1. DM Overview

Fischer&Porter Corporation has the most advanced production technology of electromagnetic flowmeter in the world. Its products are widely used in the accurate flow of sewage, paper pulp, mud, slurry and so on.

2. DM Characteristics

- ◆ For harsh operating condition, if high concentration paper pulp or low electrical conductivity fluid is mixed, it may realize high standard stable measurement.
- ◆ The measurement is not affected by the fluid density, viscosity, temperature and pressure change.
- ◆ There are no components stopping flowing in the pipe; the pressure loss is small; no maintenance is needed; the requirement of the straight pipe section is low.
- ◆ The sensor may have grounded electrode to realize good grounding of meter.
- ◆ The sensor adopts advanced machining process, which makes the meter have good ability against negative pressure.
- ◆ Full digital quantity processing; the antiinterference capability is strong;
- ◆ It has double flow direction measurement and double direction quantum accumulating function.
- ◆ HART communication function

3. Operating Principle

3.1 DM Accuracy Of Measurement

±0.5% of measured value(standard)，

±0.2% of measured value(high accuracy)

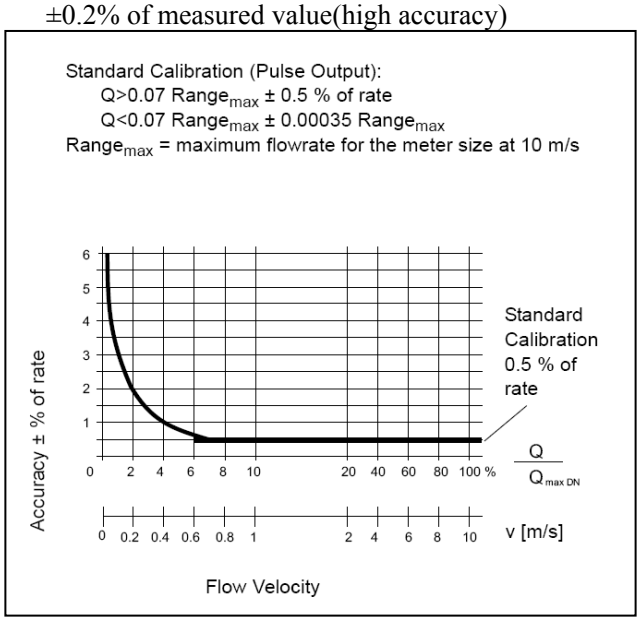


Fig. 1 Flowmeter System Accuracy

3.2 DM Technical Parameters

Fluid temperature -40℃±180℃

Ambient temperature -20℃±60℃

Supply Power Rated voltage indicated on nameplate

Installation conditions

Upstream >5 x DN straight pipe section,

Downstream >2 x DN straight pipe section

DN = Flowmeter primary meter size

Warm-Up time 30 minutes

3.3 DM Operating Principle

The Faraday Laws of Induction, which state that a volt-ageis generated in a conductor when it moves through a magnetic field, form the basis for the electromagnetic flowmeter measurements.

This measurement principle is applied to a conductive fluid which flows in a pipe in which a magnetic field is generated perpendicular to the flow direction (see Schematic).

The voltage which is induced in the fluid is measured at two electrodes located diametrically opposite to each other. This signal voltage **UE** is proportional to the magnetic induction **B**, the electrode spacing **D** and the average fluid velocity **V**.

Since the magnetic induction **B** and the electrode spacing **D** are constant values the signal voltage **UE** is proportional tothe average flow velocity **V**. The equation for calculating the volumetric flowrate shows that the signal voltage **UE** is linear and proportional to the volumetric flowrate.

The induced signal voltage is converted into scaled, analog and digital output signals in the converter.

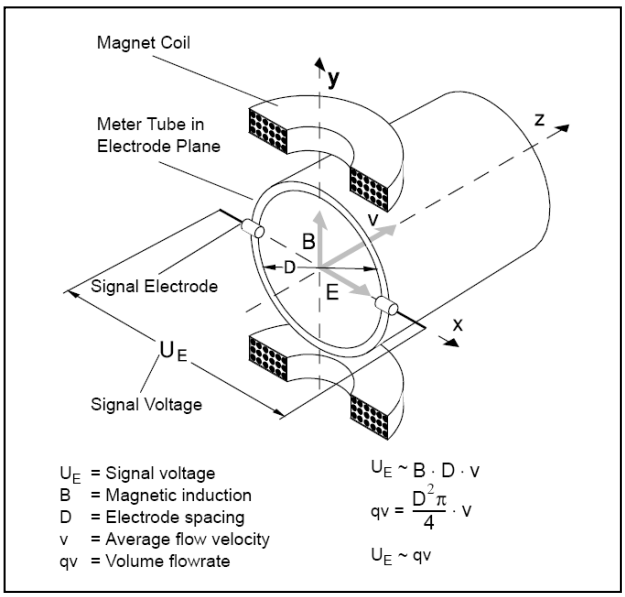


Fig. 2 Electromagnetic flowmeter Schematic

4. DIM Overview

Fischer&Porter Corporation is the enterprise which is specializing in producing and selling flowmeters in the world, which DIM series of inserting electromagnetic flowmeters are one of the most advanced flowmeters in the world , which are used to measure the liquid with electrical conductivity , especially suitable for measuring large-diameter pipe .They are widely used in petroleum, chemical technology, metallurgical, pharmaceutical, food and paper industries and other industries.

4. DIM Technical Parameters

Model

DIM series

Size

DN350-DN2000

Accuracy

±1.5% of rate (standard),

±1.0% of rate (high accuracy)

Minimum conductivity

5μS/cm

Measuring range

Continuous between 0.5 and 10 m/s

Maximum Continuous between 0.01 and 15 m/s

Fluid temperature

－40℃-＋180℃

Ambient temperature

－20℃-＋60℃

Fluid pressure

≤1.6MPa

Protection class

sensor	converter
IP67	IP67
IP68	IP6

Material

Probe material	304
Electrode material	316
Coating	PTFE

Electrical Interface

M20*1.5 ,1/2"NPT

Display type

LC-Display, Show the instantaneous flow and the totalizer flow

Power supply

220V AC 50HZ

24V DC

Ex design

Exd[ia]iam II CT5

Signal output

1、Flow switch can be set:
Pulse output (up to 1000HZ);
High / low flow alarm;
Empty pipe alarm;
Indicate flow direction;
Error alarm;

2、Current output: 4-20mA

Configuration mode

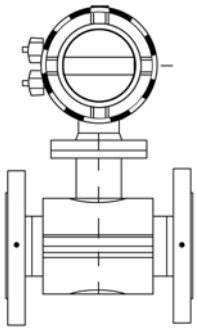
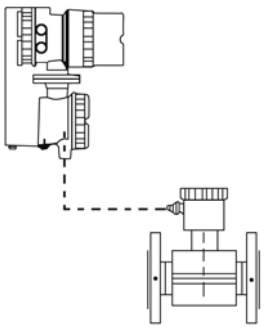
1, Field configuration is carried out by three manipulating keys.

2, Field configuration is carried out by remote controller.

3, Field configuration is carried out by manual conteoller.

Memory: As it is switched off, all data are saved in EEPROM

6. Products list

		
Design	Compact Design	Romote Design
Connecting Design	Flange	Flange

Sensor

Mode	DM43	DM47	DM41	DM48
Ex-Design	No	Exd[ia]iamIICT5	No	Exd[ia]iamIICT5
Size	DN3-DN2000			
Pressure class	Standard: 0.6-4.0 (divide according to size) Special: according to demands of users			
Flange material	Carbon steel, stainless steel			
Liner	Rubber, PTFE, PFA and so on.			
Electrode material	316,316L, Hb, Hc, titanium, tantalum, platinum–iridium, etc.			
Grounding electrode material	316,316L, Hb, Hc, titanium, tantalum, platinum–iridium, etc.			
Conductivity	≥5μS/cm			
Fluid temperature	-40℃～+180℃ (PTFE-liner)，-25℃～+65℃ (rubber-liner)			
Protection class	IP67, IP68			

Converter

Supply Power	24VDC or 220VAC			
Signal output	Current output 4-20mA, Contact output，Pulse output			
Power consumption	≤10W （AC power supply)；≤9W （DC power supply）			
Display	LCD，Instantaneous and Totalizer			
Ambient condition	Ambient temperature: -20℃～60℃; Relative humidity: 5%～90%			
Accuracy	±0.5% rate (standard), ±0.2% rate (high accuracy)			
Repeatability	±0.2% rate			
Measuring range	Recommended range of use：0.5m/s～10m/s continuous adjustable Maximum range of use：0.01m/s～15m/s continuous adjustable			
Excitation	Middle Frequency , High Frequency			
Communication	HART-Protocol (option), RS485 (option) or Profibus			
Protection class	IP67 or IP68		IP67 or IP68	
Ex-Design	No	Exd[ia]iamIICT5	No	Exd[ia]iamIICT5
Cable connection	M20X1.5 ，1/2”NPT			
Housing	Cast aluminum			

7. Selection of Size

The measured fluid must be the conductive liquid or slurry. Its conductivity is not smaller than 5 μ S/cm. The measured fluid should not contain more ferromagnetic material or air bubbles. It should select appropriate pressure class, lining material, electrode material and structure form of the meter according to the temperature, working pressure, corrosiveness, wear resistance of the measured fluid.

