

The Growco VT Series is our patented Vortex Flow Meters which are designed based on Kamen vortex shedding street principle and are typically used as standalone flow meters or used together with electronic controllers or PLC for flow measurement used in waste water treatment & sewage plants, food and beverage plants, pharmaceutical plants, chemical and Petroleum plants, heat exchangers & cooling plants or related processing installations.

➤ TYPICAL FEATURES OF VT SERIES:

- Wide applications which can be used to measure hot liquids, steams and gases.
- Easy installation in flange or wafer connections.
- Same sensor can measure liquid, gas and steam.
- Stable and reliable operations.
- Straight through compact design.
- No moving parts & low pressure drop design.
- Turndown Ratio can reach up to 1 : 10.
- Simple structure and easy maintenance.



Typical Photograph of VT Series with integral Display

➤ PRINCIPLE OF OPERATIONS

This principle states that flow around a bluff body will generate vortices on alternate sides of the bluff body. Vortex meters contain a bluff body in the form of a piece of material that has a broad, flat front. This piece of material extends vertically into the flow stream. Flow velocity is proportional to the number of vortices generated. Flow rate is calculated by multiplying flow velocity times the area of the pipe.

It is easily described by the following formula: $f = St \cdot (v/d)$ where,

f - Output frequency of the Karman Street

St - Coefficient (called as Strohar number)

v - velocity

d - Diameter of drum



As an output frequency of the Karman Street (f) is directly proportional to a velocity (v), it will work out an instantaneous flow rate by using a tested output frequency of the Karman Street. The Strohar number (St) is a key coefficient for vortex street flow meters. Within the linear section of the curve, where $St \approx 0.17$, the output frequency is directly proportional to the flow velocity, so a velocity (v) is derivable by using a tested frequency (f).

Growco VT Series vortex street flow transducers detect the output frequency by using piezoelectrical elements inside the sensors (probes) to test the stress that is alternatively acted on the elements by vortex. One of our Growco VT Series vortex flow meter's major advantages is its versatility in uses to measure liquid, steam, and gas. Steam has become the area in which vortex meters have come to excel. They can easily handle the high temperature and high flow rates associated with steam. Steam flow measurement is prevalent in the process industries where heating is part of their major processes. Our Growco VT Series vortex meters are also widely used to measure the flow of liquids and gases.

➤ GENERAL FLOW METERS SPECIFICATIONS

- Nominal Diameter Range : 25~300mm (Approx. 12")
- Reynolds No. Range : 2X10⁴~7X10⁶(For DN25--DN100)
4X10⁴~7X10⁶(For DN150--DN300)
- Display : Instant and total Flow Local LCD Display
- Working Pressure : 1.6~32MPa
- Fluid Temperature : -40°C~+150°C (Integral Type)
-40°C~+300°C (Separate Type)
- Power : 24VDC ±10% Or 3.6VDC inner lithium Battery
- Ambient Temperature : -25°C~+60°C
- Relative Humidity : 5%~95%
- Atmospheric Pressure : 86~106KPa
- Measured Fluid : Liquid, Gas and Steam
- Accuracy : +/-1.0%(For Liquid), +/-1.5%(For Gas and Steam)
- Output Signal : 4~20mA Current (2 Wires System) Or
Standard Pulse Output (3 Wires System)

Flow Ranges (General Fluid):

DN (mm)	Normal Flow Range (m ³ /h)	
	Water	Gas
25	0.7 ~ 15	15 ~ 135
40	1.3 ~ 36	20 ~ 334
50	2.2 ~ 60	35 ~ 550
80	4.3 ~ 115	60 ~ 1050
100	7.5 ~ 200	100 ~ 1850
150	16 ~ 435	220 ~ 4050
200	35 ~ 780	390 ~ 7300
250	50 ~1200	600 ~ 11300
300	75 ~1720	860 ~ 16100

Notes: The calibrated fluid is water or air. DN means the nominal diameter.

Flow Ranges Of Saturated Steam:

DN (mm)	Flow Range	Flow Range (kg/h)								
		0.1MPa	0.2MPa	0.4MPa	0.6MPa	0.8MPa	1.0MPa	1.5MPa	2.0MPa	2.5MPa
25	Min.	17.33	25.08	40.19	55.07	69.27	84.44	121.50	158.55	195.00
	Max.	155.93	225.72	361.67	495.59	623.43	759.92	1093.50	1426.95	1755.00
40	Min.	23.10	33.44	53.58	73.42	92.36	112.58	162.00	211.40	260.00
	Max.	385.77	558.45	894.79	1226.11	1542.41	1880.09	2705.40	3530.38	4342.00
50	Min.	40.43	58.52	93.77	128.49	161.63	197.02	283.50	3530.38	455.00
	Max.	635.25	919.60	1473.45	2019.05	2539.90	3095.95	4455.00	5813.50	7150.00
80	Min.	69.30	100.32	160.74	220.26	277.08	337.74	486.00	634.20	780.00
	Max.	1212.75	1755.60	2812.95	3854.55	4848.90	5910.45	8505.00	11098.50	13650.00
100	Min.	115.50	167.20	267.90	367.10	461.80	562.90	810.00	1057.00	1300.00
	Max.	2136.75	3093.20	4956.15	6791.35	8543.30	10413.65	14985.00	19554.50	24050.00
150	Min.	254.10	367.84	589.38	807.62	1015.96	1238.38	1782.00	2325.40	2860.00
	Max.	4677.75	6771.60	10849.95	14867.55	18702.90	22797.45	32805.00	42808.50	52650.00
200	Min.	450.45	652.08	1044.81	1431.69	1801.02	2195.31	3159.00	4122.30	5070.00
	Max.	8431.50	12205.60	19556.70	26798.30	33711.40	41091.70	59130.00	77161.00	94900.00

