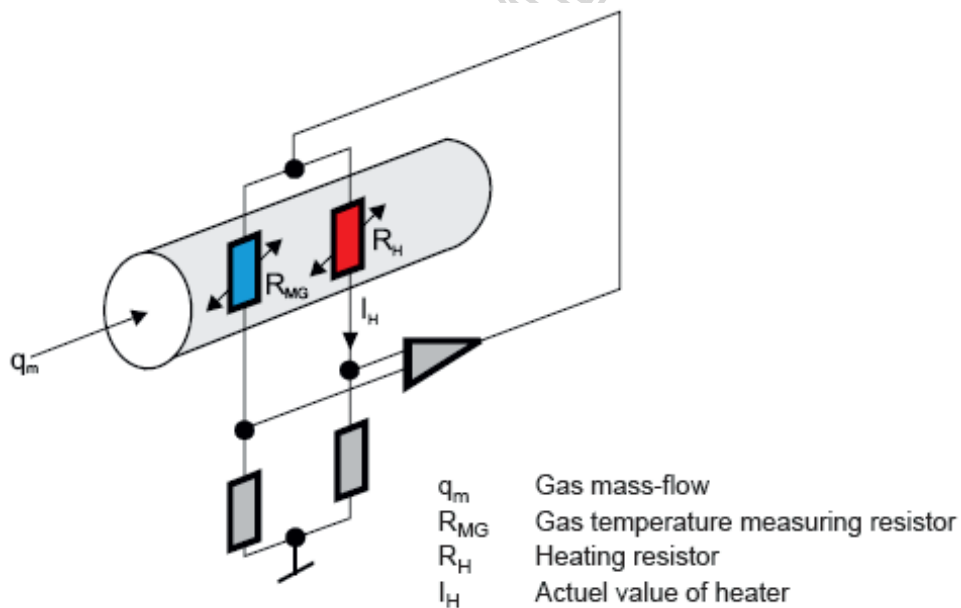


BIMCO400 Series Thermal Mass Flowmeter

1. Brief Introduction

BIMCO400 Series Thermal Mass Flowmeter is BIMCO's latest thermal mass technology with more rugged design to adapt to harsh industrial applications. It implements BIMCO's latest sensor filming technology and high sensitivity sensors to ensure a stable measurement at very low flow rate down to 0.3~30Nm/s. The standard insertion model can fit in pipe line from DN25~ DN400. The latest BIMCO600 circuit board and a dual-line LCD display provide user with most powerful and friendly operating interface. The BIMCO600 technology also ensures the product to give stable and accurate measurement and reliable output.

BIMCO400 Series Thermal Mass Flowmeter measures the gas mass flow base on thermal diffusion theory. It has two filmed RTDs as its sensors, one of which sense the velocity of the gas flow (RH) and the other one will detect the temperature shift of the gas flow (RMG). When the two RTD are in the gas flow ,the RH will be heated while the RMG will sense the temperature changing of the gas flow. More heat will be taken away as the velocity of the gas flow increasing, so the temperature on RH will decline.



According to King's law, the heating power P , the temperature difference ΔT ($T_{RH}-T_{RMG}$) and the mass flow rate are mathematical related. $P/\Delta T=K_1+K_2 f(Q)K_3$, the K_1 、 K_2 、 K_3 are constants related to the properties of the gas. BIMCO Series Thermal mass flow meter is designed base on constant power measuring method, thus the RTD is heated in a consistent power and will be more durable and stable. That is why BIMCO flow meter has less problem of zero-off which may be caused by a function failure of RTD due to over-heated in long term.

2. Application

BIMCO400 is designed for compressed air(dry), N2 gas flow measurement.



