

VORTEX FLOW METER VM410

NEW
2023 MODEL



Features

- Small pressure loss, wide range, high accuracy
- It is hardly affected by fluid density, pressure, temperature and viscosity when measuring volume flow under working status
- No moving mechanical parts, thus high reliability and low maintenance.
- Vortex flow meter can be used in a temperature range of -40...+350°C
- It has both analog standard signals and digital pulse signal output to match with computers and other digital systems

Technical Data

Measuring principle : Vortex flow meter

Fluid type : Air, Gas, Steam, Liquid

Flow range : See the table (page 3 to 6)

Flow unit : See the page 2

Accuracy: ±1.0%

Vibration Acceleration : ≤0.2g

Pipe Diameter : DN15...DN300

Process Connection : DIN Flange (Option : ANSI, JIS)

Pressure resistance : 16 bar (Option : 25, 40 bar)

Fluid Temperature : -40...+250°C (Option : -40...+350°C)

Ambient Temperature : -40...+65 °C (Non-explison-proof site)

Ambient Temperature : -20...+55 °C (Explison-proof site)

Ambient Pressure : 86...106 kPa

Relative Humidity : 5...85 %RH

Output : Pulse, 4-20mA (2-wire), RS-485, HART (Please see ordering code)

Power Supply : 12...24 Vdc or 3.6V lithium battery

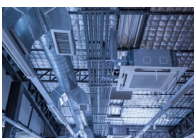
Housing Material : 304 Stainless Steel (Option : 316 Stainless Steel)

Protection class : IP65

Approval : II IG Ex ia IIC T5 Ga (Option)

Standard : ATEX, CE, EN 61010-1:2010+A1:2019, EN 61326-1:2013

Medium



Compressed air



Water / Liquids



Gases



Steam / Vapor

Application



Boiler / Steam



Chemical industry



Natural gas industry



Water supply / treatment

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Volume vs Mass flow rate and Flow rate unit

The difference between the two is that **mass flow** is the measurement of the number of molecules in a flowing gas, while **volume flow** is the measurement of the space occupied by those molecules. Since gases are compressible, the volume flow rate changes significantly when the pressure or temperature changes.

- Volume units**

Name of volume	Flow rate unit	Accumulative flow*
Normal cubic meters	Nm ³ /h, Nm ³ /m, Nm ³ /s	Nm ³
Liter	l/h, l/m, l/s	l
Cubic meters	m ³ /d, m ³ /h, m ³ /m	m ³
Standard cubic foot	Scf/h, Scf/m, Scf/s	Scf
Cubic foot	cf/h, cf/m, cf/s	cf
US gallon	USG/h, USG/m, USG/s	USG
UK gallon	UKG /h, UKG /m, UKG/s	USK
Barrel oil	bbbl/d, bbl/h	bbl

*Note: accumulative flow unit based on the instant flow unit.
The alphabet is stand for; d = day, h = hour, m = minute and s = second*

- Mass units**

Name of mass	Flow rate unit	Accumulative flow*
Grams	g/h, g/m, g/s	g
Kilograms	kg/d, kg/h, kg/m, kg/s	kg
Ton	t/d, t/h, t/m	t
Pounds	lb/d, lb,h	lb

*Note: accumulative flow unit based on the instant flow unit.
The alphabet is stand for; d = day, h = hour, m = minute and s = second*



**Note : product does not include clamp*

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Flow rate and Pressure rating : Gas

Nominal Diameter		Standard Flow Range	Standard Pressure	**Customized Pressure
mm	inch	m ³ /h	MPa	MPa
15	1/2	5-50	1.6	2.5, 4.0
20	3/4	6-60	1.6	2.5, 4.0
25	1	8-120	1.6	2.5, 4.0
32	1-1/4	10-200	1.6	2.5, 4.0
40	1-1/2	20-300	1.6	2.5, 4.0
50	2	25-500	1.6	2.5, 4.0
65	2-1/2	40-800	1.6	2.5, 4.0
80	3	60-1200	1.6	2.5, 4.0
100	4	120-2000	1.6	2.5, 4.0
125	5	150-3000	1.6	2.5, 4.0
150	6	200-4000	1.6	2.5, 4.0
200	8	350-8000	1.6	2.5, 4.0
250	10	500-12000	1.6	2.5, 4.0
300	12	600-16000	1.6	2.5, 4.0

