HORIBA
Semiconductor

STEC Fluid Control Technology

High performance Liquid Source Vaporization Control Systems

Digital Liquid Mass Flow Meter
XF-100 Series

Mixed Injection System
MV-2000 Series

New Technology For faster and more efficient liquid source vaporization

New models in the liquid source vaporization system lineup

The differential-pressure measurement method and tornado enable the new model to achieve even faster response and

High performance Liquid Source Vaporization Control Systems

As semiconductor devices offer increased performance and a wider range of functions, new processes are developed every day to improve productivity while achieving miniaturization of device design rules using larger wafer diameters. As a result, the development of new materials and an expansion of the range of liquid material used. Along with this comes the need for increasingly large vaporization flows for liquid materials used in semiconductor manufacturing processes.
HORIBA STEC has added a new line of liquid material vaporization systems featuring higher performance and efficiency by taking the advantage of the vaporization and flow control technologies it has obtained through years of experience. With this new lineup using our wealth of experience and proven track record we will continue to meet our customers needs.

XF-100 Series

Digital Liquid Mass Flow Meter

Features

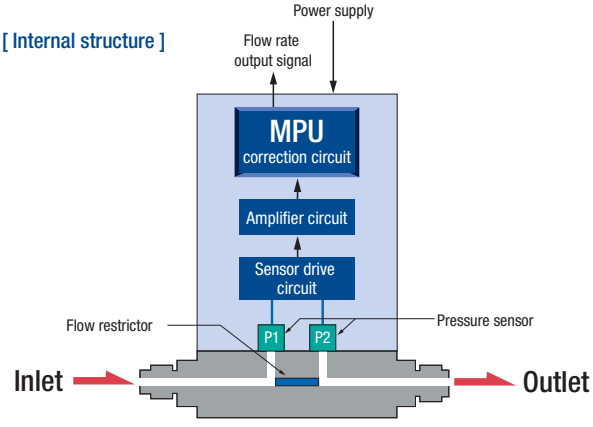
High-speed response achieved by using differential-pressure measurement method

High-speed response time of 100 msec (or less than 0.8 sec when it is used in combination with a piezo valve) thanks to the differential-pressure sensor system. Flow is stabilized in a shorter time due to its high speed response, contributing to reduction in liquid materials usage.

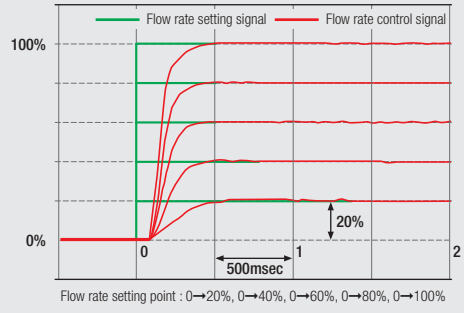
Measurement principle ▶ **Differential pressure measurement system**

In the flow rate measurement (differential-pressure measurement method) of the XF-100 Series, the pressure difference detected by pressure sensors installed up and down stream of the flow restricto, this is converted to a flow rate using Hagen- Poiseuille law.
The sensor does no heat the liquid, which allows for accurate flow rate measurement without being affected by the re-emission of dissolved gases (bubbles) or damaging materials that easily thermally decompose.
Additionally, thanks to the through flow design inherited from the LF Series, the construction ensures that bubble can not build up inside the unit.

[Internal structure]

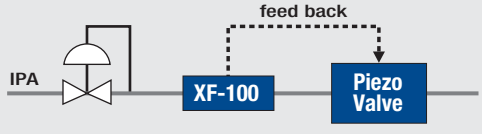


[Fast response data]



Flow rate setting point : 0→20%, 0→40%, 0→60%, 0→80%, 0→100%

[Test Flow]



- High Accuracy ±0.8% F.S. (20% improvement compared to a Legacy model)
- Ultra clean.

