Thermal Mass Flowmeter

❖ Introduction

Thermal gas mass flow meter is designed on the basis of thermal dispersion, and adopts method of constant differential temperature to measuring gas flow. It has advantages of small size, easy installation, high reliability and high accuracy. The meter contains two platinum resistance temperature sensors. The thermal principle operates by monitoring the cooling effect of a gas stream as it passes over a heated sensor. Gas flowing through the sensing section passes over two sensors one of which is used conventionally as a temperature sensor, whilst the other is used as a heater. The temperature sensor monitors the actual process values whilst the heater is maintained at a constant differential temperature above this by varying the power consumed by the sensor. The greater the gas velocity, the greater the cooling effect and power required to maintain the differential temperature. The measured heater power is therefore, a measure of the gas mass flow rate.

❖ Features

- Do not need external temperature and pressure sensor for normalize compensation.
- Wide range of flow velocity measurement (0.1 Nm/s to 100 Nm/s) for gas.
- Good vibration resistant and long service life. No moving parts.
- Easy installation and maintenance via hot-tapped installation.

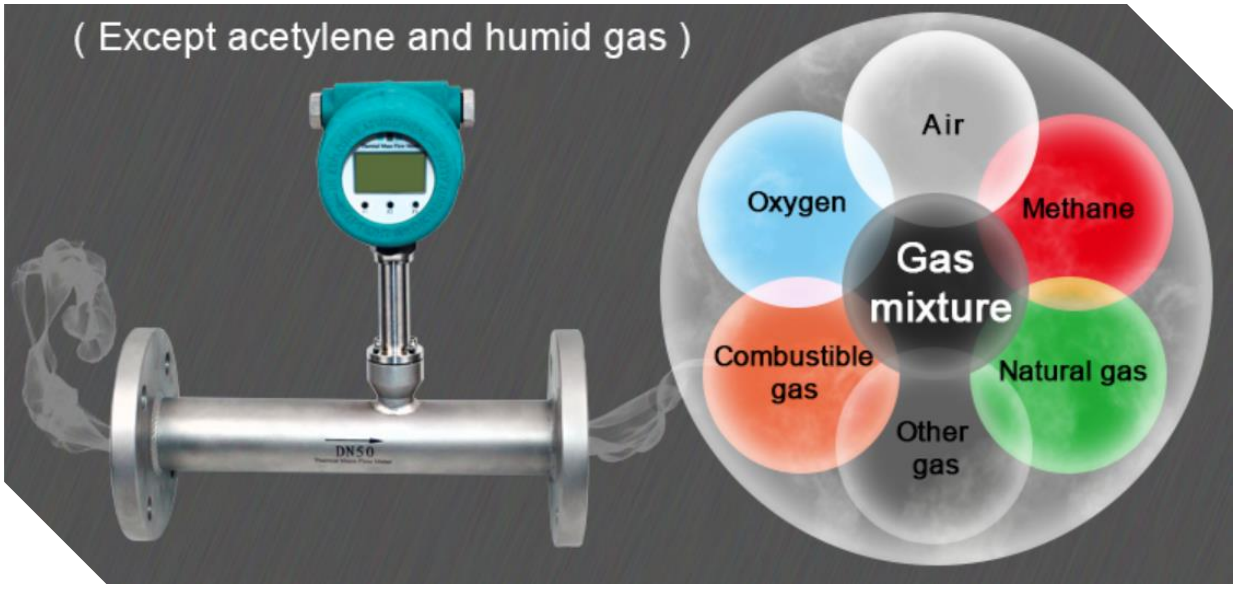
❖ Standard Specification

- Size : DN10-4000mm
- Accuracy : ±1.0 to 2.5%
- Construction : Compact and remote
- Protection Grade : IP65
- Medium Temp. : -30℃ to 200℃
- Ambient Temp. : -20℃ to 45℃
- Power Supply : 24 VDC; 220 VAC
- Display : 4-lines LCD Display
- Language : English, Chinese
  Other languages are available
- Sensor Type : Insertion, hot tapped insertion
  Flanged DIN, ANSI, JIS
  JIS 10K, 20K, 40K
- Material : Stainless Steel 304
  Stainless Steel 316
- Signal Output : 4~20 mA, pulse
- Communication : RS485 Modbus, Hart protocol