Reference air medium; 20°C, 1013.25 mbar condition

**For customized pressure of flange type. Please ask the sales department for special options.



The vortex flow meter without compensation

*When the medium is gas/air that be used by vortex flow meter
Normally, it literally does not need temp/press compensation.*



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VORTEX FLOW METER VM410

Flow rate and Pressure rating : Liquid

Nominal Diameter		Standard Flow Range	Standard Pressure	**Customized Pressure
mm	inch	m ³ /h	MPa	MPa
15	1/2	0.5-8	1.6	2.5, 4.0
20	3/4	0.5-12	1.6	2.5, 4.0
25	1	0.8-16	1.6	2.5, 4.0
32	1-1/4	1.5-25	1.6	2.5, 4.0
40	1-1/2	2-40	1.6	2.5, 4.0
50	2	2.5-60	1.6	2.5, 4.0
65	2-1/2	4-100	1.6	2.5, 4.0
80	3	6-160	1.6	2.5, 4.0
100	4	8-250	1.6	2.5, 4.0
125	5	12-400	1.6	2.5, 4.0
150	6	18-600	1.6	2.5, 4.0
200	8	30-1200	1.6	2.5, 4.0
250	10	40-1600	1.6	2.5, 4.0
300	12	60-2500	1.6	2.5, 4.0

Reference normal temperature water

**For customized pressure of flange type. Please ask the sales department for special options.



*The vortex flow meter that will be used with liquid, the medium will be **very hot water** or **hot oil**. Because of if it can stand with high temperature.*



Hot water



Hot oil

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Flow rate and Pressure rating : Steam

Pressure (MPa)		0.20	0.30	0.40	0.50	0.60	0.70	0.80	
Temperature (°C)		120	134	144	152	159	165	170	
Density (kg/m ³)		1.129	1.651	2.163	2.669	3.170	3.667	4.167	
Flange	Range	Different steam density corresponding with its measurable flow range							
DN15	Qmin	5.64	8.25	10.81	13.34	15.85	18.33	20.81	Unit : Kg/hr
	Qmax	56.45	82.55	108.15	133.45	158.50	183.35	208.10	
DN20	Qmin	6.77	9.90	12.97	16.01	19.02	22.00	24.97	
	Qmax	67.70	99.00	129.70	160.14	190.20	220.02	249.72	
DN25	Qmin	9.03	13.20	17.30	21.35	25.36	29.33	33.29	
	Qmax	135.48	198.12	259.56	320.28	380.40	440.04	499.44	
DN32	Qmin	20.32	29.71	38.93	48.04	57.06	66.00	74.91	
	Qmax	203.22	297.18	389.34	480.42	570.6	660.06	749.16	
DN40	Qmin	22.58	33.02	43.26	53.38	63.40	73.34	83.24	
	Qmax	338.70	495.30	648.90	800.70	951.00	1100.10	1248.60	
DN50	Qmin	28.22	41.27	54.07	66.72	79.25	91.67	104.05	
	Qmax	564	825	1081	1334	1585	1833.5	2081	
DN65	Qmin	45.16	66.04	86.52	106.76	126.8	146.68	166.48	
	Qmax	903.2	1320.8	1730.4	2135.2	2536	2933.6	3329.6	
DN80	Qmin	67.74	99.06	129.78	160.14	190.2	220.02	249.72	
	Qmax	1354.8	1981.2	2595.6	3202.8	3804	4400.4	4994.4	
DN100	Qmin	112.9	165.1	216.3	266.9	317	366.7	416.2	
	Qmax	2258	3302	4326	5338	6340	7334	8324	
DN125	Qmin	169.35	247.65	324.45	400.35	475.5	550.05	624.3	
	Qmax	3387	4953	6489	8007	9510	11001	12486	
DN150	Qmin	225.8	330.2	432.6	533.8	634	733.4	832.4	
	Qmax	4516	6604	8652	10676	12680	14668	16648	
DN200	Qmin	395.15	577.85	757.05	934.15	1109.5	1283.45	1456.7	
	Qmax	9032	13208	17304	21352	25360	29336	33296	
DN250	Qmin	564.5	825.5	1081.5	1334.5	1585	1833.5	2081	
	Qmax	13548	19812	25956	32028	38040	44004	49944	
DN300	Qmin	677.4	990.6	1297.8	1601.4	1902	2200.2	2497.2	
	Qmax	18064	26416	34608	42704	50720	58672	66592	

