

# Mass Flow Controller & Meter

Analogue Mass Flow Controller  
Analogue Mass Flow Meter  
Digital Mass Flow Controller  
Digital Mass Flow Meter



# Best Technology & Best Service

With the best technology, best service,  
Customers will be rewarded.

## INTRO

**LINE TECH's** vision is to become the global leader in the world's MFC/MFM business by producing and providing the best.

Founded in 1997, through constant research development focused on gas-control technology, LINE TECH has successfully given birth to the M-series: MFC/MFM. After many years of research and development in cooperation with Korea Advanced Institute of Science and Technology (KAIST), LINE TECH was able to self-produce MFC/MFM, an important technology for precise mass control and a technology that heavily depended upon foreign technology in the past.

Like a cactus that blooms in desert, LINE TECH promises and strives to develop new and better technology in order to be a leader not just in Korea, but also in the world. Built upon the basics and constructed through righteous management LINE TECH is and will always be the company that fulfills its social responsibilities. Never settling for today but always marching for better future, LINE TECH will offer you the best.

Thank you.



*Linetech*

Best Technology

Best Service

Best Partnership



## HISTORY

### NEW TECHNOLOGY & NEW VALUABLE CREATION



- 1997.03 Foundation of M-TECH
- 1997.05 Start of R&D in MFC/MFM
- 1998.01 Signs an agreement to cooperate with KAIST for R&D
- 2002.02 MFC/MFM is developed
- 2002.06 Establishes self-production process
- 2003.03 Renamed LINE TECH
- 2004.10 Establishes business in China
- 2008.03 Foundation of a foreign cooperation in Shanghai, China
- 2009.07 CE & ISO Certification
- 2010.05 3500 model developed
- 2012.12 China Beijing branch
- 2013.11 Developing Digital PCB for Mass Flow Controller
- 2014.02 Developing Metal seal MFC & compact MFC

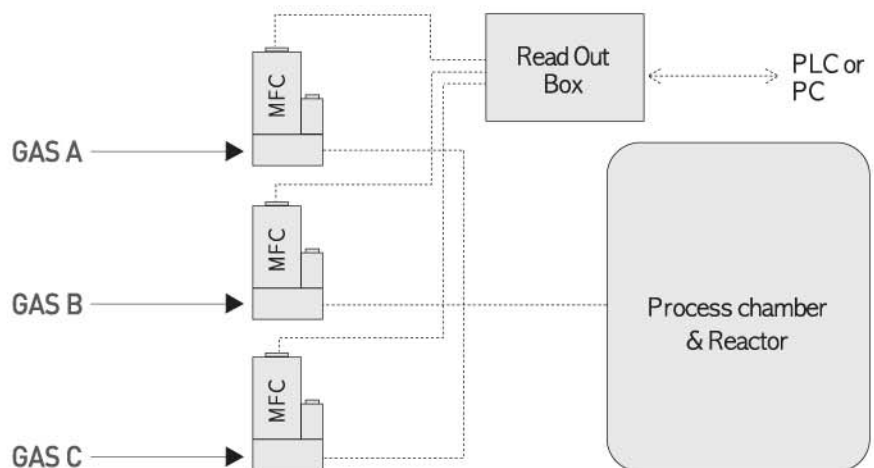


## Applications

## Thermal Mass Flow Controller and Meter

Line-Tech Mass Flow Controller is used widely in the Semiconductor industry as well as many others. These devices are designed to be rugged, easy-to-use, and economical.

- Total Industry
- Precision Gas Blending & Analyzing
- Gas Injection on Surface Treatment Industry(PVD, CVD, Reactor, Etc)
- Semiconductor Industry
- Component Leak Detection
- Research and Development
- High Pressure Industry
- Optical Fiber
- Fuel Cell
- Reactor System
- Gas Mixing System
- Laboratory