① Because the electromagnetic flowmeter has the measuring range ratio of 1500:1, the flow velocity may choose the scope of 0.01 ~ 15m/s, generally the selection of instrument caliber is the same as the process pipe.

②If the measured medium contains solid particles, the recommended range of flow velocity is 1 ~ 5m/s. If the actual velocity of flow is too fast, and it is inconvenient to change the process pipe, it may be chosen that the diameter of the optional meter is bigger than that of the process pipe so as to reduce the medium flow velocity of the measuring section of flowmeter properly and reduce wearing of particles on the electrode and lining.

③ If there are deposits in the process pipe, the recommended velocity of flow is 2～5m/s. If the actual velocity of flow is too slow, and it is inconvenient to change the process pipe, it may be chosen that the diameter of meter is smaller than that of the process pipe so as to increase the flow velocity of medium properly and avoid the influence of deposits on the instrument accuracy.

④ As the velocity of flow is too small and the accuracy measurement is also required, the sensor with the diameter smaller than that of the process pipe may be chosen, which makes the velocity of flow become faster and guarantees higher accuracy.

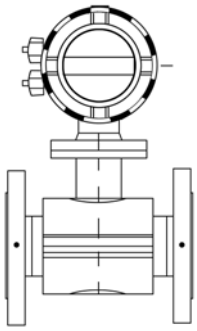
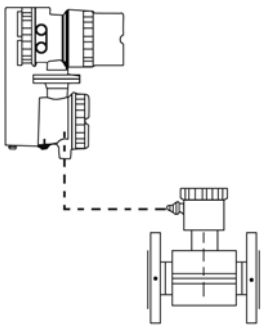
In the situation of above ②, ③ and ④, the upstream and downstream of the flowmeter need special pipe. The taper of the special pipe center should not be bigger than 15°，and the upstream of the special pipe has the straight pipe section at least 5 times the process pipe.

For choosing, several typical rates of flow corresponding to flow velocity are listed in the following table. Any flow rate corresponding to flow velocity may be calculated rapidly by this table: if the measured value Q (m^3/h), is given, the corresponding flow value Q1 of velocity of flow under the condition of relevant diameter is found in the table, then:

Corresponding velocity of flow V= Q/Q1 (m/s)

Flow rate m^3/h / Velocity m/s / Sizer mm	0.5 (Min.)	1	2	3	4	5	10 (Max.)
3	0.2 l/min	0.4 l/min	0.8 l/min	1.2 l/min	1.6 l/min	2 l/min	4 l/min
4	0.4 l/min	0.8 l/min	1.6 l/min	2.4 l/min	3.2 l/min	4 l/min	8 l/min
6	1 l/min	2 l/min	4 l/min	6 l/min	8 l/min	10 l/min	20 l/min
8	1.5 l/min	3 l/min	6 l/min	9 l/min	12 l/min	15 l/min	30 l/min
10	2.25 l/min	4.5 l/min	9 l/min	13.5 l/min	18 l/min	22.5 l/min	45 l/min
15	0.40	0.6361	1.2723	1.9084	2.5445	3.1807	6.00
20	0.60	1.1309	2.2618	3.3927	4.5236	5.6545	11.00
25	1.00	1.7670	3.5341	5.3011	7.0681	8.8352	17.00
40	2.50	4.5236	9.0472	13.5708	18.0944	22.6180	45.00
50	4.00	7.0681	14.1363	21.2044	28.2725	35.3407	70.00
65	6.00	11.9452	23.8903	35.8355	47.7806	59.7258	110.00
80	10.00	18.0944	36.1889	54.2833	72.3777	90.4722	180.00
100	15.00	28.2725	56.5451	84.8176	113.0902	141.3627	280.00
150	35.00	63.6132	127.2265	190.8397	254.4529	318.0662	630.00
200	60.00	113.0902	226.1804	339.2706	452.3608	565.4509	1100.00
250	90.00	176.7034	353.4068	530.1103	706.8137	883.5171	1700.00
300	130.00	254.4529	508.9059	763.3588	1017.8117	1272.2646	2500.00
400	230.00	452.3608	904.7215	1357.0823	1809.4430	2261.8038	4500.00
500	360.00	706.8137	1413.6274	2120.4411	2827.2547	3534.0684	7000.00
600	510.00	1017.8117	2035.6234	3053.4351	4071.2468	5089.0585	10000.00
700	700.00	1385.3548	2770.7096	4156.0645	5541.4193	6926.7741	13800.00
800	910.00	1809.4430	3618.8861	5428.3291	7237.7721	9047.2152	18000.00
900	1150.00	2290.0763	4580.1527	6870.2290	9160.3053	11450.3817	22900.00
1000	1420.00	2827.2547	5654.5095	8481.7642	11309.0189	14136.2737	28000.00

6. Products list

		
Design	Compact Design	Romote Design
Connecting Design	Flange	Flange

Sensor

Mode	DM43	DM47	DM41	DM48
Ex-Design	No	Exd[ia]iamIICT5	No	Exd[ia]iamIICT5
Size	DN3-DN2000			
Pressure class	Standard: 0.6-4.0 (divide according to size) Special: according to demands of users			
Flange material	Carbon steel, stainless steel			
Liner	Rubber, PTFE, PFA and so on.			
Electrode material	316,316L, Hb, Hc, titanium, tantalum, platinum–iridium, etc.			
Grounding electrode material	316,316L, Hb, Hc, titanium, tantalum, platinum–iridium, etc.			
Conductivity	≥5μS/cm			
Fluid temperature	-40℃～+180℃ (PTFE-liner)，-25℃～+65℃ (rubber-liner)			
Protection class	IP67, IP68			

Converter

Supply Power	24VDC or 220VAC			
Signal output	Current output 4-20mA, Contact output，Pulse output			
Power consumption	≤10W （AC power supply)；≤9W （DC power supply）			
Display	LCD，Instantaneous and Totalizer			
Ambient condition	Ambient temperature: -20℃～60℃; Relative humidity: 5%～90%			
Accuracy	±0.5% rate (standard), ±0.2% rate (high accuracy)			
Repeatability	±0.2% rate			
Measuring range	Recommended range of use：0.5m/s～10m/s continuous adjustable Maximum range of use：0.01m/s～15m/s continuous adjustable			
Excitation	Middle Frequency , High Frequency			
Communication	HART-Protocol (option), RS485 (option) or Profibus			
Protection class	IP67 or IP68		IP67 or IP68	
Ex-Design	No	Exd[ia]iamIICT5	No	Exd[ia]iamIICT5
Cable connection	M20X1.5 ，1/2”NPT			
Housing	Cast aluminum			

7. Selection of Size

The measured fluid must be the conductive liquid or slurry. Its conductivity is not smaller than 5 μ S/cm. The measured fluid should not contain more ferromagnetic material or air bubbles. It should select appropriate pressure class, lining material, electrode material and structure form of the meter according to the temperature, working pressure, corrosiveness, wear resistance of the measured fluid.

① Because the electromagnetic flowmeter has the measuring range ratio of 1500:1, the flow velocity may choose the scope of 0.01 ~ 15m/s, generally the selection of instrument caliber is the same as the process pipe.

②If the measured medium contains solid particles, the recommended range of flow velocity is 1 ~ 5m/s. If the actual velocity of flow is too fast, and it is inconvenient to change the process pipe, it may be chosen that the diameter of the optional meter is bigger than that of the process pipe so as to reduce the medium flow velocity of the measuring section of flowmeter properly and reduce wearing of particles on the electrode and lining.

③ If there are deposits in the process pipe, the recommended velocity of flow is 2～5m/s. If the actual velocity of flow is too slow, and it is inconvenient to change the process pipe, it may be chosen that the diameter of meter is smaller than that of the process pipe so as to increase the flow velocity of medium properly and avoid the influence of deposits on the instrument accuracy.

