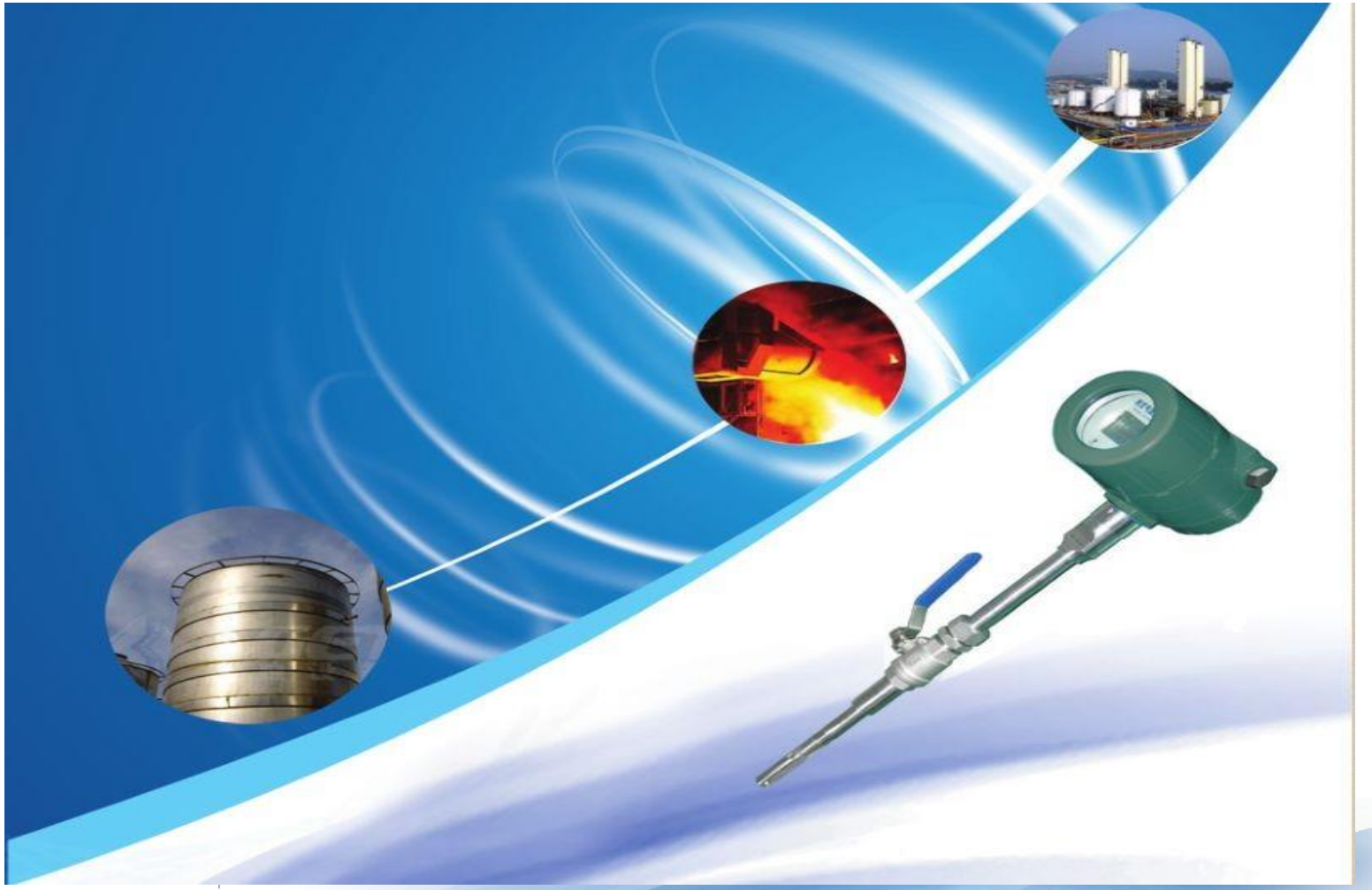
TECHWAY INSTRUMENTS

Add: 503,VALAM BUSINESS HUB,BESIDE GIRIRAJ HOTEL,NH-8,KAPURAI CHOWKDI,VADODARA-390004,GUJARAT,INDIA
Tel: 0091 8780246937 Email: hshukla@techwayinstruments.com Website: WWW.TECHWAY INSTRUMENTS.COM

