

KLINGER CORIOLIS



Flow meter

The Mass Flow meter is designed according to the principle of Coriolis force. Under the alternating current effect, the magnet and coil installed on the measuring tube will make two parallel measuring tubes vibrate according to some fixed frequency. Once flow passes through the pipes, Coriolis force will give rise to deflection (phase shift) on the vibration of two pipes, and the deflection of vibration is directly proportional to the mass flow of fluid. Pick up them and the mass flow rate could be calculated.

The vibration frequency of the measuring tube is determined by the total mass of the measuring tube and inner fluid. When the fluid density changes, the vibration frequency of the measuring tube will also change, as a result, the fluid density can be calculated.

The temperature sensor installed in the pipeline can pick up the fluid temperature on time under the coordination of the measuring circuit.



FEATURES

- » Enable to measure of the direct mass flow rate of fluid in the pipeline without changing any parameters. Which avoids some measurement errors of intermediate links.
- » Fluid measured can be more extensive, such as the steady uniform flow of common viscosity fluid, the high viscosity fluid, non Newtonian fluid, slurry containing some solid components, and the liquid containing some trace of gas.
- » Besides mass flow measurement, density and temperature, and even consistency can also, be picked up and output.

PRODUCTS GALLERY



Super-bend Type



Micro-bend Type



U-tube Type

TECHNICAL DATA

DIAMETER	DN8-DN300
MEDIUM	Liquid, Gas, Slurry
ACCURACY	±0.1%, ±0.15%, ±0.2%, ±0.5%
AMBIENT TEMPERATURE	-20°C~+60°C
MEDIUM TEMPERATURE	Integrate type: (-50~+125)°C Remote type: (-50~+200)°C Remote type with high temp.: (-50~+300)°C Remote type with low temp.: (-150~125)°C
NOMINAL PRESSURE	1.6; 2.5; 4.0; 6.3Mpa; Customized for high pressure: 10.0, 16.0, 26.0 Mpa
PROTECT LEVEL	IP65, IP67, IP68 (remote type)
OUTPUT	Pulse, 4-20mA
COMMUNICATION	RS485, HART
POWER SUPPLY	24V DC, 220V AC
SENSOR TYPE	Super-bend type, U-type, Micro-bend type
PROCESS CONNECTION	Flange (DIN, ANSI, JIS etc.) Sanitary Tri-clamp Type Thread Type (up to DN100)
BODY MATERIAL	SS316 for measuring tube; SS304 for body & flange

FLOW RANGE

DN	ALLOWABLE FLOW RANGE (KG/H)	NORMAL FLOW RANGE FOR ACCURACY 0.1% (KG/H)	NORMAL FLOW RANGE FOR ACCURACY 0.2% (KG/H)	NORMAL FLOW RANGE FOR ACCURACY 0.5% (KG/H)	STABILITY OF ZERO POINT (KG/H)
10	10~1000	100~1000	70~1000	50~1000	0.03
15	20~3000	300~3000	200~3000	150~3000	0.07
25	80~8000	800~8000	600~8000	400~8000	0.15
40	240~32000	2000~32000	1500~32000	1500~32000	0.9
50	500~50000	3500~50000	2500~50000	2000~50000	1.5
80	800~140000	8000~140000	7000~140000	6000~140000	3.5
100	1500~200000	15000~200000	12000~200000	10000~200000	7
150	5000~500000	50000~500000	35000~500000	28000~500000	17
200	10000~1000000	200000~1000000	120000~1000000	80000~1000000	45
300	25000~2500000	500000~2500000	300000~2500000	200000~2500000	70

Table 1: Flow Range for liquid (U-tube Version)

DN	MAX. FLOW RANGE (KG/H)	NORMAL FLOW RANGE FOR 0.1% ACCURACY (KG/H)	NORMAL FLOW RANGE FOR 0.2% ACCURACY (KG/H)	NORMAL FLOW RANGE FOR 0.5% ACCURACY (KG/H)	STABILITY OF ZERO POINT (KG/H)
3	1.2~120	10~120	8~120	6~120	0.004
8	8~800	80~800	55~800	40~800	0.035
10	10~1000	100~1000	70~1000	50~1000	0.045
15	20~3000	300~3000	200~3000	150~3000	0.09
25	80~8000	600~8000	400~8000	300~8000	0.25
40	240~24000	2400~24000	1200~24000	1000~24000	1
50	500~45000	5000~45000	2500~45000	2000~45000	2
80	800~120000	10000~120000	8000~120000	6000~120000	3.5
100	1500~200000	20000~200000	15000~200000	10000~200000	7
150	5000~500000	50000~500000	35000~500000	30000~500000	23
200	10000~1000000	100000~1000000	70000~1000000	50000~1000000	45
250	15000~1500000	150000~1500000	120000~1500000	75000~1500000	70