④ As the velocity of flow is too small and the accuracy measurement is also required, the sensor with the diameter smaller than that of the process pipe may be chosen, which makes the velocity of flow become faster and guarantees higher accuracy.

In the situation of above ②, ③ and ④, the upstream and downstream of the flowmeter need special pipe. The taper of the special pipe center should not be bigger than 15°，and the upstream of the special pipe has the straight pipe section at least 5 times the process pipe.

For choosing, several typical rates of flow corresponding to flow velocity are listed in the following table. Any flow rate corresponding to flow velocity may be calculated rapidly by this table: if the measured value Q (m^3/h), is given, the corresponding flow value Q1 of velocity of flow under the condition of relevant diameter is found in the table, then:

Corresponding velocity of flow V= Q/Q1 (m/s)

Flow rate m^3/h / Velocity m/s / Sizer mm	0.5 (Min.)	1	2	3	4	5	10 (Max.)
3	0.2 l/min	0.4 l/min	0.8 l/min	1.2 l/min	1.6 l/min	2 l/min	4 l/min
4	0.4 l/min	0.8 l/min	1.6 l/min	2.4 l/min	3.2 l/min	4 l/min	8 l/min
6	1 l/min	2 l/min	4 l/min	6 l/min	8 l/min	10 l/min	20 l/min
8	1.5 l/min	3 l/min	6 l/min	9 l/min	12 l/min	15 l/min	30 l/min
10	2.25 l/min	4.5 l/min	9 l/min	13.5 l/min	18 l/min	22.5 l/min	45 l/min
15	0.40	0.6361	1.2723	1.9084	2.5445	3.1807	6.00
20	0.60	1.1309	2.2618	3.3927	4.5236	5.6545	11.00
25	1.00	1.7670	3.5341	5.3011	7.0681	8.8352	17.00
40	2.50	4.5236	9.0472	13.5708	18.0944	22.6180	45.00
50	4.00	7.0681	14.1363	21.2044	28.2725	35.3407	70.00
65	6.00	11.9452	23.8903	35.8355	47.7806	59.7258	110.00
80	10.00	18.0944	36.1889	54.2833	72.3777	90.4722	180.00
100	15.00	28.2725	56.5451	84.8176	113.0902	141.3627	280.00
150	35.00	63.6132	127.2265	190.8397	254.4529	318.0662	630.00
200	60.00	113.0902	226.1804	339.2706	452.3608	565.4509	1100.00
250	90.00	176.7034	353.4068	530.1103	706.8137	883.5171	1700.00
300	130.00	254.4529	508.9059	763.3588	1017.8117	1272.2646	2500.00
400	230.00	452.3608	904.7215	1357.0823	1809.4430	2261.8038	4500.00
500	360.00	706.8137	1413.6274	2120.4411	2827.2547	3534.0684	7000.00
600	510.00	1017.8117	2035.6234	3053.4351	4071.2468	5089.0585	10000.00
700	700.00	1385.3548	2770.7096	4156.0645	5541.4193	6926.7741	13800.00
800	910.00	1809.4430	3618.8861	5428.3291	7237.7721	9047.2152	18000.00
900	1150.00	2290.0763	4580.1527	6870.2290	9160.3053	11450.3817	22900.00
1000	1420.00	2827.2547	5654.5095	8481.7642	11309.0189	14136.2737	28000.00

8. Installation of Meter

8.1 In- and Outlet Pipe Sections

The metering principle is independent of the flow profile as long as standing eddies do not extend into the metering section,such as may occur after double elbows, tangential inflow or partially open gate valves upstream of the flowmeter. It is recommended that flow control devices be installed downstream from the meter primary. It is essential to assure that the meter tube is always completely filled with fluid. Experience indicates that in most cases a straight upstream section with a length of 3 x DN and a downstream section of 2 x DN are sufficient (DN = flowmeter primary size). In calibration stands the reference conditions of EN 29104 require straight length of 5 x DN upstream and 2 x DN downstream. EMF for custody transfer require special straight up- and downstream pipe sections.

8.2 Electrode axis

The meter can be installed in vertical, horizontal or sloped pipelines. The electrode axis should be horizontal if at all possible.A vertical electrode axis orientation should be avoided. An ideal installation is shown in Fig. 4 .

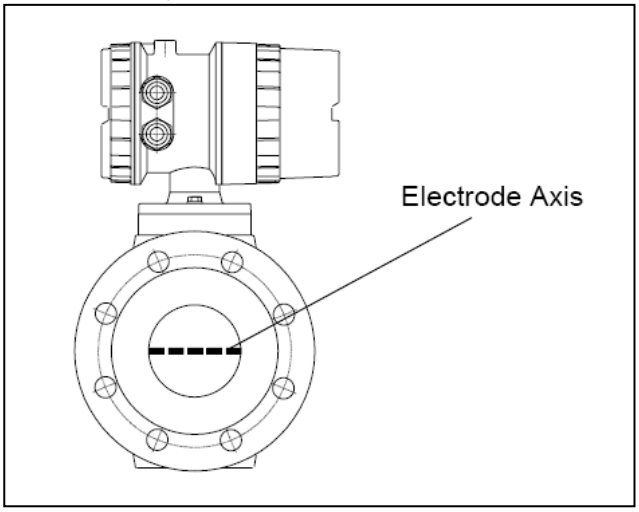


Fig.4 Electrode Axis

8.3 Grounding

The grounding of the flowmeter primary is essential not only for safety reasons but also of importance to assure trouble free operation of the electromagnetic flowmeter. The ground screws on the flowmeter primary are to be brought to the ground potential. For technical reasons this should be identical to the potential of the metering fluid if possible.

For plastic or insulated lined pipelines the fluid is grounded by installing grounding plates. When there are stray potentials present in the pipeline a grounding plate is recommended on both ends of the meter primary.

Primaries with hard or soft rubber liner sizes DN 125 and up include a grounding element within the vicinity of the flanges.

8.4 Installation in Larger Size Pipelines

The flowmeter primary can readily be installed in larger pipeline sizes by utilizing reducers. The pressure drop which results from the reduction can be determined from the Nomograph Fig. 5 . The pressure drop is determined in the following manner:

1. Calculate the diameter ratio d/D.
2. Determine the flow velocity from the Flowrate Nomograph Fig. 3 .
3. Read the pressure drop on the Y-Axis in Fig. 5 .

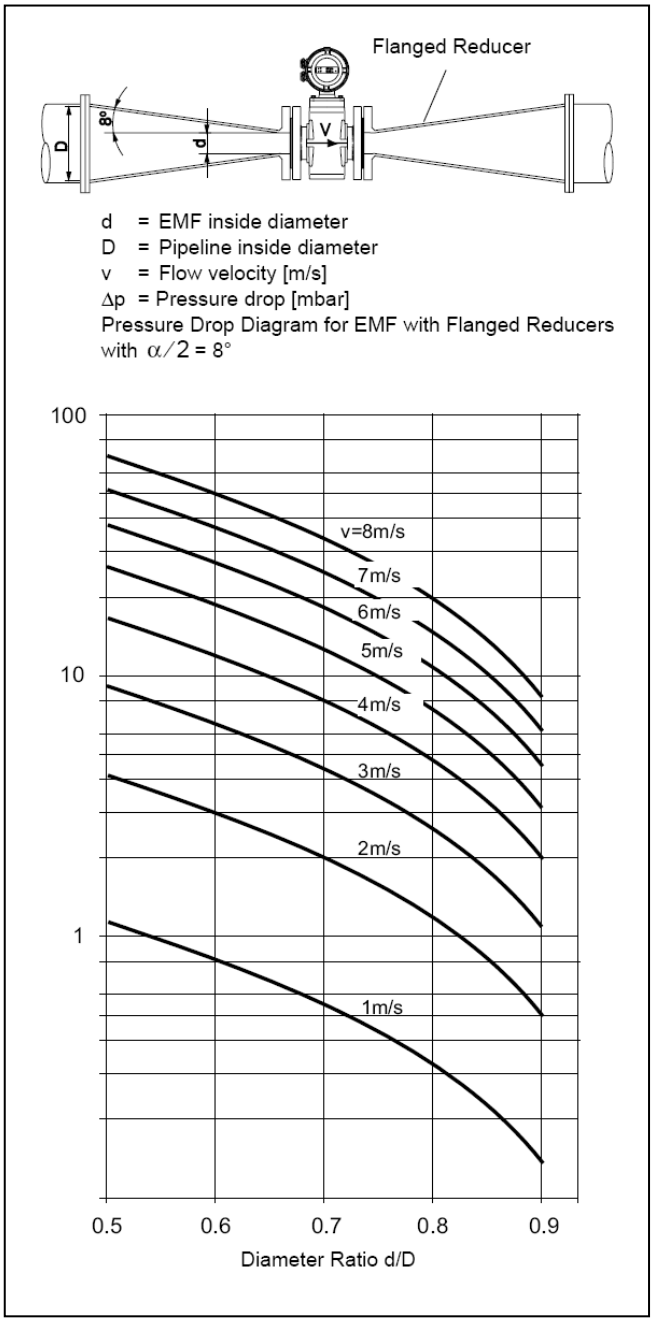
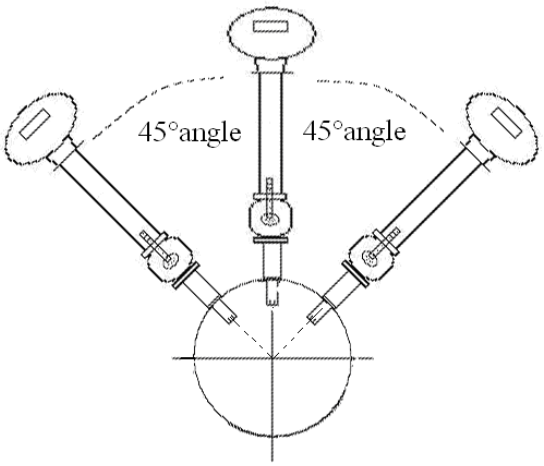


