



MF Series In-line Mass Flow Meters

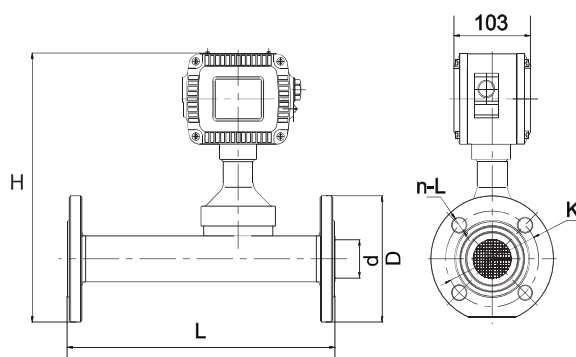
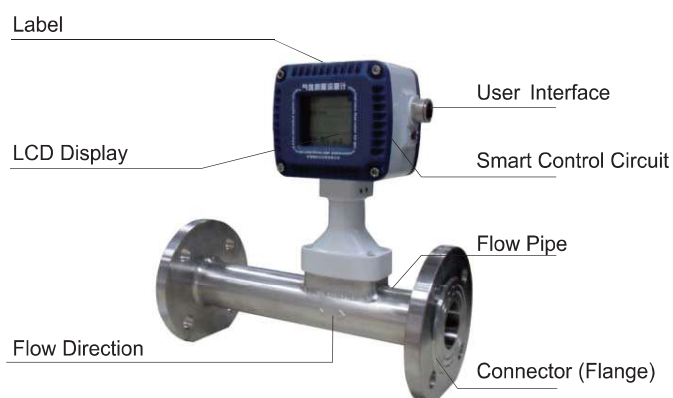
The Products

MF series In-line flow meters are designed for all purpose industrial gas metering and control. The meters provide direct mass flow information as well as well-designed user friendly interfaces (RS485/4~20mA/pulse etc.) for data process. The series cover the DN range from 25 to 100 mm with an accuracy of $\pm(1.5+0.5FS)\%$ or better depending on the requests. The meters can work at an environment of -20 to 60C and pressure up to 1.5 MPa. The package ensures hygienic safety and can be used for beverage and food industrial gas process such as CO₂. Other applications include special gas monitoring in steel process, hydrogen flow control in chemical industry, process gases (oxygen, nitrogen, helium, compressed air or argon) monitoring in manufacture, to name a few.

Features

- ✎ Directly sense mass flow using thermal mass flow principle
- ✎ Proprietary MEMS sensor design for better reliability
- ✎ Standard 8 ~ 24 V power supply
- ✎ Low pressure loss reducing energy cost
- ✎ Industrial standard communication ports for easy networking and remote control
- ✎ Large data storage capability for data log and analysis
- ✎ Hazard proof (Ex ia IIC T4) or Class I Division I, (Zone 0) Groups A-D

Mechanical Dimensions



Siargo Mass Flow Products - In-line Mass Flow Meters

Model	Connection	DN (mm)	L	H	D	d	K	n-L	Ref. Standards
MF25	F	25	300	315	115	25	85	4 - ϕ 14	GB/T-9116.1-2000
MF32	F	32	300	326	140	32	100	4 - ϕ 18	
MF40	F	40	300	330	150	40	110	4 - ϕ 18	
MF50	F	50	360	344	165	50	125	4 - ϕ 18	
MF65	F	65	360	362	185	65	145	8 - ϕ 18	
MF80	F	80	400	374	200	80	160	8 - ϕ 18	
MF100	F	100	400	396	220	100	180	8 - ϕ 18	

Specifications

Accuracy	$\pm(1.5 + 0.5 \text{ FS})\%$
Flow Range	0.01 ~ 65 Nm ³ /sec (e.g. DN50: 0.06 ~ 400 Nm ³ /hr)
Environment	Temperature: -20 ~ + 60°C Humidity: < 95%RH(No icing or condensation)
Display	Flow rate and accumulated flow
Data Storage	Accumulated flow; flow rate; max. 3000 items
Calibration	Air @ 20 °C; 101.325 kPa
Protection	IP65
Ex Proof	Ex ia IIC T4

Note: the above parameters are applicable at 20°C and 101.325kPa.

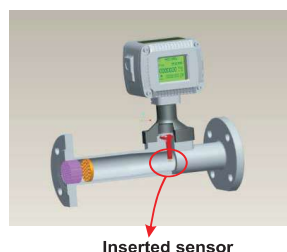
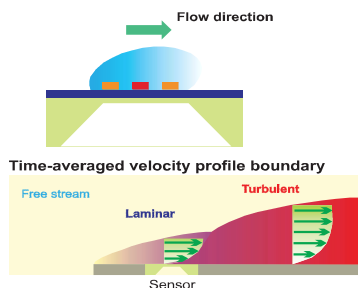
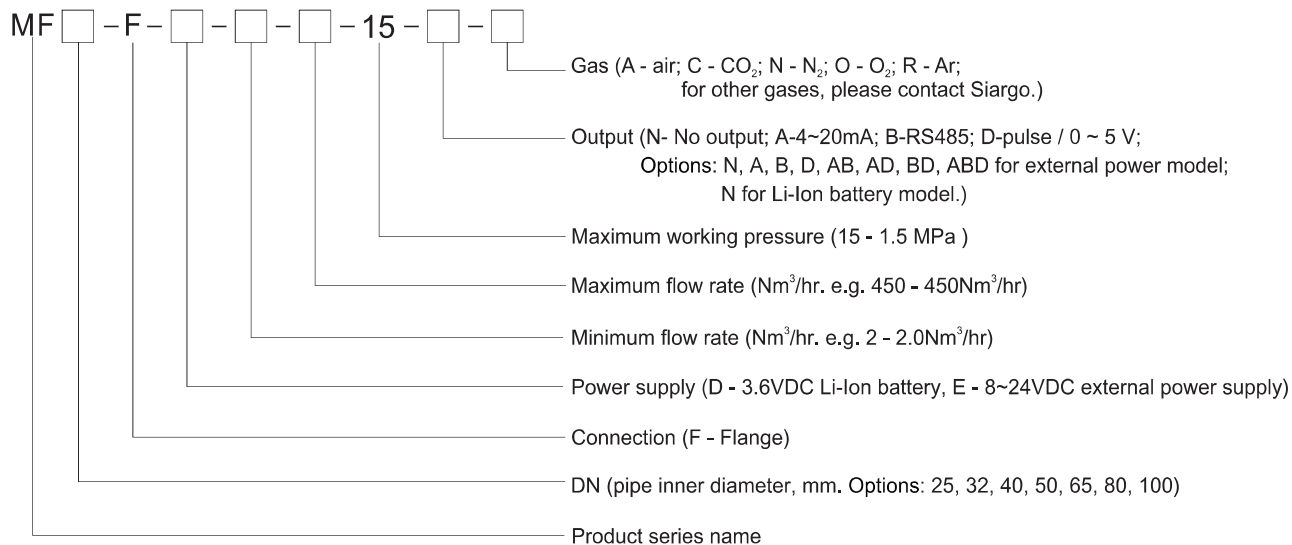
Model	Max. flow rate**	Min. flow rate
MF25	100	1.0
MF32	160	1.6
MF40	250	2.5
MF50	400	4.0
MF65	650	6.5
MF80	1000	10
MF100	1600	16

