

GAS VIEW

The smart and lightweight vortex meter
for monitoring gas flows

> Introduction

Mass Flow ONLINE B.V. sells flow measuring and controlling products through the internet. From the website www.massflow-online.com flow meters or controllers can be ordered 24 hours a day 7 days a week. Most products are in stock and will be shipped world-wide within two working days.

> Description

The new GAS-VIEW series offer a compact, light weight and cost-effective solution for monitoring the flow or consumption of gases. The unique sensor body and transmitter design makes GAS-VIEW one of the most compact, lightweight vortex meters in the industry. The GAS-VIEW offers an easy-to-read digital display and has integrated totaliser and alarm functions.

> GAS-VIEW series

The GAS-VIEW series operate on the vortex principle. The obstruction (bluff body) placed in the flow of the gas sheds vortices downstream at a frequency proportional to the velocity of the gas. This pattern of vortices is named the Von Kármán vortex street. A piezo-electric sensor detects the vortices and creates electrical pulses which are proportional to the gas flow rate. The instruments may be mounted in any position; the local read-out unit can be rotated. GAS-VIEW flow meters can be supplied in full scale ranges from 17 l/min up to 850 l/min at max. 10 bar pressure rating. An LCD display allows reading of actual flow and two total flow indicators with one reset switch. Furthermore the instruments can be supplied with an analog output or with two alarm outputs, thereby operating as a flow switch. The GAS-VIEW series can also be supplied as a "Lite" version. This "Lite" version has no local readout and only a pulse output.

> Fields of application

- ◆ Combustion air
- ◆ Compressed air
- ◆ Air consumption management
- ◆ Chemical processing
- ◆ Medical gas distribution
- ◆ PPS material is compatible with nearly all gases



> GAS-VIEW features

- ◆ Indication in:
 - Actual flow (volume per minute or per hour)
 - Totalised flow (consumption)
 - Alarm High + Low
- ◆ Unique coupling design allows free positioning of the transmitter for ease of reading regardless of meter body orientation
- ◆ No moving parts makes it maintenance free
- ◆ Immune to dust and moisture
- ◆ Low pressure drop
- ◆ Mounting in any position
- ◆ Wide flow ranges
- ◆ Fast response
- ◆ Alarm and counter functions (2 counters, one with reset switch)
- ◆ Optional analog 4-20 mA or pulse output with external power
- ◆ Measures both clean and wet gas
- ◆ Detachable display
- ◆ Sustainable product design
 - Battery powered model available with replaceable battery pack and low battery indication
 - Low power consumption
 - Maintenance free
 - Lightweight and compact
 - EEPROM retains parameters and total flow

> Technical specifications

Performance

Acceptable gases	: Air, Ar, O ₂ , N ₂ , CO ₂ , wet gases <i>This product is NOT compatible with flammable, corrosive or toxic gases.</i>
Operating pressure	: 1..10 bar(a)
Operating temperature	: -10 .. 80°C
Accuracy	: ± 3% FS
Rangeability	: up to 1:5
Repeatability	: < 0.5% FS typical
Display	: 8 digit totaliser with two separate 4 digit indicators showing flow rate per hour and minute + 7 digit resettable totaliser

Mechanical parts

Materials (wetted parts)	: PPS-Resin (Polyphenylene sulphide), viton
Ingress protection (housing)	: IP65

Electrical specifications

Output	: analog: 4 .. 20 mA or pulse (scaled or unscaled)
Power	: Battery (3.6 V lithium) powered if no output (other than local readout) is required (4 years of life at room temperature)
External power supply	: 12 .. 45 Vdc

> Available models with local read-out

Model	Nom. size	Capacity	Output
FLM3S-10	4 mm	72 .. 17 l/min	No, battery powered
FLM30-10	8 mm	18 .. 90 l/min	No, battery powered
FLM31-10	15 mm	55 .. 283 l/min	No, battery powered
FLM32-10	25 mm	167 .. 850 l/min	No, battery powered
FLM3S-1*	4 mm	72 .. 17 l/min	4-20mA or pulse + alarms
FLM30-1*	8 mm	18 .. 90 l/min	4-20mA or pulse + alarms
FLM31-1*	15 mm	55 .. 283 l/min	4-20mA or pulse + alarms
FLM32-1*	25 mm	167 .. 850 l/min	4-20mA or pulse + alarms

