ISO 9001/14001

AceMag®

Electromagnetic Flowmeter

SeoJin Instech Co., Ltd.

www.seojin.biz

Electromagnetic Flowmeter AceMag

AceMag Electromagnetic Flowmeter

- **Accuracy**
  - High measurement resolution
  - Reasonable excitation drive method
  - High Zero stability through noise removal
  - Compensation of the process temperature and pressure(Option)
- **Stability**
  - Square Wave excitation drive method, Noise removal and realizing high Zero-input stability
- **Display**
  - Flow rate, Velocity, Error message, Alarm
- **Remote Control**
  - Monitoring and controlling through RS-485(Modbus) program
- **Easily Operation**
  - RS-485(Modbus), HART, TMS Communication(Option)
  - Saving data to USB memory(Option)
  - Self-diagnosis, Easy output calibration Functions
- **Advanced Fuctions**
  - Flow simulation, Pulse control(Semi-automatic System)

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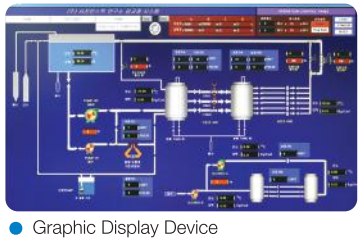
Electromagnetic Flowmeter

Applications

All liquids of which the conductivities are more than 5μS/㎝

- **Water Treatment Industry**
  : Clean water, Sewage, Agricultural water, Industrial water and Waste water
- **Chemistry Industry**
  : Petrochemistry, Alkali salt, Acid & Alkaline water, Liquid with high viscosity, Liquid chemicals, Coolant and Processing water
- **Steel & Cement Industry**
  : Cement sludge, Coal sludge, Circulated water, Coolant and Sea water
- **Pulp & Paper Industry**
  : Waste water, Coolant and Washing water



● Graphic Display Device

● Liquid Flow Test Room

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Operating Principle

Electromagnetic Flowmeter AceMag operates on Faraday's law of induction and Fleming's rule that states that the signal voltage(UE) is generated through the X-axis which is perpendicular to the conductor moving direction(Z-axis) and the magnetic field(Y-axis) around the moving conductor(fluid) when a conductor moves through the perpendicular direction to the line of magnetic force which is the magnetic intensity(B) in the space, and this signal voltage(UE) is directly proportional to the magnetic density(B) and the average fluid velocity(V).

AceMag measures and indicates the flow rates based on the above explained theory.

K : Proportional factor

B : Magnetic intensity

V : Average flow velocity

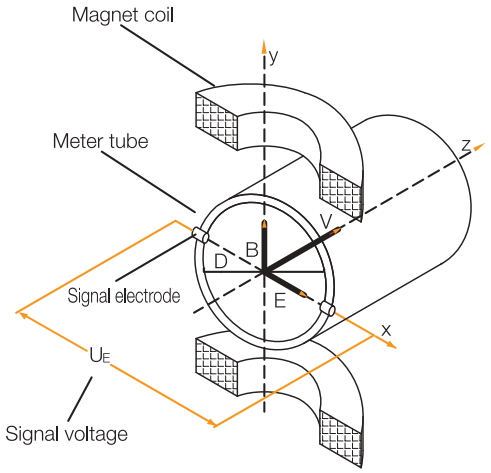
U_E : Signal voltage

D : Electrodes spacing

Qv : Volume flow

U_E = K x B x D x V

U_E = K x 4B x Qv / (πD)



Features

- **High Accuracy**
  - ± 0.5%, (±0.2 % of rate, 0.1m/s ~10m/s - Option)
- **Wide Measuring Range (Turn Down Ratio)**
  - Max. Ragne 1,500 : 1
- **High Stability**
  - Square Wave Excitation Drive method, Noise Removal, High Zero stability
- **Easy Operation and Maintenance**
  - RS -485(Modbus), HART Communication(Option), TMS Communication(Option), USB Memory(Option), Self-diagnosis, Easy output calibration function.
- **Other Features**
  - Displaying various data : Displays real time status (Forward, Reverse, Totalizer, Flow Rate, Error Message and Alarm)
  - Various additional functions : Flow simulation, pulse control(Semi automatic system)