** For CO₂, Max. flow rate will be 0.75 times as the table.

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Product Selection

In addition to the models listed, we can also provide customized products that are tailored to customers' very needs. For further information, please contact manufacturer. The meters are made by referencing to: ISO-14511; CE Directives: EN61000-6-1 EN61000-6-2



Siargo Mass Flow Products - Insertion Mass Flow Meters



MFI Series Insertion Mass Flow Meters

The Products

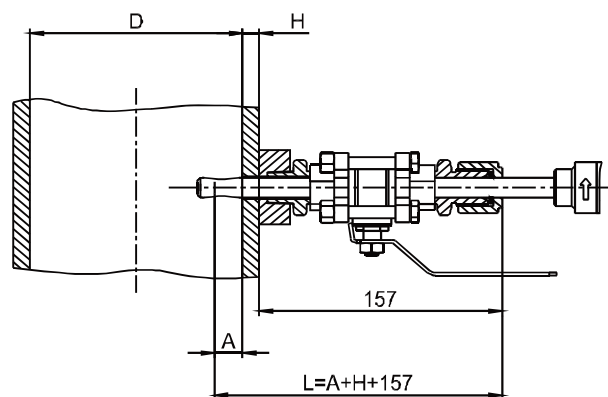
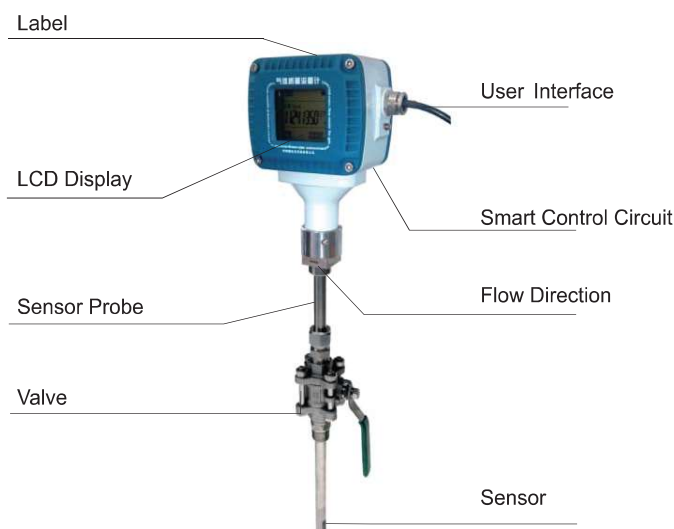
MFI series insertion mass flow meters are designed for gas monitoring and control in a large pipe line where installation of an in-line flow meter is either difficult or costly. The insertion meters are equipped with a self-sealed valve and hence provide a solution that only requires minimal interruption to the normal working circumstance. The suggested starting metering DN is 150 mm and above. All of the insertion meters have an accuracy of $(1.5+0.5FS)\%$ or better depending on the requests. The meters can work at an environment of -20 to $60\text{ }^{\circ}\text{C}$ and pressure up to 1.5 MPa . Applications include but not limited to oxygen, nitrogen, methane, and compressed air flow monitoring for manufacture process control.

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Features

- ✎ Highly sensitive, measuring as low as 0.01 Nm/sec , and as high as 65 Nm/sec
- ✎ Directly sense mass flow using thermal mass flow principle
- ✎ Proprietary MEMS sensor design for better reliability
- ✎ Standard $8 \sim 24\text{Vdc}$ power supply
- ✎ Low pressure loss reducing energy cost
- ✎ Industrial standard communication ports for easy networking and remote control

Insertion Probe Length



Calculation of the insertion depth L :

$$L = A + H + 157, A = 1/8D$$

where D is pipe diameter and H is pipe wall thickness

Siargo Mass Flow Products - Insertion Mass Flow Meters

DN (mm)	Insertion Depth (mm)	Probe Length (mm) (H= pipe wall thickness)	Full Length (mm)	Full Scale Flow (Nm ³ /hr)	Min Flow (Nm ³ /hr)
80	11	174+H	250;D=14; Ball valve=15	1000	10
100	13	176+H		1600	16
125	16	179+H		2500	25
150	20	183+H		3500	35
200	26	189+H		6500	65
250	33	196+H		10000	100
300	40	203+H		15000	150
350	46	209+H		20000	200
400	53	216+H		25000	250
450	60	223+H		32000	320
500	66	229+H	325;D=14; Ball valve=15	40000	400
600	80	243+H		55000	550
700	93	256+H		75000	750
800	106	269+H		100000	1000
900	119	282+H		130000	1300
1000	132	295+H		160000	1600
1100	146	308+H	400;D=19; Ball valve=20	200000	2000
1200	159	335+H		230000	2300
1300	172	349+H		270000	2700
1400	186	362+H		320000	3200
1500	199	375+H		360000	3600
1600	212	388+H		400000	4000

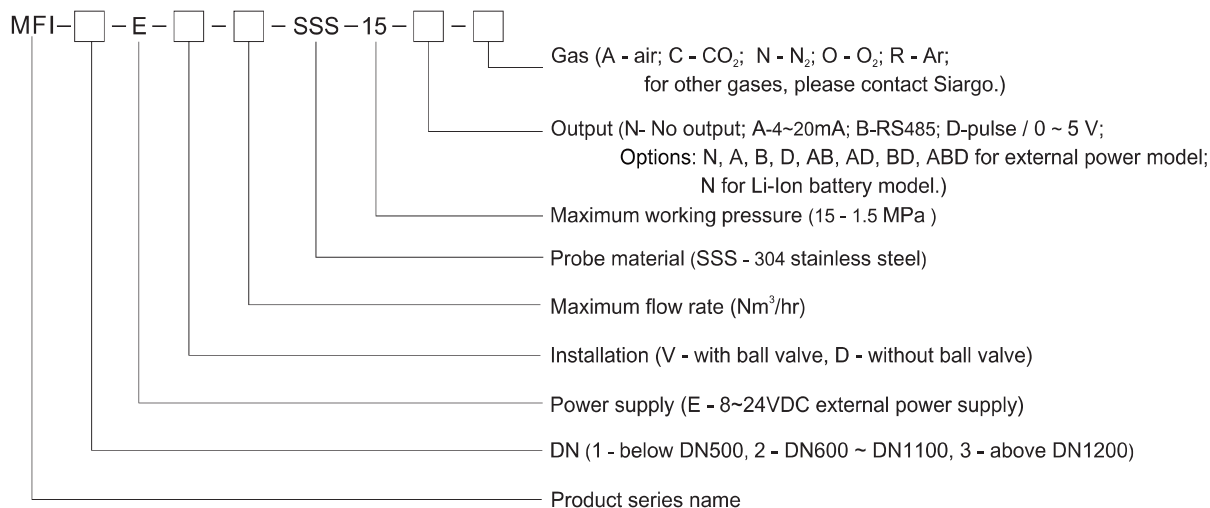
Specifications

Accuracy	± (1.5 + 0.5 FS)%
Flow Range	0.01 ~ 65 Nm/sec (e.g. DN150: 0.6 ~ 3500 Nm ³ /hr)
Environment	Temperature: -20 ~ + 60°C; Humidity: <95%RH (No icing or condensation).
Flow channel	80 ~ 1600 mm
Display	Flow rate, accumulated flow
Interface	4 ~ 20 mA; RS485; Pulse
Calibration	Air @ 20 -C; 101.325 kPa
Protection	IP65

Note: the above parameters are applicable at 20°C and 101.325kPa.