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Flow rate and Pressure rating : Steam

Pressure (MPa)		0.90	1.00	1.20	1.40	1.60	1.80	2.00	
Temperature (°C)		175	180	188	195	201	207	212	
Density (kg/m ³)		4.665	5.147	6.127	7.106	8.085	9.065	10.05	
Flange	Range	Different steam density corresponding with its measurable flow range							
DN15	Qmin	23.325	25.735	30.635	35.53	40.425	45.325	50.25	Unit : kg/hr
	Qmax	233.25	257.35	306.35	355.3	404.25	453.25	502.5	
DN20	Qmin	27.99	30.882	36.762	42.636	48.51	54.39	60.3	
	Qmax	279.9	308.82	367.62	426.36	485.1	543.9	603	
DN25	Qmin	37.32	41.176	49.016	56.848	64.68	72.52	80.4	
	Qmax	559.8	617.64	735.24	852.72	970.2	1087.8	1206	
DN32	Qmin	83.97	92.646	110.286	127.908	145.53	163.17	180.9	
	Qmax	839.7	926.46	1102.86	1279.08	1455.3	1631.7	1809	
DN40	Qmin	93.3	102.94	122.54	142.12	161.7	181.3	201	
	Qmax	1399.5	1544.1	1838.1	2131.8	2425.5	2719.5	3015	
DN50	Qmin	116.62	128.675	153.17	177.65	202.12	226.62	251.25	
	Qmax	2332.5	2573.5	3063.5	3553	4042.5	4532.5	5025	
DN65	Qmin	186.6	205.88	245.08	284.24	323.4	362.6	402	
	Qmax	3732	4117.6	4901.6	5684.8	6468	7252	8040	
DN80	Qmin	279.9	308.82	367.62	426.36	485.1	543.9	603	
	Qmax	5598	6176.4	7352.4	8527.2	9702	10878	12060	
DN100	Qmin	466.5	514.7	612.7	710.6	808.5	906.5	1005	
	Qmax	9330	10294	12254	14212	16170	18130	20100	
DN125	Qmin	699.75	772.05	919.05	1065.9	1212.75	1359.75	1507.5	
	Qmax	13995	15441	18381	21318	24255	27195	30150	
DN150	Qmin	933	1029.4	1225.4	1421.2	1617	1813	2010	
	Qmax	18660	20588	24508	28424	32340	36260	40200	
DN200	Qmin	1632.75	1801.45	2144.45	2487.1	2829.75	3172.75	3517.5	
	Qmax	37320	41176	49016	56848	64680	72520	80400	
DN250	Qmin	2332.5	2573.5	3063.5	3553	4042.5	4532.5	5025	
	Qmax	55980	61764	73524	85272	97020	108780	120600	
DN300	Qmin	2799	3088.2	3676.2	4263.6	4851	5439	6030	
	Qmax	74640	82352	98032	113696	129360	145040	160800	

