YUA
Fast · Accurate · Managing

0.1 Nm/s
Low measurement limit
1:2500 Turndown ratio

01010
Full-digital Signal Processing
Eliminates zero point drift

Intelligent diagnosis prevent the sensor from being polluted and damaged



F221x - F222x Series

Thermal Mass Flow Meter

OEM Type Thermal Mass Flow Meter

THERMAL MASS FLOW METER

Product Overview

F221x & F222x flow meter is based on thermal measurement technology. It can measure the standard flow, mass flow, consumption, and gas temperature directly

No moving parts, stable signal, vibration proof, high reliability, long-term measuring accuracy

Full-digital signal processing is used instead of the conventional analog bridge design, resulting in a wider range and more accurate measurment.

The low measuring limit can reach 0.1Nm/s, and the turndown ratio can reach 1:2500. It has a wider measuring range than common flow meters on the market, making it suitable for measuring extremely volatile flow, low-flow bypass, and the gas consumption of single equipment.

With the innovative, intelligent diagnosis technology, it can sense the sensor pollution online and protect the sensor from overheating

Product Advantages

Low Measuring Lower Limit

The low measuring limit can reach 0.1 Nm/s

Full-digital Signal Processing

Eliminates zero point drift and provides highly accurate measurements

30+ Points of Calibration

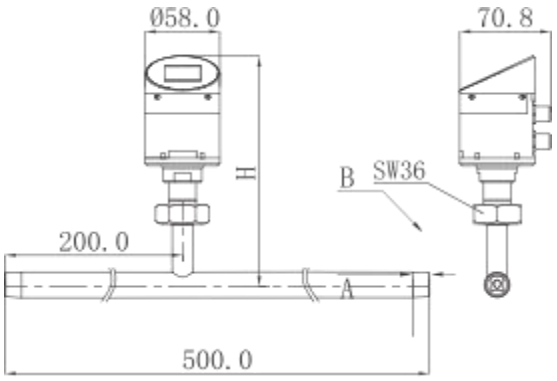
Overcome the nonlinear defects which occur in thermal measurement

Installation under Pressure

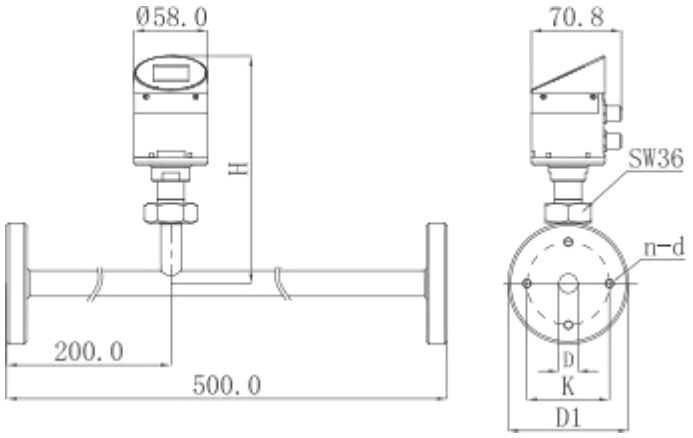
Non-intrusive installation without downtime, almost zero pressure drop

- Full-digital signal processing, higher accuracy, long-term stability
- Based on the thermal flow measurement principle, it's not required to compensate gas pressure and temperature, integrated temperature measurement
- With an ultra-wide 1:2500 turndown ratio, the measuring range is from 0.1 Nm/s to 250 Nm/s
- The fully isolated electrical structure can completely filter out field disturbrance
- The capacitive touch 1.5" IPS LCD with an ultra-wide viewing angle
- Standard Modbus RTU (RS485) interface, 4 to 20 mA current and pulse output
- Insert type F221x: Suitable for pipes with diameters from DN20 to DN1000, and can be installed under pressure via a 1/2" ball valve.
- Pipe type F222x:
  Pipe size: DN15, DN20, DN32, DN40, DN50, DN65, DN80
  The process for connection: R-type thread, Flange EN1092-1, ANSI/B16.5