→Catalogue

Thermal Gas 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, etc.
- 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

- Measuring the mass flow or volume flow of gas
- Do not need to do temperature and pressure compensation in principle with accurate measurement and easy operation.
- Wide range: 0.5Nm/s～100Nm/s for gas. The meter also can be used for gas leak detection
- Good vibration resistance and long service life. No moving parts and pressure sensor in transducer, no vibration influence on the measurement accuracy.
- Easy installation and maintenance. If the conditions on site are permissible, the meter can achieve a hot-tapped installation and maintenance. (Special order of custom-made)
- Digital design, high accuracy and stability
- Configuring with RS485 or HART interface to realize factory automation and integration

Application

Industry:Electric power
Application:Measure air volume of the Primary air, and secondary air
Advantage:No moving parts.Don't clog pipes
High measurement range ratio,small pressure loss

Industry:Water treatment
Application:Measure the air flow in the aeration tank
Advantage:Measure the small flow ,Resistance soiling,dust-fast

Industry:Petrochemical industry,Natural gas
Application:Torch gas emissions,Flue gas,Fertilizer Plant ammonia gas measurement,Natural gas measurement
Advantage:High sensitivity measurement for small flow,High measurement range ratio,Easy to remove and clean

Industry:Glass,Ceramics and building materials industry
Application:Gas furnace inlet control ,Cement industry vertical mills discharge hot air flow control
Advantage:Directly mass flow measurement,high accuracy,actual component calibration

Industry:Food industry,Beverage industry,Pharmacy

Application:Carbon dioxide treatment in the brewery,Exhaust gas flow monitoring in the fermentation container,Food processing operations in the fresh air is added,bottle sterilization in the pharmaceutical industry flow monitoring of hot air

Advantage:High sensitivity measurement for small flow,directly mass measurement,high accuracy

Industry:Air separation unit

Application:Measure the gas of different pipes and confirm the distribution of the gas inside

Advantage:Directly measure mass

High measurement range ratio,small pressure loss

Industry:Machine manufacturing,Electronic

Application:All kinds of gas flow measurement in the fuel cell factory,Various kinds of pure gas measurement in the laboratory

Advantage:Without temperature and pressure compensation,high sensitivity for small flow,Mass flow measurement,high measurement range ratio and small pressure loss

Industry:Metallurgical

Application:Blast furnace gas,Coke oven gas,Steel aerated,Rolling gas, Hydrogen Oxygen ,Nitrogen

Advantage:Easy installation,Easy cleaning,High measurement range ratio,small pressure loss,high accuracy.

Insertion Type

Streamline type thermal gas mass flow meter
Application: DN80<Pipe Dia.<DN500

Flange clamp type gas mass flow meter

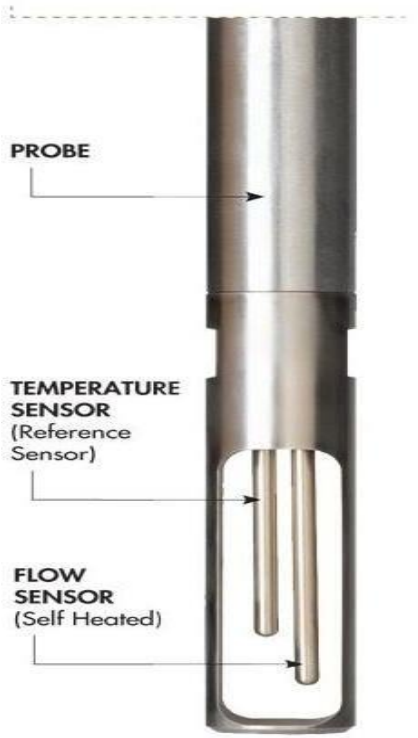
Streamline remote type display gas mass flow meter