Transmitter Type

SMF

Compact Type

- RS485 (Modbus)
- RS485 (Modbus)
- HART

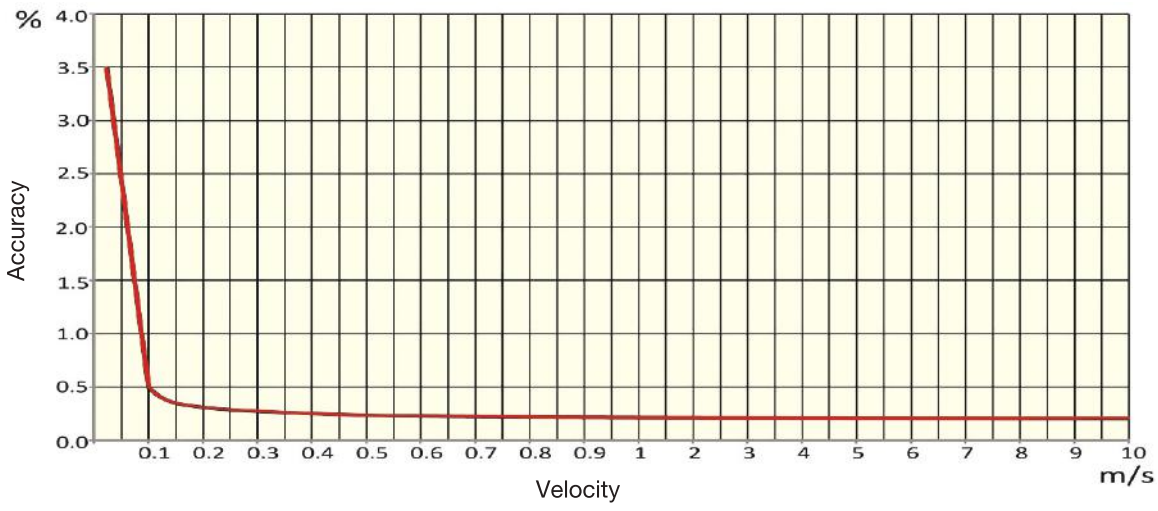
Remote Type

- RS485 (Modbus)
- RS485 (Modbus)
- HART
- RS485 (Modbus)
- USB
- RS485 (Modbus)
- TMS

Battery Type

- Analog Output

Performance Gragh



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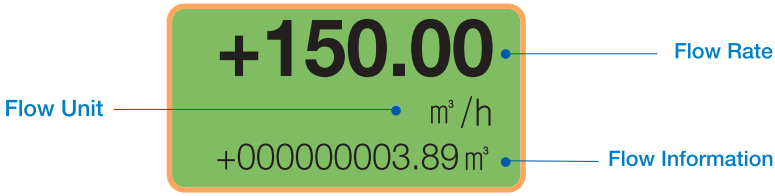
Display Infomation



Flow Unit

- Liter, Gallon, Cubic Meter, USG

Flow Information

- Total Flow Rate - Forward, Reverse, D(Forward - Reverse)
- Flow velocity
- MTP
- Error message(SYS Error, Freq Err, Hi Alarm, Lo Alarm, Empty Pipe)

Lining and Electrode

Materials	Lining		Electrode				
	PTFE	Hard Rubber	316L SS	Ha-C	Ti	Ta	Pt
Sulfuric Acid (H_2SO_4)	◎	X	X	X	X	◎	◎
Salt Water (Brine)	◎	X	X	◎	◎	◎	◎
Sodium Hydroxide (< NaOH 50%)	◎	X	△	X	△	X	◎
Sodium Hypochlorite (NaOCl)	◎	X	X	◎	◎	◎	◎
Hydrochloric Acid (< HCl 40%)	◎	X	X	X	X	◎	◎
Sludge	◎	◎	◎	◎	◎	◎	◎
Iron Chloride ($FeCl_2$)	◎	X	X	X	◎	X	X
Polymer	◎	X	◎	◎	◎	◎	◎
Milk	◎	◎	◎	X	X	◎	◎
Water (100°C)	◎	X	◎	◎	◎	◎	◎

