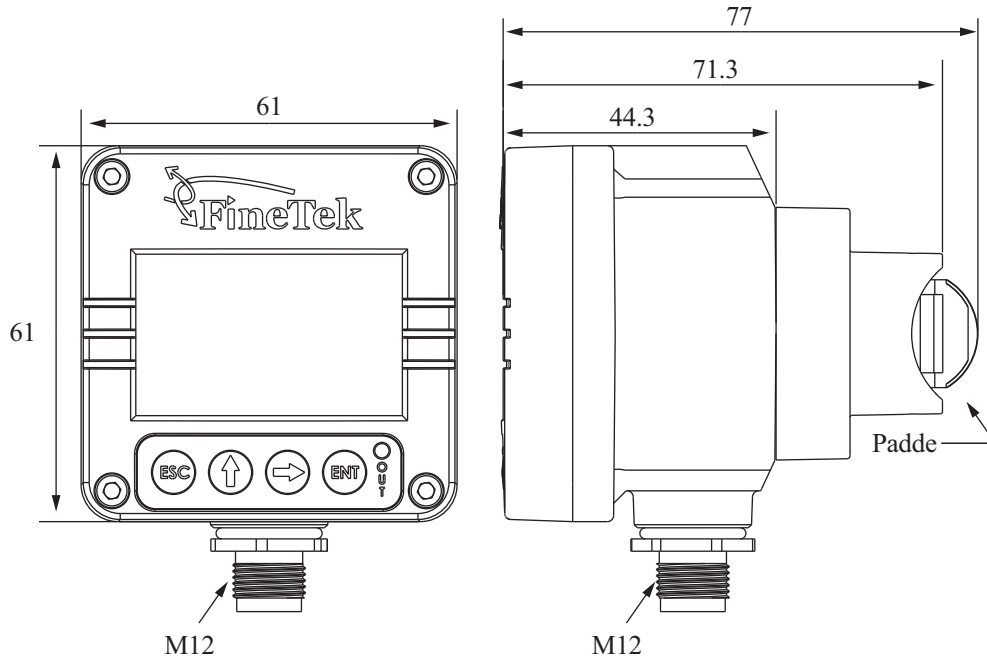
# STANDARD SPECIFICATIONS

## SUS Pipe material & SUS316 Blade

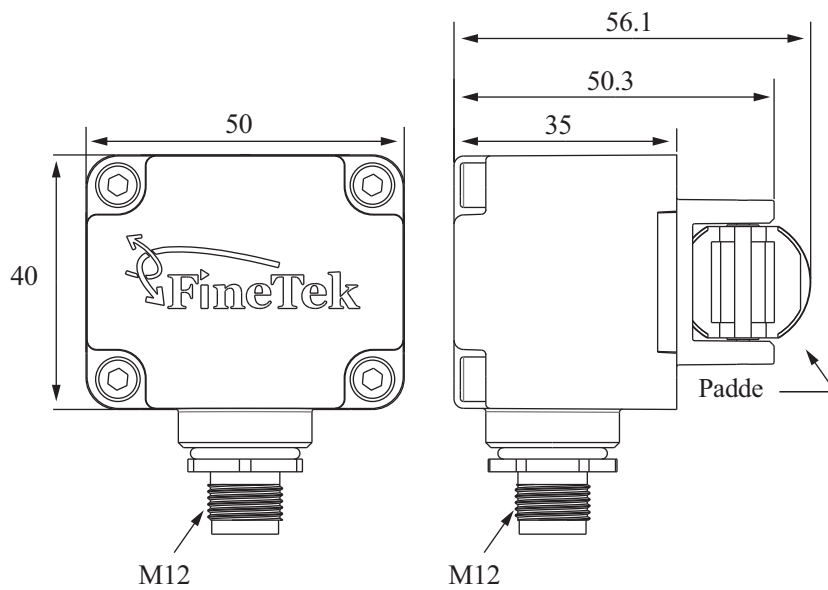
Model Type	
Specification	Intelligent All-in-one model
Applicable pipe diameter	DN25 \ DN40
Pipe material	SUS304 \ SUS316 \ SUS316L
Flow velocity range	0.5~8 m/s
Accuracy	Under standard K Factor $\pm 3\%$ F.S.
Repeatability	$\pm 0.4\%$
Measuring principle	Magnetic
Viscosity range	300 cSt, max.
Impurity range	Must be nonmagnetic 1%, max. (Size of particles 0.5mm max.)
Process temp.	-15°C~100°C (5°F~212°F)
Ambient humidity	<80%, non-condensing
Installation method	Transmitter +T-fitting
Process pressure	10-bar, Max.
IP rating	IP66, the connector shall be inserted and fastened
Analog output	4~20mA
impedance	1300 $\Omega$ , at 36Vdc 1000 $\Omega$ , at 30Vdc 700 $\Omega$ , at 24Vdc 450 $\Omega$ , at 18Vdc 200 $\Omega$ , at 12Vdc
Pulse output	NPN, PNP 200mA overcurrent protection
Frequency range	0~300Hz
Display	LCM, 128*64, Backlit
Power supply voltage	12~36Vdc $\cdot \pm 10\%$
Power consumption	<1.5VA
Reverse protection of power supply	YES
Communication port	RS485, Modbus
Accumulated flow storage device	16K, FRAM