Product Selection

In addition to the models listed, we can also provide customized products that are tailored to customers' very needs. For further information, please contact manufacturer. The meters are made by referencing to: ISO-14511; CE Directives: EN61000-6-1 EN61000-6-2



Siargo Mass Flow Products - Low Pressure Mass Flow Meters



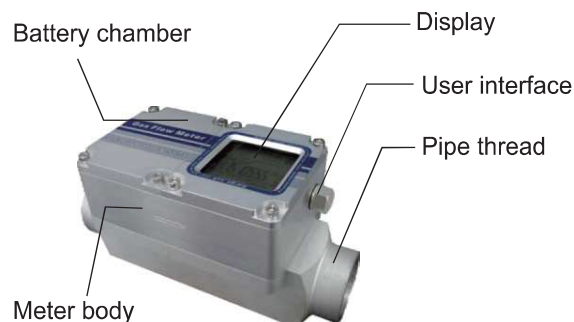
MF-GD Series Low Pressure Mass Flow Meters

The Products

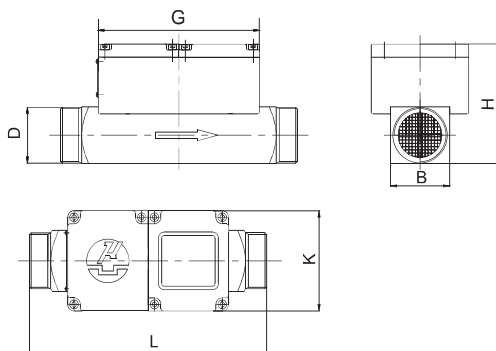
MF-GD series low pressure mass flow meters are designed for all low pressure industrial gas metering and control. The meters substantially reduce the installation cost as well as other logistical cost. In addition, the all electronic meters provide easy data access as well as remote data networking capabilities.

Features

- ✎ Automatical compensation for temperature and pressure variations
- ✎ Integrated MEMS sensors for extended rangeability
- ✎ Proprietary low power technology ensures the long lasting battery life
- ✎ Small form factors reduce logistical and installation cost
- ✎ Large data storage for easy historical data download and analysis
- ✎ All electronic meters ready for data access and networking



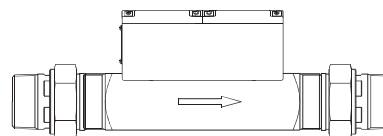
Mechanical Dimensions



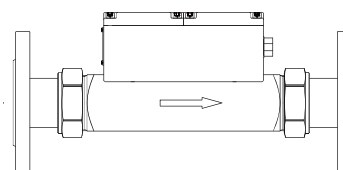
	D	B	L	H	K	G
MF32GD	M48X2	70	280	132	115	188
MF50GD	M64X2	70	280	137	115	188
MF65GD	M80X2	90	360	162	115	188
MF80GD	M100X2	100	360	172	115	188

Please contact Siargo to get detailed information on the meters with BSPT or flange connectors.

With BSPT connectors



With flanges



Siargo Mass Flow Products - Low Pressure Mass Flow Meters

Specifications

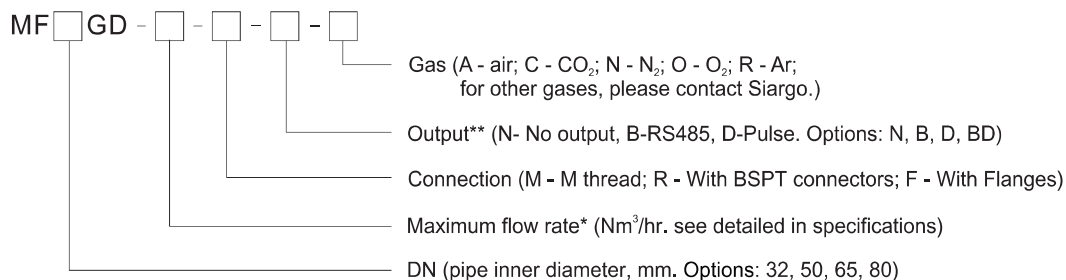
Model	DN (mm)	Max. Flow rate (Nm ³ /h)	Min. Flow rate (Nm ³ /h)
MF32GD	32	10, 16 or 25	0.25
MF50GD	50	40 or 65	0.65
MF65GD	65	100	1.0
MF80GD	80	160	1.6

Accuracy	±(1.5+0.5FS)%
Turn-down Ratio	(MF-GD)
Max. Working Pressure	0.2 MPa
Environment Temperature	-20 ~ +60°C
Medium Temperature	-10 ~ +55°C
Humidity	< 95%RH (No icing or condensation)
Power Supply	3.6V battery (L3638A)
Battery life	36 months
Real time clock life	10 years
Output	RS485
LCD display	Flowrate; Accumulated flowrate; Battery status
Calibration	Air @ 20°C, 101.325kPa
Mechanical	M-Thread (BSPT-Thread or flange with mechanical connector)
Protection	IP66
Ex Proof	Ex ia IIC T4

Note: the above parameters are applicable at 20°C and 101.325kPa.



Product Selection



Siargo Mass Flow Products - Gas Flow Meters MF5600 Series



MF5600 Series with Detachable Display Gas Flow Meters

The Products

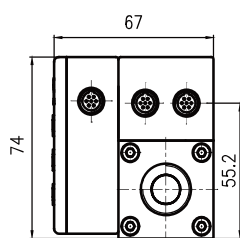
MF5600 series mass flow meters are specially designed for applications where the display is often required to be placed separated away from the flow channel or meter body, such as the oxygen metering system in a hospital. These meters are opted with the standard industrial user interfaces (RS485 and 4 ~ 20mA), and user defined alarm functions for better monitoring or control over the network. The off-the-shelf products (MF5612 and MF5619) are for gas flow measurement of 0 ~ 300 SLPM and 0 ~ 800 SLPM, respectively.

Features

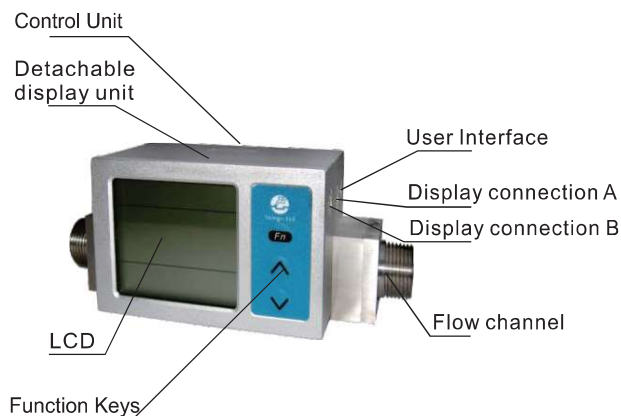
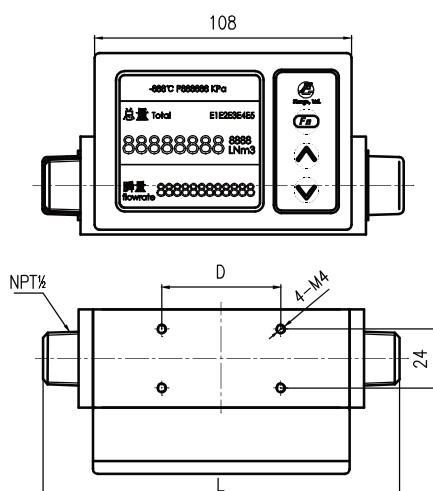
- ✎ Detachable display that can be placed away from the flow channel via a specially designed cable
- ✎ Standard 4 ~ 20 mA or RS485 for remote data communication
- ✎ Hygienic stainless steel body ready for oxygen metering
- ✎ Extended rangeability for accurate flow monitoring and control
- ✎ Intrinsic safe enclosure