Flange insert type gas mass flow meter

Standard thermal gas mass flow meter
Application: DN80<Pipe Dia.<DN4000

Flange Type

Sensor Structure



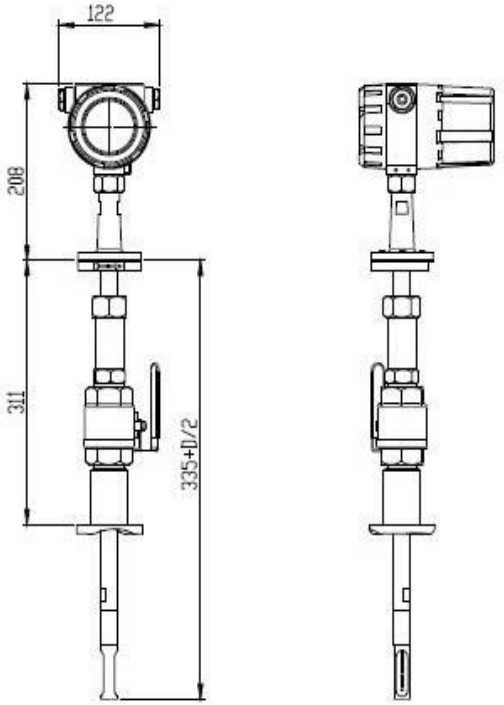
- Integral insertion should be inserted into the the axis pipe,so the length of measurement bar is decided by the pipe size.When placing order,if the gas mass flow meter can’ t reach the pipe axis,factory will supply the calibration coefficient so that to finish the accuracy measurement

Technical Parameters

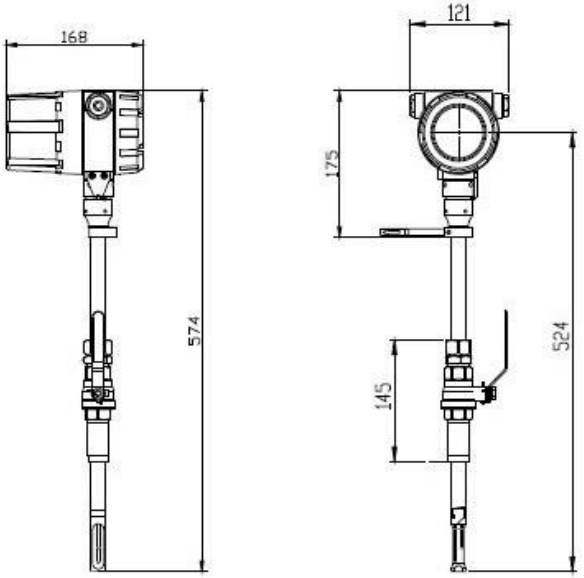
Description	Specification
Medium	Gas(Except acetylene)
Pipe size	DN10-4000mm
Sensor type	Standard Insertion, Hot-tapped Insertion and Flanged
Construction	Compact and Remote
Sensor Housing Material	SS304 or SS 316
Pipe Material	Carbon steel, stainless steel, plastic, etc
Velocity	0.1-100N/ms
Medium temperature	Sensor: -30~+200℃ ;Max.350℃ Transmitter:-20-+45℃
Working pressure	Medium pressure≤1.6MPa
Accuracy	±1.0~2.5%
Power supply	Compact type: 24VDC or 220VAC, Power consumption ≤18W Remote type: 220VAC, Power consumption ≤19W
Response time	1S
Output	4-20mA (optoelectronic isolation, maximum load 500Ω), Pulse,RS485 (optoelectronic isolation) and HART
Alarm output	1-2 line Relay, Normally Open state, 10A/220V/AC or 5A/30V/DC
Display	4 lines LCD display Mass flow, Volume flow in standard condition, Flow totalizer, Date and Time, Working time, and Velocity, etc.
Protection class	IP65