Product Dimensions



F222x Thread-type dimension schematic



F222x Flange-type dimension schematic

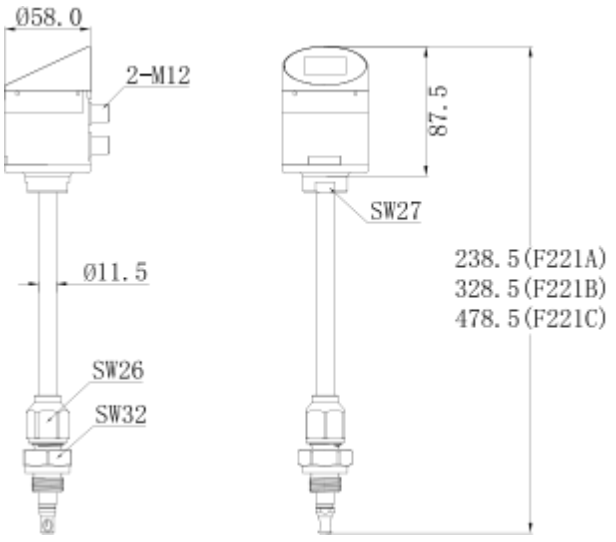
F221x Detailed dimension of thread-type

DN	Inch	A Thread length (mm)	B Male thread (mm)	H Pipe center to top of housing (mm)
15	1/2	≥13.2	R1/2"	177
20	3/4	≥14.5	R3/4"	176
25	1	≥16.8	R1"	175
32	1 1/4	≥19.1	R1 1/4"	177
40	1 1/2	≥19.1	R1 1/2"	177
50	2	≥23.4	R2"	177

F222x Detailed dimension of flange-type

DN	(Inch)	D Pipe inner diameter (mm)	D1 Flange outer diameter (mm)	K Screw hole center distance (mm)	H Pipe center to top of housing (mm)	n Number of flange holes	d Screw ole diameter (mm)
15	1/2	15	95	65	177	4	14
20	3/4	20	105	75	176	4	14
25	1	25	115	85	175	4	14
32	1 1/4	32	140	100	177	4	18
40	1 1/2	40	150	110	177	4	18
50	2	50	165	125	177	4	18

Product Dimensions



F221x dimension schematic

Product Applications

Thermal flow meters are widely used in the fields of industrial processes, chemical industry, petrochemical industry, power engineering, heating system, etc.



Monitoring of compressed air consumption

F221x Measuring Range

(Inch)	DN	ID (mm)	Min Flow (Nm^3/h)	Max Flow -Std (Nm^3/h)	Max Flow -High (Nm^3/h)
3/4	20	20	0.1	135	282
1	25	25	0.2	212	441
1 1/4	32	32	0.3	347	723
1 1/2	40	40	0.5	542	1131
2	50	50	0.7	848	1767
2 1/2	65	65	1.2	1433	2986
3	80	80	1.8	2171	4523
4	100	100	2.8	3392	7068
5	125	125	4.4	5301	11044
6	150	150	6.4	7634	15904
8	200	200	11.3	13571	28274
10	250	250	17.7	21205	44178
12	300	300	25.4	30536	63617

* For more pipe sizes and flow ranges, please consult sales

F222x Measuring Range

(Inch)	DN	ID (mm)	Min Flow (Nm^3/h)	Max Flow (Nm^3/h)
1/2	15	15	0.06	76
3/4	20	20	0.1	135
1	25	25	0.2	212
1 1/4	32	32	0.3	347
1 1/2	40	40	0.5	542
2	50	50	0.7	848
2 1/2	65	65	1.2	1433
3	80	80	1.8	2171

* For more pipe sizes and flow ranges, please consult sales

Technical Data

Flow

Measuring Range	0(0.1) … 250 Nm/s
Accuracy	±(1.5% RD + 0.3% FS) [1% RD Option]
Sampling Rate	> 20 Samples / sec
Medium	Compressed air, nitrogen, oxygen, Carbon dioxide & other non-condensing gases
Reference Conditions	20 °C, 1 bar(a) -ISO 1217 (Configurable)

Output

4~20 mA Output (Standard)	Flow rate / Temperature (Configurable)
Pulse Output (Standard)	Consumption / Alarm
Digital Output (Standard)	Modbus RTU (RS485)
Connector	2 × 5pin M12, Female

Power

Power	18 … 30VDC 5W @ 24VDC

Display

Display	1.5" IPS LCD with capacitive touch

Operating Environment

Environment Temperature	-30 … +70 °C
Medium Temperature	-40 … 150 °C
Operating Pressure	F221x: 0 … 1.7 MPa(a) F222x: 0 … 1.7MPa(a) (4.0 / 6.3 MPa.a Option)