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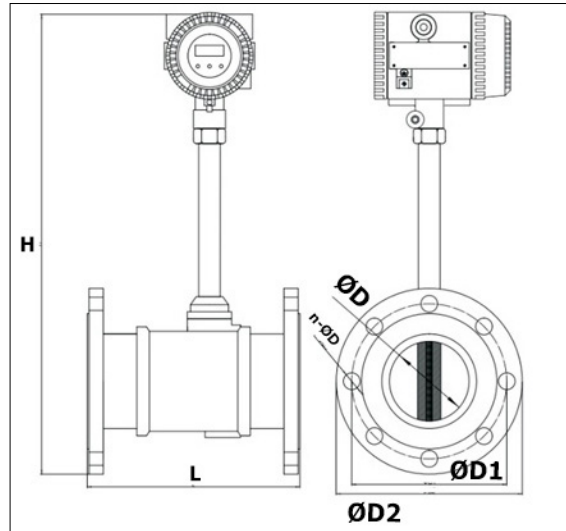
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Installation Dimensions



Diameter (mm)	L (mm)	H (mm)	ØD (mm)	ØD1 (mm)	ØD2 (mm)	n-ØD (mm)
15	170	440	15	65	95	4-φ14
20	170	445	20	75	105	4-φ14
25	170	450	26	85	115	4-φ14
32	170	462	32	100	140	4-φ18
40	190	465	38	110	150	4-φ18
50	190	473	48	125	165	4-φ18
65	220	487	62	145	185	4-φ18
80	220	500	73	160	200	8-φ18
100	240	533	95	180	220	8-φ18
125	260	560	118	210	250	8-φ18
150	280	608	140	240	285	8-φ22
200	300	640	200	295	340	12-φ22
250	360	705	250	355	405	12-φ26
300	400	752	300	410	460	12-φ26

*Note : DIN PN16 Flange Connection Dimension

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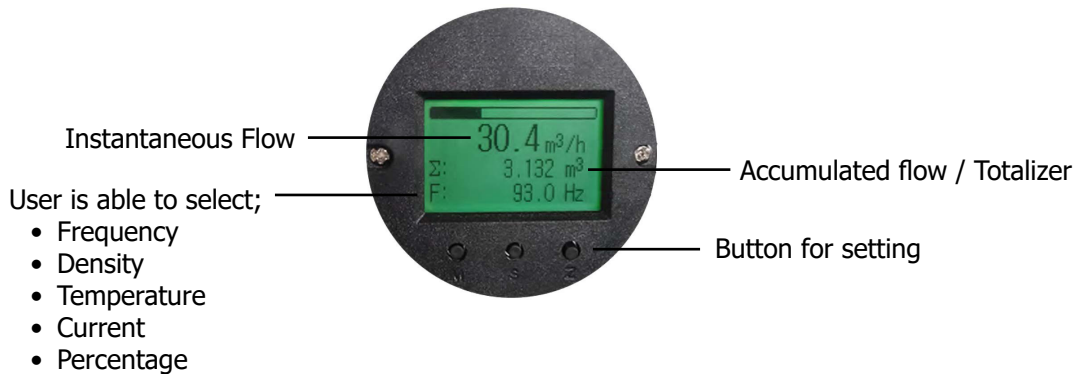
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VORTEX FLOW METER VM410

Product Feature

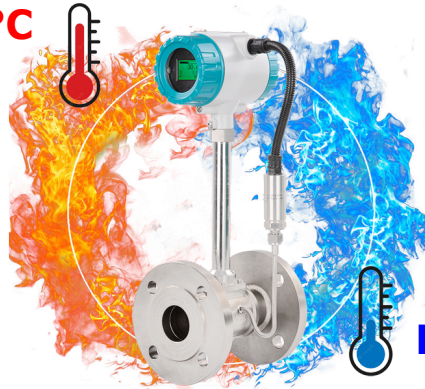
- **Low Power consumption LCD Display**



- **Extremely temperature resistance**

The vortex flow meter is able to stand high temperature up to 250°C in standard version. If the temperature of medium is more than 250°C, The vortex flow meter still be useable in high temperature version (optional).