Dimensions

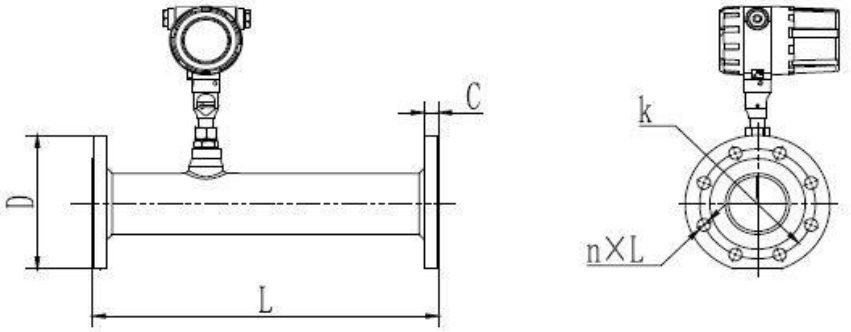
Dimensions of hot-tapped insertion sensor



Dimensions of standard insertion sensor



The dimensions of flanged sensor

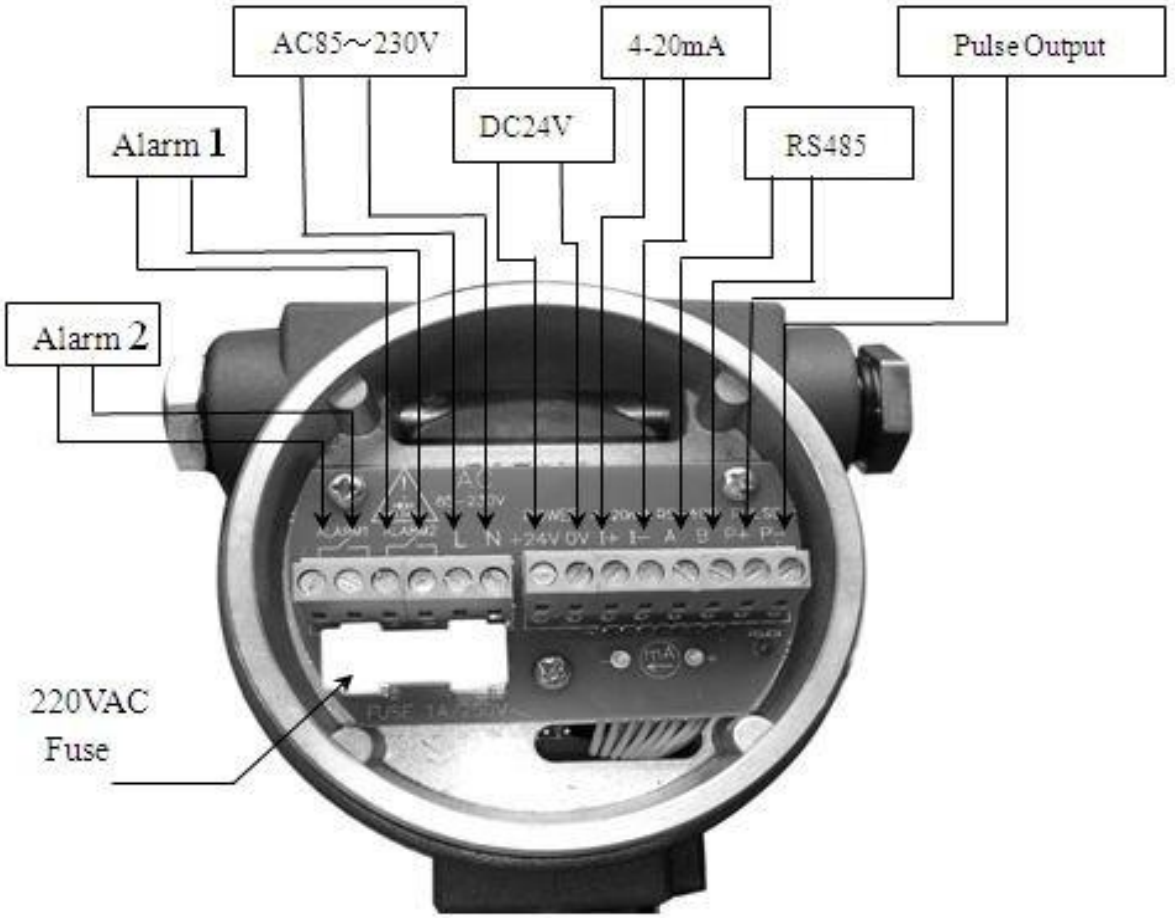


Size table (PN16 flange,Unit: mm)

Nominal Dia.	Flange Outer Diam	Center Hole	Screw Hole	Screw Thread	Sealing Face		Flange Thickness	Pipeline Length
DN	D	K	NxL		d	f	C	L
15	95	65	4x14	M12	46	2	14	280
20	105	75	4x14	M12	56	2	16	280