Other

Process Connection	G1/2" (ISO 228-1) (F221x Insert type)
EMC	Compliant with IEC 61326-1
Pole / Pipe Section Material	SUS304 (Standard) SUS316 (Option)

Order Information

Model	Process Connection	Digital Output	Analog Output	Flow Range	Gas type	Accuracy	Description
F221A							Thermal Mass Flow Meter, Insert type, 160 mm pole length (Suitable for pipe diameter DN20 ~ 100)
F221B							Thermal Mass Flow Meter, Insert type, 250 mm pole length (Suitable for pipe diameter DN20 ~ 250)
F221C							Thermal Mass Flow Meter, Insert type, 400 mm pole length (Suitable for pipe diameter DN20 ~ 600)
	1						ISO G1/2" Screw
		1					Modbus RTU (RS485)
			1				4 … 20 mA + Pulse Output
				V0205 0002			Standard Range (0~120 Nm/s)
				V0205 0003			Extended Range (0~250 Nm/s)
					V0202 0001		Air
					V0202 0002		Oxygen (O_2)
					V0202 0003		Nitrogen (N_2)
					V0202 0004		Hydrogen (H_2), Real Gas Calibration
					V0202 0005		Nitroous Oxide (N_2O)
					V0202 0006		Carbon Dioxide (CO_2)
					V0202 0007		Natural Gas (NG)
					V0202 0008		Argon (Ar)
					V0202 0009		Helium (He), Real Gas Calibration
					V0202 0010		Other Specified Gases (Specify Gas or Gas Mix)
						V0204 0001	Standard Accuracy Calibration ±(1.5% RD + 0.3% FS)
						V0204 0002	High Accuracy Calibration ±(1% RD + 0.3% FS)

* Built-in 4G or Wi-SUN module, not compatible with explosion-proof function

* There are difference in regulations and standards between contuntries and regions. Please select according to the local Wi-SUN frequency band

Order Information

Model	Digital Output	Analog Output	Process Connection	Gas type	Accuracy	Description
F222A						Thermal Mass Flow Meter, Pipe type, Maximum pressure: 1.7 MPa(a)
F222B						Thermal Mass Flow Meter, Pipe type, Maximum pressure: 4.0 MPa(a)
F222C						Thermal Mass Flow Meter, Pipe type, Maximum pressure: 6.3 MPa(a)
	1					Modbus RTU (RS485)
		1				4 … 20 mA + Pulse Output
			V0207 0001			R thread (ISO-7-1), DN15, 1/2"
			V0207 0002			R thread (ISO-7-1) , DN20, 3/4"
			V0207 0003			R thread (ISO-7-1), DN25, 1"
			V0207 0004			R thread (ISO-7-1), DN32, 1.25"
			V0207 0005			R thread (ISO-7-1), DN40, 1.5"
			V0207 0006			R thread (ISO-7-1), DN50, 2"
			V0207 0023			R thread (ISO-7-1), DN65, 2.5"
			FLG-15			Flange (EN 1092-1), DN15, 1/2"
			FLG-20			Flange (EN 1092-1), DN20, 3/4"
			FLG-25			Flange (EN 1092-1), DN25, 1"
			FLG-32			Flange (EN 1092-1), DN32, 1 1/4"
			FLG-40			Flange (EN 1092-1), DN40, 1 1/2"
			FLG-50			Flange (EN 1092-1), DN50, 2"
			FLG-65			Flange (EN 1092-1), DN65, 2.5"
			FLG-80			Flange (EN 1092-1), DN80, 3"
				V0202 0001		Air
				V0202 0002		Oxygen (O_2)
				V0202 0003		Nitrogen (N_2)
				V0202 0004		Hydrogen (H_2), Real Gas Calibration
				V0202 0005		Nitroous Oxide (N_2O)
				V0202 0006		Carbon Dioxide (CO_2)
				V0202 0007		Natural Gas (NG)
				V0202 0008		Argon (Ar)
				V0202 0009		Helium (He), Real Gas Calibration
				V0202 0010		Other Specified Gases (Specify Gas or Gas Mix)
					V0204 0001	Standard Accuracy Calibration ±(1.5% RD + 0.3% FS)
					V0204 0002	High Accuracy Calibration ±(1% RD + 0.3% FS)

* Wi-SUN communication module is available as an option. Please refer to the accessories list (P108) for details

https://yua-instruments.com/

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