# DIMENSIONS

## INTELLIGENT ALL-IN-ONE MODEL

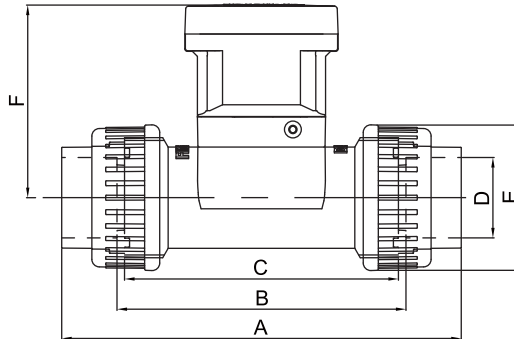


## FLOW TRANSMITTER MODEL & PULSE OUTPUT MODEL



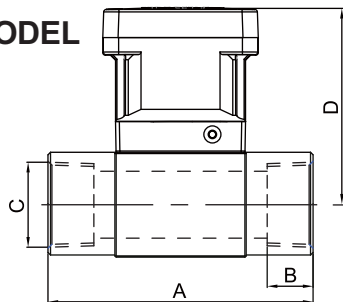
# DIMENSIONS

## INTELLIGENT ALL-IN-ONE MODEL (ENGINEERING PLASTICS)



Diameter-DN (mm)	Pipe standards	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)
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	76.7
40	DIN/ISO ASTM JIS	189	125	119	50 48.3 48.7	83	83.3
50	DIN/ISO ASTM JIS CNS 4053-1	216	140	130	63 60.3 60.8 60	103	90

## INTELLIGENT ALL-IN-ONE MODEL (STAINLESS STEEL)

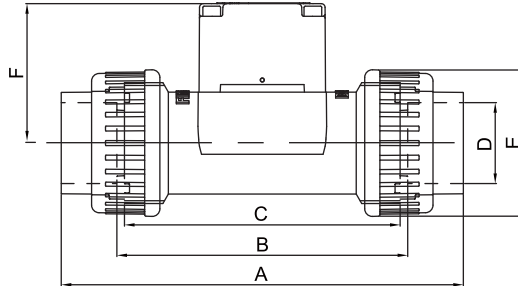


Diameter-DN (mm)	A (mm)	B (mm)	C (mm)	D (mm)
20	94	17 18.3 18.3	PF 3/4" PT 3/4" NPT 3/4"	77
25	104	23 18 18	PF 1" PT 1" NPT 1"	77
40	129	23 22 22	PF 1-1/2" PT 1-1/2" NPT 1-1/2"	83.4
50	148.5	27.5 24 24	PF 2" PT 2" NPT 2"	90



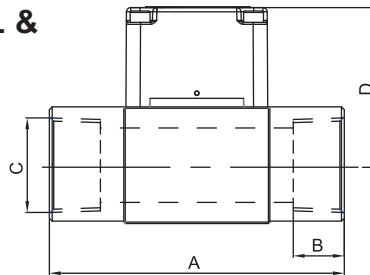
# DIMENSIONS

## FLOW TRANSMITTER MODEL & PULSE OUTPUT MODEL (ENGINEERING PLASTICS)



Diameter-DN (mm)	Pipe standards	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)
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