flow system
higher efficiency vaporization

MV-2000 Series

Mixed injection

Features 1

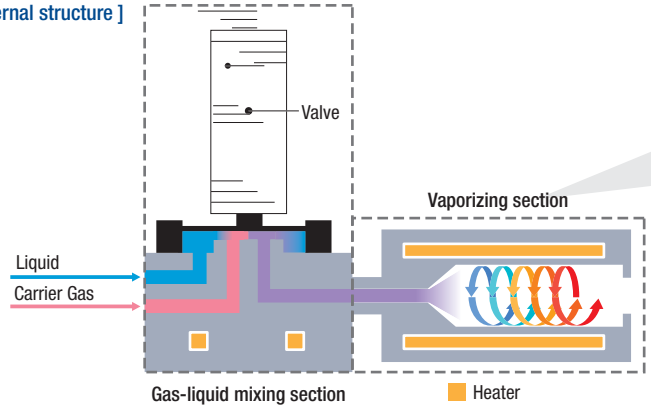
Stable vaporization using the tornado flow method

The tornado flow method ensures that stable, high-efficiency vaporization is achieved, even at low temperatures.This improved vaporization performance allows even liquid materials that easily thermally decompose to be vaporized.

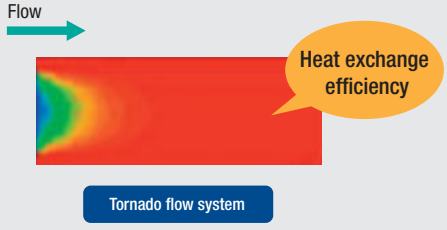
Measurement principle ▶ **What is the tornado flow method?**

The MV-2000 Series is equipped with a spiral element (Tornado Flow element) inside the vaporization section. This allows for a larger vaporization area than previous models, ensuringimproved vaporization efficiency.

[Internal structure]



[Vaporization section temperature distribution image]

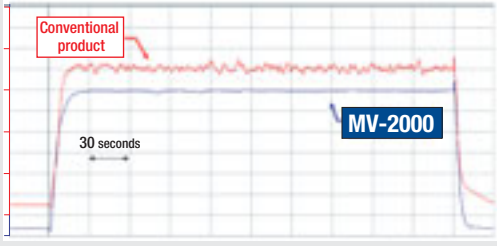


Features 2

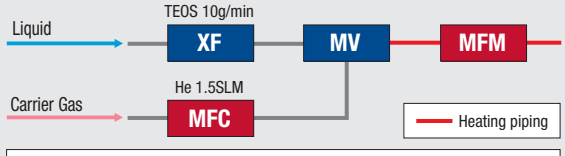
High flow rate vaporization using the tornado flow method

The high-efficiency vaporization system enables higher flow rate vaporization than our previous models, whilst maintaining the same temperature conditions.
There is no need to change the layout since this higher flow rate is achieved with the same footprint as the previous MV series.

[Stability Data (Comparison of flow rate output)]



[Test Flow]



Gas-liquid mixing section Temperature: 80 ˚C Vaporizing section temperature: 80 ˚C
Heating piping temperature: 150 ˚C

■ Allows you to build a compact vaporization system

XF-100 Series Mass flow meter

Model	XF-122	XF-132	XF-124	XF-134
Flow Range (g/min)*1	0.2/0.5/1/2	5/10/20/30	0.2/0.5/1/2	5/10/20/30
Measurement Range	5 to 100% F.S.			
Application Liquid	All liquids except those corrosive to stainless steel (ex, HCl and HF)			
Viscosity	MAX.10cP			
Accuracy*2	0.8% F.S.			
Linearity*2	0.4% F.S.			
Repeatability*2	0.4% F.S.			
Response speed*3	0.1sec(when combined with a piezo valve: Close to set point within 0.8sec)			
Operating Temperature	5 to 50 ˚C			
Temperature coefficiency	±0.1%F.S./ ˚C (15 ˚C < environmental temperature < 45 ˚C)			
Operating Pressure*4	0.1～0.3MPa(G) @23±2 ˚C			
Pressure Resistance	1MPa(G)			
Pressure Drop	MAX 90kPa(D) @23±2 ˚C			
Flow Rate Signal	Analog : Input,Output 0～5VDC Digital : RS485 Serial communication F-NET Protocol		DeviceNet™ Protocol	
Power Supply	±15V±5% 200mA		DC24V(DC11V-DC25V) 6VA max. 540mA at11V	
Leak Integrity	≤ 5×10^{-12}Pa · m^3/s(He)			
Wetted Material*5	SUS316L, SPRON510 ,Ni			
Standard Fitting	1/4 inch VCR type Male, 1/8 inch VCR type Male			
Interface	D-Subminiature 9 contact pin in connector with M3 screw type Digital interface / RJ45 connector Valve Connector / EGG.00.302.CYM / by LEMO		Device-NET / Shield type micro-connector Digital interface / RJ45 connector Valve Connector / EGG.00.302.CYM / by LEMO	