Delivery Performance

Boryeong Thermal Power Plant	Yeoju Disposal Plant of Sewage	Jebu Island Disposal Plant of Sewage	Andong Disposal Plant of Sewage
Samcheonpo Thermal Power Plant	Iksan Sewage Treatment Plant	Goseong District Office of Waterworks	Geumsan Booster Station
Pyeongta Power Station Unit1~4	Seosan Disposal Plant of Sewage	Giheung CC	Seobu Sanitation Office
Yeongheung Thermal Power Plant (RAW WATER STORAGE TK IN-LET)	Yangyang District Office of Waterworks	Dongtan Post Office	Seobu District Office of Waterworks
Dongtan Land Develop Zone	Dangjin Hyundai Steel	Dongwon F&B Asan Factory	Gwangju Gu-dong Gym
Boryeong Thermal Power Plant	National Red Cross-Daejeon	Hwasun Gym	Vietnam Disposal Plant of Sewage
Ongin Sewage Treatment Plant	Jeongeup Disposal Plant of Sewage	Baekhak Disposal Plant of Sewage	Godae Bugok Disposal Plant of Sewage
Hapdeok Sewage Treatment Plant	Boseong Sewage Treatment Plant	Daegu Dyeing Industrial	Goyang Biomass
Yesan Industry Waste Water Disposal Plant	Gumi Eco Energy Town	Anseong Disposal Plant of Sewage	Gwangju Foods Resources Center
Bubian Sewage Treatment Plant	Ulsan Industry Water	Donghae Biomass	Kori Unit 1,2
Sunchang Sewage Treatment Plant	LG Chemistry	Namdong Power Station	Ulsan Incinerator
Samsung Electronic	Samsung Electro-mechanics	Gapyeong Domestic Waste Water	Sejong Combined Heat & Power Plant


Gangneung Stadium


Gyeongsan Disposal Plant of Sewage


Tancheon Disposal Plant of Sewage


Munoseong Disposal Plant of Sewage


Seosan Disposal Plant of Sewage


Suncheon Disposal Plant of Sewage


Ilyang Pharm. Co.,


Posco


Ssangchi Disposal Plant of Sewage

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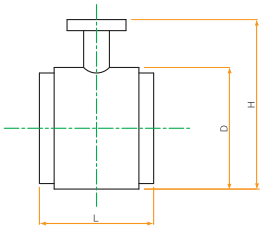
Other Transducers

Wafer Type

Size	DN25~DN150
Electrode	316L, Hb, Hc, Ti, Ta, Pt
Lining	PTFE
Conductivity	Up to 5μS/㎝
Accuracy	±0.5%RD
Velocity	0.1m/s~10m/s

Dimension



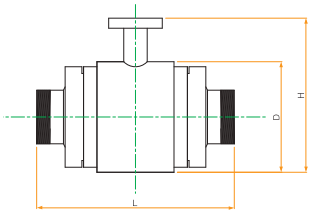
WAFER

DN(mm)	L	D	H
25	90	72	112
32	90	82	122
40	90	92	132
50	125	108	148
65	125	128	168
80	130	142	182
100	160	162	202
125	170	192	232
150	185	219	259

Socket Type

Size	DN15~DN150
Electrode	316L, Hb, Hc, Ti, Ta, Pt
Lining	PTFE
Conductivity	Up to 5μS/㎝
Accuracy	±0.5%RD
Velocity	0.1m/s~10m/s

Dimension



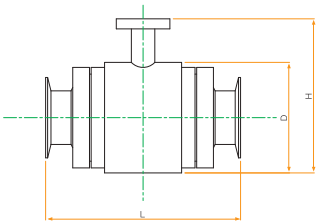
SOCKET

DN(mm)	L	D	H
10	190	91	130
15	190	91	130
20	190	91	130
25	190	91	130
32	200	105	145
40	220	120	160
50	230	140	180
65	240	150	190
80	250	160	200
100	270	190	230
125	290	220	260
150	310	240	280

Clamp-ON Type

Size	DN10~DN100
Electrode	316L, Hb, Hc, Ti, Ta, Pt
Lining	PTFE
Conductivity	Up to 5μS/㎝
Accuracy	±0.5%RD
Velocity	0.1m/s~10m/s

Dimension



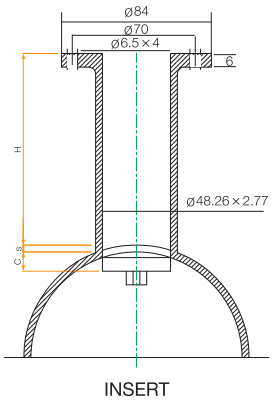
CLAMP-ON

DN(mm)	L	D	H
10	180	91	230
15	180	91	230
20	180	91	230
25	180	91	230
32	190	105	145
40	200	120	165
50	220	140	180
65	230	150	190
80	250	160	200
100	270	190	230