Table 2: Flow Range for liquid (Micro-bend Version)

DN	MAX. FLOW RANGE (KG/H)	NORMAL FLOW RANGE FOR 0.1% ACCURACY (KG/H)	NORMAL FLOW RANGE FOR 0.2% ACCURACY (KG/H)	NORMAL FLOW RANGE FOR 0.5% ACCURACY (KG/H)	STABILITY OF ZERO POINT (KG/H)
50	500~50000	5000~40000	3500~40000	2000~50000	2
80	800~120000	10000~120000	8000~120000	6000~120000	3.5
100	1500~200000	25000~200000	20000~200000	10000~200000	7
150	5000~500000	60000~500000	50000~500000	40000~500000	23

Table 3: Flow Range for liquid (Super-bend Version)

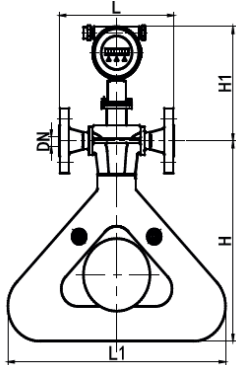
The flow value of other gas mediums = The value in the below table * Air density under standard condition
Medium density under standard condition

DN (MM)	START FLOW (NM ³ /H)	FLOW RANGE WITH ACCURACY 0.5% (NM ³ /H)
15	12.5	62.5 ~ 2500.0
25	33.33	166.7 ~ 6666.7
40	133.33	666.7 ~ 26666.7
50	208.33	1041.7 ~ 41666.7
80	583.33	2916.7 ~ 116666.7
100	833.33	4166.7 ~ 166666.7
150	2083.33	10416.7 ~ 416666.7

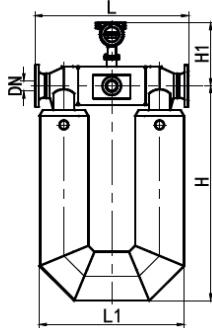
Table 4: Flow range of volume for air under standard temperature and pressure condition (hereafter we call "standard condition")