Mechanical Dimensions



	Unit:mm	
	D	L
MF5612	50	150
MF5619	70	182.5



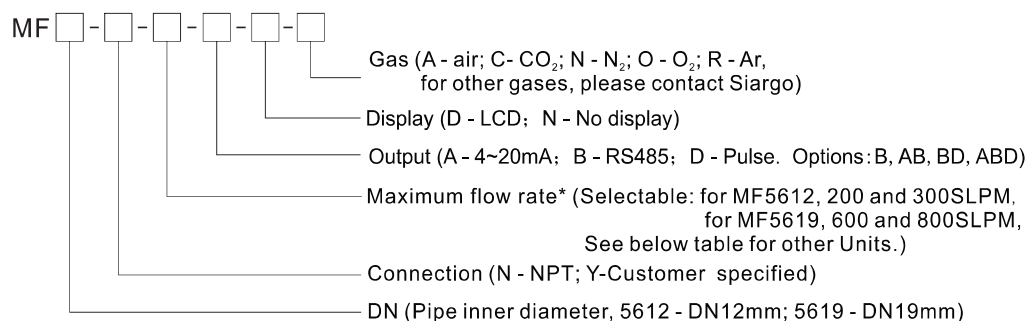
Siargo Mass Flow Products - Gas Flow Meters MF5600 Series

Specifications

Parameter	MF5612	MF5619	Unit
DN	12	19	mm
Max. Flowrate	200, 300	600, 800	SLPM
Min. Flowrate	0.3	0.8	SLPM
Turn-down ratio	30:1		
Accuracy	$\pm (1.5 + 0.2 \text{ FS})$		%
Repeatability	± 0.5		%
Max. Pressure	1.0		MPa
Operating Temperature	-10 ~ +55		°C
Humidity	< 95 %RH (No icing or condensation)		
Power Supply	12 ~ 24Vdc, 50 mA		
Output	4 ~ 20 mA; RS485; Pulse		
Mechanical Connection	NPT 1/2	NPT 3/4	
Calibration	Air @ 20 C, 101.325 kPa		

Note: the above parameters are applicable at 20°C and 101.325kPa.

Product Selection



* There is flow rate number only for unit SLPM. If other unit is selected, there must be flow rate number with unit together.
For CO₂, selectable: 200 SLPM (without 300 SLPM) for MF5612; 600 SLPM (without 800 SLPM) for MF5619.

Typical flow range:

Model	DN	Connection	Flow Range		
			SLPM	SCFM	NCMH
MF5612	12mm	1/2"	200	7	12
			300	10.5	18
MF5619	19mm	3/4"	600	21	36
			800	28	48

Accessories



Cable 1: User interface cable
(Part Number: IC7-150)



Cable 2: LCD cable
(Part Number: IC7-30-IC7, Length: 30cm;
Part Number: IC7-200-IC7, Length: 2m)



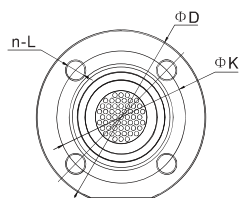
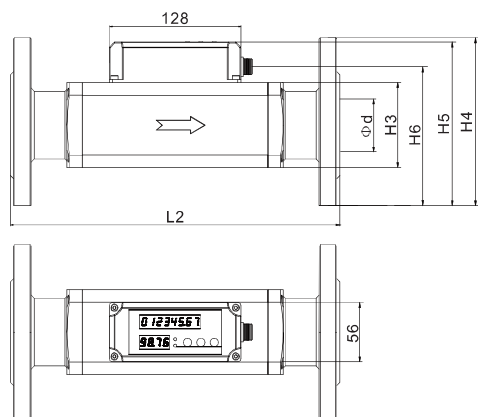


MF/s series mass flow meters are designed for industrial gas flow monitoring, metering and control applications. The meters provide gas mass flow in a non-hazardous environment without additional temperature and pressure compensation. It also provides industrial standard Modbus RS485 communication as well as 4~20mA output for easy remote data access.

- ✍ Proprietary MEMS mass flow sensing technology
- ✍ Direct mass flow measurement
- ✍ LED display for clarity at remote distance
- ✍ Data safety with historical data onsite storage
- ✍ Industrial standard Modbus RS485 communication
- ✍ Optional 4 ~20mA for remote data
- ✍ Multiple gas measurement capability
- ✍ IP65 protection rating with aluminum alloy meter enclosure

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Siargo Mass Flow Products - MF/s Series Mass Flow Meters



Model	DN	L2	H3	H4	H5	H6	d	D	K	n-L
MF25	25	312	52	110.5	117.5	94	25	115	85	4 - Φ 14
MF32	32	316	60	134	132.5	109	32	140	100	4 - Φ 18
MF50	50	320	80	158.5	154.5	154.5	50	165	125	4 - Φ 18
Reference	GB/T-9119-2000									

Flanged connection

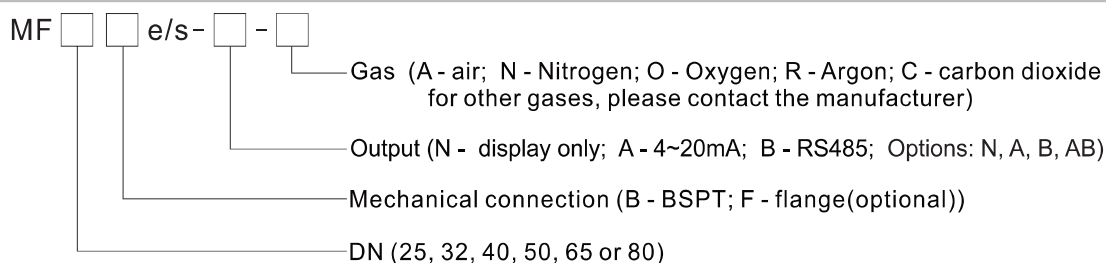
Specifications

Model	DN (mm)	Max flow (Nm ³ /h)	Min flow (Nm ³ /h)
MF25Be/s, MF25Fe/s	25	100	2
MF32Be/s, MF32Fe/s	32	160	3
MF40Be/s, MF40Fe/s	40	250	5
MF50Be/s, MF50Fe/s	50	400	10
MF65Be/s, MF65Fe/s	65	650	15
MF80Be/s, MF80Fe/s	80	1000	20

Accuracy	±(2.0+0.5FS)%
Turn-down ratio	50:1
Max pressure rating	1.0 MPa
Storage temperature	-20~+60 °C
Working temperature	-10~+55 °C
Humidity	10~90%RH (non condensation or icing)
Power supply	12~24Vdc
Display	4 digits for instant flow, 8 digits for accumulated flow
Output	RS485; 4~20mA (option)
Data safety	Time, instant flow, accumulated flow; 1500 items
Meter body	Aluminum alloy; stainless steel (option)
Enclosure	Aluminum alloy
Connection	BSPT or flange (option)
Calibration	Air (20°C; 101.325kPa)
Protection rating	IP65

Note: the above parameters are applicable at 20°C and 101.325kPa.