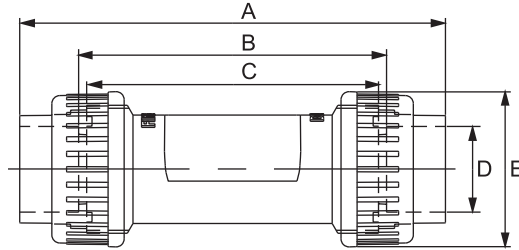
## FLOW TRANSMITTER MODEL & PULSE OUTPUT MODEL (STAINLESS STEEL)



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

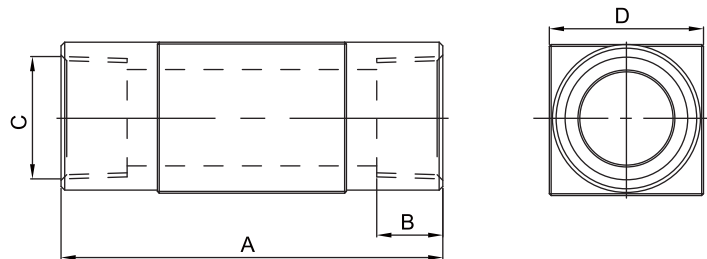
# DIMENSIONS

## T-FITTING(ENGINEERING PLASTICS)



Diameter-DN (mm)	Pipe standards	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
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

## SELECTING FLOW AND PIPE DIAMETER

### Plastic Blade

Material	Pipe diameter (mm)	Flow Range (m <sup>3</sup> /h)	
		Flow velocity 0.3m/s (min)	Flow velocity 10m/s (max)
PVC Pipe material & PP Blade	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 <sup>3</sup> /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 :

### Intelligent All-in-One Model

Material	Connection & Standard Type	K Factor (Pulse/Liter)			
		DN20	DN25	DN40	DN50
PVC Pipe material & PP Blade	DIN/ISO	70	49	17	9.2
	ASTM	70	49	17	9.2
	JIS	70	49	17	9.2
	CNS 4053-1	70	---	---	9.2
SUS Pipe material & PVDF Blade	Thread PF	70	49	17	9.2
	Thread PT	70	49	17	9.2
	Thread NPT	70	49	17	9.2
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

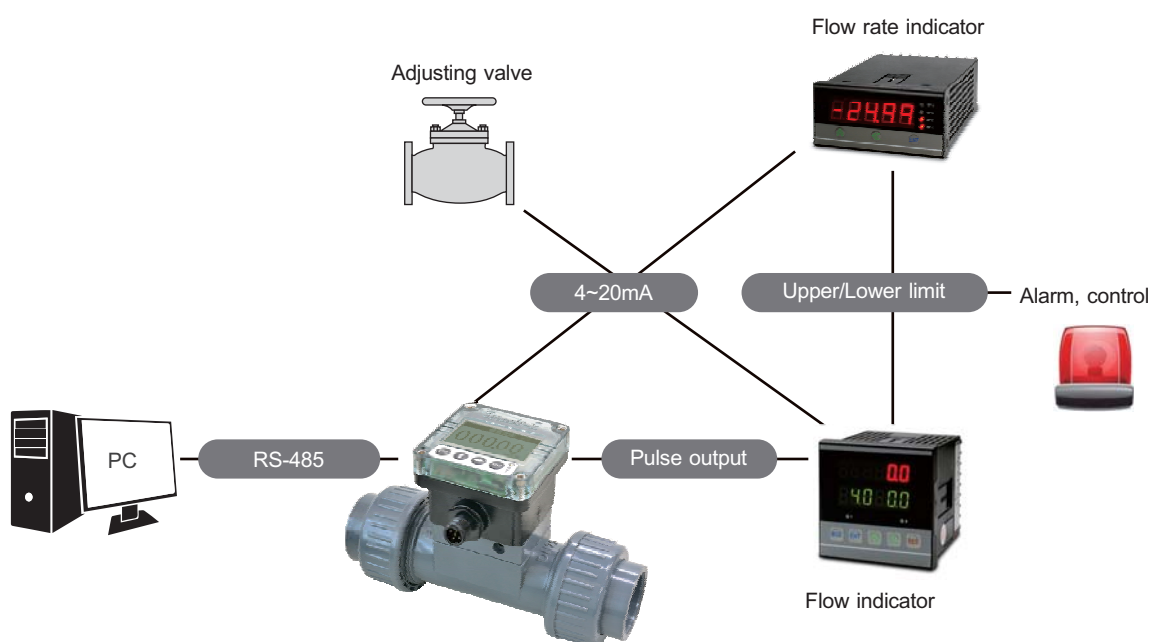
※ US: GL (Gallon) K factor = Pulse/Liter × 3.785; UK: GL (Gallon) K factor = Pulse/Liter × 4.546.