INSTALLATION DIMENSION

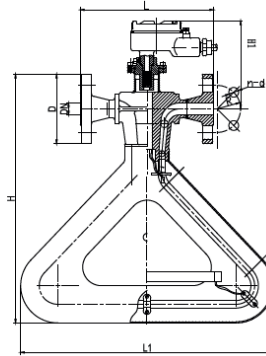
U-tube Type



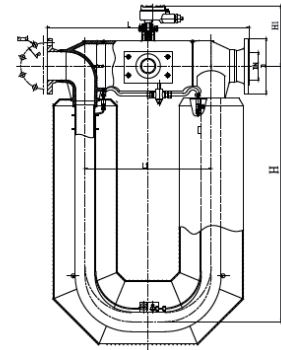
DN (10~25) Compact Version



DN (40~200) Compact Version



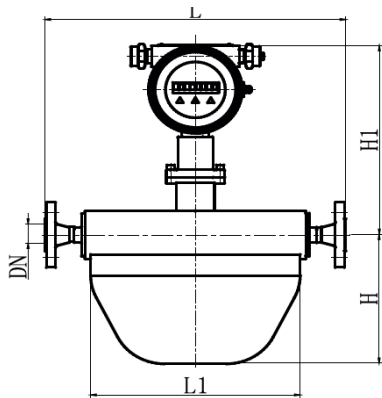
Separate Version



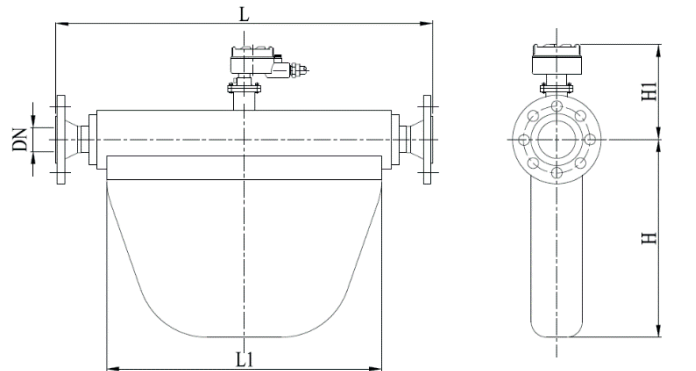
CODE	DN	L ($\leq 4.0\text{MPa}$)	L ($\geq 6.3\text{MPa}$)	L1	H (INTEGRATE)	H (SEPARATE)	
10	10	150	170	350	290	266	182
15	15	180	194	340	320	266	200
25	25	200	248	450	428	285	200
40	40	520	547	450	660	285	192
50	50	558	588	522	748	277	202
80	80	780	808	705	1030	288	242
100	100	920	948	853	1140	326	272
150	150	1100	1140	1050	1526	356	302
200	200	1364	1410	1160	1655	386	350

INSTALLATION DIMENSION

Micro-bend Type



Dimensions of Micro-bend type



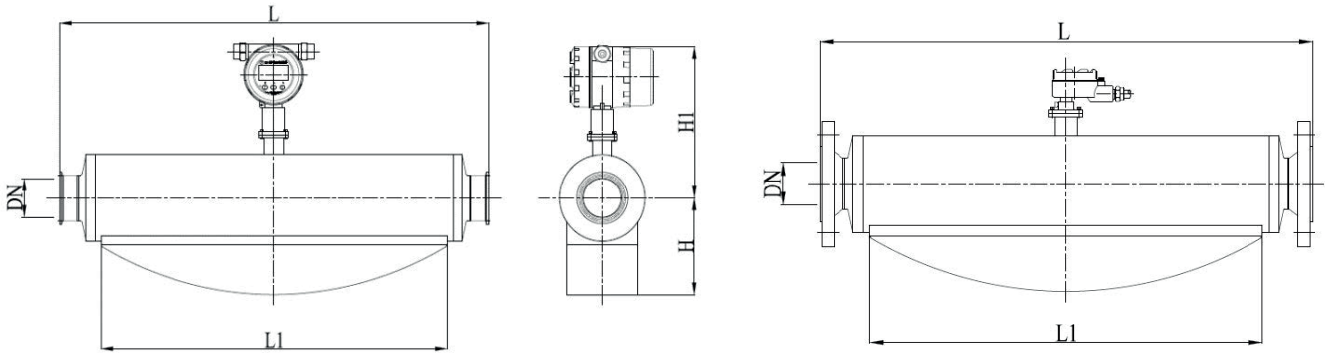
Micro-bend Version

Unit: mm

CODE	DN	L ($\leq 4.0\text{MPa}$)	L ($\geq 6.3\text{MPa}$)	L1	H (INTEGRATE)	H (SEPARATE)	
8	8	424	484	302	154	270	185
10	10	424	484	302	154	270	185
15	15	400	414	280	191	298	213
25	25	500	536	360	258	302	218
40	40	600	634	460	306	315	230
50	50	800	828	640	410	325	240
80	80	900	928	700	495	350	265
100	100	1130	1156	860	665	370	285
150	150	1410	1450	1200	905	400	316
200	200	1800	1844	1450	1175	426	342
250	250	1966	2006	1530	1300	468	383

INSTALLATION DIMENSION

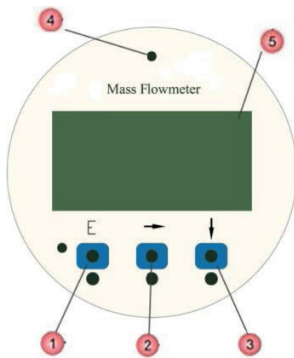
Super-bend Type



Super-bend Version

CODE	DN	L ($\leq 4.0\text{MPa}$)	L ($\geq 6.3\text{MPa}$)	L1	H (INTEGRATE)	H (SEPARATE)	
50	50	800	834	588	200	330	250
80	80	935	973	730	200	355	270
100	100	1130	1182	870	275	370	290
150	150	1370	1410	1070	378	400	330