Fig. 5. Nomograph for EMF Pressure Drop Determinations

8.5.DIM installation instruction

To order to maintain the stable state when the medium enters the pipe, the user should observe the following installation requirements:

1、 The right installation location:horizontal position or ±45° angle,when installing,the sensor must be vertical to the pipe .



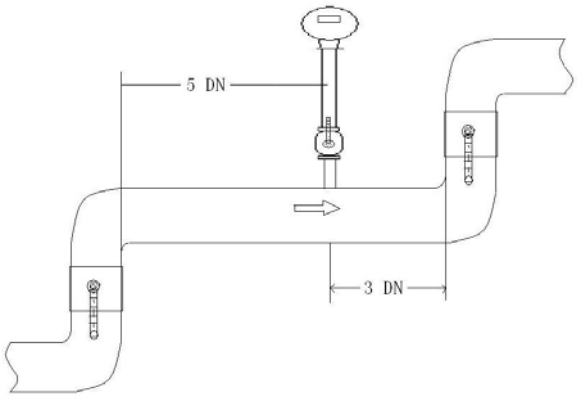
2, Do not install the meter on the top of pipe ,because the bubble may exist .

3, Do not install the meter on the bottom of pipe,because the sediment may exist .

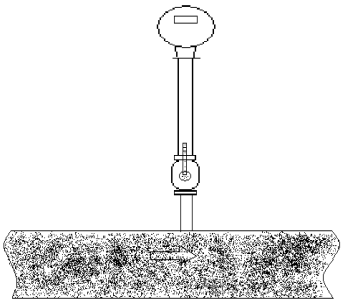
4, The distance between the top of sensor and the inside pipe must be 1/8DN(0-±2mm)。

5, Ensure the meter good grounding。

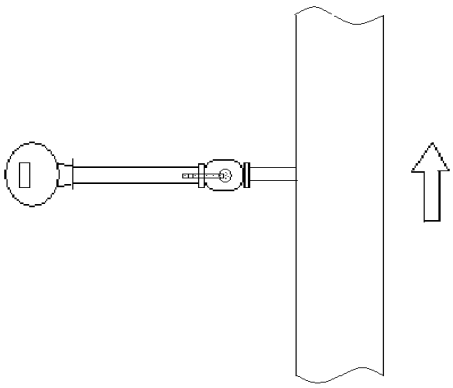
6, Experience indicates that in most cases a straight upstream section with a length of 3 x D and a downstream section of 2 x D are sufficient (D = flowmeter primary size)
（as the following figure shows）



7、The pipeline system must always be completely filled with fluid（as the following figure shows）.

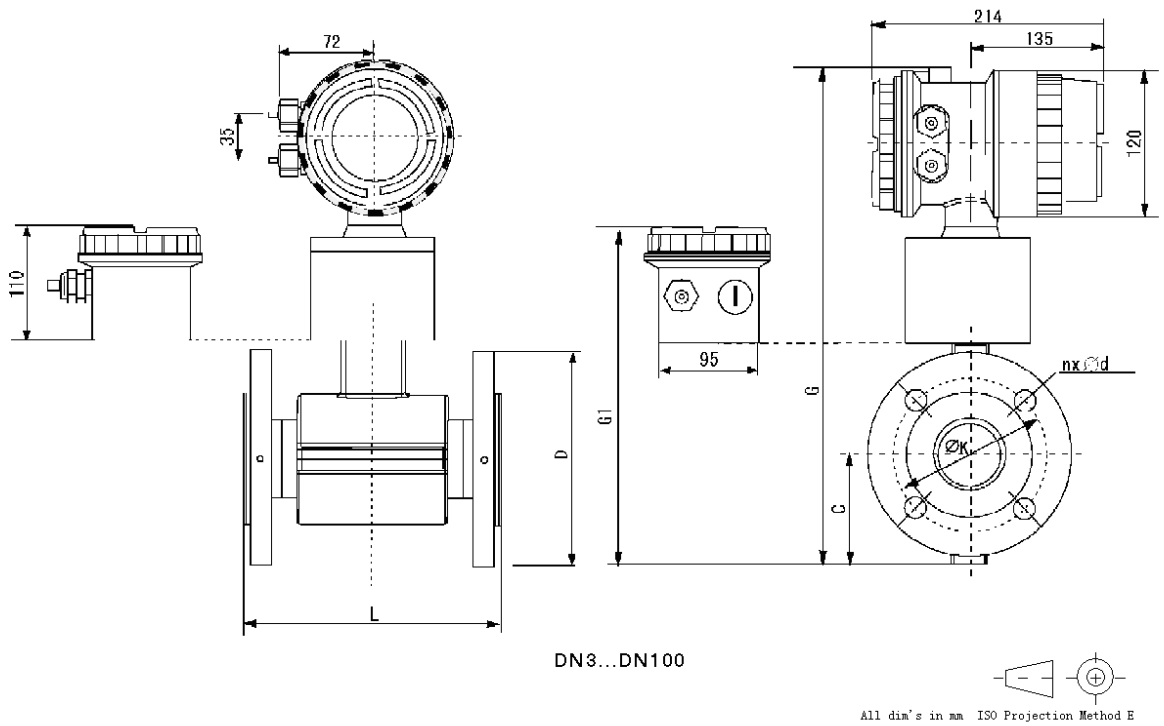


8、When the meter is installed on the vertical pipe,ensure the medium flow from the bottom to the top（as the following figure shows）.



9. Dimensions and Connections

Flange connection: DN3-100



Size mm	Pressure Mpa	External dimension of meter （mm）				Flange connection dimension （mm）				Weight （kg）	
		L	G	G1	C	D	K	n	d	Compact	Sensor
3-8	4.0	130	346	234	62	90	60	4	14	5.0	4.0
10	4.0	200	346	234	62	90	60	4	14	5.5	4.5
15	4.0	200	346	234	60	95	65	4	14	5.5	4.5
20	4.0	200	368	256	73	105	75	4	14	6.0	5.0
25	4.0	200	358	256	73	115	85	4	14	6.5	5.5
32	4.0	200	378	266	78	140	100	4	18	8.0	7
40	4.0	200	386	274	82	150	110	4	18	8.5	7.5
50	4.0	200	402	290	90	165	125	4	18	10.0	9.0
65	4.0	250	430	318	104	195	145	8	18	14.0	13.0
80	4.0	250	442	330	110	200	160	8	18	18.0	16.0
100	4.0	250	482	370	130	220	180	8	18	19.0	17.0

1) Other pressure ratings upon request.