❖ Flow Range for Common Gas

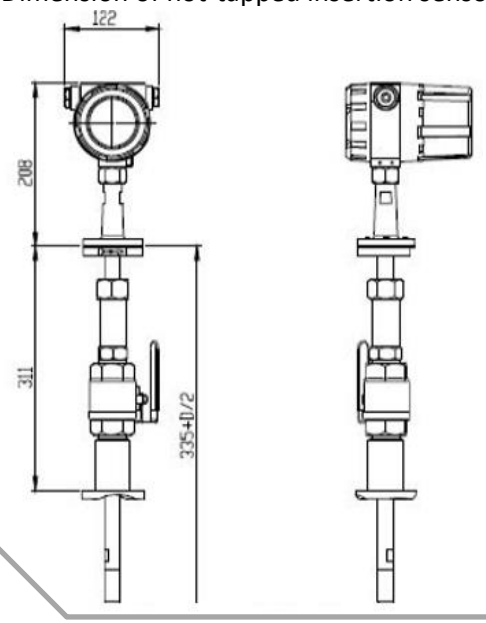
Unit : Nm^3/h

Caliber (mm)	Air	Nitrogen (N_2)	Oxygen (O_2)	Hydrogen (H_2)
15	65	65	32	10
25	175	175	89	28
32	290	290	144	45
40	450	450	226	70
50	700	700	352	110
65	1200	1200	600	185
80	1800	1800	900	280
100	2800	2800	1420	470
125	4400	4400	2210	700
150	6300	6300	3200	940
200	10000	10000	5650	1880
250	17000	17000	8830	2820
300	25000	25000	12720	4060
350	45000	45000	22608	5600
400	70000	70000	35325	7200
450	100000	100000	50638	9200
500	135000	135000	69240	11280
600	180000	180000	90432	16300
700	220000	220000	114500	22100
800	280000	280000	141300	29000
900	400000	400000	203480	36500
1000	600000	600000	318000	45000
2000	700000	700000	565200	18500

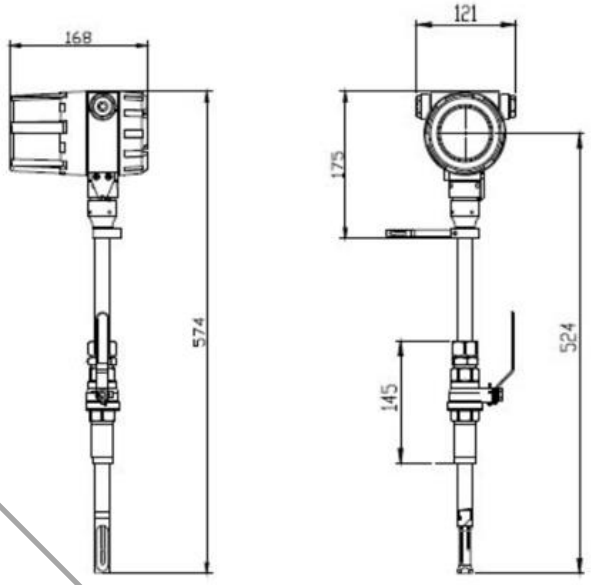


❖ Dimension

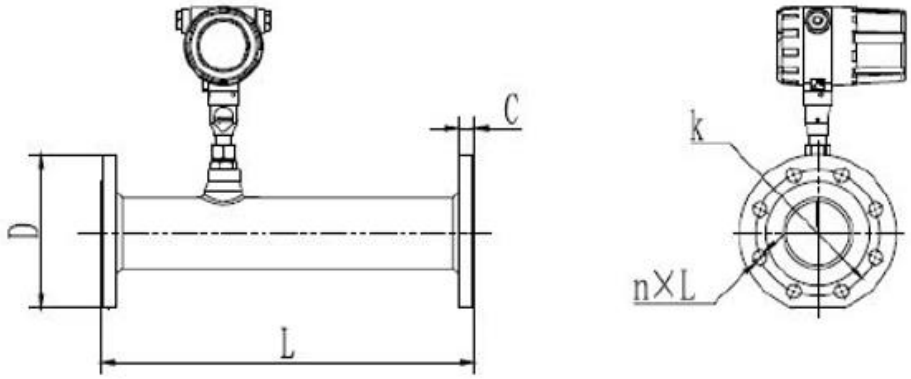
Dimension of hot-tapped insertion sensor



