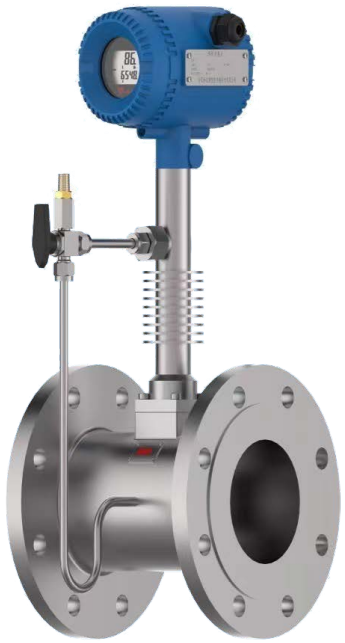
Working principle

VFM60 is a powerful flow meter utilizing “Karman vortex” theory, which can meet the requirement of measuring the flow rate of various fluids such as gas, steam and liquid.



Special features

- Super low flow measurement down to 2m/s
- Unique dual sensor technology excellent in anti-vibration
- Multi-variable flow meter, measures flow rate, temperature , pressure, FAD measurement available
- Blue tooth function optional, can read and set on COMATE APP with and smart phone or pad
- Self-diagnose function plus remote diagnose function, ensure easier trouble-shooting.
- No mechanical wear part

Features

Process Fluids	Used in liquid, gas, and steam applications. Fluids must be homogeneous and single-phase.
Line Sizes	The wafer and flanged type cover line sizes as below. 0.5”, 0.75”,1”, 1.5”, 2”, 2.5”, 3”, 4”, 5”, 6”, 8”,10” ,12”, (DN15, DN20, DN25, DN40, DN50, DN65, DN80, DN100, DN125, DN150, DN200, DN250, DN300) The insertion type covers DN300~1000.
Process connection	Flange, wafer, insertion, ANSI, JIS, DIN Standard flanges are optional for flanged connection
Displayer	Integral or remote.3 buttons control. 2 lines LCD displayer. 1st line has 5 digits to display mass flow or volume flow or frequency or temperature or pressure 2nd line has 8 digits to displayer total flow A small extra line above 1st line will indicate what parameter being displayed in 1st line.
Measurable parameter	Standard version: Volume flow rate in pipe (Can measure mass flow rate, temperature and pressure if wired to separate RTD and pressure transmitter.) Multi-variable version: Mass flow rate, volume flow rate in standard condition, temperature, pressure, volume flow rate in pipe, velocity.
Output signal	Pulse, high level ⩾ 5V, low level < 1V, 50% duty ratio 4~20mA (HART@4~20mA) ModBus-RTU RS485
Pressure allowance	1.6MPa (232 psiG)、2.5MPa (362 psiG)、4.0MPa (580 psiG)、6.3Mpa (913 psiG) for option

Measurement range

Medium	Min Velocity	Max Velocity
Gas	6m/s for DN15、DN20 (19.7 ft/s) for 0.5" and 0.75" 4m/s, DN25、DN32 (13.1 ft/s) for 1" and 1.25" 2m/s, DN40 ~ DN300 (6.7 ft/s) for 1.5" ~ 1.2"	60m/s (196.9 ft/s)
Steam	6m/s for DN15、DN20 (19.7 ft/s) for 0.5" and 0.75" 4m/s, DN25、DN32 (13.1 ft/s) for 1" and 1.25" 2m/s, DN40 ~ DN300 (6.7 ft/s) for 1.5" ~ 1.2"	70m/s (229.7 ft/s)
Liquid	0.3m/s (1 ft/s)	7m/s (23 ft/s)

VFM60N Standard type vortex meter without temperature & pressure compensation

Specification

Process connection	Flange Wafer	DN15~DN300 or 0.5 inch to 12 inch DN15~DN300 or 0.5 inch to 12 inch
Medium temperature	Standard Medium High	–40 ~ 150 ℃ or –40 ~ 302 ℉ –40 ~ 250 ℃ or –40 ~ 482 ℉ –40 ~ 350 ℃ or –40 ~ 662 ℉
Power supply	4~20mA 2 wise system VFM60MV with 4~20mA (2 wire) Modbus RTU	13.5 ~ 42V 15.5 ~ 42V Current Iq < 9mA 13.4 ~ 42V
Reynolds and accuracy	Gas/steam (m^3/h)	±1%RD (Re ⩾ 20000) ±2%RD (10000 < Re < 20000)
	Liquid (m^3/h)	±0.75%RD (Re ⩾ 20000) ±2%RD (10000 < Re < 20000)
	Gas/steam (m^3/h)	±1.5%RD (Re ⩾ 20000) ±2.5%RD (10000 < Re < 20000)
Turndown ratio	Gas Steam Liquid	1:30 1:35 1:22
Repeatability	Volume flow Mass flow Temperature Pressure	±0.3% ±0.3% ±0.05 ℃ ±0.05%FS