Max. 350°C



- **Structure of Triangular prism and Welding**

Intergally forged triangular prism, more stable and safe. Advanced welding technology durable structure, welding seam smooth and beautiful.



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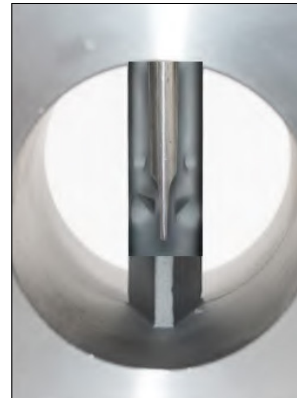
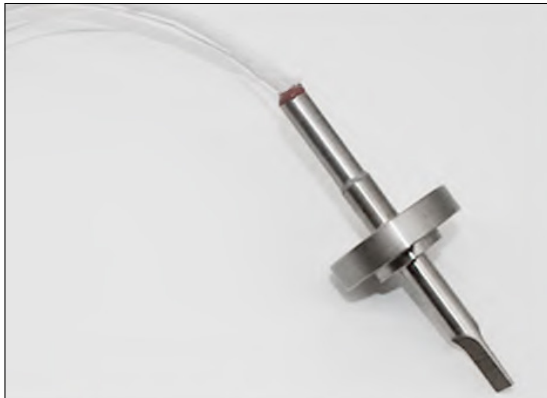
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VORTEX FLOW METER VM410

Product Feature

- **High Stability and accuracy**

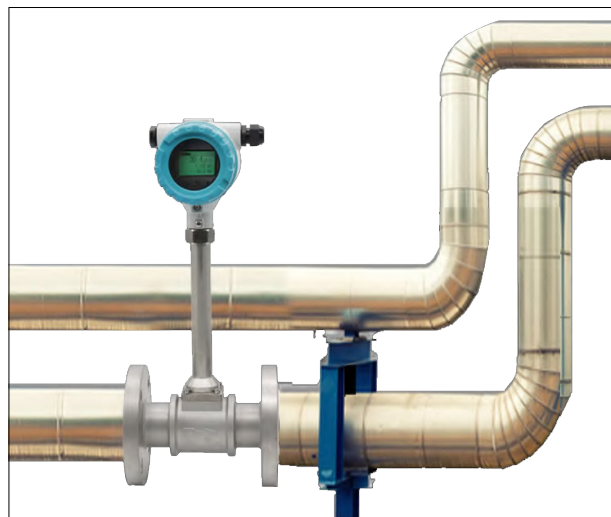
Built-in interfrated flow and temperature sensor, no burrs, ensure stable signal and high accuracy measurement. For impact testing with no leakage and stable signal. Built-in four piezoelectric crystals, eliminates interface and zero point drift.



Note : Temperature and flow integrated sensor (with temperature compensation)

- ***High Anti-vibration detector**

Generally, vortex flow meter always have problem when use with vibrated tube in site. But this is a new generation of vortex flow meter for anti-vibration. The flow meter passed nnti-vibration testing, under different amplitude and vibration, make sure measuring accuracy under different working condition.



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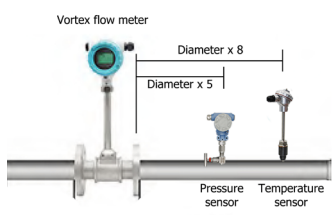
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Installation guide