### Flow transmitter type & Pulse Output type

Material	Connection & Standard Type	K Factor (Pulse/Liter)			
		DN20	DN25	DN40	DN50
PVC Pipe material & PP Blade	DIN/ISO	56.5	30	8.3	5.92
	ASTM	56.5	30	8.3	5.92
	JIS	56.5	30	8.3	5.92
	CNS 4053-1	56.5	---	---	5.92
SUS Pipe material & PVDF Blade	Thread PF	56.5	30	8.3	5.92
	Thread PT	56.5	30	8.3	5.92
	Thread NPT	56.5	30	8.3	5.92

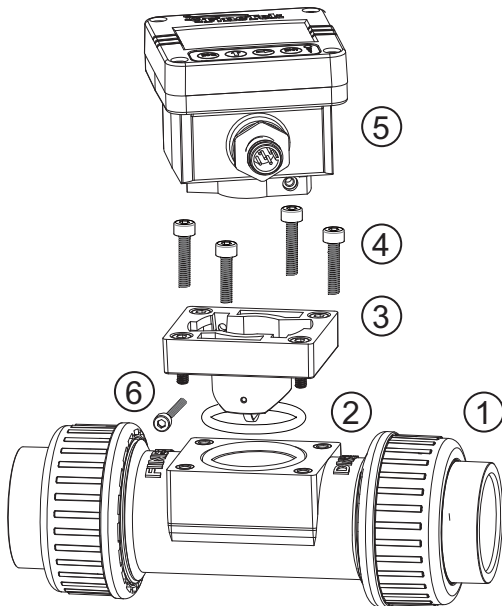
※ US: GL (Gallon) K factor = Pulse/Liter × 3.785; UK: GL (Gallon) K factor = Pulse/Liter × 4.546.

### CONTROL SYSTEM DIAGRAM



# TRANSMITTER INSTALLATION

## INTELLIGENT ALL-IN-ONE MODEL

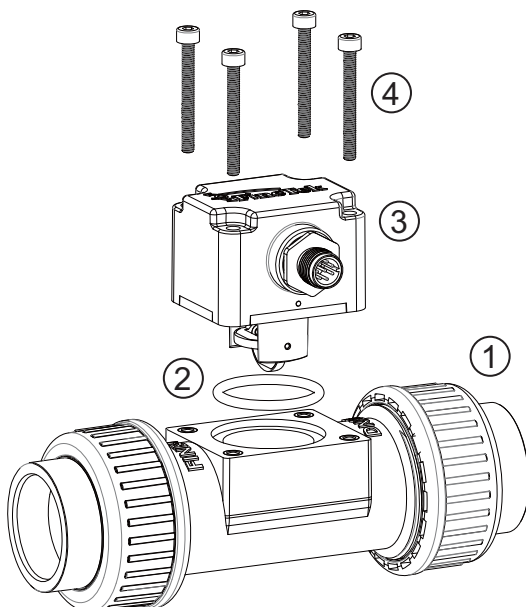


### Installation steps

1. T-fitting of flow meter.
2. Place the O-shaped ring in the sealing tank, and unfold it naturally.
3. Make the blade holder face downward and go through the hole and O-shaped ring. Level and align it.
4. Fasten and align the 4 screws evenly with the  
\*Fastening torque:  
Plastic Blade = 8~10kgf-cm(0.784~0.98N.m)  
Stainless Blade = 10~12kgf-cm(0.98~1.176N.m)
5. Point the M12 connector of the display towards you, and insert it into the slot. Level it horizontally and rotate it clockwise to the edge for alignment.
6. Fasten the 2 fixing screws.  
\*Fastening torque=6~8kgf-cm(0.588~0.784N.m)

\*Note: The above steps are for whole machine installation. To install the header only, please perform steps 5~6. Please apply the fastening torque on the screws as required.