CONVERTER DISPLAY CONTENT

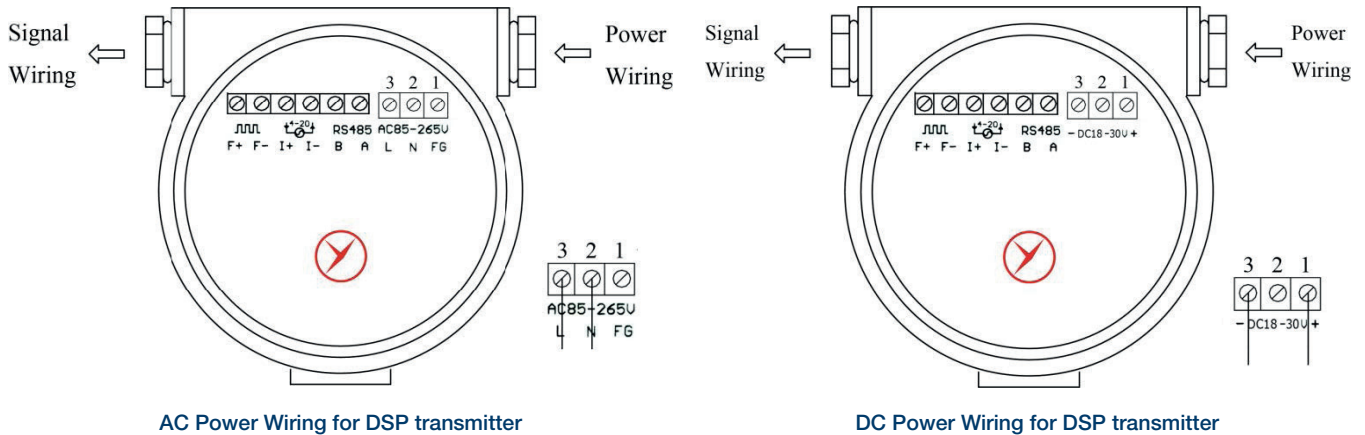


NO.	NOTES
1	E key: enter
2	→ key: move curse or return
3	↓ key: page down
4	Light for working status
5	Two lines OLED

Note: Operation point of Photoelectric Key is located right behind the glass panel. It is better to operate the photoelectric key in vertical direction, rather tha horizontal direction.

KEY	MEASUREMENT STATE	MENU STATE	FUNCTION STATE	DATA STATE
↓	Show the measurement results and state on Page1/2/3. Page down to menu state.	Next Menu.	Select Function.	Change number, change unit, change character.
→	Return to the last screen.	Return to the upper-level menu, press the key several times to return to the measurement state.	Select Function.	Move the cursor right.
E		Enter the Menu.	Confirm and Save the function	Save the input, choose Yes or No, then back to function men.