Picture: LCD displayer of thermal mass flowmeter

2. Product features

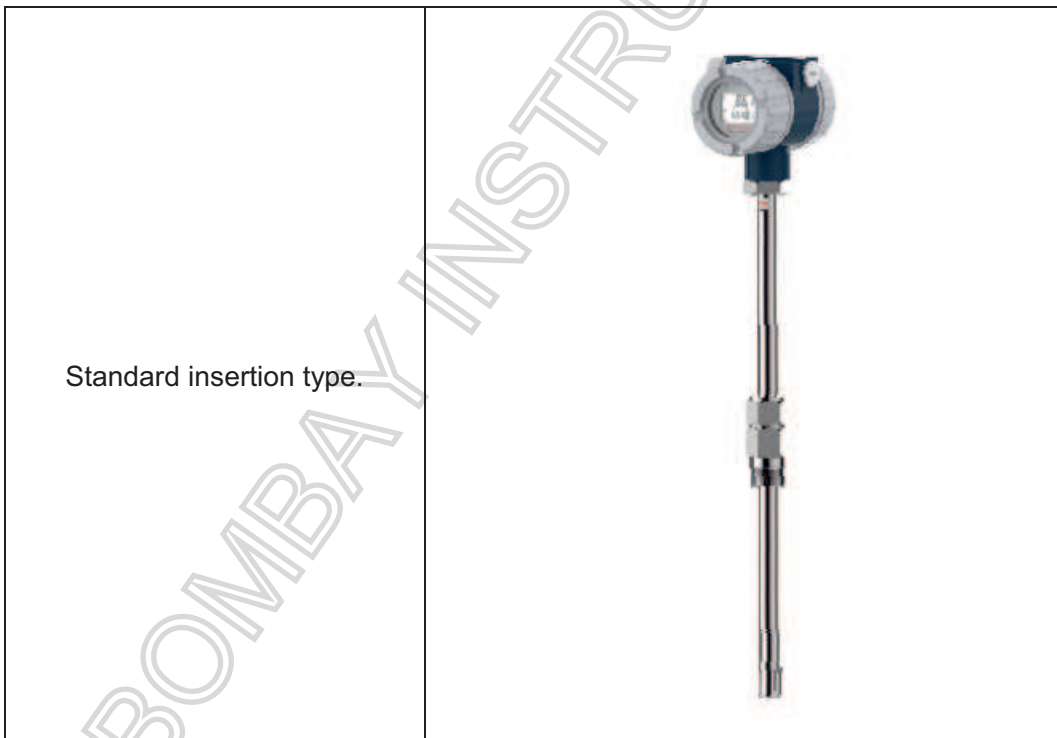
- 1) 100:1 turn down ratio in 5 ranges: 0.3~30Nm/s; 0.6~60Nm/s;0.9~90Nm/s; or 1.2~120Nm/s.
- 2) No pressure loss, suitable for pipe in any shape with known sectional area
- 3) For the insertion type, installation and maintenance can be finished on line
- 4) Measure the mass flow and standard flow directly.

- 5) Patent protected mathematical model for treatment of flow with impurity of water, is suitable for the special working environment of gas drainage
- 6) High accuracy data acquisition circuit to ensure outstanding repeatability and accuracy of the flow meter.
- 7) Electrical structure of total isolation to ensure a excellent EMC properties and avoid the interference from outside
- 8) High efficiency design of power supply, the total power consumption is only 60mA@24VDC
- 9) 16V~32V wide voltage range input to fit in all electricity environment
- 10) Self-protection design of Zener safety barrier inside
- 11) Metric Unit display and Metric/British unit selectable
- 12) RamTron F-RAM for permanent storage of date
- 13) Password function makes device management easier
- 14) Self-diagnose function makes trouble shooting easier

3. Process connection

The insertion type BIMCO400 can be installed and maintained on line. To install it, you have to weld and install a base with screw thread outside on the pipe and install a 1 inch ball valve on the base. Then drill a hole of 22mm diameter on the pipe with a special tool and install the flow meter on the pipe through the hole. The position and depth of how the sensor is fixed have already been set before delivery.

The fitting in diameter of pipe for insertion type: 1" ~ 16" .



4. Special designs

To meet some special requirement on actual applications, we have made some improvement on the structures, which make it easier to be used.

1) Anti-ejection design

In some high pressure applications, there is a risk that when the pressure is too high, the nut sleeve will fail or be loosed unintentional, and the flow meter will be ejected out and cause damage or injury. On BIMCO insertion thermal mass flow meter, when the customer need to used it in a high pressure application, the sensor base is wider than the nut sleeve. So as long as the sleeve is still fixed on pipe with thread, the meter will not be totally ejected out. Please reference to below picture

2) Ball valve mounting

When users want to replace or re-calibration or for any reason want to remove the flow meter while do not want to stop the flow , our ball valve mounting can help. Once the meter is installed with a customized ball valve, user can remove the meter away while still keep the pipeline sealed with the ball valve.

This design should only be used when it is absolute necessary and the fluid is not explosive or hazard.



Ball valve mounting

3) Hot tapping holder and hot tapping driller

Some user may not want to stop the flow when installing the flow meter. With the help of our hot tapping holder and hot tapping driller can help do that.

The hot tapping driller can help you open a hole for inserting the flow meter without stopping the flow. It should work with a ball valve. And the in the hole process of drilling and removing the tool , the pipe will be totally sealed.



Hot tapping driller

After the hole is open, user may find it is too hard to push the flow meter to a certain depth when the pressure is too high. But with the help of our hot taping holder, you can easily do that. The holder can be fixed on the ball valve and on the other side hold the flow meter, you can easily push the meter in by rotating a lever. The whole process will be much easier.



Hot taping holed

All above designs make users be able to install or remove the flow meter without stopping the flow, and make the whole process easier. Customer do not bother to waste the time of whole facility to install the meters any more, and the engineers will be able to finish their job quicker ,easier and more flexible .