Product selection





HMF1000 Series Handheld Mass Flow Meters

The Products

HMF1000 series handheld mass flow meters are designed and manufactured for onsite measurement for gas flowrate with multiple gas options and large dynamic range using the proprietary MEMS mass flow sensing technology. The product is particularly suitable for applications in instrumentation and inline gas monitor where the multiple gas measurements specially the low flowrate measurement is required. This manual provides the instructions for proper use of the products, including operation, maintenance and storage. For further customization or other product related questions, please contact the manufacturer.

Features

- ✎ Multiple gas mass flow measurement a handheld form factor
- ✎ Gas selection with front key board for N₂, Air, Ar, H₂ and He (1000 sccm model)
- ✎ Excellent for instrumentation testing and onsite gas flow rate monitor
- ✎ MEMS mass flow sensing technology with temperature and pressure compensation
- ✎ High sensitivity for low flow measurement, and models cover different flowrate applications
- ✎ Instant flowrate, totalizer, and via easily accessible interface
- ✎ Split gas ration for gas chromatography mass spectrometers
- ✎ Record, data access with front keyboard for data safety
- ✎ Portability design with battery operation

Description



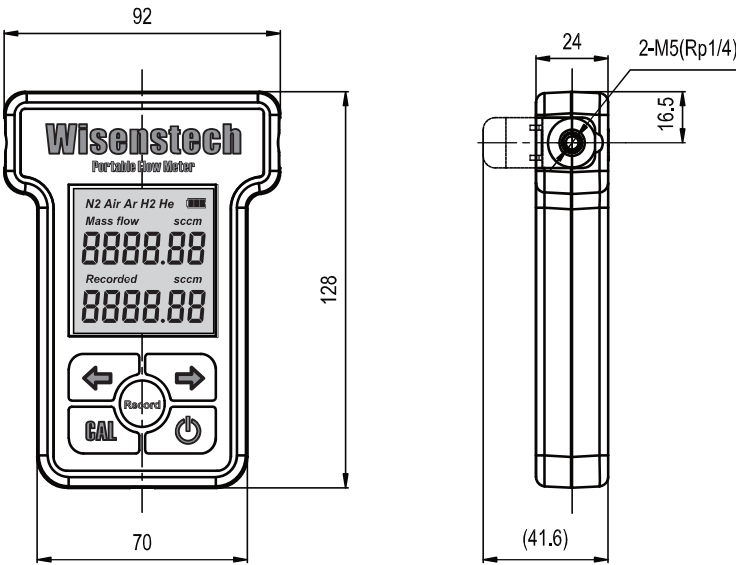
Siargo Mass Flow Products - HMF1000 Series Handheld Flow Meters

Specifications

Parameter	Value	Unit
Mass Flow Rate	0 ~ 1000	sccm
	0 ~ 3	SLPM
	0 ~ 30	SLPM
Accuracy	±(2+0.5FS)	%
Response time	8	msec
Turn-down ratio	>100:1	
Power supply	3.6V Li-ion battery	
User interface	Front keyboard	
Operational temperature	0 ~ 50	°C
Storage temperature	- 10 ~ 80	°C
Max. Working Pressure	0.4	MPa
Safety rating	IP65	
Dimension	92×128×24	mm ³
Weight	200	g

Note: the above parameters are applicable at 20°C and 101.325kPa.

Mechanical Dimensions



Description:

The Gas turbine flow meter in the series LWQ are specially designed for use in natural gas, compressed, air and other fluid measurement

They operate according to the turbine principle, i.e. the speed of an impeller turning in the fluid flow is measured and converted into pulse or 4-20mA signals depending on the detailed models

Special Features:

- Pressure resistant to 16 bar
- Natural Gas Measurement
- Temperature and Pressure
- Compensation is available
- Output signal: Pulse or 4 to 20 mA
- Communication: RS485/Hart
- Connection: Thread/Flange

Gas Turbine Flow Meter

LWQ Series For Natural Gas/Compressed Air

Technical Specifications:

Flow Range

Nominal Diameter	Standard Flow Range (SFR)		Extended Flow Range (EFR)	
(mm)	Code	(m ³ /h)	Code	(m ³ /h)
25	S	2.5 to 25	W	4 to 40
40	S	5 to 50	W	6 to 60
50	S1	6 to 65	W1	5 to 70
	S2	10 to 100	W2	8 to 100
65	S	15 to 200	W	10 to 200
80	S1	15 to 300	W	10 to 160
	S2	20 to 400		
100	S1	20 to 400	W	13 to 250
	S2	32 to 650		
125	S	25 to 700	W	20 to 800
150	S1	32 to 650	W	80 to 1600
	S2	50 to 1000		
200	S1	80 to 1600	W	50 to 1000
	S2	130 to 2500		
250	S1	130 to 2500	W	80 to 1600
	S2	200 to 4000		
300	S	200 to 4000	W1	130 to 2500
			W2	320 to 6500
400	S	400 to 8000	W	260 to 8000



LWQ-D (NEW)

Need help?

www.suremeter.com
overseas@suremeter.com

Model Selection:

LWQ- X -XXX XX X X X -XXX -X

Converter

N: Pulse Output without display
A: 4-20mA (2-wire) with display
B: No output; Battery Power Supply
C1: 24V DC ; Pulse + 485
C2: 24V DC ; 2-wire 4-20mA; Pulse + RS485
C3: 24V DC ; 3-wire 4-20mA; Pulse + RS485
D1: 4-20mA (2-wire); T & P Compensation
D2: 4-20mA (3-wire); T & P Compensation

Diameter

XXX: 3 digits; For example:
025: 25mm; 050: 50mm; 080: 80mm
100: 100mm; 150: 150mm; 300: 300mm

Flow range

XX: 2 digits;
Refer to Flow Range Table

Body Material

S: Stainless Steel 304
L: Cast Aluminum

Rotor Material

S: ABS Plastic
L: Aluminum Alloy

Explosion Proof

N: Without Ex Proof
E1: Exia II CT4
E2: Exd II BT6

Connection

THR: Thread Connection; DN25, DN40 and DN50
Flange Connection:
ANSI Flange - A15: ANSI 150#; A30: ANSI 300#; A60: ANSI 600#
DIN Flange - D16: DIN PN16; D25: DIN PN25; D40: DIN PN40
JIS Flange - J10: JIS 10K; J20: JIS 20K; J40: JIS 40K

Accuracy

N: 1.5%
G: 1.0%

Note:

Please read the nameplate or calibration certificate for specifications.

Output (Depending on converter Model)	
	Pulse
	4-20mA
Accuracy	1.0% of Rate/ 0.5% of Rate
Ambient Conditions	
Operating Temperature	-20...+60 °C
Fluid Temperature	-20...+80 °C
Material	
Housing	SS304/ Cast Aluminum
Rotor	Aluminum Alloy/Plastic ASB
Bearing	SS304

Product Photo:



LWQ-N2



LWQ-C



LWQ-D1

Need help?

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Gas Roots Rotary Meter



Product Advantage:

- Proven High Accuracy, measurement accuracy is not affected by changes in gas specific gravity, pressure, or fluctuating flow.
- No straight pipe required, suitable to be installed at narrow place
- Low starting rate, wide turndown ratio, suitable for widely fluctuating flow measurement;
- Local display for flow rate with multiple signal output.

Description:

Rotary meters are designed to measure the volume of gases, gas mixtures with a high accuracy.

Gas rotary meter is suitable for custody transfer applications, and the industry accepts rotary type operating principle to ensure permanent, non-adjustable accuracy using precision machined impellers (rotor) encased within a rigid measuring chamber.