Upstream/Downstream requires	15 x D / 5 x D Details please check in manual
Viscosity allowance	DN15 or 0.5 inch ⩽ 4mPas DN25 or 1 inch ⩽ 5mPas DN40~DN300 or 1.5~12 inch ⩽ 7mPas
Anti–vibration (both punch and fixed freq)	0.5g
Display	LCD displayer
Saturated /superheated steam measurement	Support
Natural gas/Biogas, ect	Support
Communication	HART(V5、V7)/ Modbus–RTU/ Pulse
Explosive proof	NEPSI Ex d II c T3 Gb

VFM60MV Multi–variable Vortex Meter standard type support up to 150 ˚C

VFM60MV Multi–variable Vortex Meter high temperature support up to 250˚C

Actual flow measuring range

Pipe size		Steam/gas actual flow				liquid actual flow			
		Min flow m^3/hr	Max flow m^3/hr	Min flow cu.ft/min	Max flow cu.ft/min	Min flow m^3/hr	Max flow m^3/hr	Min flow GPM	Max flow GPM
15mm	0.5 inch	3.8	44.5	2.2	26.2	0.2	4.4	0.8	19.6
20mm	0.75 inch	6.8	79.1	4	46.6	0.3	7.9	1.5	34.8
25mm	1 inch	7.1	123.6	4.2	72.7	0.5	12.4	2.3	54.4
32mm	1.25 inch	11.6	202.5	6.8	119.2	0.9	20.2	3.8	89.2
40mm	1.5 inch	9	316.4	5.3	186.2	1.4	31.6	6.0	139.3
50mm	2 inch	14.1	494.4	8.3	291	2.1	49.4	9.3	217.7
65mm	2.5 inch	23.9	835.5	14	491.7	3.6	83.5	15.8	367.8
80mm	3 inch	36.2	1265.5	21.3	744.9	5.4	126.6	23.9	557.2
100mm	4 inch	56.5	1977.4	33.3	1163.9	8.5	197.7	37.3	870.6
125mm	5 inch	88.3	3089.7	52	1818.5	13.2	309.0	58.3	1360.4
150mm	6 inch	127.1	4449.2	74.8	2618.7	19.1	444.9	84.0	1958.9
200mm	8 inch	226	7909.6	133	4655.4	33.9	791.0	149.3	3482.5
250mm	10 inch	353.1	12358.8	207.8	7274.1	53.0	1235.9	233.2	5441.4
300mm	12 inch	508.5	17796.6	299.3	10474.7	76.3	1779.7	335.8	7835.6