Insert Type

Size	DN40~DN2000
Electrode	316L, Hb, Hc, Ti, Ta, Pt
Lining	PVDF
Conductivity	Up to 5μS/㎝
Accuracy	±2%RD
Velocity	0.1m/s~10m/s

Dimension



INSERT

DN(mm)	Sensor Length	Connection	C	D	Range
40	101	93	10	88-s	50
50			10	88-s	70
80			10	88-s	90
100			12.5	85.5-s	140
125			15.5	82.5-s	220
150			19	79-s	310
200			25	73-s	560
250			31	67-s	880
300			37.5	60.5-s	1270
350			44	54-s	1730
400			50	48-s	2260
500	206	145	62.5	140.5-s	3530
600			75	128-s	5080
700~2000	Consult with manufacturing factory				

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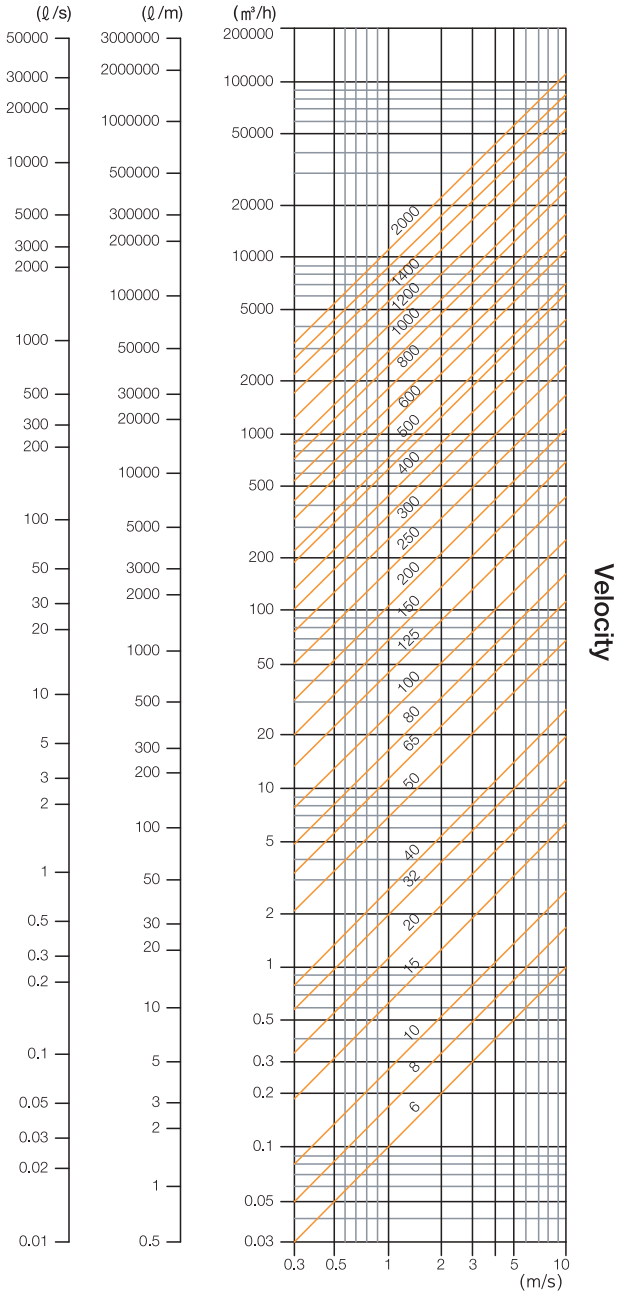
Flow Range