WIRES TERMINAL DESCRIPTION



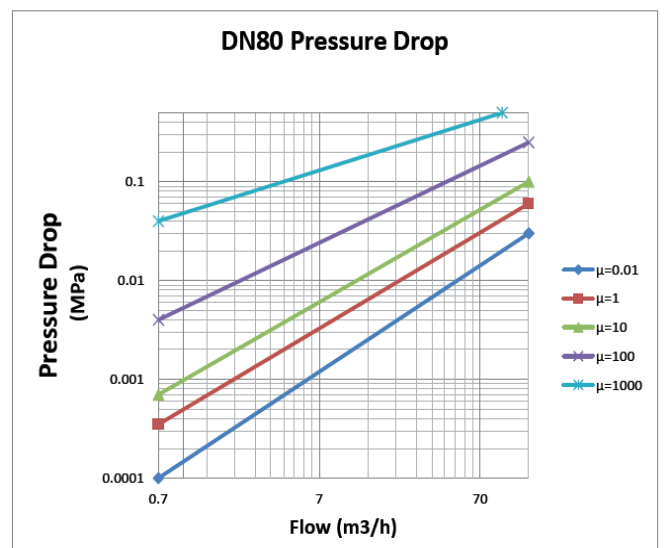
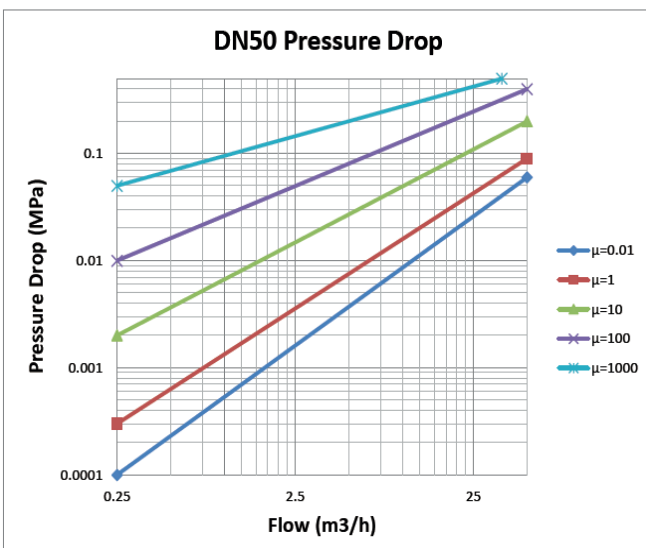
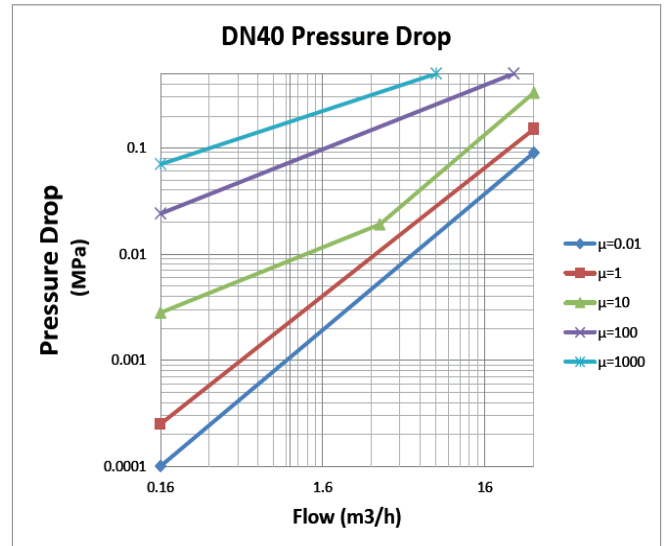
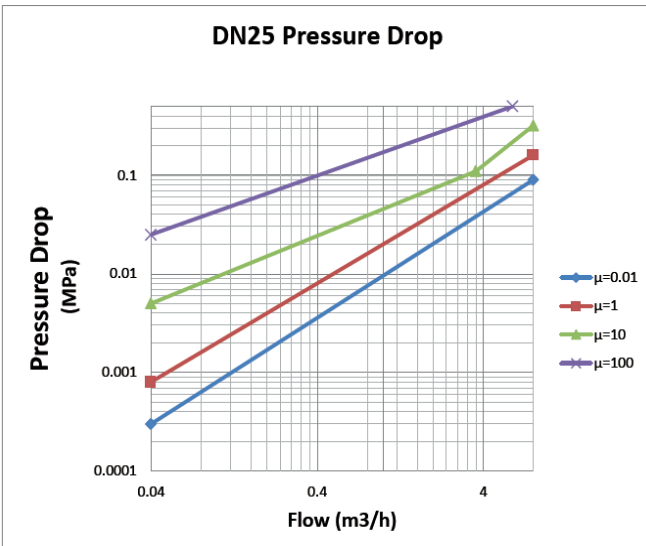
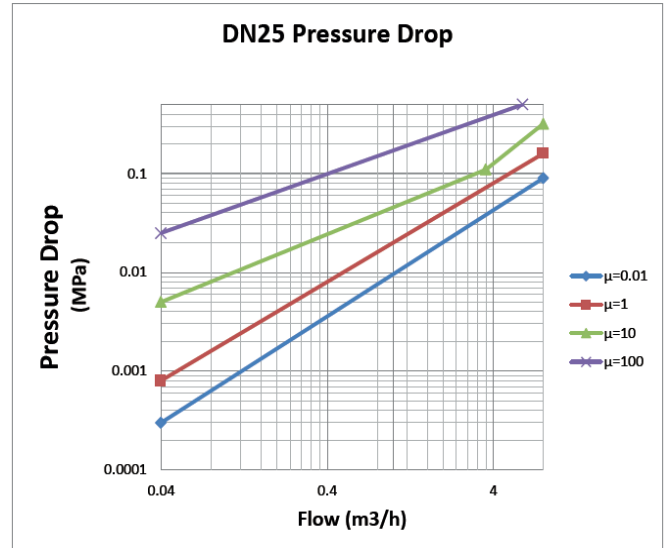
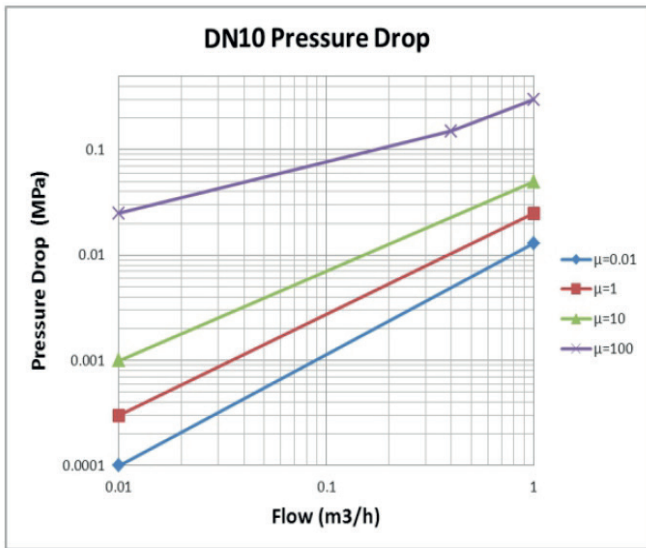
WIRES TERMINAL DESCRIPTION