Saturated steam measuring range——Metric unit flow rate in kg/hr

Pipe size		T=121 dgrC P=1 barG D=1.155 kg/m^3		T=144 dgrC P=3 barG D=2.185 kg/m^3		T=159 dgrC P=5 barG D=3.182 kg/m^3		T=165 dgrC P=6 barG D=3.671 kg/m^3		T=171 dgrC P=7 barG D=4.218 kg/m^3	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
15mm	0.5 inch	4.4	51.4	8.3	97.2	12.1	141.6	14	163.3	16.1	187.7
20mm	0.75 inch	7.8	91.4	14.8	172.8	21.6	251.7	24.9	290.4	28.6	333.6
25mm	1 inch	8.2	142.7	15.4	270	22.5	393.3	25.9	453.7	29.8	521.3
32mm	1.25 inch	13.4	233.9	25.3	442.4	36.8	644.3	42.5	743.3	48.8	854.1
40mm	1.5 inch	10.4	365.4	19.8	691.3	28.8	1006.7	33.2	1161.4	38.1	1334.5
50mm	2 inch	16.3	571	30.9	1080.2	44.9	1573	51.9	1814.8	59.6	2085.2
65mm	2.5 inch	27.6	964.9	52.2	1825.5	76	2658.4	87.6	3066.9	100.7	3523.9
80mm	3 inch	41.8	1461.7	79	2765.2	115.1	4026.9	132.7	4645.8	152.5	5338
100mm	4 inch	65.3	2283.9	123.4	4320.6	179.8	6292.1	207.4	7259	238.3	8340.7
125mm	5 inch	102	3568.6	192.9	6751	280.9	9831.4	324.1	11342.2	372.4	13032.3
150mm	6 inch	146.8	5138.8	277.8	9721.4	404.5	14157.2	466.7	16332.8	536.2	18766.5
200mm	8 inch	261	9135.6	493.8	17282.5	719.1	25168.4	829.6	29036.2	953.2	33362.7
250mm	10 inch	407.8	14274.4	771.5	27003.9	1123.6	39325.6	1296.3	45369	1489.4	52129.2
300mm	12 inch	587.3	20555.1	1111	38885.6	1618	56628.8	1866.6	65331.4	2144.7	75066.1

Pipe size		T=176 dgrC P=8 barG D=4.723 kg/m^3		T=185 dgrC P=10 barG D=5.752 kg/m^3		T=192 dgrC P=12 barG D=6.671 kg/m^3		T=199 dgrC P=14 barG D=7.706 kg/m^3		T=215 dgrC P=20 barG D=10.57 kg/m^3	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
15mm	0.5 inch	18	210.1	21.9	255.9	25.4	296.8	29.4	342.9	40.3	470.3
20mm	0.75 inch	32	373.6	39	455	45.2	527.6	52.2	609.5	71.7	836
25mm	1 inch	33.4	583.7	40.6	710.9	47.1	824.5	54.4	952.4	74.6	1306.3
32mm	1.25 inch	54.6	956.3	66.6	1164.7	77.2	1350.8	89.2	1560.4	122.3	2140.3
40mm	1.5 inch	42.7	1494.3	52	1819.8	60.3	2110.6	69.7	2438.1	95.5	3344.2
50mm	2 inch	66.7	2334.8	81.2	2843.5	94.2	3297.8	108.8	3809.5	149.3	5225.3
65mm	2.5 inch	112.7	3945.8	137.3	4805.5	159.2	5573.3	183.9	6438	252.3	8830.7
80mm	3 inch	170.8	5977.1	208	7279.4	241.2	8442.4	278.6	9752.2	382.2	13376.7
100mm	4 inch	266.8	9339.3	325	11374	376.9	13191.2	435.4	15237.9	597.2	20901.1
125mm	5 inch	416.9	14592.6	507.8	17771.9	588.9	20611.3	680.3	23809.1	933.1	32658
150mm	6 inch	600.4	21013.3	731.2	25591.5	848	29680.3	979.6	34285.2	1343.6	47027.5
200mm	8 inch	1067.3	37357.1	1299.9	45496	1507.6	52765	1741.5	60951.4	2388.7	83604.5
250mm	10 inch	1667.7	58370.4	2031.1	71087.6	2355.6	82445.3	2721	95236.6	3732.3	130632.1
300mm	12 inch	2401.5	84053.4	2924.7	102366.1	3392	118721.2	3918.3	137140.7	5374.6	188110.2