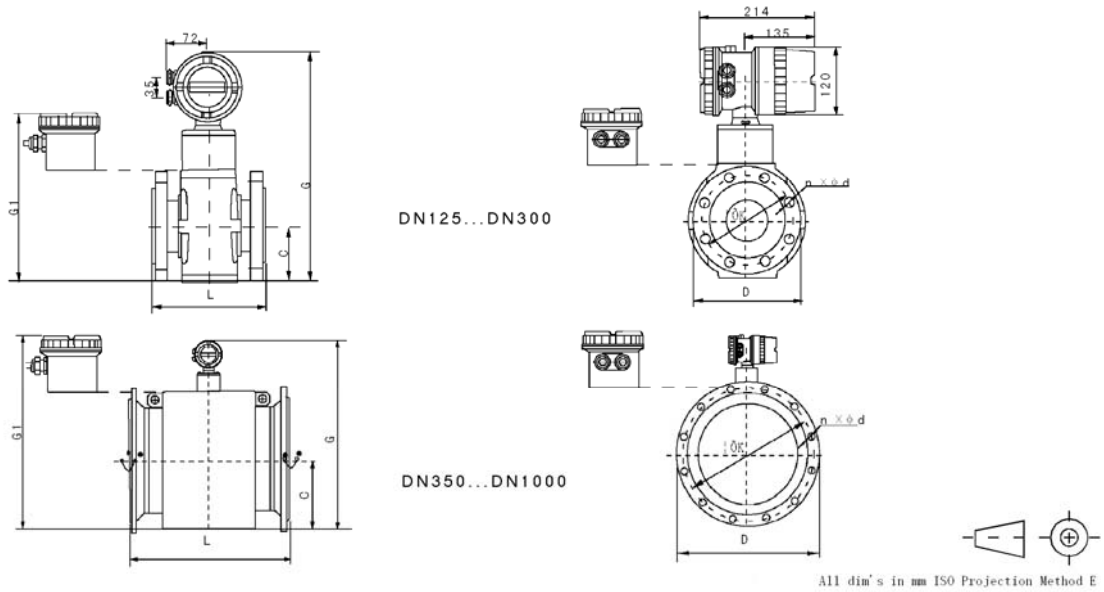
2) When grounding electrode (standard layout) is installed, DN3-100 calibre, the dimension L does not change.

3) When one grounding plate (mounted on one flange) is installed, dimension L increases as follows:
[DN3-100] by 3 mm.

4) When protection plates (mounted on both flanges) are installed, dimension L increases as follows:
[DN3-100] by 6 mm.

Fig. 6 DN3-100

Flange connection: DN125-1000



Size mm	Pressure Mpa	External dimension of meter (mm)				Flange connection dimension (mm)				Weight (kg)	
		L	G	G1	C	D	K	n	d	Compact	Sensor
125	1.6	250	466	355	127	250	210	8	18	29.0	28.0
150	1.6	300	508	397	148	285	240	8	22	31.0	30.0
200	1.0	350	570	459	179	340	295	8	22	55.0	54.0
200	1.6	350	570	459	179	340	295	12	22	55.0	54.0
250	1.0	450	626	515	207	395	350	12	22	80.0	79.0
250	1.6	450	626	515	207	405	355	12	26	80.0	79.0
300	1.0	500	712	601	250	445	400	12	22	87.0	86.0
300	1.6	500	712	601	250	460	410	12	26	87.0	86.0
350	1.0	550	729	618	250	505	460	16	22	128.0	126.0
350	1.6	550	729	678	250	520	470	16	26	148.0	146.0
400	1.0	600	780	669	275	565	515	16	26	153.0	151.0
400	1.6	600	780	669	275	580	525	16	30	173.0	171.0
500	1.0	600	851	740	310	670	620	20	26	189.0	187.0
500	1.6	600	851	740	310	715	650	20	33	213.0	221.0
600	1.0	600	952	841	361	780	725	20	30	245.0	243.0
600	1.6	600	952	841	361	840	770	20	36	315.0	313.0
700	1.0	700	1032	920	405	859	840	24	30	319.0	317.0
700	1.6	700	1032	920	405	910	840	24	36	387.0	385.0
800	1.0	800	1132	1020	455	1015	950	24	33	385.0	383.0
800	1.6	800	1132	1120	455	1025	950	24	39	450.0	448.0
900	1.0	900	1232	1120	505	1115	1050	28	33	487.0	485.0
900	1.6	900	1232	1020	505	1125	1050	28	39	589.0	587.0
1000	1.0	1000	1232	1120	505	1230	1160	28	36	579.0	577.0
1000	1.6	1000	1232	1120	505	1255	1170	28	42	779.0	777.0

1) Other pressure ratings upon request

2) When grounding electrode (standard layout) is installed, DN3-100 calibre, the dimension L does not change.

Fig. 7 DN125-1000

DM41/DM48 Remote converter

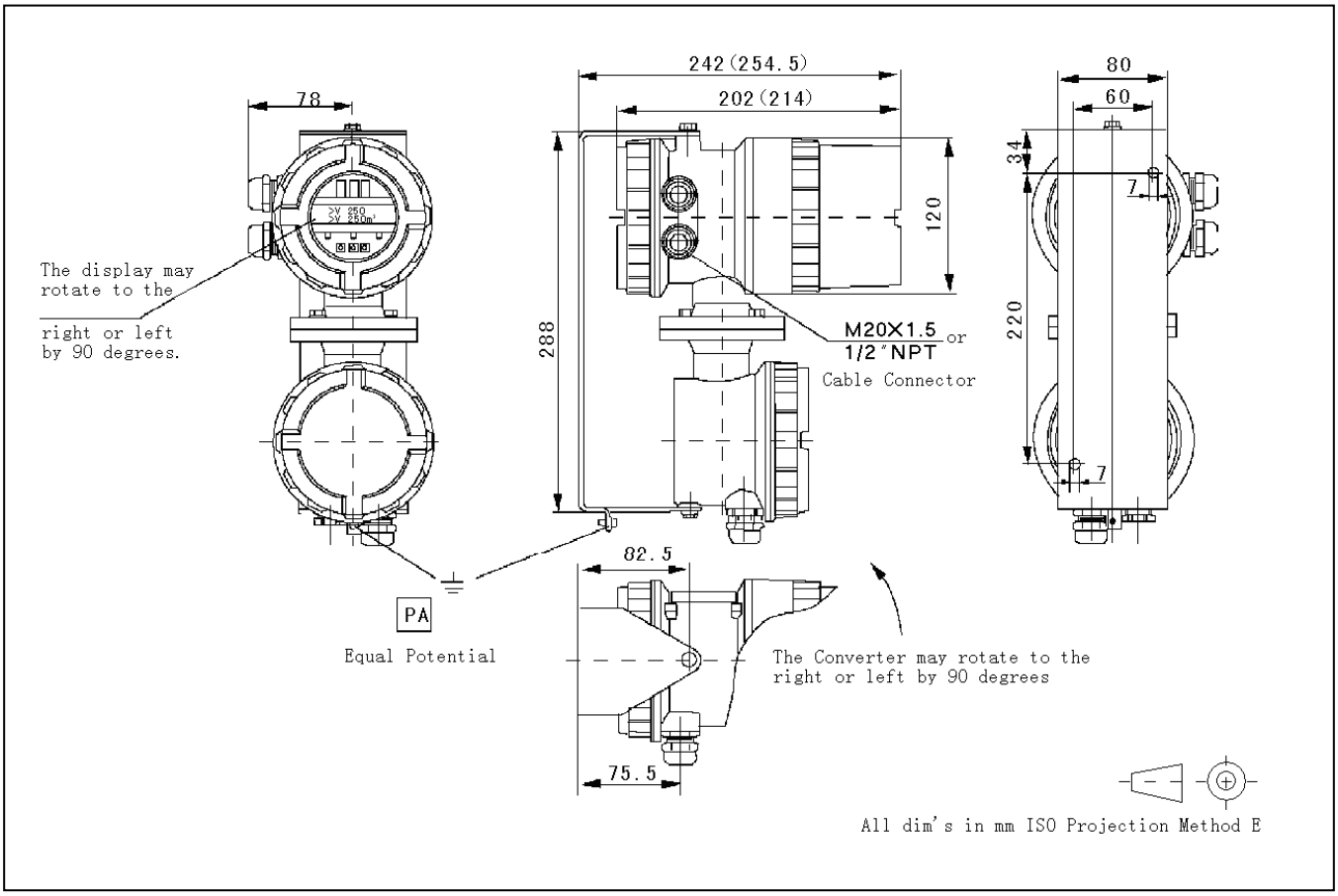


Fig. 8 The external dimensions of Remote Converter

10.3 DIM technical parameters of Converter

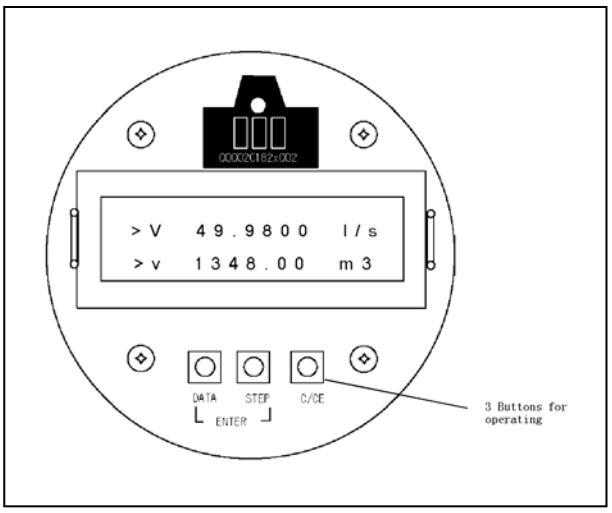


Fig. 9 Converter Keypad and Display

Measuring range

Continuous between 0.5 and 10 m/s

Maximum Continuous between 0.01 and 15 m/s

Accuracy

±1.5% of rate (standard)

