SRK-M Series Micro-Flowrate Thermal Mass Flow Meter

General

SRK-M Micro-flowrate 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.

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

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 affect and power required maintaining the differential temperature. The measured heater power is therefore a measure of the gas mass flow rate.

The format of gas velocity and power is shown as below:

$$V = \frac{K[Q/\Delta T]^{1.87}}{\rho_g} \quad \cdots\cdots\cdots (1)$$

Where: ρ_g is specific gravity of medium

K is balance coefficient

Q is heater power

ΔT is differential temperature

The medium temperature range of meter is -40° C~220° C.

In the format (1), the specific gravity of medium is related to the density:

$$\rho = \rho_n \times \frac{101.325 + P}{101.325} \times \frac{273.15 + 20}{273.15 + T} \quad \cdots\cdots\cdots(2)$$

Where: ρ_g is specific gravity of medium (kg/m^3)

ρ_n is the medium density in standard condition, 101.325Kpa and 20 ° C(kg/m^3)

P is the pressure in working condition (kPa)

T is the temperature in working condition (°C)

In the formats (1) and (2), there is a certain functional relationship between the velocity and pressure in working condition, medium density, the temperature in working condition.

Due to the sensor temperature is always 30° C higher than the medium temperature (environment temperature), and the meter adopts method of constant differential temperature, therefore the meter do not need to do temperature and pressure compensation in principle.

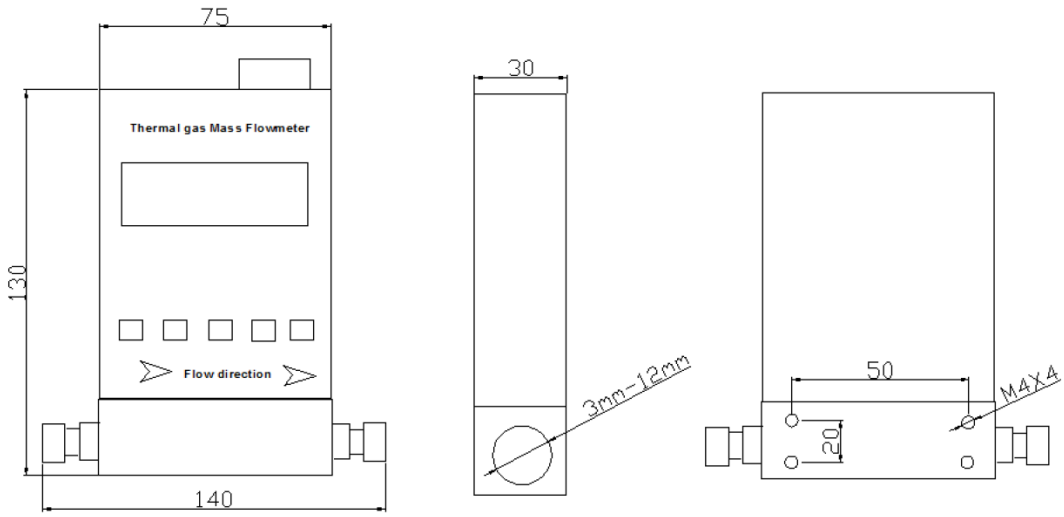
Specifications

Medium	Various Gases (Except acetylene)
Pipe Size	DN3~DN10 mm
Velocity	0.1 ~ 100 Nm/s
Accuracy	± 1 ~2.5 %
Working Temp.	Sensor -40~ +220 °C, Transmitter: -20 ~ +40 °C
Working Pressure	≤ 1.6Mpa
Power Supply	18-30V DC, max current 625mA
Response Time	1 s
Output	4-20mA ,Pulse,RS485
Alarm Output	2 line Relay, Normally Open state,3A/30V/DC
Display	4 Line LCD,Mass Flow,Volume Flow in Standard Condition,Flow totalizer,Velocity.,etc
Temperature Coefficient	User Specified Conditions: Within ±50°F, affect±0.02% per °F of reading. ±50-100°F, affect±0.03% per °F of reading. Within ±25 °C, affect±0.04% per °C of reading. ±25 °C-50 °C, affect±0.06% per °C of reading.
Pressure Coefficient	User Specified Conditions:, within±50 psig(3.4 barg) can ignore. Higher pressure needs specific calculation.
Enclosure	Hazardous area IP67 or NEM4A(IP65), aluminum casting with powder coated
Sensor Material	Stainless Steel 316
Electrical Connection	3/4” NPT , Hazardous area IP67 1/2”NPT,NEMA 4X IP65

Flow Range

DN(mm)	Min(mL/min)	Max(mL/min)	Min(L/h)	Max(L/h)
3	0.000	21000	0.000	1272
4	0.000	37000	0.000	2261
6	0.000	84000	0.000	5100
8	0.000	150000	0.000	9050
10	0.000	235000	0.000	14137

Dimensions



Model Selection

Item	Code	Description
Product Code	SRK-M	Micro-Flowrate Thermal Mass Flow Meter
Size	DN	3mm,4mm,6mm,8mm,10mm
Output	1	4-20mA
	2	Pulse
	3	RS485,Modbus
	4	Hart Protocol
Alarm	A0	No alarm
	A1	1 alarm relay output
	A2	2 alarm relay outputs
Process Connection		Please specify