



Thermal Mass Flow Meter



Introduction

Thermal 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, etc.



Principle

- 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.

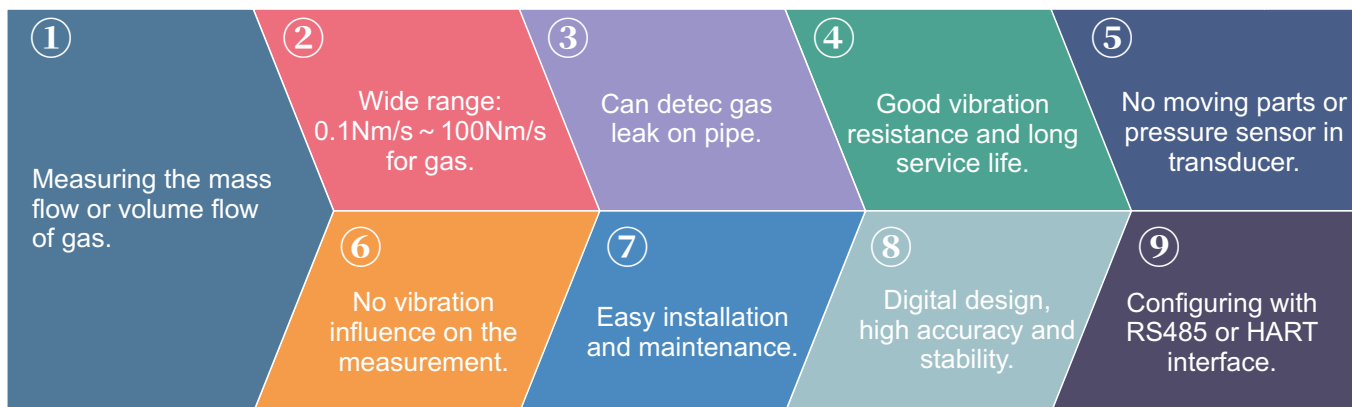
Application



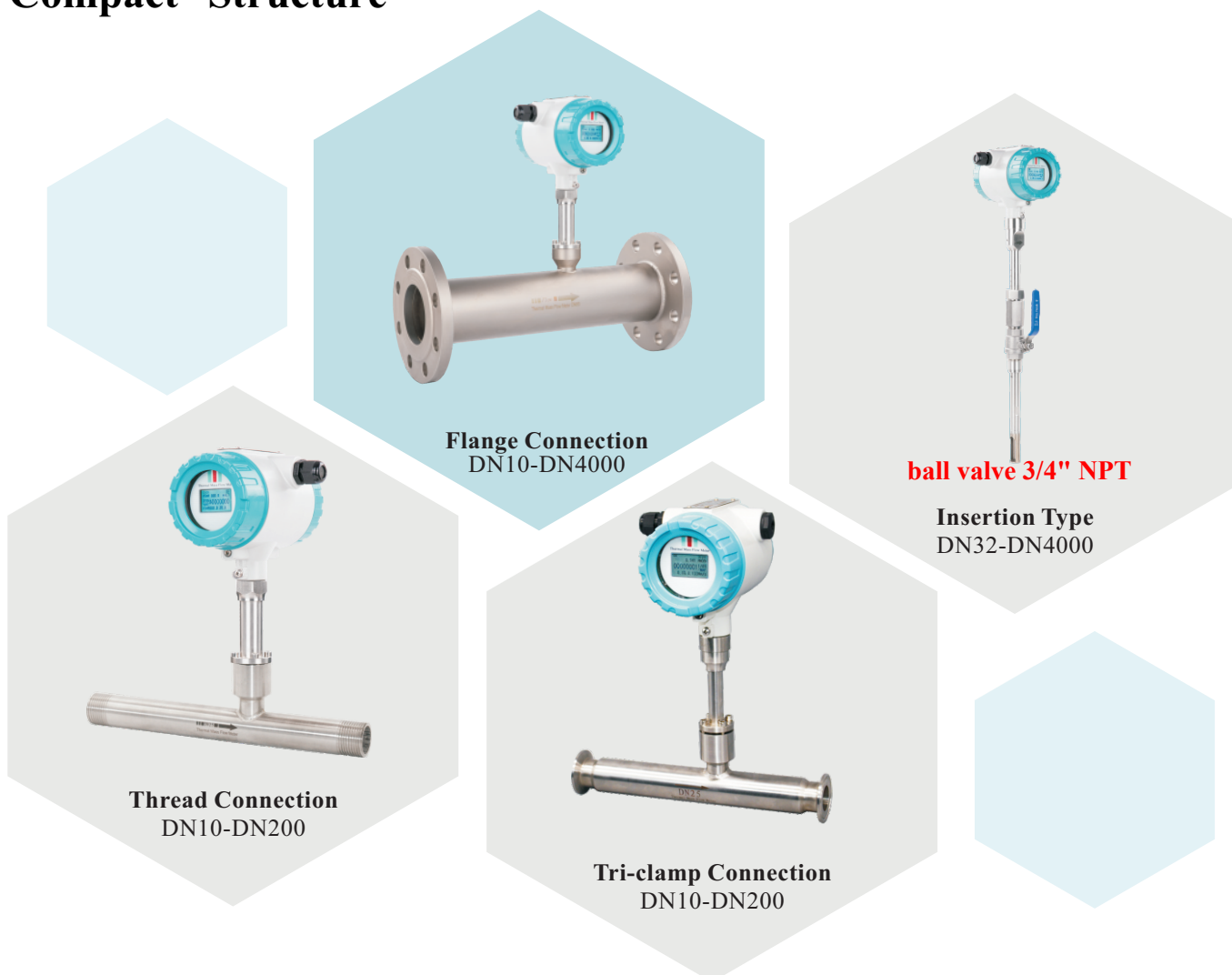
(Except acetylene and humid gas)