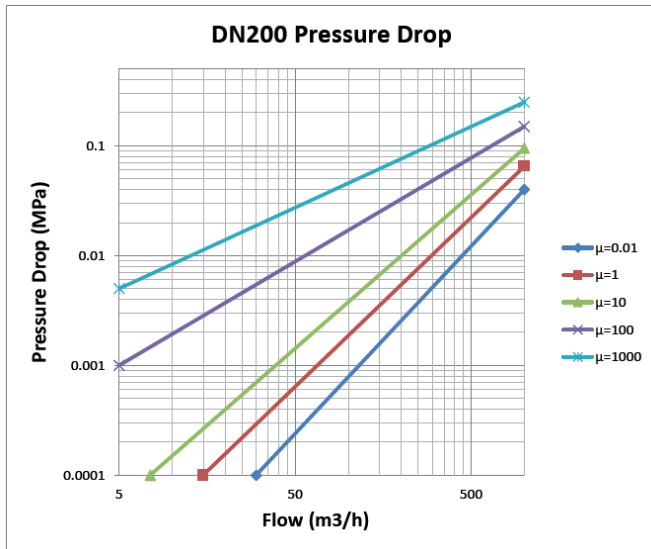
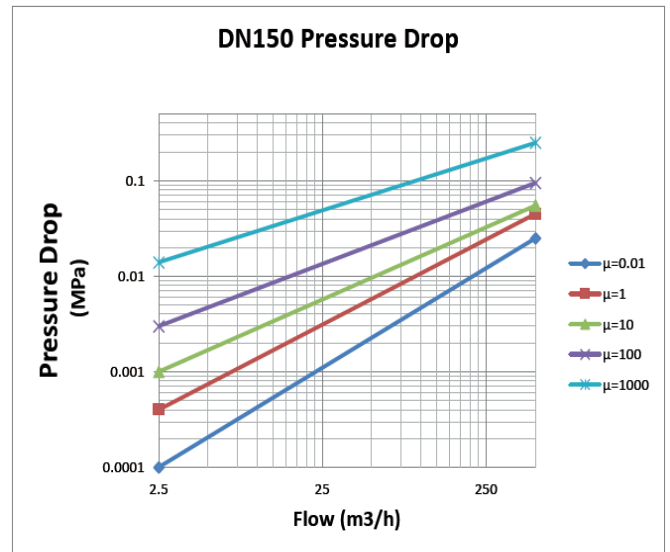
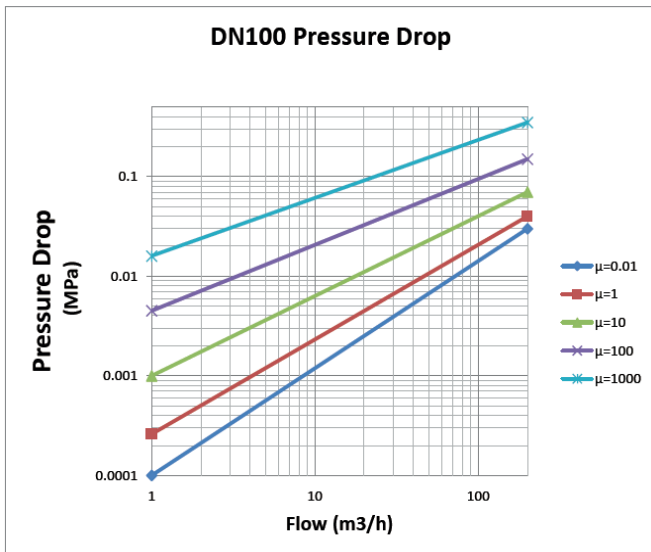
- » The pressure drop of the flow meter is the unrecoverable pressure loss resulting from the resistance of the flow. The flow path of the mass flow meter is relatively complex and always with reducing pipe. So, the pressure drop is a very important factor and can't be ignored.
- » The pressure drop of the mass flow meter is dependent upon the fluid characteristics, the flow state, and the structural parameters of the sensor.
- » When the fluid density, viscosity, and flow rate are fixed, the pressure drop is only relevant to the structural factors of the sensor part, such as diameter, cross-sectional area of the flow tube, flow tube shape, etc.
- » The reducing pipe is inevitable for the design and manufacture of the mass flow meter. The total cross-sectional area of the two flow tubes is less than the cross-sectional area of the flange.
- » Thus, the velocity increases when the fluid enters the mass flow meter. The maximum flow velocity is a very important factor for industrial control, and the flow velocity affects the technological process and safety, etc.
- » As a result, some users may have the requirement of the upper limit of the flow velocity. When the viscosity is between two adjacent Pressure Drop lines, the Pressure Drop can be calculated with the formula.