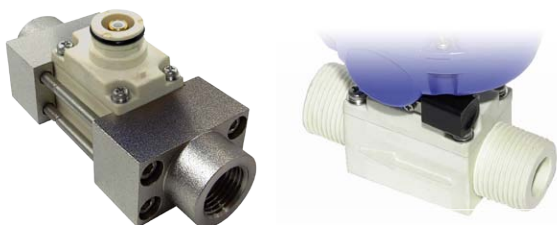
Flow range may vary under different process conditions

> Indicated pulse unit

Nominal size (mm)	Scaled pulse [l/pulse]	Unscaled pulse (nominal) [ml/pulse]	Frequency @ max. flow rate [Hz]
4	0.1	2.225	130
8	1	11.02	140
15	1	59.08	80
25	10	316.5	45

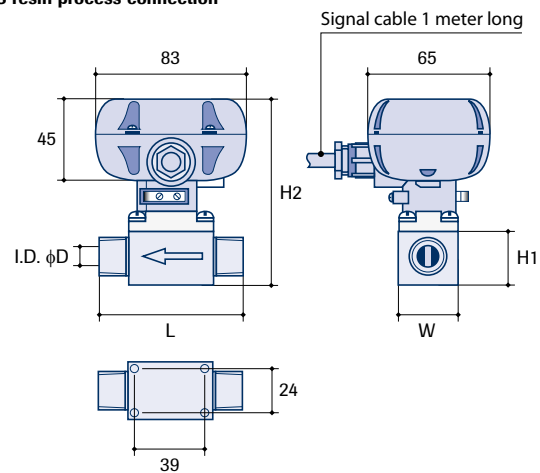
> Process connections (in/out)

Each model has an PPS-Resin R male thread type. NPT or Rc female thread is also available as an option. The connectors will be supplied in stainless steel thereby eliminating the risk of damaging threads when using metallic tubing.



> Dimensions and weights

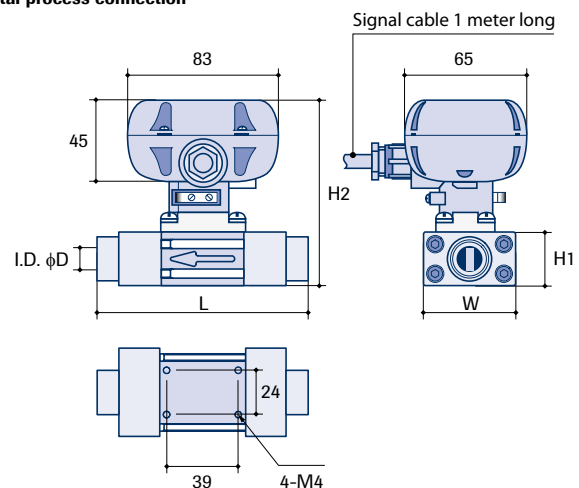
PPS resin process connection



Model	Nom. size	φD	R	L	W	H1	H2	Approx. weight
FLM3S-1*	4	8.5	3/8"	80	32	29	102	285
FLM30-1*	8	13	1/2"	80	32	29	102	285
FLM31-1*	15	14	3/4"	85	32	29	102	290
FLM32-1*	25	24.5	1 1/4"	120	46	46	119	420

Dimensions in mm, weight in g

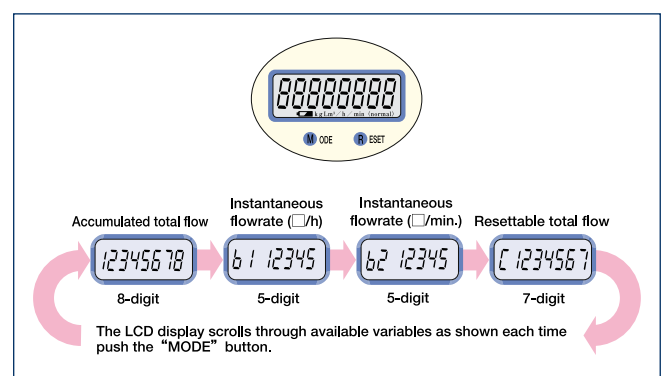
Metal process connection



Model	Nom. size	φD	Rc	NPT	L	W	H1	H2	Approx. weight
FLM3S-1*	4	8.5	1/4"	1/4"	115	50	29	102	850
FLM30-1*	8	13	3/8"	3/8"	115	50	29	102	850
FLM31-1*	15	14	1/2"	1/2"	115	50	29	102	850
FLM32-1*	25	24.5	1"	1"	180	66	46	119	1750