- Detailed Gas Composition is needed for Model Selection

Features



Compact Structure



Remote Structure



Parameters

Media	Various Gases (Except Acetylene)
Pipe Size	Insertion: DN32~DN4000 Flange: DN10~DN300 Tri-clamp: DN10~DN100 Thread type: DN10~DN100
Velocity	0.1-100 Nm/s
Accuracy	In-line: $\pm 1.0\%$ FS Insertion: $\pm 1.5\%$ FS
Working Temperature	Sensor: $-40\sim+220^{\circ}\text{C}$ Transmitter: $-20\sim+80^{\circ}\text{C}$
Working Pressure	Insertion $\leq 1.6\text{Mpa}$ Flange $\leq 4.0\text{Mpa}$ Tri-clamp $\leq 1.6\text{Mpa}$ Thread $\leq 4.0\text{Mpa}$ Special pressure please double check
Power Supply	24 VDC and 220 VAC
Response Time	1s
Output	4-20mA, Pulse, RS485 (HART is optional)
Alarm Output	1-2 way relay, 10A/220V/AC or 5A/30V/DC
Construction	Compact, Remote
Pipe Material	Carbon Steel, Stainless Steel, Plastic etc.
Display	4 lines LCD Mass flowrate, Nominal flowrate, Flow totalizer, Velocity, OLED display optional
Grade	IP65
Flow Unit	Nm^3/h , Nm^3/min , NI/h , NI/min , t/h , t/min , kg/h , kg/min
Flow Rate Turndown	100:1
Cable length for remote type	10m standard, 100m max optional