No	Characteristic	Description
1	Concentric reducers pipeline 	Upsteam : 15 x Diameter Downsteam : 5 x Diameter
2	Concentric expansion pipeline 	Upsteam : 25 x Diameter Downsteam : 5 x Diameter
3	Single quarter bend 	Upsteam : 20 x Diameter Downsteam : 5 x Diameter
4	Two quarter bends on the same surface 	Upsteam : 25 x Diameter Downsteam : 5 x Diameter
5	Two quarter bends on the different surface 	Upsteam : 40 x Diameter Downsteam : 5 x Diameter
6	Regulating valve, half-open gate 	Upsteam : 50 x Diameter Downsteam : 5 x Diameter
7	Valve position	Flow regulating valve must be installed at the downstream of flow sensor.
8		Pressure and temperature taps (for remote type vortex flow meter with T&P compensation only) Remote type vortex flow meter with pressure and temperature compensation need to place pressure and temperature tap according to the requirement. Install pressure tapping point at 3-5D downstream of flow sensor and temperature taking point at 5-8D downstream of flow sensor.
9	Vibration Flow sensor should be not installed on a strong vibration pipeline	If install the flow sensor on a vibration pipeline, there are following methods to decrease the disturbing of vibration: Installing a fixed support on pipeline at 2D upstream of flow meter. At the condition of meeting the straight length, install a hosepipe as a transmission.
10	High temperature pipeline	If the heat preservation not good, the flow meter should be installed downward vertical.

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Ordering code

Series : VM410-A-B-C-D-E-F-G-H

A : Pipe diameter

xx : DN15...DN300

B : Fluid type	
L : Liquid	
G : Air / Gas	
ST : Steam	
C : Display and Output Feature	
NP : No Display + pulse	
DB : Display + Battery	
DA : Display + 4-20mA + pulse + RS485	
DR : Remote Display (10 m cable) + 4-20mA + pulse + RS485	
DH : Display + 4-20mA + pulse + HART	
D : Process Connection	
FD16 : Flange DIN PN16 (Standard connection for pressure 16 bar)	
C : Clamp (for DN15-100)	
xx : The special connection is below.**	
E : Fluid temperature	
- : -40...+250 °C (Standard)	
H : -40...+350 °C	
F : Compensation	
- : No compensation	
TP : Temp & pressure compensation	
G : Body Material (option)	
- : Stainless Steel 304 (Standard)	
S16 : Stainless Steel 316	
H : Explosion Proof (option)	
- : Non-Explosion proof	
EX : ATEX II 1G Ex ia IIC T5 Ga	

****Special Process Connection**

FD25 : Flange DIN PN25 | **FD40** : Flange DIN PN40

FA150 : Flange ANSI 150 | **FA300** : Flange ANSI 300 | **FA600** : Flange ANSI 600

FJ10 : Flange JIS 10K | **FJ20** : Flange JIS 20K | **FJ30** : Flange JIS 30K

Example Ordering : VM410-25-ST-DA-FD16-T-P

Description : Vortex flow meter pipe diameter DN25, have monitor and output signal is 4-20 mA + pulse + RS485, Flange DIN PN16 connection, Body Material is Stainless Steel 304, resistance liquid temperature -40...+250°C

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VORTEX FLOW METER VM410

Other product and accessory

VM420 : Clamp type vortex flow meter



Features

- The flow meter suits for food industry
- No moving mechanical parts, thus high reliability and low maintenance.
- Vortex flowmeter can be used in a temperature range of -40...+350°C



VM430 : Insertion type vortex flow meter



Features

- The flow meter suits for huge diameter tube
- No moving mechanical parts, thus high reliability and low maintenance.
- Vortex flowmeter can be used in a temperature range of -40...+350°C

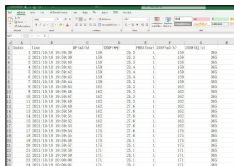
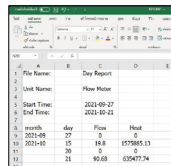


FDI-7600 : Flow totalizer display



Features

- Display indicator for flow meter, able to record the totalizer and flow rate together
- Built-in memory for recording data
- There is a software for management data, graphing, export data to CSV file

File Name:	Day Report		
Unit Name:	Flow Meter		
Start Time:	2012-09-27		
End Time:	2012-10-21		
month	day	Flow	Total
2012-09	27	0	0
2012-10	15	19.8	1575815.13
2012-10	20	0	
2012-10	21	90.69	659472.24