## FLOW TRANSMITTER MODEL & PULSE OUTPUT MODEL



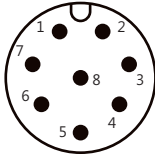
### Installation steps

1. T-fitting of flow meter.
2. Place the O-shaped ring in the sealing tank, and unfold it naturally.
3. Make the blade of the transmitter face downward and go through the hole and O-shaped ring. Level and align it.
4. Fasten and align the 4 screws evenly.  
\*Fastening torque:  
Plastic Blade = 8~10kgf-cm(0.784~0.98N.m)  
Stainless Blade = 10~12kgf-cm(0.98~1.176N.m)

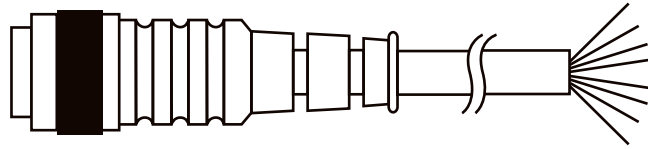
\*Note: Please apply the fastening torque on the screws as required.

## M12 CONNECTOR

Connector socket



Plug

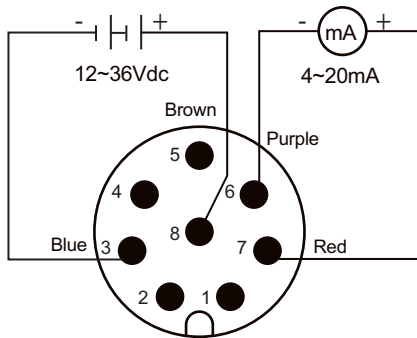


Cable

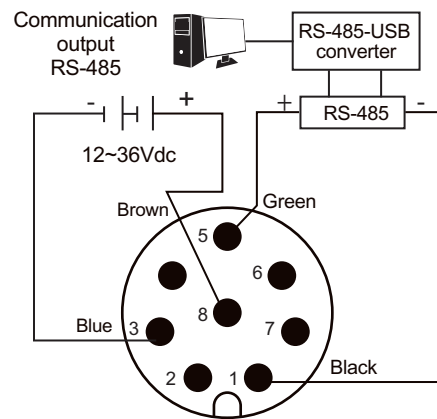
M12 Socket Pin No.	Function	Cable Color
1	Communication output RS485 -	Black
2	Pulse output Pulse -	Yellow
3	Power supply input DC 0V -	Blue
4	Pulse output Pulse +	Pink
5	Communication output RS485 +	Green
6	Analog output 4~20mA -	Purple
7	Analog output 4~20mA +	Red
8	Power supply input DC12~36V +	Brown