saturated steam measuring range——Imeprial unit flow rate in lb/hr

Pipe size		T=249.8 dgrF P=14.5 pisG D=0.0721 lb/ft³		T=291.2 dgrF P=43.5 pisG D=0.1364 lb/ft³		T=318.2 dgrF P=72.5 pisG D=0.1986 lb/ft³		T=329 dgrF P=87 pisG D=0.2292 lb/ft³		T=339.8 dgrF P=101.5 pisG D=0.2633 lb/ft³	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
15mm	0.5 inch	9.7	113.3	18.4	214.3	26.8	312.1	30.9	360.1	35.5	413.7
20mm	0.75 inch	17.3	201.4	32.7	381	47.6	554.9	54.9	640.1	63	735.5
25mm	1 inch	18	314.7	34	595.3	49.5	867	57.2	1000.2	65.7	1149.3
32mm	1.25 inch	29.5	515.6	55.7	975.4	81.2	1420.5	93.6	1638.8	107.6	1882.9
40mm	1.5 inch	23	805.6	43.5	1524.1	63.4	2219.5	73.2	2560.6	84.1	2942.1
50mm	2 inch	36	1258.8	68	2381.3	99.1	3467.9	114.3	4000.9	131.3	4597
65mm	2.5 inch	60.8	2127.3	115	4024.5	167.5	5860.8	193.2	6761.5	222	7768.9
80mm	3 inch	92.1	3222.5	174.2	6096.2	253.7	8877.9	292.6	10242.2	336.2	11768.4
100mm	4 inch	143.9	5035.1	272.2	9525.3	396.3	13871.7	457.2	16003.4	525.4	18388
125mm	5 inch	224.8	7867.4	425.2	14883.3	619.3	21674.5	714.4	25005.4	820.9	28731.3
150mm	6 inch	323.7	11329.1	612.3	21432	891.8	31211.3	1028.8	36007.7	1182.1	41373.1
200mm	8 inch	575.4	20140.5	1088.6	38101.4	1585.3	55486.7	1829	64013.8	2101.5	73552.2
250mm	10 inch	899.1	31469.6	1701	59533.4	2477.1	86698	2857.8	100021.5	3283.6	114925.3
300mm	12 inch	1294.7	45316.2	2449.4	85728.1	3567	124845.2	4115.2	144031	4728.4	165492.4

Pipe size		T=348.8 dgrF P=116 pisG D=0.2948 lb/ft³		T=365 dgrF P=145 pisG D=0.3591 lb/ft³		T=377.6 dgrF P=174 pisG D=0.4165 lb/ft³		T=390.2 dgrF P=203 pisG D=0.4811 lb/ft³		T=419 dgrF P=290 pisG D=0.6599 lb/ft³	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
15mm	0.5 inch	39.7	463.3	48.4	564.2	56.1	654.3	64.8	755.9	88.9	1036.8
20mm	0.75 inch	70.6	823.6	86	1003	99.7	1163.3	115.2	1343.7	158	1843.2
25mm	1 inch	73.5	1286.8	89.6	1567.2	103.9	1817.6	120	2099.6	164.6	2879.9
32mm	1.25 inch	120.5	2108.4	146.7	2567.7	170.2	2978	196.6	3440	269.6	4718.5
40mm	1.5 inch	94.1	3294.3	114.6	4012.1	132.9	4653.1	153.6	5375	210.6	7372.7
50mm	2 inch	147.1	5147.4	179.1	6268.9	207.7	7270.4	240	8398.4	329.1	11519.8
65mm	2.5 inch	248.5	8699.1	302.7	10594.4	351.1	12287	405.5	14193.3	556.2	19468.4
80mm	3 inch	376.5	13177.3	458.5	16048.3	531.8	18612.3	614.3	21500	842.6	29490.6
100mm	4 inch	588.3	20589.6	716.4	25075.4	830.9	29081.7	959.8	33593.7	1316.5	46079.1
125mm	5 inch	919.2	32171.2	1119.4	39180.3	1298.3	45440.2	1499.7	52490.2	2057.1	71998.6
150mm	6 inch	1323.6	46326.5	1612	56419.7	1869.5	65433.9	2159.6	75585.9	2962.2	103678
200mm	8 inch	2353.1	82358.2	2865.8	100301.6	3323.6	116326.8	3839.3	134374.9	5266.2	184316.4
250mm	10 inch	3676.7	128684.7	4477.8	156721.3	5193.2	181760.7	5998.9	209960.7	8228.4	287994.4
300mm	12 inch	5294.5	185306	6448	225678.6	7478.2	261735.4	8638.4	302343.4	11848.9	414711.9

saturated steam measuring range——Imeprial unit flow rate in lb/hr

The standard model number is usually VFM60MV–2–WC–1–N–N–ML1–M–N–XXX,
Please reference to the table below for what the model codes stand for.