Dimension of standard insertion sensor

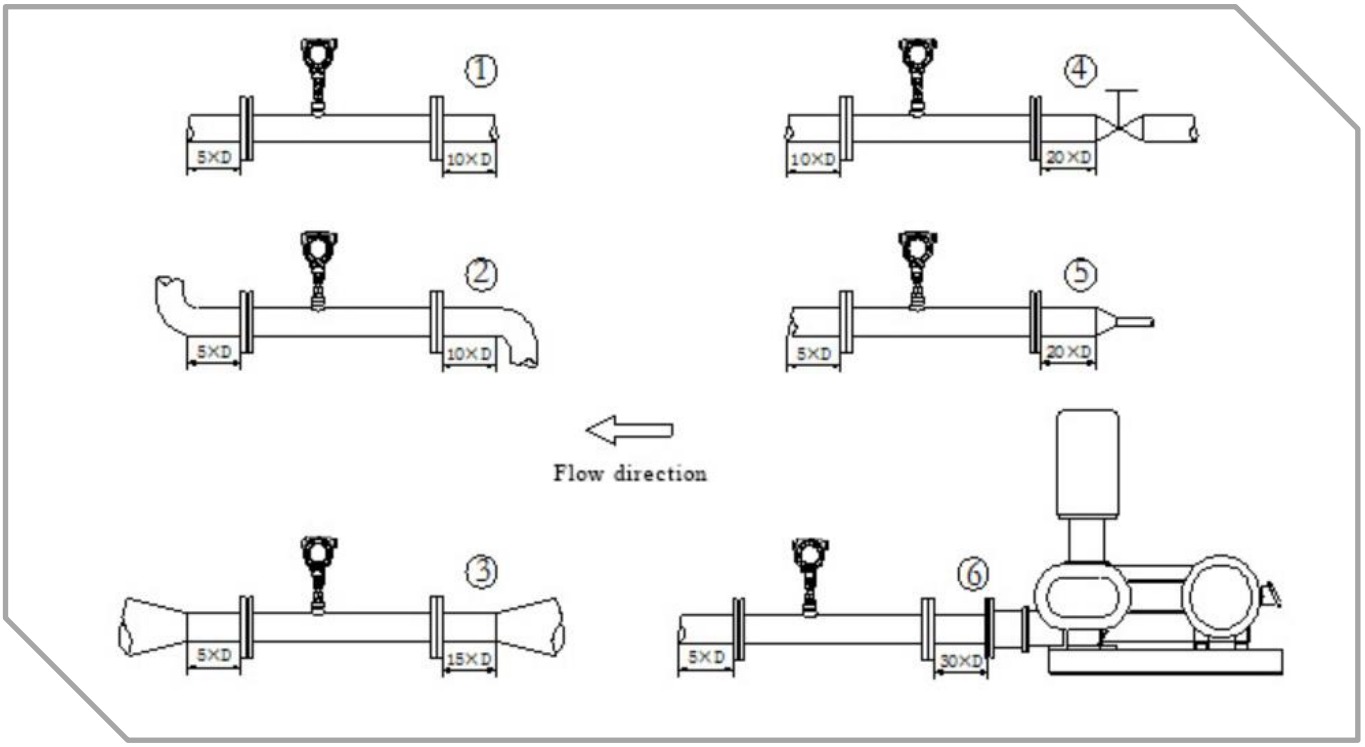


Dimension of flanged sensor



Nominal Diameter	Flange Outer Diameter	Center Hole	Bolt Hole	Screw	Sealing Surface		Flange Thickness	Installation Length
DN	D	k	n x L		d	f	C	L
15	95	65	4 x 14	M12	46	2	14	280
20	105	75	4 x 14	M12	56	2	16	280
25	115	85	4 x 14	M12	65	2	16	280
32	140	100	4 x 18	M16	76	2	18	350
40	150	110	4 x 18	M16	84	2	18	350
50	165	125	4 x 18	M16	99	2	20	350
65	185	145	4 x 18	M16	118	2	20	400
80	200	160	8 x 18	M16	132	2	20	400
100	220	180	8 x 18	M16	156	2	22	500

❖ Installation



❖ Model Selection

Model	QTMF	X	X	X	X	X	X	X
Caliber	DN 15 to DN 4000							
Structure	Compact	C						
	Remote	R						
Sensor Type	Insertion		I					
	Flange		F					
	Clamp		C					
	Thread		S					
Material	SS304			304				
	SS316			316				
Pressure	1.6 MPa				1.6			
	2.5 MPa				2.5			
	4.0 MPa				4			
Temperature	-40 to 200 °C					T1		
	-40 to 450 °C					T2		
Power Supply	85 to 250 VAC						AC	
	24 to 36 VDC						DC	
Signal Output	4-20 mA + Pulse + RS485							RS
	4-20 mA + Pulse + HART							HT