Pipe Size (mm)	Max. Range 0 ~ 10m/s	Design Range 0 ~ 15m/s
15A	0 ~ 100 ℓ/min	0 ~ 150 ℓ/min
20A	0 ~ 180 ℓ/min	0 ~ 270 ℓ/min
25A	0 ~ 290 ℓ/min	0 ~ 435 ℓ/min
32A	0 ~ 480 ℓ/min	0 ~ 720 ℓ/min
40A	0 ~ 750 ℓ/min	0 ~ 1125 ℓ/min
50A	0 ~ 70 ㎥/h	0 ~ 105 ㎥/h
65A	0 ~ 120 ㎥/h	0 ~ 180 ㎥/h
80A	0 ~ 180 ㎥/h	0 ~ 270 ㎥/h
100A	0 ~ 280 ㎥/h	0 ~ 420 ㎥/h
125A	0 ~ 440 ㎥/h	0 ~ 660 ㎥/h
150A	0 ~ 630 ㎥/h	0 ~ 945 ㎥/h
200A	0 ~ 1,130 ㎥/h	0 ~ 1,695 ㎥/h
250A	0 ~ 1,800 ㎥/h	0 ~ 2,700 ㎥/h
300A	0 ~ 2,500 ㎥/h	0 ~ 3,750 ㎥/h
350A	0 ~ 3,450 ㎥/h	0 ~ 5,175 ㎥/h
400A	0 ~ 4,500 ㎥/h	0 ~ 6,750 ㎥/h
500A	0 ~ 7,000 ㎥/h	0 ~ 10,500 ㎥/h
600A	0 ~ 10,150 ㎥/h	0 ~ 15,225 ㎥/h
700A	0 ~ 13,800 ㎥/h	0 ~ 20,700 ㎥/h
800A	0 ~ 18,000 ㎥/h	0 ~ 27,000 ㎥/h
900A	0 ~ 23,000 ㎥/h	0 ~ 34,500 ㎥/h
1000A	0 ~ 28,000 ㎥/h	0 ~ 42,000 ㎥/h

Flow Rate

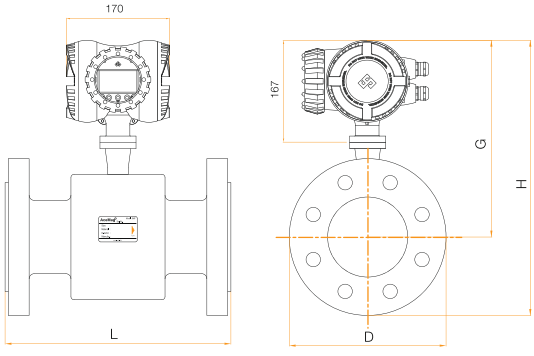


Standard Dimensions

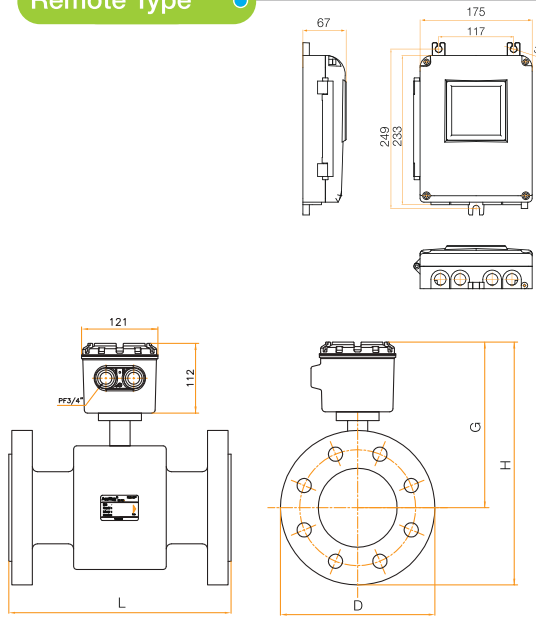
Dimensions								W	
Pipe Size		D	L	G		H			
				Compact	Remote	Compact	Remote	Compact	Remote
[mm]	[inch]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]	[kg]
10	3/8	90	150	252	198	295	241	6	4
15	1/2	95	150	252	198	300	246	6	4
20	3/4	100	150	252	198	305	251	6	4
25	1	125	150	258	204	316	262	7	5
32	1-1/4	135	150	263	209	333	279	9	7
40	1-1/2	140	200	263	209	338	284	10	8
50	2	155	200	268	214	351	297	12	10
65	2-1/2	175	200	283	229	371	322	17	15
80	3	185	200	288	234	388	334	17	15
100	4	210	250	298	244	408	354	22	20
125	5	250	250	313	259	438	384	24	22
150	6	280	300	333	279	476	422	35	33
200	8	330	350	363	309	533	479	45	43
250	10	400	400	388	334	586	532	74	72
300	12	445	500	420	366	643	589	102	100
350	14	490	500	441	387	694	640	123	121
400	16	560	600	466	412	749	695	147	145
450	18	620	600	494	440	801	747	209	207
500	20	675	600	521	467	856	802	212	210
600	24	795	600	576	522	966	912	252	250
700	28	905	700	634	580	1081	1027	352	350
800	32	1020	800	694	640	1201	1147	462	460
900	36	1120	900	744	690	1301	1247	552	550
1,000	40	1235	1000	804	750	1421	1367	682	680

The information may be subject to change without notice. So, please check the correct dimensions before ordering.