25	115	85	4x14	M12	65	2	16	280
32	140	100	4x18	M16	76	2	18	350
40	150	110	4x18	M16	84	2	18	350
50	165	125	4x18	M16	99	2	20	350
65	185	145	4x18	M16	118	2	20	400
80	200	160	8x18	M16	132	2	20	400
100	220	180	8x18	M16	156	2	22	500

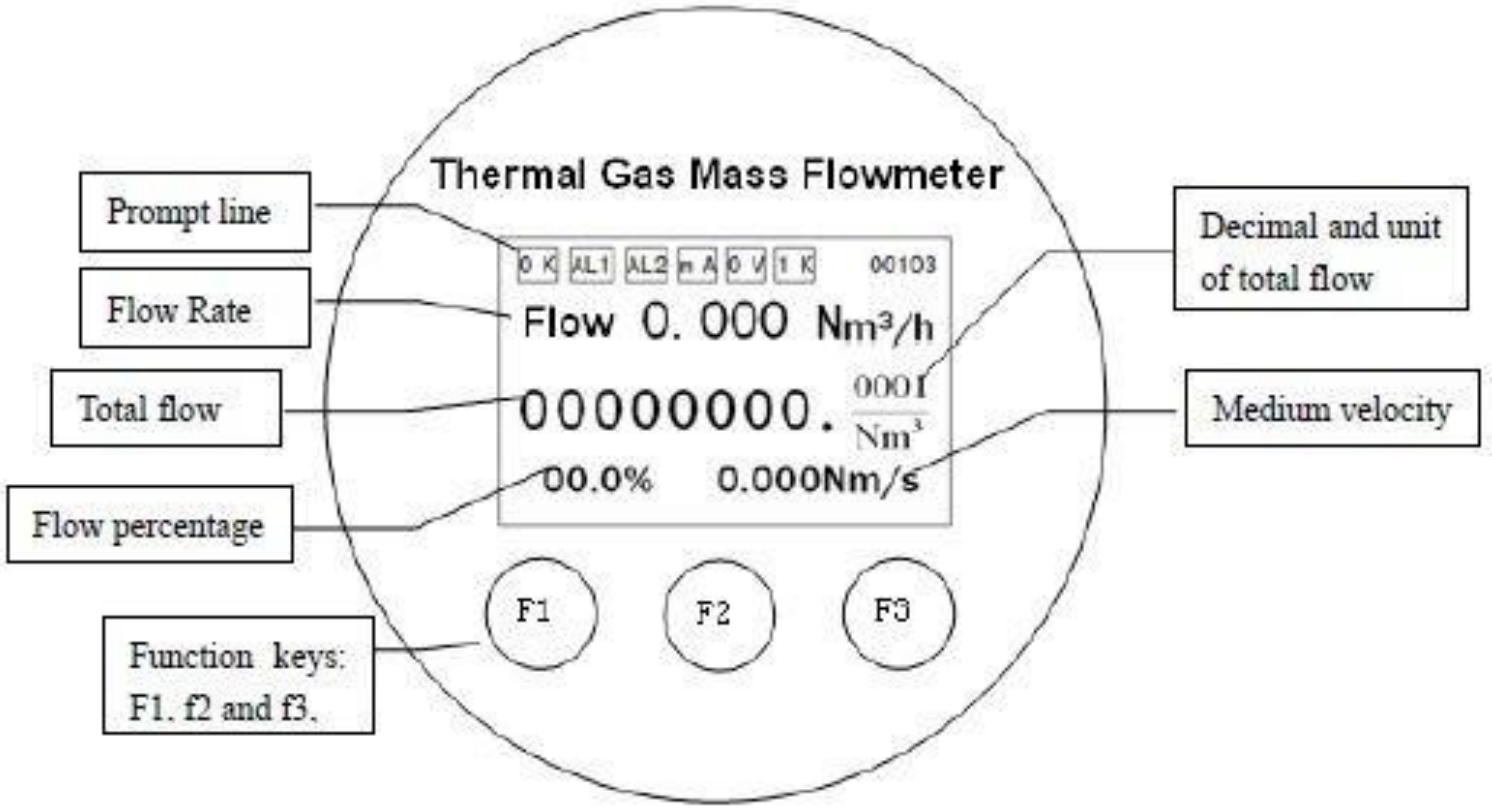
For DN15-DN80, the meter can be made with threading to connect.
The above table is used for rated pressure of 1.6MPa. If the rated pressure is more than 1.6MPa, please contact us for special order.