This meter is ideal for utility (custody transfer) grade metering for all types of gases including natural gas and also propane.

Product Specifications:

General Specification

Connection	Standard: DIN Flange; ANSI and JIS are available on request
Accuracy	Standard: 1.5% of Rate; Optional: 1.0% of Rate
Condition	Fluid Temperature: -10...+60 °C
	Ambient Temperature: -30...+60 °C
	Relative Humidity: 5%-90% RH
	Atmospheric Pressure: 86 to 186 Kpa
Power Supply	Main Power: 24V DC
	Backup Battery: 3.6V DC Lithium Battery Low battery warning: < 2.0V DC
Power Consumption	Main Power: <1 watt; Backup Battery Life: > 3 Years
Output	Optional: (1) Pulse (2) 4-20mA (3) IC card: Scaled Pulse (4) RS485 (5) HART

Need help?

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Measuring Range Table:

Diameter (mm)	Model	Start Rate (m³/h)	Max. Flow rate (m³/h)	Pressure Loss (Pa)	Pressure Rating (MPa)	Accuracy	Turndown Ratio	Body Material
DN25	LLQ-16	0.03	16	120	1.0/1.6	1.5/1.0	20:1	Aluminum Alloy
DN40	LLQ-20	0.05	20	130	1.0/1.6	1.5/1.0	20:1	
	LLQ-25	0.05	25	130	1.0/1.6	1.5/1.0	20:1	
	LLQ-30	0.05	30	130	1.0/1.6	1.5/1.0	20:1	
	LLQ-40	0.07	40	180	1.0/1.6	1.5/1.0	30:1	
	LLQ-60	0.08	60	180	1.0/1.6	1.5/1.0	60:1	
DN50	LLQ-20	0.05	20	140	1.0/1.6	1.5/1.0	20:1	
	LLQ-25	0.05	25	140	1.0/1.6	1.5/1.0	20:1	
	LLQ-30	0.05	30	140	1.0/1.6	1.5/1.0	20:1	
	LLQ-40	0.07	40	200	1.0/1.6	1.5/1.0	30:1	
	LLQ-60	0.08	60	200	1.0/1.6	1.5/1.0	60:1	
	LLQ-85	0.08	85	210	1.0/1.6	1.5/1.0	70:1	
DN65	LLQ-100	0.1	100	220	1.0/1.6	1.5/1.0	70:1	
	LLQ-140	0.1	140	220	1.0/1.6	1.5/1.0	120:1	
DN80	LLQ-100	0.1	100	220	1.0/1.6	1.5/1.0	70:1	
	LLQ-140	0.1	140	240	1.0/1.6	1.5/1.0	100:1	
DN100	LLQ-200	0.1	200	240	1.0/1.6	1.5/1.0	100:1	
	LLQ-300	0.18	300	280	1.0/1.6	1.5/1.0	110:1	
DN150	LLQ-450	0.18	450	300	1.0/1.6	1.5/1.0	110:1	
	LLQ-650	0.5	650	580	1.0/1.6	1.5/1.0	80:1	Cast Iron
DN200	LLQ-1000	0.6	1000	600	1.0/1.6	1.5/1.0	80:1	
	LLQ-1600	0.8	1600	850	1.0/1.6	1.5/1.0	60:1	
DN250	LLQ-3000	2	3000	1050	1.0/1.6	1.5/1.0	40:1	

Product Photo:



Application:

A complete line of rotary meter sizes are available to measure a wide range of gas volumes for the custody transfer and majority of commercial.

Model Selection:

LLQ - XX XXXX X - XX XXX

Max Range _____
Refer to table (Flow Rate)

Diameter _____
Refer to table (Flow Rate)

Converter _____
N: Basic meter, without display and output
C: Digital display; Out: Pulse and control signal for IC card
D: Digital display with temperature and pressure compensation
Standard output: 4-20mA/ Pulse/ Control signal for IC card
Optional output: RS485 communication and mechanical display

Accuracy _____
P1: 1.0% of Rate
P2: 1.5% of Rate

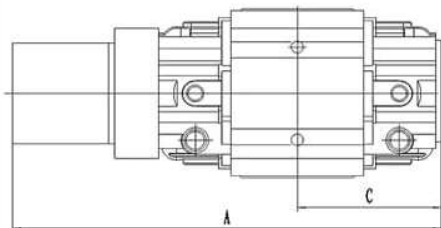
Pressure Rate _____
WP1: 1.0Mpa
WP2: 1.6Mpa

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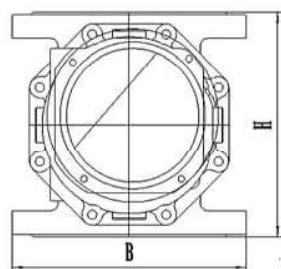
www.suremeter.com
overseas@suremeter.com

Drawing and Dimensions:

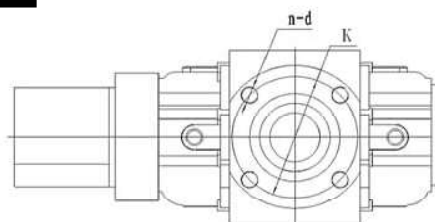
Drawings 1-6



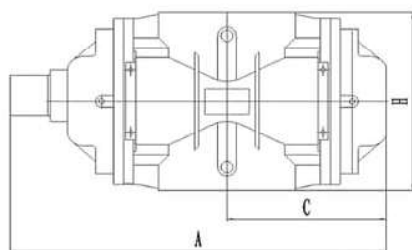
Drawing 1



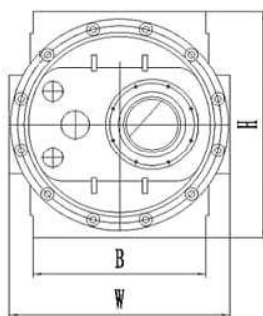
Drawing 2



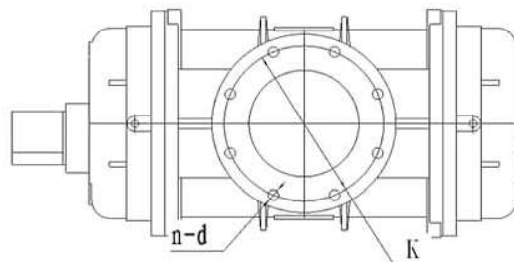
Drawing 3



Drawing 4



Drawing 5



Drawing 6

Installation Dimensions

Diameter (mm)	Model	Flow Direction	A	B	C	W	H	Weight (kg)	Flange
			(mm)						K
DN 25	LLQ-16	Inlet: UP Outlet: Down	307	180	82	-	175	9	85
DN 40	LLQ-20		327		82		175	10	110
	LLQ-25		364		108		171.5	11	110
	LLQ-30		364		108		171.5	11	110
	LLQ-40		389		120		171.5	11	110
	LLQ-60		389		120		171.5	11	110
DN 50	LLQ-20		340	100	175	11	125		
	LLQ-25		364	108	171.5	11	125		
	LLQ-30		364	108	171.5	11	125		
	LLQ-40		389	120	171.5	11	125		
	LLQ-60		413	138	171.5	11	125		
	LLQ-85		450	156	171.5	13	125		
DN 65	LLQ-100		481	172	175	14	145		
	LLQ-140		518	190	175	15	145		
DN 80	LLQ-100		481	172	171.5	14	160		
	LLQ-140		518	190	171.5	15	160		
	LLQ-200		514	187	245	25	160		
DN 100	LLQ-300		594	210	226	245	31	180	
	LLQ-450		685	274	245	37	180		
DN 150	LLQ-650	726	285	271	446	460	175	240	
	LLQ-1000	845		351	446	460	200	240	
DN 200	LLQ-1600	942		400	446	460	235	295	
DN 250	LLQ-3000	1130		480	620	720	600	355	