5. Packing

A standard package of the BIMCO thermal mass flow meter is in a 71.5 x 24.5 x 19.5mm carton (for basic version). Along with the flow meter, the package also contains the accessories for installation (Nut sleeve set) , a copy of manual and a calibration certificate.

Each and every BIMCO thermal mass flow meter will be calibrated on a sonic nozzle calibration system, which is the most accurate air calibration system (0.05%) in the world. The flow meter will be calibrated at 19 velocity points and verified at 8 velocity points. All meter factors are input to the meter automatically and checked by experienced engineers. We ensure you that every flow meter from BIMCO have been well cared for best accuracy, repeatability and durability .



Sonic nozzle calibration system

6. Specification

Media Compatibility	Compressed air(dry), N2 Gas, Oxygen
Pipe diameter	DN25~DN400
Flow velocity range	0.3~30Nm/s; 0.6~60Nm/s;0.9~90Nm/s; or 1.2~120Nm/s.
Accuracy	1.5% RD ±0.5% FS
Temperature of medium	-40~+150° C
Pressure of medium	1.6Mpa
Power supply	AC85~264V or DC16~32V
Response time	1 second
Output	Frequency /4~20mA with Bluetooth as standard
Communication	RS~485 as standard , 4~20mA@HART as optional
Date displayed	Mass flow, Volume flow in normal condition Total flow , Temperature of medium. Velocity
Ingress protection grade	IP65
Ex-proof	Ex d II C T3 Gb (NEPSI) (Optional)

7. Model Selection

Mode codes											
Model	Basic Model	BIMCO400-	C	2	T	1	C	B	C	8	1
	Insertion(NPT)	C									
	Insertion(NPT)(wit anti-ejection design)	D									
Probe length	290mm (DN25~DN150)	1									
	440mm (DN25~DN400)	2									
Transmitter	Integral			T							
	Remote			R							
Material	Ocr18Ni9(304)				1						
	316				2						
Pressure Rating	1.6 Mpa					1					
Max Temperature	Standard (T≤150℃)						N				
	Other						Q				
Enclosure	Customized							C			
Transmitter	pulse/frequency + 4~20mA@HART +Bluetooth									7	
	pulse/frequency + 4~20mA + RS485 +Bluetooth									8	
Power supply	13.5~42VDC										1
	85~265VAC 50/60Hz										2
Pipe size	please use 3 digit pipe size, such as DN50=050, DN300=300										xxx

Remark:

1. Ball valve, Hop-tap insertion tool and hot-tap hole opener are as accessories, please remark if you need any of them
2. Please indicate flow rate along with the model number selected
3. If you have any requirement that cannot be fulfilled in this document, please check with us to see the availability
4. The model selected in 1st line is the standard configuration with no accessories

8. Other ordering information

1) Measurement range

Standard: 0.6~60Nm/s,

Option 2: 0.3~30Nm/s,

Option 2: 0.9~90Nm/s,

Option 3: 1.2 ~ 120Nm/s,

2) Accessories available

Anti-ejection design

Ball valve

Hot taping driller

Hot taping holder

Degreasing

Appendix I Standard Volume flow rate range in popular sizes

Pipe size (mm)	Pipe size (inch)	Option 1 (0.3~30Nm/s,)		Standard (0.6~60Nm/s)		Option 2 (0.9~90Nm/s)		Option 3 (1.2~120Nm/s)	
		Min (Nm3/hr)	Max (Nm3/hr)	Min (Nm3/hr)	Max (Nm3/hr)	Min (Nm3/hr)	Max (Nm3/hr)	Min (Nm3/hr)	Max (Nm3/hr)
25 mm	1"	0.53	53	1.05	105.9	1.58	158.8	2.11	211.8
32 mm	1 1/4"	0.87	86.7	1.73	173.5	2.6	260.3	3.47	347.1
40 mm	1 1/2"	1.36	135.6	2.71	271.1	4.06	406.7	5.42	542.3
50 mm	2"	2.12	211.9	4.23	423.7	6.35	635.5	8.47	847.4
65 mm	2 1/2"	3.58	358.1	7.1	716.1	10.7	1074.1	14.3	1432.2
80 mm	3"	5.42	542.3	10.8	1084.7	16.2	1627.1	21.6	2169.4
100 mm	4"	8.47	847.5	16.9	1694.9	25.4	542.3	33.8	389.8
125 mm	5"	13.2	1324.2	26.4	2648.3	39.7	3972.4	52.9	5296.6
150 mm	6"	19.1	1906.8	38.1	3813.5	57.2	5720.3	76.2	7627.1
200 mm	8"	33.9	3389.8	67.7	6779.6	101.6	10169.4	135.5	13559.3
250 mm	10"	53	5296.6	105.9	10593.2	158.8	15889.8	211.8	21186.4
300 mm	12"	76.3	7627.1	152.5	15254.2	228.8	22881.3	305	30508.4
400 mm	16	135.6	13559.3	271.2	27118.	406.8	40678	542.4	54237.3

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