±1.0% of rate (high accuracy)

Reproducibility

≤0.2 % of rate

Minimum conductivity

5μS/cm

(20μS/cm for deionized water)

Response Time

For 0-99 % step change (corresp. to 5τ) ≥1 s

Excitation

Middle-frequency ,high-frequency

Supply Power

High voltage AC 220V 50HZ

Low voltage DC 24V

Excitation

Middle Frequency

High Frequency

Power

≤10W (flowmeter primary incl. converter) for AC supply

≤9W for DC supply (flowmeter primary incl. converter)

Ambient temperature (Verification as Ex)

-20～+60℃

Electrical connection

Bolt terminal, no bolt spring compaction wiring terminal

Cable connection M20X1.5 or 1/2 ″ NPT

Protection class

IP67

Positive/opposite direction flow measurement

The transducer may measure in one direction (positive direction); it also may measure in two directions (positive/opposite direction).

The flow direction displays in the mode of arrow on the indicator. The initial direction signal is the signal in positive direction.

Display

The transducer adopts two-line liquid crystal display.

It has back light display. The data may be input by three keys. It also may be operated by use of the remote controller without opening the cover.

2×16 character LCD lattice display may be accumulated through separating each flow direction by the internal accumulator. It may be expressed as 16 different engineering units. The rate of flow may be displayed in percentage or in 45 different engineering units. The signal transducer body case may rotate by 90 degrees. In the mode of multiparameter, the first and second line of the display may display the instantaneous flow rate, several accumulated values, positive and opposite direction, meter number and current output value in percentage (%), engineering unit value or bar graph.

Design of signal converter body case

The appearance of body case cast by the light metal is sprayed and coated. The coating thickness is 60μm. The middle body is dark grey. The front cover and rear cover are milk white.

Signal cable (remote design)

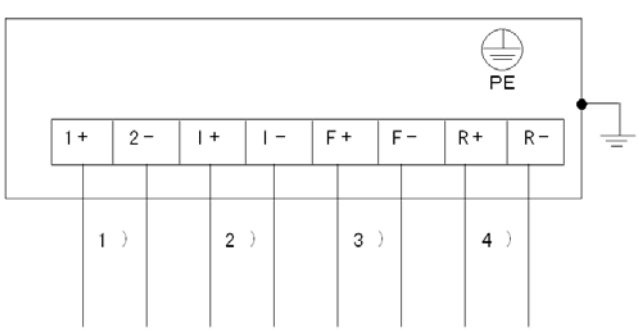
The standard length of the cable between the sensor and the signal transducer is 10m. The maximum length is 50m. The cable of 10m is provided with the machine. If the cable over 10m is needed, it needs special instruction in ordering.

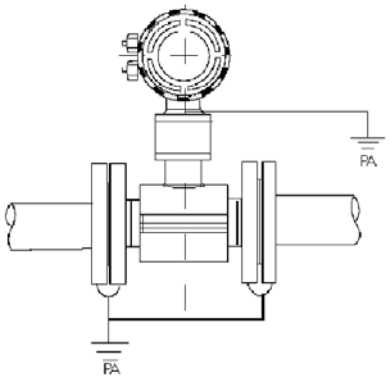
Data protection

As it is switched off, all data are saved in EEPROM

11Meter Wiring

11.1 DM43/DM47 Compact design wiring





1) Supply Power:

Terminals: 1+、2-

For the supply voltage see the nameplate of the meter

2) Current output

Terminals: I+/I-

0/4-20mA. Load≤300Ω; 0/2-10mA.Load ≤800Ω; 0-5mA.≤1800Ω

0-10-20mA or 4-12-20mA load≤300Ω

Explosion protection type: Exd [ia] iam llCT5

3) Pulse output

Terminals: F+/F-

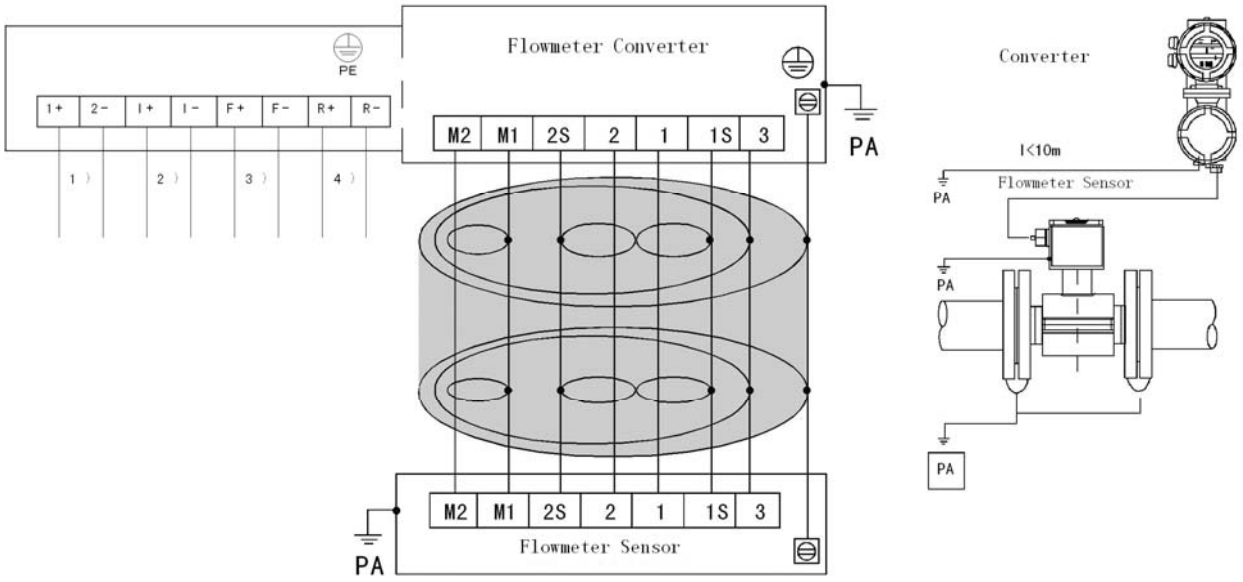
The pulse coefficient may be selected; the pulse width may be set as 0.1-2000ms;

The maximum frequency is 5kHz.

4) RS485

Terminals: R+/R-

11.2 DM41/DM48 /DIM41/DIM48remote design wiring



1) Supply Power:

Terminals: 1+、2-

For the supply voltage see the nameplate of the meter

2) Current output

Terminals: I+/I-

0/4-20mA. Load≤300Ω; 0/2-10mA.Load ≤800Ω; 0-5mA.≤1800Ω

0-10-20mA or 4-12-20mA load≤300Ω

Explosion protection type: Exd [ia]iam llCT5

3) Pulse output

Terminals: F+/F-

The pulse coefficient may be selected; the pulse width may be set as 0.1-2000ms;

The maximum frequency is 5kHz.