Compact Type



Remote Type

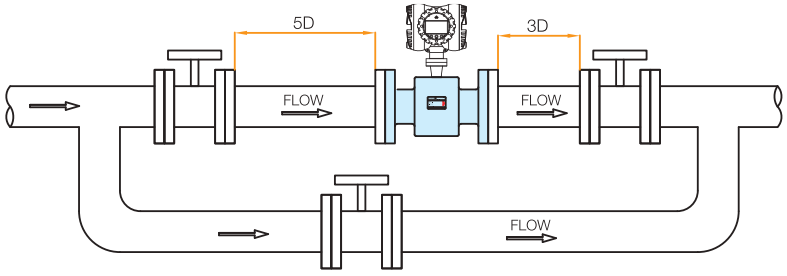


To improve the quality of the products, the shape of the actual products may differ from the drawing above. So, please check the correct information before ordering.

Pipe Installation

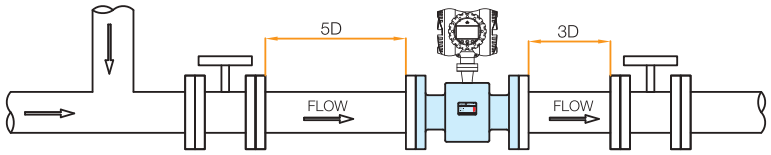
By-Pass Pipe

Require straighten pipe length
Upstream : 5D / Downstream : 3D



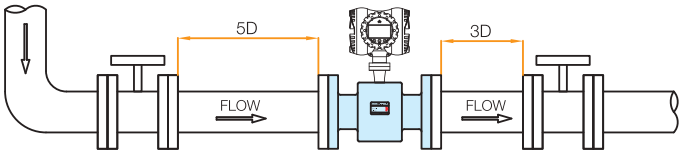
T-shaped Pipe

Require straighten pipe length
Upstream : 5D / Downstream : 3D



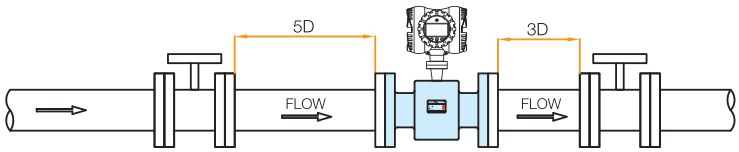
90° Bend Pipe

Require straighten pipe length
Upstream : 5D / Downstream : 3D



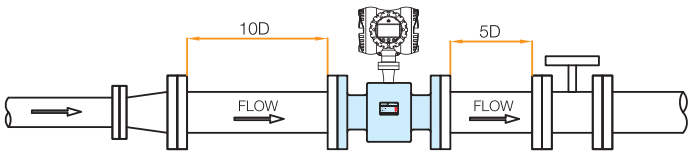
Horizontally Straight Pipe

Require straighten pipe length
Upstream : 5D / Downstream : 3D

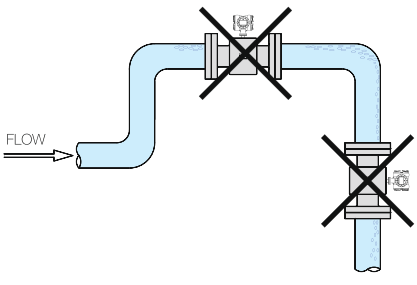


Reducted, Expanded Pipe

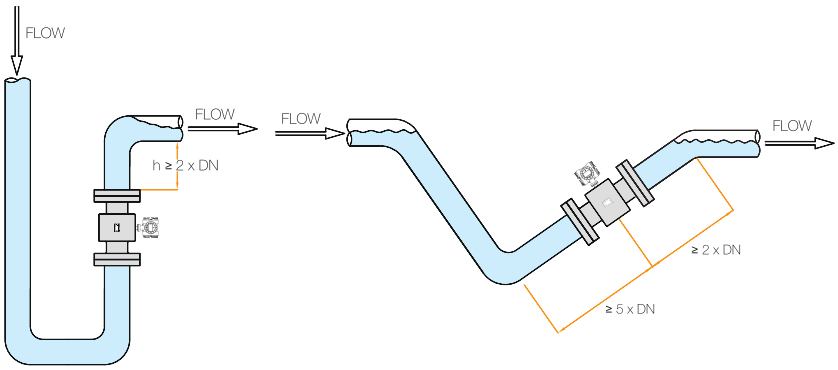
Require straighten pipe length
Upstream : 10D / Downstream : 3D