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overseas@suremeter.com

Mini Flow Meter

Technical Parameters:

Items	Diameter	Measuring range	K-Factor
	(mm)	(L/min)	(cm ³ /imp)
Measuring range	1.15	0.035-1.6	0.5
	1.3	0.01-1.86	0.6
	1.5	0.045-2.08	0.67
	2	0.085-2.32	1.02
	2.5	0.12-2.4	1.44
	3.7	0.15-3.0	2.28
Pressure range	Maximum 20.0bar		
Temperature range	-10°C/to 100°C		
Accuracy level	±1%		
Repeatability accuracy	±0.25%		
Pipe connection	G 1/4 female thread (ordered to meet need from customers)		
Material	Shell: Green Brass(lead-free brass)		
	Bearing: INO*18/8(1.4305) stainless steel		
	Turbine: PVDF (polyvinylidene fluoride)		
	Magnets: SrFeO ceramics		
	Sealing: MVQ(silicone rubber "O" washer)		
Installation style	Horizontal installation		
Dimension	55*40*47		
Weight	About 300g		
Authentication	NSF, CE		



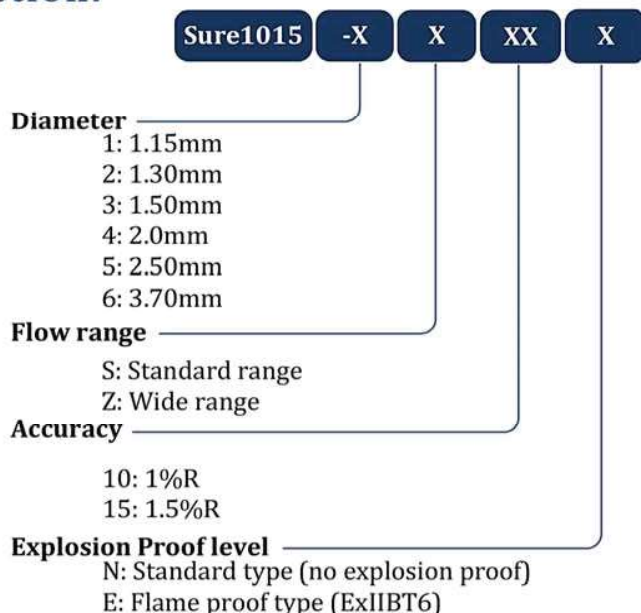
Description:

Mini flow meter is based on turbine theory and designed for measuring micro-flow. This meter has extremely high accuracy especially under the condition of high temperature and high pressure.

The Electronic pulse transmitter is also integrated in this mini flow meter. It can maintain the 1% accuracy and the 0.2% repeatability.

Because of smart structure design, no debris can store in the working process and it's clean after work.

Model Selection:



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1. Brief Introduction

Fischer&Porter Corporation has the most advanced vortex flowmeter in the world. It may carry out the flow measuring, detecting and controlling for various liquids, gases, high/low temperature superheated steam and saturated steam. It is widely used in the industry department, municipal construction and environmental protection engineering, such as petroleum, chemical industry, metallurgy, electric power, paper making, drug making, food and so on.

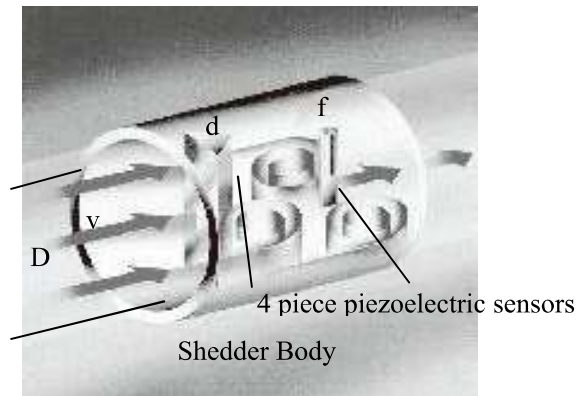
2. Characteristics

- Shock resistance type: the vortex flowmeter of Fischer & Porter Corporation adopts 4- piece piezoelectric crystals for measuring. Two of them are used to detect the flow of fluid. The other two are used to detect the vibration signal of pipe. 4-piece piezoelectric crystals adopt parallel connection mode to counteract the vibration signal detected by piezoelectric crystal detecting flow signal, thus the influence of external vibration on detecting flow is eliminated fundamentally.
- Temperature and pressure compensation: VT/VR transducer may receive temperature sensor PT100 signal directly ,temperature compensation ,output 4-20mA current signal ; Or receive temperature sensor PT100 signal and pressure converter 4-20mA signal , temperature and pressure compensation, output RS485 signal, displays the fluid flow after temperature and pressure compensation.
- Explosion proof design: Exia II CT6
Exd II CT6
- Intelligent type: The meter parameters and meter range may be changed by three manual buttons or manual controller to modify instrument parameters

Pipe design Vortex Flowmeter

- and range on site.
- Output mode: 4-20mA current signal output , pulse signal and RS485 port.
- Display mode: LCD multi-function screen can display the frequency, instantaneous flow and accumulated flow and so on, the type of temperature and pressure compensation can also display temperature, pressure, density, mass flow and so on.
- Communication mode: HART-communication protocol
RS485 Modbus port

3. Principle of Operation

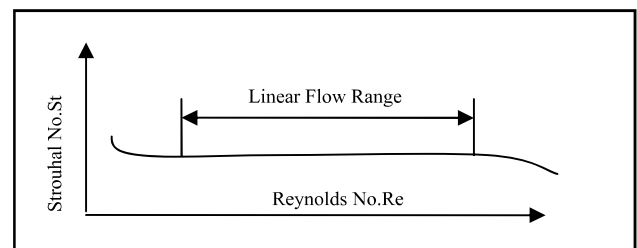


The operation of the Vortex Flowmeter is based on the Karman Vortex Street principle. Vortices are formed alternately on both of its sides as a fluid flows around the shedder body. The flow causes these vortices to be shed forming a vortex street(Karman Vortex Street). The frequency f of the vortex shedding in proportional to the flow velocity v and inversely proportional to the width of the shedder body d :

$$f = St \cdot v / d$$

St , the Strouhal Number, a dimensionless number, defines the quality of the vortex flowrate measurements.

(See the formula and chart)



As a result, the vortex shedding frequency to be evaluated, is a function only of the flow velocity and is independent of the fluid density and viscosity.