## WIRING

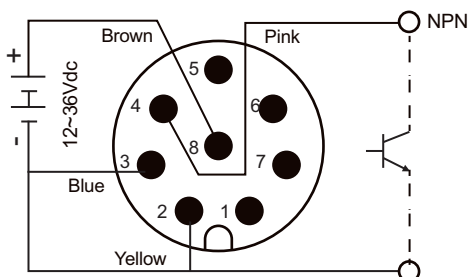
4~20mA output



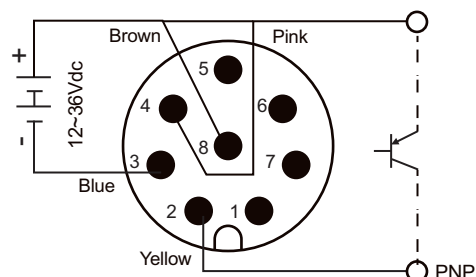
Communication output RS-485



Pulse output NPN

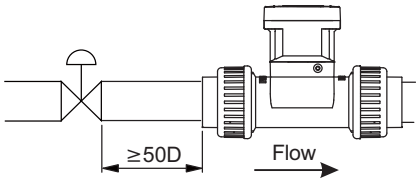
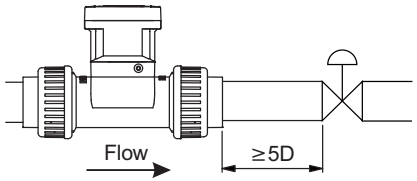
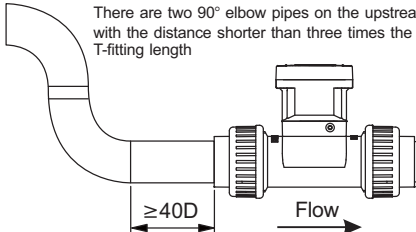
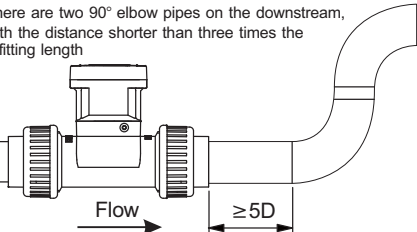
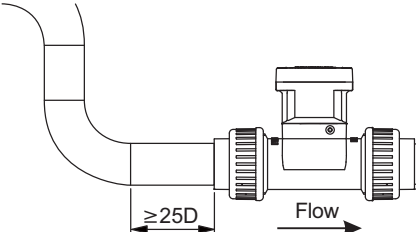
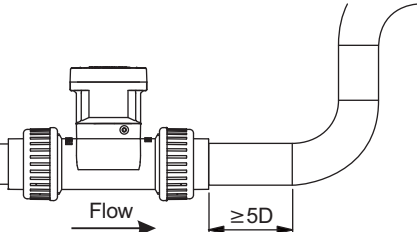
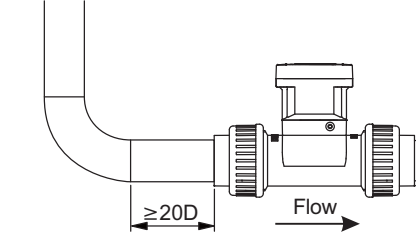
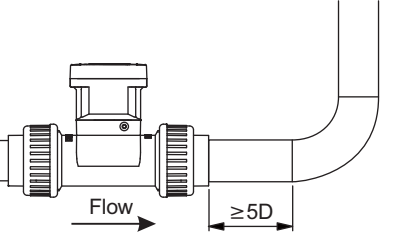
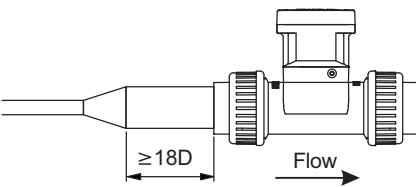
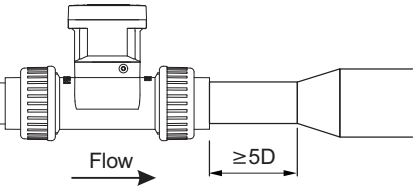
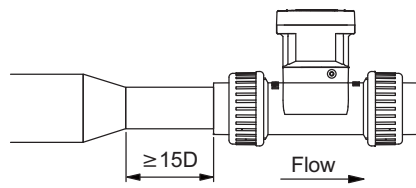
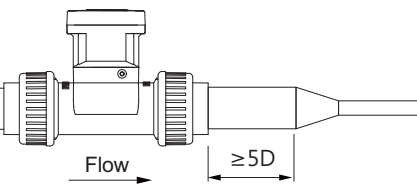