Installation Cautions

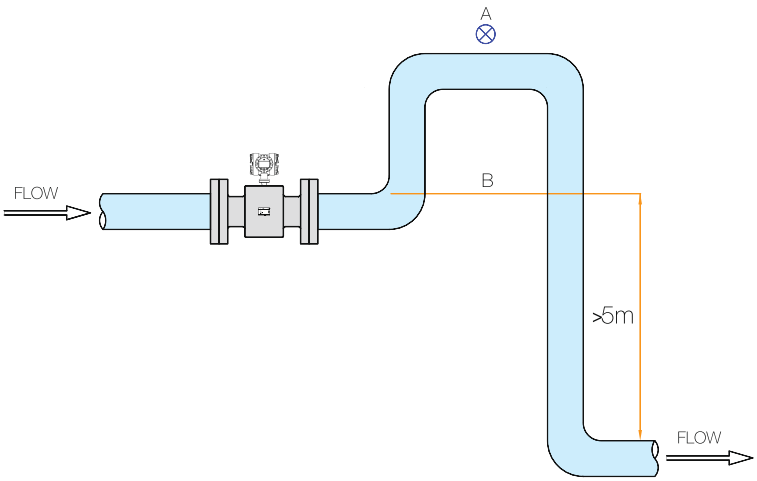


Flowmeter Installation

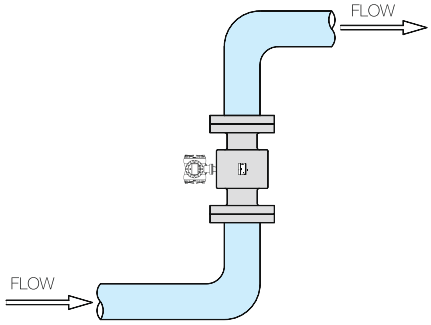


Installation for Part Empty Pipe

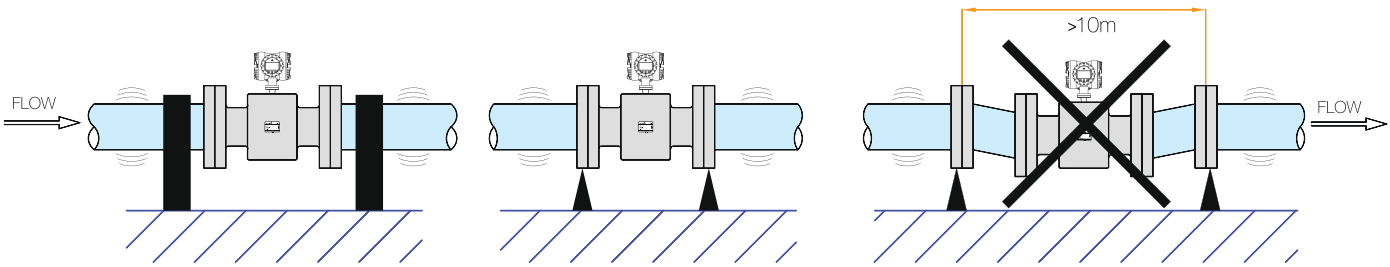
Installation Cautions



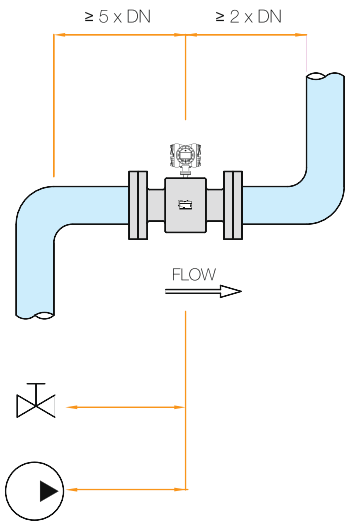
Siphon, Vent Valve Installation



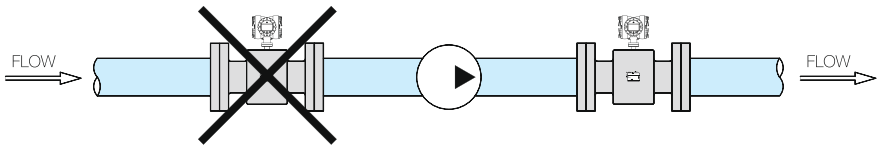
Vertical Pipe Installation



Installation for Anti-Vibration



Straighten Pipe Length



Pump Installation

AceMag®

Specifications

Model	Compact	Remote (Basic)	Remote (HART)	Remote (USB)	Remote (TMS)
Pipe Size	10A~1000A				
Transducer Material	Carbon Steel, 304SS				
Case Material	Cast Aluminum	AL Alloy			
Lining	PTFE, PFA, Hard Rubber				
Electrode	316LSS, Hastelloy-C, Hastelloy-B, Titanium, Tantallum, Platinium				
Process Connection	JIS 10K, ANSI, DIN, (etc.)				
Measuring Range	0~12m/s (Measuring forward & reverse flow, 0~15m/s : Option)				
Accuracy	0.1~10m/s RD ±0.5% 0.1~10m/s RD ±0.2% (Option)				
Fluid Temperature	PTFE -10℃ ~ +160℃ Hard Rubber -10℃ ~ +80℃				
Ambient Temperature	-25℃ ~ +60℃				
Conductivity	Up to 5㎲/㎝				
Power Supply	Free Voltage (AC 85 ~ 230V)				
Frequency	Free Frequency (48~60Hz)				
Display	Graphic LCD (back light)				
Output	• Analog output : DC 4~20mA (max. road 500Ω) • Alarm - High, Low output alarm • Pulse : DC 15V (Open Collector)				
	RS-485 HART Communication (Option)	RS-485	RS-485 HART Communication	RS-485 USB Data Logging	RS-485 TMS Communication
Cable	N/A	10 m (Built in)			

Ordering Information

[Sensor Part]

SMF- 0 0 0 0 - A - 1 - A - 1 - A - 1 - A - 1

1. Pipe Size(Unit::mm)

Ex) 0150 = 150mm