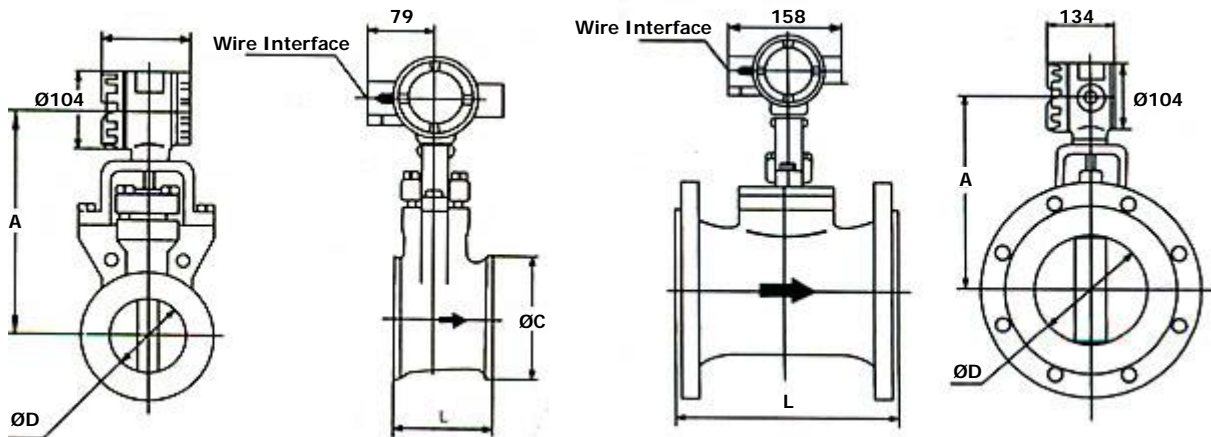
Outline Dimensions (see below tables & pictures):

Wafer Connection Type

DN (mm)	A	Φc	ΦD	L	Weight (kg)
25	189.5	51	25	70	3.2
40	197	73	40	70	4
50	197.5	92	50	75	5.5
80	224.5	127	70	100	9
100	233	157	94	120	12

Flange Connection Type

DN (mm)	A	ΦD	L	Weight (kg)
25	190	25	180	5
40	197	40	200	8
80	225	70	330	19
100	233	94	410	25
150	246	139	270	33
200	369	186	310	45
250	292	231	370	70
300	315	276	400	100

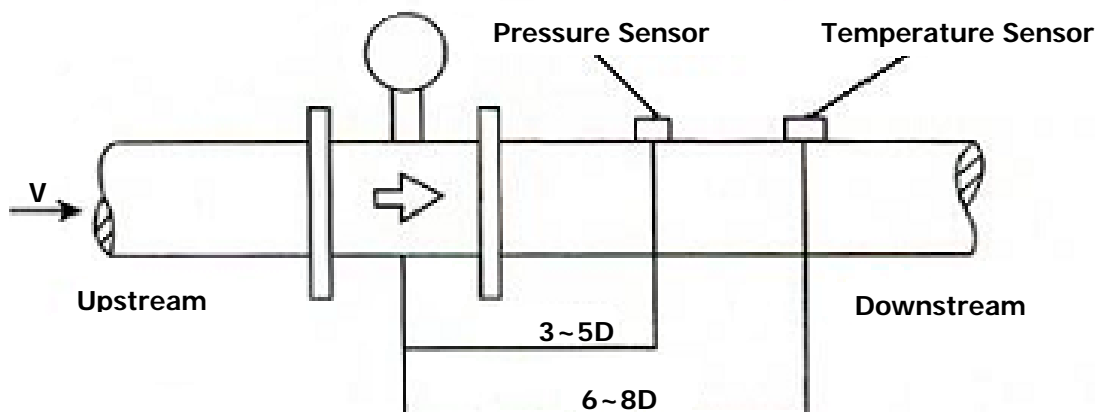


Straight Pipes Requirements :

Connection Pipe Types	Minimum requirements of straight pipes	
	Upstream of flow meter	Downstream of flow meter
Concentric Shrink pipe	15D	5D
Concentric flare pipe	35D	5D
One 90° turning	20D	5D
Two 90° turning in same plane	25D	5D
Two 90° turning in different plane	30D	5D
Full open valve	20D	5D
Half-open valve	40D	5D

Note: D-Means the nominal diameter of flow meter.

If there are needs to install temperature sensor and/or pressure sensor in the pipe system, the sensor (s) should be installed on the downstream of the flow meter as per the below picture shows.



➤ **CAUTIONS FOR THE INSTALLATION:**

- ❑ Welding slug, foreign sharp particles, etc. in the pipe must be cleared up before the Flow meter is installed.
- ❑ Install the Flow meter correctly (according to purchase requirements).
- ❑ Ensure that liquid are completely filled in the pipe with straight pipes requirements on the upstream as well as the downstream of the flow meter.
- ❑ Do not install at close proximity to high vibration equipment such as air compressors.
- ❑ Please read the correct provided installation & operations manuals properly before any installation and also follow any required local standard recommendations of pipeline installations to ensure compliance to local safety requirements.

➤ **NOTES WHEN ORDERING:**

- Describe its application and specify minimum, normal & maximum flow rates.
- Specify accuracy type.
- Specify its model/series or size.
- Specify working & maximum pressures.
- Specify fluid name & Reynolds number.
- Specify voltage & output signal.
- Specify fluid minimum & maximum temperature.
- Other useful details (such as safe or explosive areas) or contact us.

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