Pulse output PNP



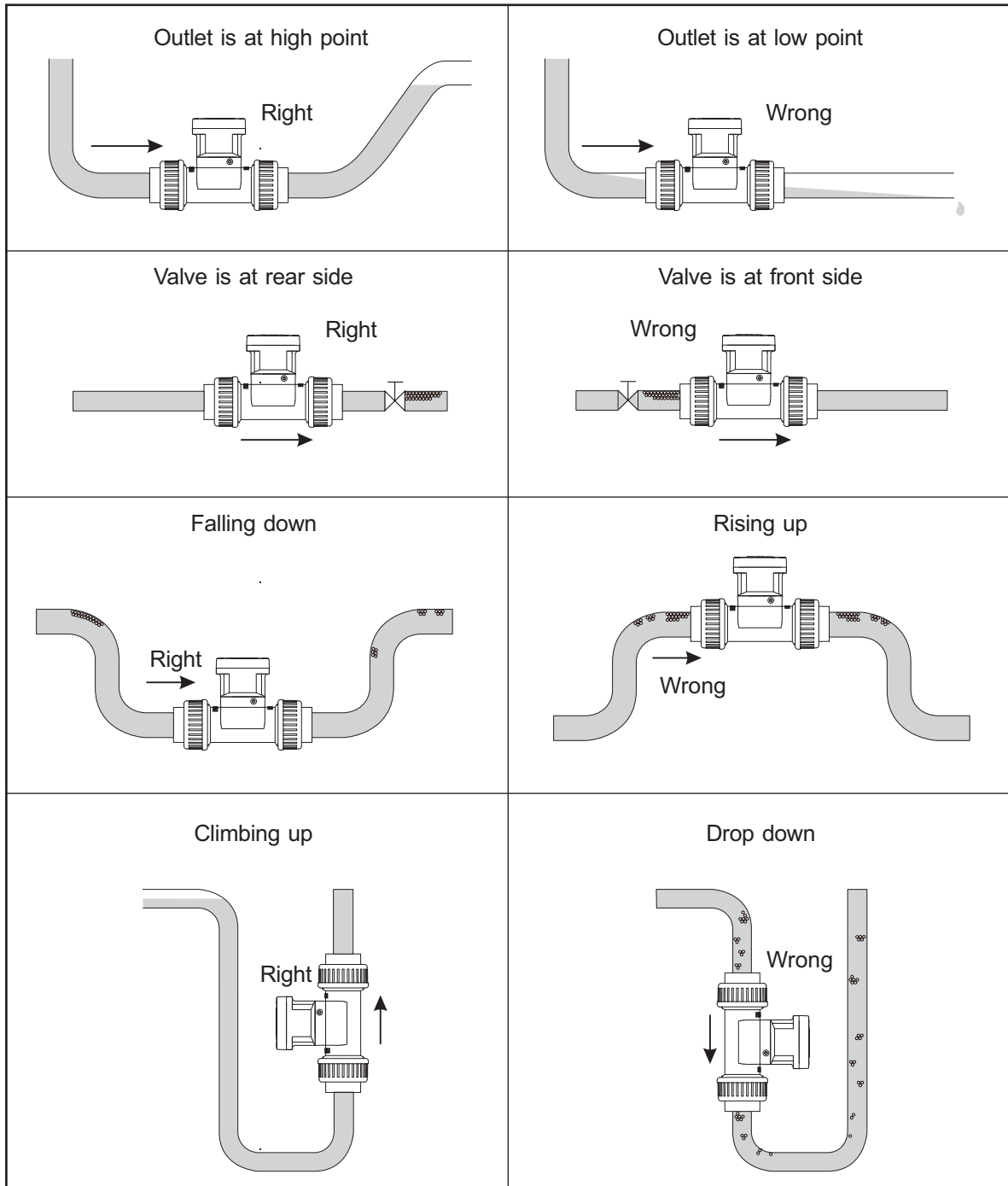
# REQUIREMENTS FOR STRAIGHT PIPE SECTION

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	<p>There are two 90° elbow pipes on the upstream, with the distance shorter than three times the T-fitting length</p> 	<p>There are two 90° elbow pipes on the downstream, with the distance shorter than three times the T-fitting length</p> 
Dual elbow pipes		
Single elbow pipe		
Diverging pipe		
Convergin pipe		

# INSTALLATION REQUIREMENTS

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



# ORDER INFORMATION

EPR1 0 0 0 0 - <sup>09</sup> <sup>10</sup> <sup>11</sup> <sup>12</sup> <sup>13</sup> <sup>14</sup> <sup>15</sup> <sup>16</sup> <sup>17</sup> <sup>18</sup> <sup>19</sup> <sup>20</sup> A <sup>22</sup>

<sup>09</sup> <sup>10</sup> <sup>11</sup> **Pipe diameter** \_\_\_\_\_

- 020: DN20(3/4")
- 025: DN25(1")
- 040: DN40(1-1/2")
- 050: DN50(2")

<sup>12</sup> **Display model** \_\_\_\_\_

- A: Without display (Flow transmitter model & pulse output model)
- B: LCM display (Intelligent all-in-one model)

<sup>13</sup> <sup>14</sup> **Pipe diameter** \_\_\_\_\_

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

<sup>15</sup> <sup>16</sup> **T-fitting standand** \_\_\_\_\_

(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)

<sup>17</sup> <sup>18</sup> **T-fitting standand 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)

<sup>19</sup> <sup>20</sup> **Blade material** \_\_\_\_\_

- 18: PP (60°C)
- 24: PVDF (100°C)
- MB: SUS 316 (100°C)

<sup>22</sup> **Output** \_\_\_\_\_

- A: 4~20mA, RS-485, PNP NPN 200mA(Intelligent all-in-one model & Flow transmitter model)
- B: PNP NPN 200mA (Pulse output model)