Model Selection

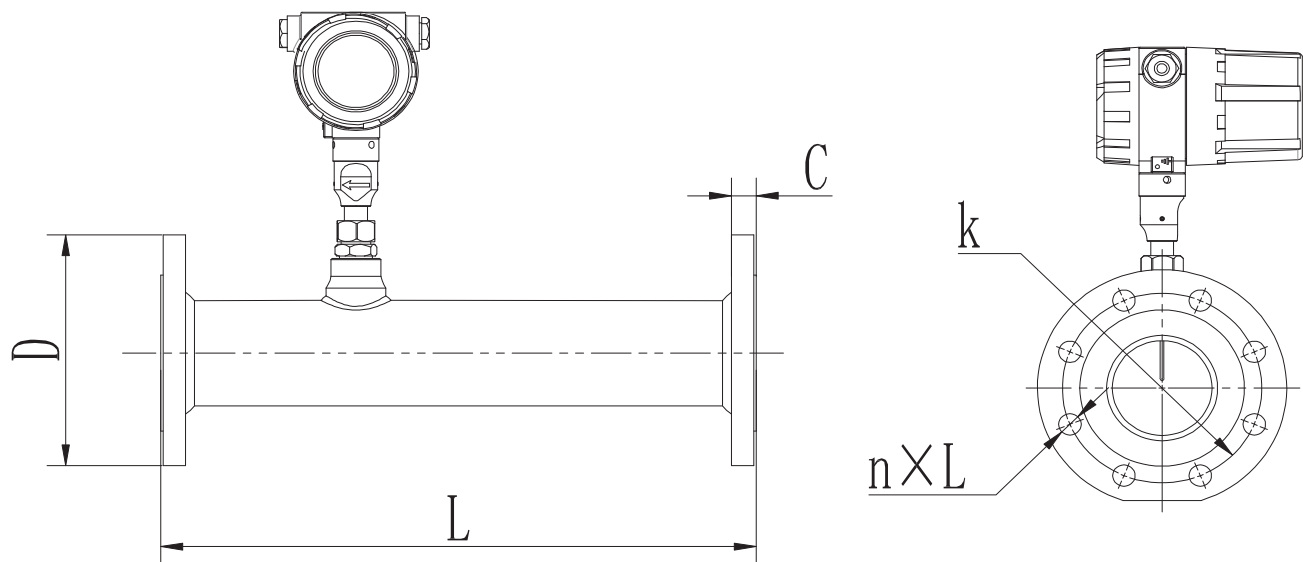
Model	FPC	X	X	X	X	X	X	X
Caliber	DN10-DN4000 (3/8"-158")							
Structure	Compact Remote		C R					
Explosion Proof	Ex d IIC T6 Gb Without			EX W				
Material	SS304 SS316 Others				304 316 O			
Connection	Flange (DN10~DN300) Tri-clamp (DN10~DN100) Thread (DN10~DN100) Insertion (DN32~DN4000)	DIN D10:PN10, D16:PN16, D25:PN25, D40:PN40 ANSI A15:150#, A30:300# JIS J10:10K, J20:20K, J30:30K, J40:40K				D** A** J** C T I		
Power Supply	85~250 VAC 24~36 VDC						AC DC	
Signal Output	4-20mA+Pulse+RS485 4-20mA+Pulse+HART							RS HT

Flow Range (m³/h)

Caliber (mm)	Air	Nitrogen (N ₂)	Oxygen (O ₂)	Hydrogen (H ₂)
10	28	28	14	4
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

Caliber (mm)	Air	Nitrogen (N ₂)	Oxygen (O ₂)	Hydrogen (H ₂)
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