4. Technical Parameter Table

				
Meter Model			VT 8000	VR 8000
Accuracy	Liquids		1.0%, 0.75%	1.0%, 0.75%
	Gases/steam		1.0%	1.0%
Reproducibility			≤±0.2% of rate	≤±0.2% of rate
Allowable viscosity of measured medium			≤7.5mPa s	≤7.5mPa s
Typical flow Range			1:20	1:20
Sensor	Flange connection DIN		DN15-DN600	DN15-DN600
	Clamp connection DIN		DN15-DN300	DN15-DN300
	Fluid Temperature	Normal Temperature	-20°C--150°C	-20°C--150°C
		Medium Temperature	-20°C--250°C	-20°C--250°C
		High Temperature	-20°C--350°C	-20°C--350°C
	Pressure range	Standard	≤16MPa/900 lb	≤16MPa/900 lb
		Special	According to demands of users	According to demands of users
Materials		0Cr18Ni9 /316/316L/Hast.C/Ti According to demands of users	0Cr18Ni9 /316/316L/Hast.C/Ti According to demands of users	
Conver-ter	Supply Power		12-42 VDC / Battery power	12-42 VDC / Battery power
	Cable Connection		M20x1.5、1/2 " NPT	M20x1.5、1/2 " NPT
	Display		LC-Display	LC-Display
	Communication		HART-Protocol RS485 Modbus	HART-Protocol RS485 Modbus
	Ex-Design	Exia	Exia II CT6	Exia II CT6
		Exd	Exd II CT6	Exd II CT6
	Protection class	Standard	IP67	IP67
		Diving	-	Sensor IP68 / Transmitter IP67
	Ambient temperature		-40°C--80℃	-40°C--80℃
	Materials		Cast aluminum	Cast aluminum
	Power consumption		<0.5 W	<0.5 W

5. Flowrate 5.1 Flowrate (liquids)

Size				
DN	Inch	Q _V min[m ³ /h]	Q _V max[m ³ /h]	Frequency[Hz] at Q _V max
15	1/2"	0.5	5	370
25	1"	1.2	12	240
40	1-1/2"	2.5	25	190
50	2"	3.5	35	140
80	3"	13	130	100
100	4"	20	200	70
125	5"	30	300	60
150	6"	45	450	50
200	8"	90	900	45
250	10"	120	1200	29
300	12"	180	1800	26
350	14"	400	3200	22
400	16"	500	4000	20
500	20"	600	5000	17
600	24"	800	7000	14

Reference medium: water (20°C , 1.103bar,ρ₀=998kg/m³)

5.2 Flowrate (gases/superheated steam)

Size				
DN	Inch	Q _V min[m ³ /h]	Q _V max[m ³ /h]	Frequency[Hz] at Q _V max
15	1/2"	8	18	1700
25	1"	10	50	2040
40	1-1/2"	18	180	1550
50	2"	30	300	1030
80	3"	70	700	700
100	4"	100	1000	500
125	5"	150	1500	360
150	6"	200	2000	285
200	8"	400	4000	260
250	10"	600	6000	220
300	12"	1000	10000	210
350	14"	1500	12000	170
400	16"	1800	14400	140
500	20"	2600	21000	110
600	24"	3300	29000	94

Reference medium: air (20°C , 1.103bar, ρ₀=1.2kg/m³)

5.3 Flowrate (saturated steam) [kg/h]

P[bar a] DN/inch	0.5	1	1.5	2	3	4	5	6	7	8	9	10	12	15	25	30	35	40
15 min 1/2 max	3 7	4 14	5 21	6 27	7 40	8 52	9 64	10 76	10 88	11 100	12 112	12 124	14 147	15 182	21 300	25 360	30 420	34 480
25 min 1 max	9 45	13 89	15 129	17 169	21 248	24 324	27 401	29 476	31 551	33 624	35 699	37 773	41 920	45 1140	58 1875	69 2250	81 2625	92 3000
40 min 1-1/2 max	18 117	25 230	30 335	35 440	42 644	48 842	54 1041	59 1236	63 1431	67 1622	71 1817	75 2009	81 2391	91 2964	131 4875	158 5850	184 6825	210 7800
50 min 2 max	24 150	34 295	41 430	47 565	56 825	64 1080	72 1335	78 1585	84 1835	89 2080	95 2330	95 2575	109 3065	128 3800	210 6250	252 7500	294 8750	336 10000
80 min 3 max	60 360	84 708	102 1032	116 1355	141 1980	161 2592	179 3204	195 3804	210 4404	223 4992	236 5592	249 6180	270 7356	302 9120	481 15000	578 18000	674 21000	770 24000
100 min 4 min	90 570	126 1121	152 1634	175 2145	211 3135	241 4104	269 5073	293 6023	315 6973	335 7904	355 8854	373 9785	407 11647	493 14440	811 23750	974 28500	1136 33250	1298 38000
150 min 6 max	180 1350	252 2655	305 3870	349 5081	422 7425	483 9720	577 12015	685 14265	793 16515	899 18720	1007 20970	1112 23175	1324 27585	1642 34200	2700 56250	3240 67500	3780 78750	4320 90000
200 min 8 max	150 2400	213 4720	311 6880	408 9032	597 13200	781 17280	966 21360	1147 25360	1327 29360	1505 33280	1685 37280	1863 41200	2217 49040	2749 60800	4521 100000	5425 120000	6330 140000	7234 160000
250 min 10 max	480 4200	673 8260	813 12040	931 15806	1126 23100	1288 30240	1517 37380	1801 44380	2086 51380	2363 58240	2647 65240	2926 72100	3482 85820	4318 106400	7101 175000	8622 210000	9942 245000	11362 280000
300 min 12 max	840 6000	1178 11800	1422 17200	1630 22580	1970 33000	2254 43200	2506 53400	2731 63400	2951 73400	3345 83200	3747 93200	4141 103000	4929 122600	6111 152000	100051 250000	12062 300000	14072 350000	16082 400000
Densit ρ _{sat} [kg/m ³]	0.30	0.59	0.86	1.13	1.65	2.16	2.67	3.17	3.67	4.16	4.66	5.15	6.13	7.60	12.50	15.00	17.50	20.00
Temp. T _{sat} [°C]	81.3	99.6	111.4	120.0	133.0	144.0	152.0	159.0	165.0	170.0	175.0	180.0	188.0	198.0	224.0	234.0	242.0	250.0

Specification Explanation

Vortex flowmeter	V	X	X	X	X	X	X	X	X	X	X	X
Compact design	T											
Remote design	R											
Serial number		8										
None			0									
Exi			1									
Exd			2									
Process Connections												
Flange				1								
Wafer				3								
Fluid												
Liquid					1							
Gas					2							
Steam					3							
Materials												
Housing	Shedder	Sensor										
0Cr18Ni9(304)	0Cr18Ni9(304)	0Cr18Ni9(304)					1					
316	316	316					2					
316L	316L	316L					3					
Hc	Hc	Hc					H					
Others							Q					
Normal temperature ($T \leq 150^{\circ}\text{C}$)								N				
Moderate temperature ($T \leq 250^{\circ}\text{C}$)								S				
High temperature ($T \leq 350^{\circ}\text{C}$)								H				
Converter												
Power supply / Locale display / Pulse output / 4-20mA signal output / HART									1			
Power supply / Locale display / Pulse output / RS 485 Modbus									2			
Power supply / Locale display / Temperature&pressure compensation / Pulse output									3			
Power supply / Locale display / Temp.&pre. Compensation / Pulse output / RS 485 Modbus									4			
Power supply / Locale display / Temp. compensation / Pulse output / 4-20mA output / HART									5			
Power supply / Locale display / Temp.&pre.compensation / Pulse output / 4-20mA output / HART									6			
Battery power / Locale display / External 24VDC with pulse output									7			
Battery power / Locale display / Temperature compensation / Pulse output									8			
Other									9			
Supply Power												
12-42V DC										A		
Battery power										B		
Cable Connection												
M20x1.5											M	
1/2 " NPT											N	
Other											Q	