Mode codes

1	General model	VFM60–MV	Vortex mass flowmeter with integral RTD and pressure sensor	Standard
		VFM60–N	Vortex flowmeter without integral RTD and pressure sensor	Option
2	Fluid type	1	Liquid	Option
		2	Gas	Standard
		3	Steam	Option
3	Process connection	IN	Insertion (only for DN300 ~ DN1000 or 12 inch ~ 40 inch)	Option
		WC	Wafer with carbon steel flanges up to 16 barG (232 psiG) (DN15 ~ DN300)	Standard
		WF	Wafer with stainless steel flanges up to 16 barG (232 psiG) (DN15 ~ DN300)	Option
		D1	Flanged DIN PN16 up to 16 barG (232 psiG) (DN15 ~ DN300)	Option
		D2	Flanged DIN PN25 up to 25 barG (362 psiG) (DN15 ~ DN300)	Option
		D3	Flanged DIN PN40 up to 40 barG (580 psiG) (DN15 ~ DN300)	Option
		D4	Flanged DIN PN63 up to 63 barG (913 psiG) (DN15 ~ DN300)	Option
		C1	Flanged ANSI CL150 up to 16 barG (232 psiG) (0.5 inch ~ 12 inch)	Option
		C2	Flanged ANSI CL300 up to 40 barG (580 psiG) (0.5 inch ~ 12 inch)	Option
		C3	Flanged ANSI CL400 up to 63 barG (913 psiG) (0.5 inch ~ 12 inch)	Option
		J1	JIS 10K up to 16 barG (232 psiG) (DN15 ~ DN300)	Option
		J2	JIS 20K up to 40 barG (580 psiG) (DN15 ~ DN300)	Option
		J3	JIS 30K up to 63 barG (913 psiG) (DN15 ~ DN300)	Option
4	Wetted part material	1	OCr18Ni9 (304)	Standard
		2	316	Option
5	Degreased	Q	Other	Option
		N	Wet part not degreased	Standard
		D	Wet part degreased for Oxygen measurement	Option
6	Medium Temperature	N	T≤150℃	Standard
		S	T≤250℃ (wafer or flanged)	Option
		H	T≤350℃ (wafer or flanged)	Option
7	Transmitter	ML1	Integral transmitter, multi–variable, bluetooth, RS485, pulse,	Standard
		ML2	Integral transmitter, multi–variable, bluetooth, pulse, 4 wire 4~20mA	Option
		ML3	Integral transmitter, multi–variable, bluetooth, RS485, pulse, 4 wire 4~20mA	Option
		ML4	Integral transmitter, multi–variable, bluetooth, pulse, 4 wire HART@4~20mA	Option

7	Transmitter	ML5	Integral transmitter, multi-variable, pulse, 2 wire 4~20mA	Option
		ML6	Integral transmitter, multi-variable, pulse, 2 wire HART@4~20mA	Option
		MR1	Remote transmitter (dual display), multi-variable, bluetooth, RS485, pulse	Option
		MR2	Remote transmitter (dual display), multi-variable, bluetooth, RS485, pulse, 4 wire 4~20mA	Option
		NL1	Integral transmitter, bluetooth, RS485, pulse,	Option
		NL3	Integral transmitter, bluetooth, RS485, pulse, 4 wire 4~20mA	Option
		NL4	Integral transmitter, bluetooth, pulse, 4 wire HART@4~20mA	Option
		NL6	Integral transmitter, pulse, 2 wire HART@4~20mA	Option
		NR1	Remote transmitter (dual display), bluetooth, RS485, pulse,	Option
		NR2	Remote transmitter (single display), bluetooth, pulse, 4 wire 4~20mA	Option
		NR3	Remote transmitter (dual display), bluetooth, RS485, pulse, 4 wire 4~20mA	Option
		NR4	Remote transmitter (single display), bluetooth, pulse, 4 wire HART@4~20mA	Option
		NR6	Remote transmitter (single display), pulse, 2 wire HART@4~20mA	Option
8	Cable grinder	M	M20x1.5	Standard
		N	NPT 1/2	Option
9	Ex-proof	N	No Ex-proof	Standard
		1	NEPSI Ex d IIC T3 Gb	Option
10	Pipe size	015	DN15 or 0.5 inch	
		020	DN20 or 0.75 inch	
		025	DN25 or 1 inch	
		032	DN32 or 1.25 inch	
		040	DN40 or 15 inch	
		050	DN50 or 2 inch	
		065	DN65 or 2.5 inch	
		080	DN80 or 3 inch	
		100	DN100 or 4 inch	
		125	DN125 or 5 inch	
		150	DN150 or 6 inch	
		200	DN200 or 8 inch	
		250	DN250 or 10 inch	
		300	DN300 or 12 inch	