4) RS485

Terminals: R+/R-

5）Terminal structure of remote sensor

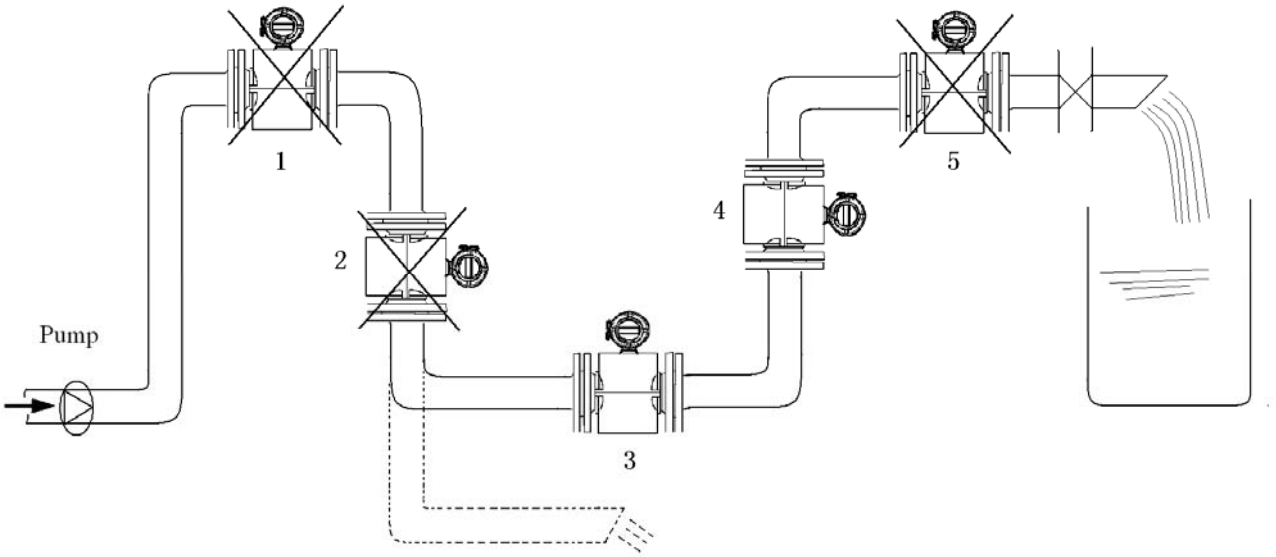
Code	Correspongding cable	Application
M2	White core	Excitation signal
M1	White screen	
2S	Bule screen	Flow signal
2	Bule core	
1	Red core	
1S	Red screen	
3	Screen copper wire	Grounding

12. Installation instruction

Observe the following things when designing pipeline and installing meter：

12.1 Location

The location of the installation of flow meter should avoid direct sunlight, the environment temperature should be between-20-60°C. Pipeline should be filled with medium, the location of the installation shown in Position1,5 and 2 should be avoided because there are not filled with medium, it should be converted to the 3,4 position. Sensor installation location shows in the flowing Figure.

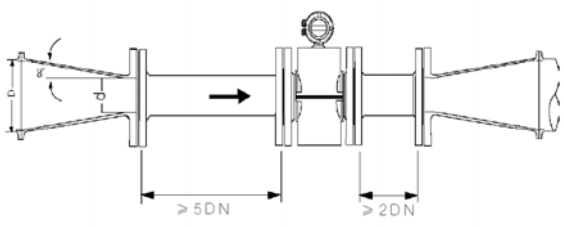


12.2 Noises elimination

Meter should not be installed near electrical appliances which can easily lead to electromagnetic interference ,such as motors, transformers, frequency converter and so on.

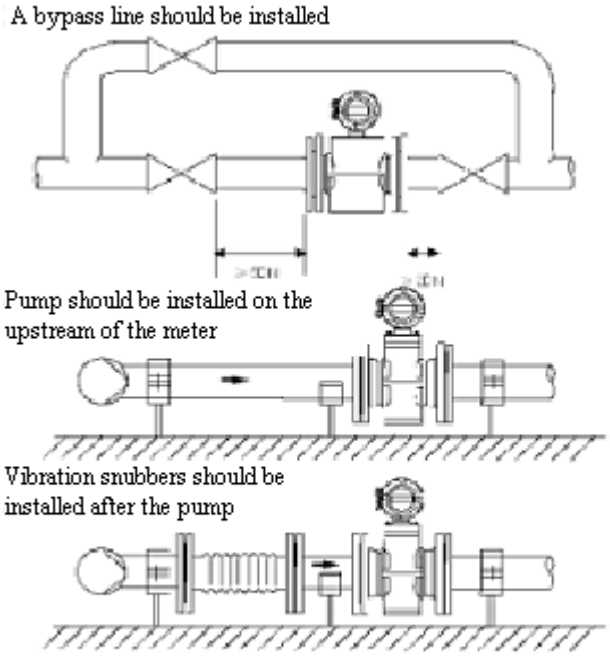
12.3 The length of pipe section

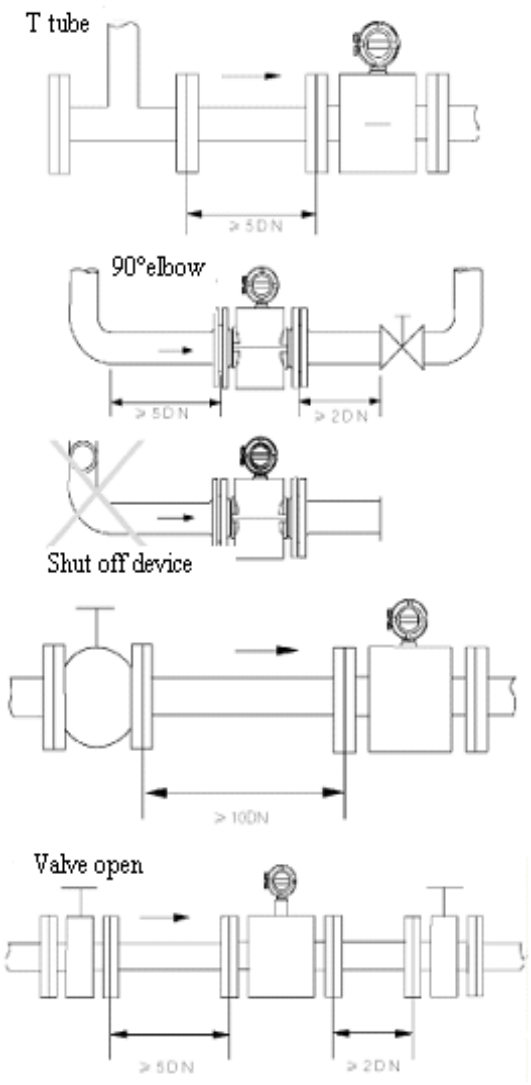
In order to assure the accuracy of the measurement,the requirements of installing meter should be satisfied .



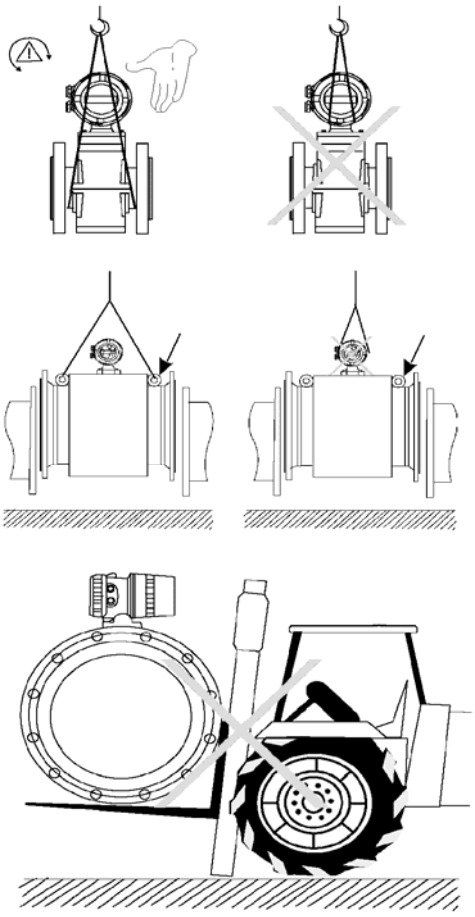
When using different-diameter pipe,the center cone angle α of different-diameter pipe should be less 15°

Note：Do not insert or install any things on the upstream of the metering pipe which possibly affects the velocity distribution .