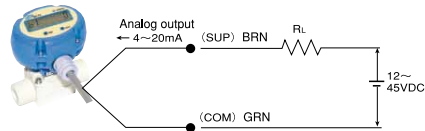
Dimensions in mm, weight in g

> Display

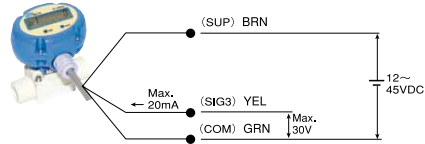


> Electrical connection

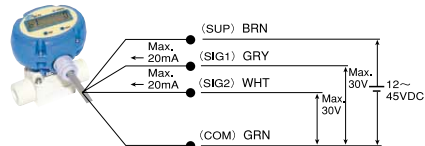
Analog output (2-wire)



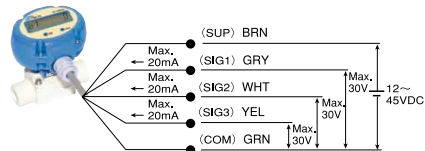
Scaled or unscaled pulse output (3-wire)



High/low alarm output (2 outputs) (4-wire)

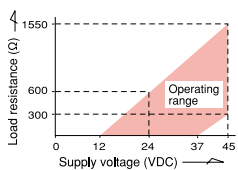


High/low alarm output (2 outputs) + scaled or unscaled pulse output (5-wire)



※ : Transmission distance; longest 1km with the conductive area 2.0mm².

Load resistance range

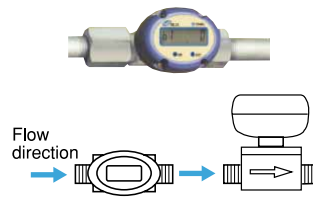


Polarities

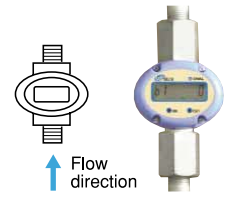
BRN : SUP, (and analog output)
 GRY : SIG, 1... Alarm 1 output
 (upper and lower)
 WHT : SIG, 2... Alarm 2 output
 (upper and lower)
 YEL : SIG, 3... Scaled or unscaled
 pulse output

> Tubing guidelines

Horizontal line



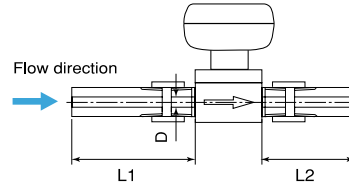
Vertical line



With PPS external threads, exercise care to avoid applying excessive stress or impact, observing the tightening torques shown in the table.

Nominal size (mm)	Tightening torque tolerances (N · cm)
4	1960
8	1960
15	1960
25	9800

D: Flowmeter I.D.



- Secure a straight tube length 7D min. upstream of, and 3D min. downstream of the meter.
- Any equipment having a "sharp increase in the tube diameter" such as a throttle valve or a tapered tube, if present upstream of the meter, should be located at least 50D.
- Flow regulating valve should be located downstream of the meter for controlling the flow.
- Use tubing having an inside diameter larger than the meter inside diameter.

Required straight tube lengths

Nominal size (mm)	I.D. (D) (mm)	Upstream tube		Downstream tube	
		(L1) (mm)	(mm)	(L2) (mm)	(mm)
4	8.5	59 min.		25 min.	
8	13	91 min.		39 min.	
15	14	98 min.		42 min.	
25	24.5	171 min.		73 min.	

> Technical specifications *Lite* version

Performance

Acceptable gases	: Air, Ar, O ₂ , N ₂ , CO ₂ , wet gases
	<i>This product is NOT compatible with flammable, corrosive or toxic gases.</i>
Operating pressure	: 1..10 bar(a)
Operating temperature	: -10 .. 80°C
Accuracy	: ±3% FS
Rangeability	: up to 1:5
Repeatability	: <0.5% FS typical

Mechanical parts

Materials (wetted parts)	: PPS-Resin (Polyphenylene sulphide), viton
Ingress protection (housing)	: IP53

Electrical specifications

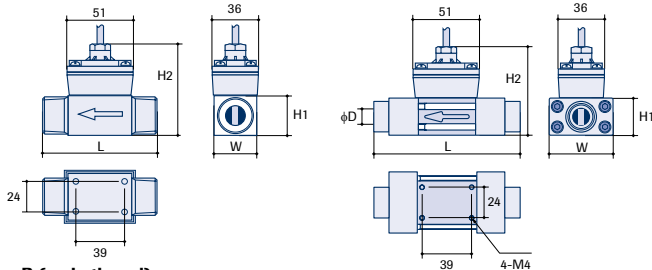
Output	: pulse (unscaled)
External power supply	: 12 .. 24 Vdc