Flange Type Dimension



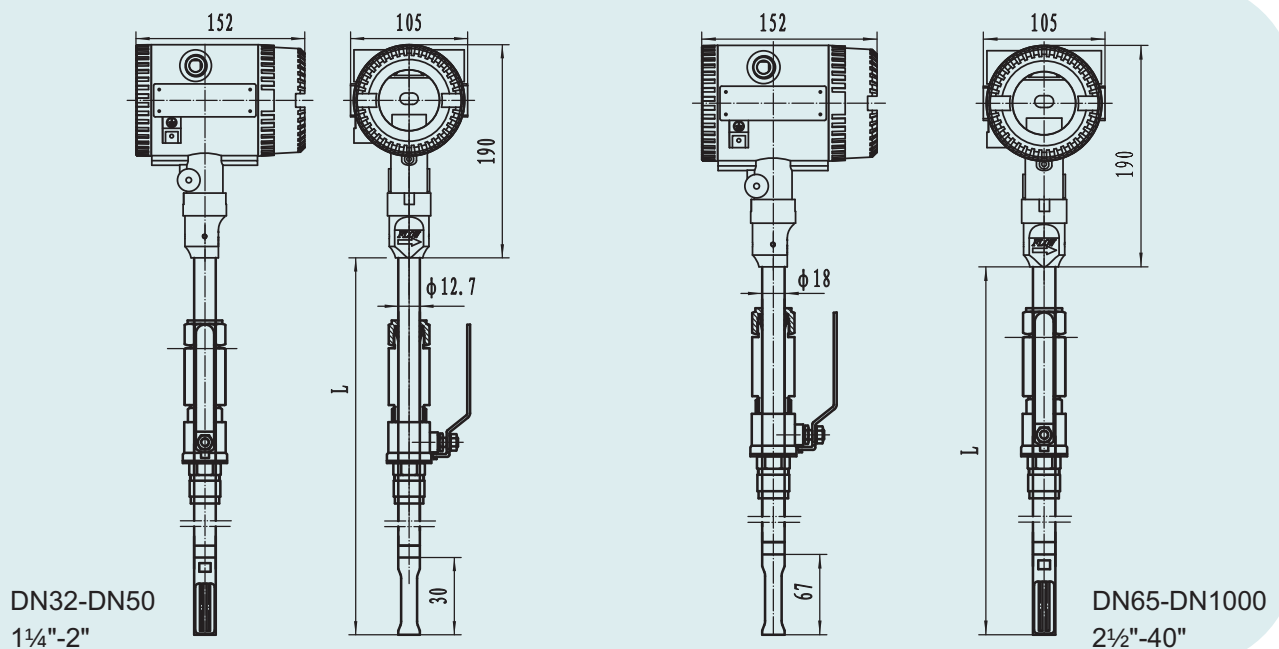
Flange Type

DIN PN16 Flange (Unit: mm)

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

Above drawing is DIN PN16, other standards can be provided on request

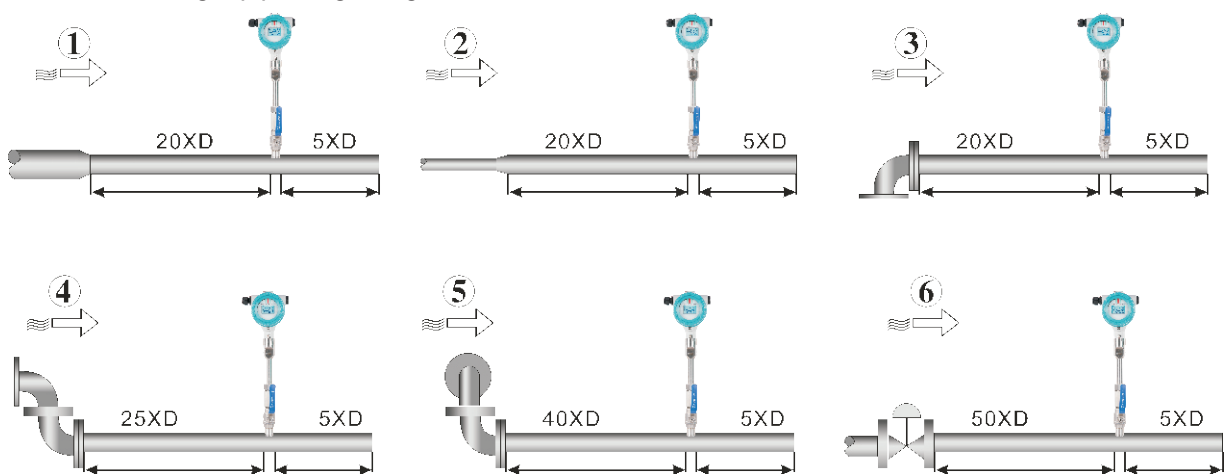
Insertion Type Dimension



Unit:mm

Installation

1. When installing the thermal mass flowmeter, keep away from elbows, obstacles, reducers and valves to ensure a stable flow field. It is required to have a long upper straight pipe. The front straight pipe length is greater than 10D, and the rear straight pipe length is greater than 5D.



upstream and downstream straight pipe

2. When the site cannot meet the requirements of the straight pipe section, the gas rectifier can be connected in series to greatly reduce the requirements for the straight pipe section.