0010	0080	0400
0015	0100	0450
0020	0125	0500
0025	0150	0600
0032	0200	0700
0040	0250	0800
0050	0300	0900
0065	0350	1000

2. Flange Standard

A = JIS 10K RF
B = JIS 20K RF
C = ANSI #150 RF
D = ANSI #300 RF
OP = etc

3. Body Material

1 = Carbon Steel
2 = Stainless Steel (304SS)

4. Elect Material

A = 316LSS
B = Hastelloy-C
C = Hastelloy-B
D = Titanium
E = Tantalum
F = Platinum

5. Lining Material

1 = Hard Rubber
2 = PTFE
3 = PFA

6. Grounding/Lining Protectoin

A = Flange Grounding
B = Grounding Ring
C = Grounding Electrode

7. Process Temperature

1 = ≤ 80℃ (All Lining)
2 = ≤ 160℃ (PTFE)

8. Sensor Type

A = Flange Type
B = Wafer Type
C = Clamp Type
D = Insert Type
E = Socket Type
F = Flange Type with Removable Electrodes

9. Conduit Connection

1 = None (STD for Compact type)
2 = M20 x 1.5P Cable Grand (STD for Remote type)
3 = PF 1/2"
4 = PT 1/2"
5 = NPT 1/2"
6 = PF 3/4"
7 = PT 3/4"
8 = NPT 3/4"
OP = etc

[Transmitter Part]

SMF - H - 1 - A - 1 - A - 1

1. Transmitter Sort

H = Integral Mount
R = Remote Mount

2. Protection Grade

1 = IP65
2 = IP67 (Integral Type)
3 = IP68 (Remote Type)

3. Ex-Proof

A = None
B = Ex d IIC T6

4. Input/Output Signal

1 = 4 to 20mA / Pulse / RS485 (STD)
2 = STD + HART Communication
3 = STD + USB
4 = STD + TMS

5. Accuracy (Factory Calibration)

A = 3 Points, 0.5%
B = 5 Points, 0.2% (KOLAS)
OP = Other Requirements

6. Conduit Connection

1 = M20x1.5P Cable Grand (STD)
2 = PF 1/2"
3 = PT 1/2"
4 = NPT 1/2"
5 = PF 3/4"
6 = PT 3/4"
7 = NPT 3/4"
} Not applicable to Remote Mount Type
OP = etc

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