Transmitter Wirings



Display

The display of meter in working status is shown as below.



Upper Range Value of Common Gas

(Unit: Nm3/h. The follow table can be extended)

Nominal Dia.(mm)	Air	Nitrogen（N2）	Oxygen（O2）	Hydrogen(H2)
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	63000	3200	940
200	10000	10000	5650	1880
250	17000	17000	8830	2820
300	25000	25000	12720	4060
400	45000	45000	22608	7200
500	70000	70000	35325	11280
600	100000	100000	50638	16300
700	135000	135000	69240	22100
800	180000	180000	90432	29000
900	220000	220000	114500	77807
1000	280000	280000	141300	81120
1200	400000	400000	203480	91972
1500	600000	600000	31800	10152
2000	700000	700000	565200	18048

The flow rate in standard condition: The flow rate is in the condition of 20℃ temperature

and 101.325kPa pressure

Model selection

Model												
TMF												Instruction
Sensor type	C											Thermal gas mass flow meter
	D											Streamline insertion type
	E											Line insertion type
	F											Flange type
	G											Clamp type
Caliber(mm)	Tube Inner Dia.:10-6000mm											Direct Input Dia.
	Square tube need supply side length:25*25-2000*2000											*Special pipe need be marked
Material					A							1Cr18Ni9Ti
					B							0Cr18Ni9
					C							0Cr17Ni12Mo2
					D							Anti-corrosion coating
					E							Other material
Pressure(MPa)						S						1.6
						M						2.5
						T						4
Temperature(C)							I					-40~200C
							II					-40~450C
Output								1				RS-485
								2				4-2mA
								3				PULSE
								4				Relay normally open contact
								5				HART
Power supply									DC			24VDC
									AC			220VAC
Display											J	Status display
											S	Remote display

- Note:1.Integral insertion should be inserted into the the axis pipe,so the length of measurement bar is decided by the pipe size.
- When placing order,if the gas mass flow meter can't reach the pipe axis,we will supply the calibration coefficient so that to finish the accuracy measurement