> Available models *Lite* version

Model	Capacity	Max. Pulse Output
FLP04-G2PA	72 .. 17 l/min	320 Hz
FLP08-G2PA	18 .. 90 l/min	350 Hz
FLP15-G2PA	55 .. 283 l/min	200 Hz
FLP25-G2PA	167 .. 850 l/min	120 Hz

> Dimensions and weights *Lite* version



R (male thread)

Nom. size	φD (meter I.D.)	R (conn.)	L	W	H1	H2	Approx. weight*
4	8.5	3/8"	80	32	29	68	270
8	13	1/2"	80	32	29	68	270
15	14	3/4"	85	32	29	68	280
25	24.5	1 1/4"	120	46	46	85	410

Dimensions in mm, weight in g

Rc and NPT (female thread)

Nom. size	φD (meter I.D.)	Rc (conn.)	NPT (conn.)	L	W	H1	H2	Approx. weight*
4	8.5	1/4"	1/4"	115	50	29	68	840
8	13	3/8"	3/8"	115	50	29	68	840
15	14	1/2"	1/2"	115	50	29	68	840
25	24.5	1"	1"	180	66	46	85	1740

Dimensions in mm, weight (incl. cable) in g

> Indicated pulse unit *Lite* version

Nominal size (mm)	Scaled pulse [I/pulse]	Unscaled pulse (nominal) [ml/pulse]	Frequency @ max. flow rate [Hz]
4	n.a.	0.890	320
8	n.a.	4.408	350
15	n.a.	23.63	200
25	n.a.	126.6	120

> Tubing guidelines *Lite* version

Horizontal run

Vertical run

With PPS male thread, avoid forcibly tightening or excessive impact loads. Torque to the specification given below.

Nom. size (mm)	Permissible tightening torque (N · cm)
4	1960
8	1960
15	1960
25	9800

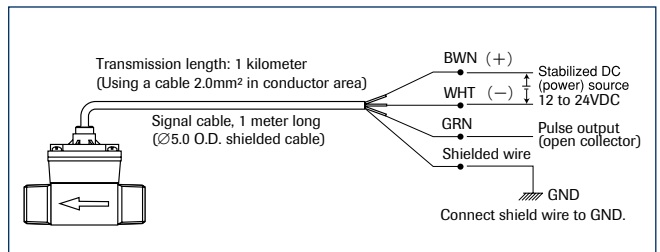
- Secure a straight tube length 7D min. upstream of, and 3D min. downstream of, the flow monitor.
- If a throttle valve or expansion tube exists, where the flow path cross section abruptly changes, upstream of the flow monitor, locate it at least 50D away from the flow monitor.
- Provide a throttle valve downstream of the flow monitor for regulating the flow.
- For process connection, use tubes having an inside diameter larger than that of the flow monitor.

D: Flow monitor I.D.

Required straight tube lengths *Lite* version

Nominal size (mm)	I.D. (D) (mm)	Upstream tube (L1) (mm)		Downstream tube (L2) (mm)	
		min.	max.	min.	max.
4	8.5	59	75	25	41
8	13	91	107	39	55
15	14	98	114	42	58
25	24.5	171	187	73	89

> Electrical connection *Lite* version



> Process connections (in/out)

Each model has an PPS-Resin R male thread type. NPT or Rc female thread is also available as an option. The connectors will be supplied in stainless steel thereby eliminating the risk of damaging threads when using metallic tubing.

> Pressure drop (all models)

Pressure loss calculation formula

$$\Delta P = \Delta P_o \times \frac{\rho}{\rho_o} \times \left(\frac{Q}{Q_o} \right)^2$$

ΔP : Pressure drop [kPa]

ΔP_o : Pressure drop max. of flowrate is 0.7 kPa for 4 mm model and 1.52 kPa for other models

ρ : Density of fluid at measurement [kg/m³]

ρ_o : standard density at 0°C and 101.3 kPa of the gas

Q : Flowrate at measurement [L/min.]

Q_o : Max. flowrate (Page 2 or 4 stated value) [L/min.]

> Installation conditions (all models)

Select an **installation location** that meets the following requirements:

CAUTION: Installation in an explosionproof area (hazardous location) is NOT permitted.

① A location free from rainwater and moisture (for use indoors).

CAUTION: Avoid exposure to the sun.

② A location with least temperature variation (preferably within a range 0 to +60 °C).

③ A location free from excessive vibration and shock (preferably pipe oscillation 0.2G max.).

④ A location for ease of display readability and servicing.

⑤ A location where fluid pressure is held below permissible pressure of 0.98MP.

⑥ A location free for the fluid from freezing..

All information is subject to change without notice.