PRESSURE DROP

The pressure drop of the flow meter is the unrecoverable pressure loss resulting from the resistance of the flow. The flow path of the mass flow meter is relatively complex and always with reducing pipe. So, the pressure drop is a very important factor and can't be ignored. The pressure drop of the mass flow meter is dependent upon the fluid characteristics, the flow state, and the structural parameters of the sensor. When the fluid density, viscosity, and flow rate are fixed, the pressure drop is only relevant to the structural factors of the sensor part, such as diameter, cross-sectional area of the flow tube, flow tube shape, etc.

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Note: the mass flow value should be converted to the volume flow value. The pressure drop of the Mass Flow Meter can be checked from the following Pressure Drop Chart (including Pressure Drop, flow, and viscosity parameters). Please contact the factory for the detailed sizing calculation by providing the fluid name, viscosity, density, and flow range.

MODEL SELECTION

SPECIFICATIONS	MODEL CODE										DETAILS
MF											Coriolis Mass Flowmeter
SENSOR TYPE	U										U Type
	W										Micro-bend Type
	S										Super-bend Type
DIAMETER	DN8-DN200										Stand for diameter
PROCESS CONNECTION	DXX										D10: DIN PN10 flange;D25;DIN PN 25 flange
	AXX										A15: ANSI150#flange;A30;ANSI 300# flange
	JXX										J10: JIS 10K flange; J20; JIS 20K flange
	XXX										On request
MEDIUM	L										Liquid
	G										Gas
STRUCTURE & TEMPERATURE RATING	1										Compact Type, -50C~+125°C
	2										Remote Type, -50C~+200°C
	3										High-temperature Remote Type, -50°C~+300°C
	4										Low-temperature Remote Type, -150°C~+125°C
POWER SUPPLY	DC										24V DC
	AC										220V AC
COMMUNICATION	M										Modbus RS485
	H										HART
ACCURACY	1										± 0.1%
	2										± 0.2%
	5										± 0.5%
ACCESSORIES	W										Hygeian
	B										Jacket

SENSOR INSTALLATION

Basic requirements:

The installation of the Mass Flowmeter should decrease the tortuosity of the process connection. Meanwhile, do not support the pipeline by the sensor of the Mass Flowmeter. It is better to support the sensor of the Mass Flowmeter using a rubber connector as the buffer.