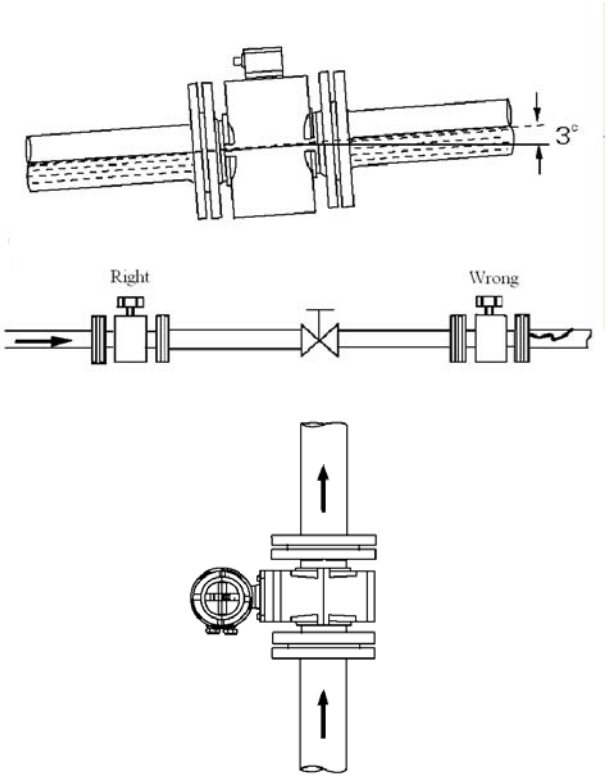




12.5 Right lifting

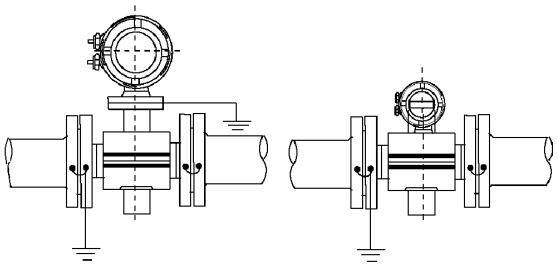


12.6 Avoid air bubble



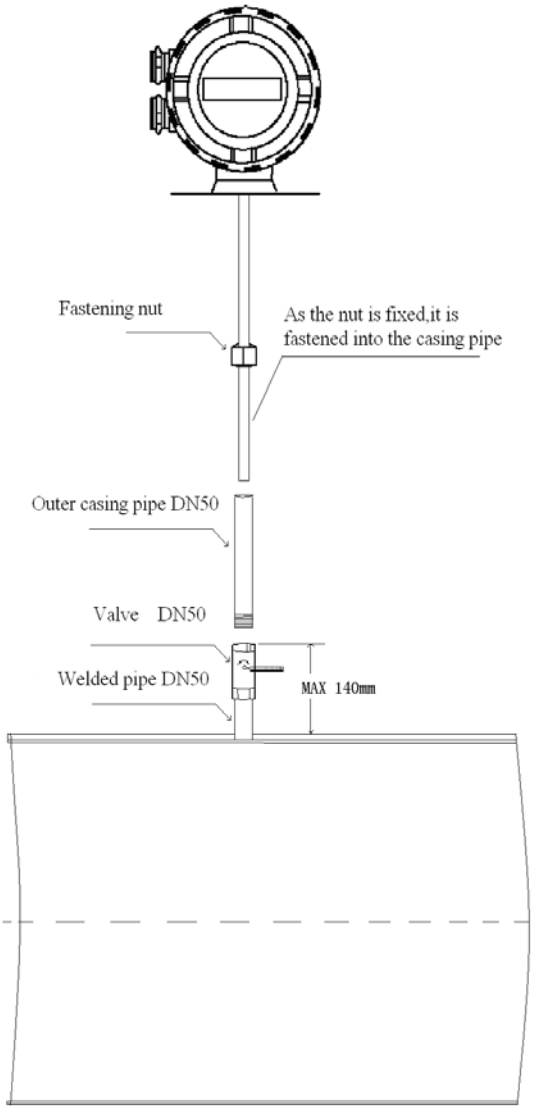
12.4 Meter grounding

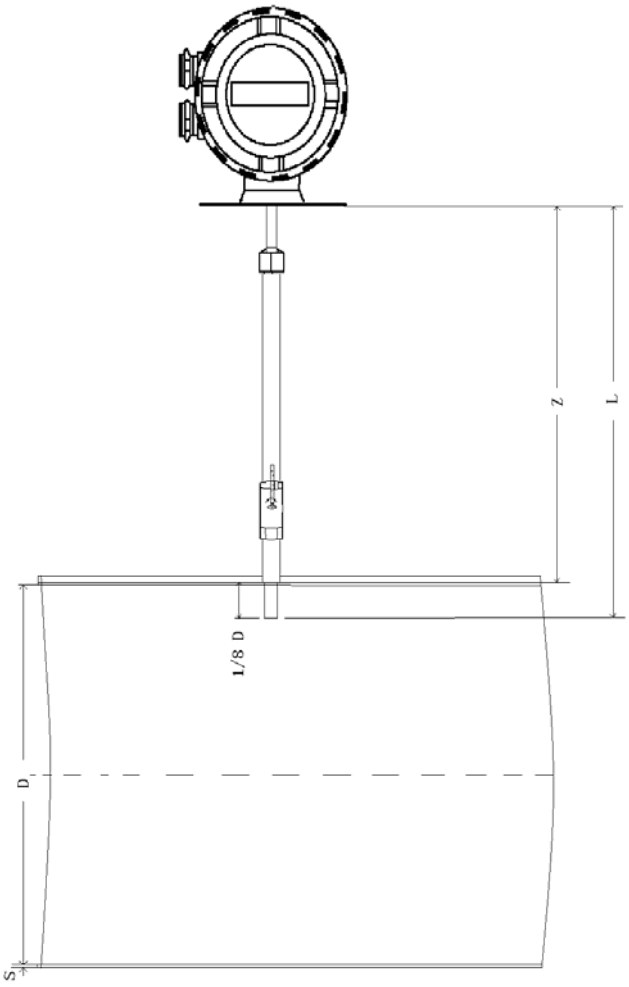
When the meter is installed ,ensure the meter good grounding 。



12.7 Dimension and installation drawing of insertion electromagnetic flowmeter

Dimension	Calibre range	L (mm)
Dimension1	DN350—DN900	480
Dimension2	DN1000—DN2000	620





Installation dimension:Z=L-S-1/80
In which :S= thickness of pipe wall
D=inside diameter of pipe

13.1 DM specification Explanation

Electromagnetic flowmeter	**DM** XX	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Compact without Ex-design	43															
Remote without Ex-design	41															
Compact with Ex-design	47															
Remote with Ex-design	48															
Process Connections																
Flanged		F														
Connection materials																
CS			1													
SS			2													
Liner materials																
Polychloroprene Rubber （DN65-DN2000）				S												
Polyurethane Rubber （DN65-DN2000）				H												
PTFE （DN10-DN1000）				P												
PFA （DN3-DN600）				F												
Others				Q												
Electrode materials																
316					M											
Hc					H											
Hb					B											
Ti					T											
Ta					F											
Pt					P											
Others					Q											
Accessories																
No						0										
Grounding ring (grounding electrode)）						1										
Protect flange						2										
Others						9										
Fluid temperature range																
≤120℃							A									
≤180℃							B									
Protection class	**Sensor** **Converter**															
	IP67 IP67							1								
	IP68 IP67							2								
Accuracy class																
±0.5% of rate (standard）									N							
±0.2% of rate (high accuracy)									S							
Supply Power																
220 VAC 50Hz										1						
24 VDC										2						
Display																
LCD											W					
Signal output																
Current output（4-20mADC) +Pulse output + Alarm output												1				
Communication																

NO	N			
HART-Protocol	H			
Others	Q			
Cable Connection				
M20×1.5		M		
Others (according to the demands of users)		Q		
Excitation type				
Middle-frequency			M	
High-frequency			H	
Accessories				
Without remote controller				N
With remote controller				A

13.2 DIM specification Explanation

Insertion Electromagnetic flowmeter	**DIM**	XX	X	X	X	X	X	X	X	X	X	X	X	X	X
Compact without Ex-design		43													
Remote without Ex-design		41													
Compact with Ex-design		47													
Remote with Ex-design		48													
Process Connections															
Screwed M60X2			M												
Flanged DN50			F												
Others（according to the demands of users）			Q												
Pipe diameter															
350mm-900mm				1											
1000mm-2000mm				2											
Others				3											
Connection materials															
probe electrode coating															
304 316 PTFE					N										
Others					Q										
Protection class	**sensor**	**Converter**													
	IP67	IP67				1									
	IP68	IP67				2									
Accuracy class															
±1.5%(standard）							N								
±1.0%(high accuracy ）							S								
Power supply															
220 VAC 50Hz								1							
24 VDC								2							
Display															
LCD									W						
Signal output															
Current output（4-20mADC) +Pulse output + Alarm output										1					
Communication															
None											N				
HART-Protocol											H				
Others											Q				
Cable Connection															
M20×1.5												M			
1/2”NPT												N			
Others（according to the demands of users）												Q			
Excitation type															
Middle-frequency													M		
High-frequency													H		
Installation accessories															
Without ball valve														N	
With ball valve														V	
Accessories															
Without remote controller															N
With remote controller															A