*1: Full scale flow rate when IPA is used. Please contact us for figures for when real liquid is used.
*2: The accuracy, linearity, and repeatability in the above table are according to our own conditions (SEMI E56-0309 compliant, 23±2°C, calibration liquid used).
*3: The responsiveness in the above table is the time from PID adjustment (Less than 0.8 sec. (Converge to the larger of the ±2% S.P. or ±0.5% F.S. regions in the range of total flow control), 23±2°C, calibration liquid used).
*4: Working pressure at 23±2°C. This may not be applicable outside of the range.
*5: SPRON510 is Ni-Co alloy from SII.

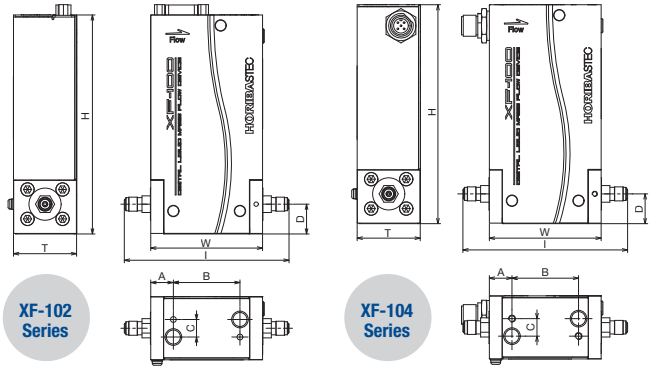
MV-2000 Series

Model	MV-2000
Liquid Material	All liquids except those corrosive to stainless steel(ex. HCl, HF)
Setting Temperature	By vaporization conditions(Control Valve : Max 140 ˚C Vaporizer : Max 200 ˚C)
Leak Integrity	≤ 1×10^{-8} Pa·m^3/s (He)
Internal leak standard	≤ 1×10^{-6} Pa·m^3/s (He)
Wetted parts	SUS316L , PFA
Temperature Sensor	Thermocouple type K (CA)
Pressure Resistance	1MPa (G)
Standard Fitting	Liquid inlet: 1/8 VCR type Male Carrier gas inlet: 1/4 VCR type Female Gas outlet: 1/2 VCR type Male
Operating Temperature	15 ～ 50 ˚C
Option	Air valve(Internal leak standard: ≤ 1×10-9 Pa · m3 / s(He))

- The generated flow rate may differ depending on the liquid material, amount of generation, generation conditions, etc. We will recommend the model most suited to your needs upon consultation.
- The vaporizer has a heater, temperature sensor, and switch inside of it. Please contact us for more details on their specifications.

Dimensions

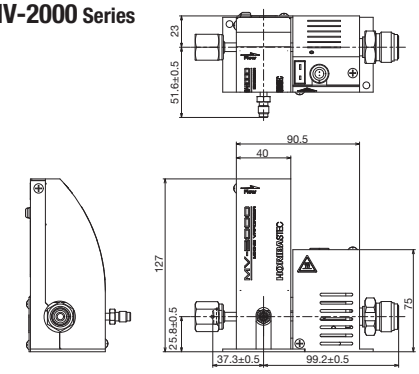
XF-100 Series



Model	H	T	W	I 1/8 VCR	I 1/4 VCR	A	B	C	D
XF-102 series	125	36	63.8	94	106	12.9	38	10	17
XF-104 series	125	36	63.8	94	106	12.9	38	10	17

- Equivalent joints are sometimes used instead of the ones listed.

MV-2000 Series



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