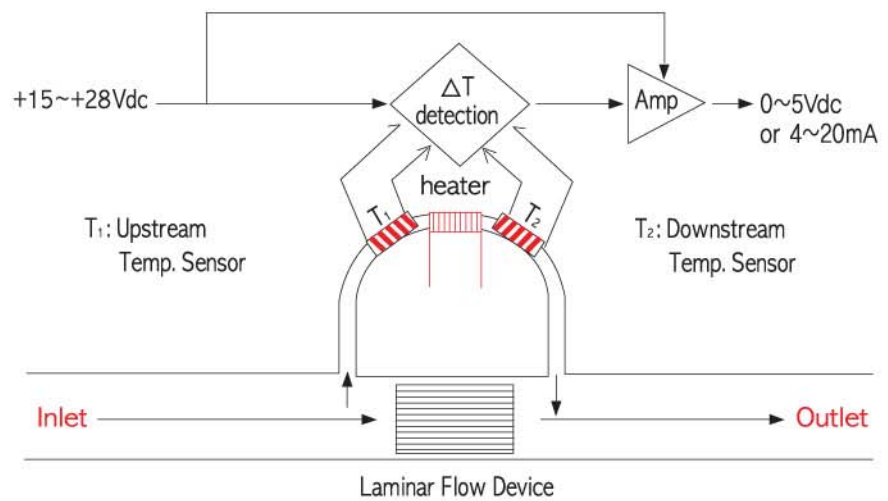
**Advantages**

- Mass Flow Measurement
- No Temperature or Pressure Corrections Required
- Compact Flow Control System
- Highly Accurate
- Wide Pressure Range Available. (90bar)
- High Response Time
- High Repeatability



**Measurement Technique**

Gas flow is divided at constant rate by a laminar flow bypass. Gas molecules traveling through the sensor carry heat downstream, creating a differential temperature between the RTDs. The difference in temperature between the RTDs is proportional to the mass flow rate.





---

01

ANALOGUE  
MFC/MFM ❖❖

Mass Flow Controller  
& Meter



NEW TECHNOLOGY &  
NEW VALUABLE CREATION

Technology

Innovation

Partnership

[www.line-tech.co.kr](http://www.line-tech.co.kr)

# ANALOGUE MFC/MFM

Mass Flow Controller  
& Meter

## ANALOGUE Mass Flow Controller & Mass Flow Meter

### Mass Flow Controller Specifications

Model	FULL SCALE N2(slpm)	ACCURACY (% FS)	REPEATABILITY (%)	RESPONSE TIME(sec)	IN/OUT SIGNAL (Vdc / mA)	SUPPLY POWER (Vdc)	OPERATING PRESSURE(psia)	OPERATING TEMP. (°C)
M3030VA	0.010~30	±1.0	±0.25	<2	0~5 or 4~20	+15 or 24	5~1300	0~50
M3050VA	25~50	±2.0	±0.25	<3	0~5 or 4~20	+15 or 24	5~1300	0~50
M3100VA	30~100	±1.0	±0.25	<2	0~5 or 4~20	+15 or 24	30~1000	0~50
M3300VA	100~300	±1.0	±0.25	<2	0~5 or 4~20	+15 or 24	45~240	0~50
M3500VA	300~1000	±1.0	±0.25	<2	0~5 or 4~20	+15 or 24	60~240	0~50

### Mass Flow Meter Specifications

Model	FULL SCALE N2(slpm)	ACCURACY (% FS)	REPEATABILITY (%)	RANGE	IN/OUT SIGNAL (Vdc / mA)	SUPPLY POWER (Vdc)	OPERATING PRESSURE(psia)	OPERATING TEMP. (°C)
M2030VA	0.010~30	±1.0	±0.25	50:1	0~5 or 4~20	+15 or 24	5~1300	0~50
M2050VA	25~50	±2.0	±0.25	50:1	0~5 or 4~20	+15 or 24	5~1300	0~50
M2100VA	30~100	±1.0	±0.25	50:1	0~5 or 4~20	+15 or 24	30~1000	0~50
M2300VA	100~300	±1.0	±0.25	50:1	0~5 or 4~20	+15 or 24	45~1300	0~50
M2500VA	300~1000	±1.0	±0.25	50:1	0~5 or 4~20	+15 or 24	60~1300	0~50

# M3030VA

## Mass Flow Controller

### Features

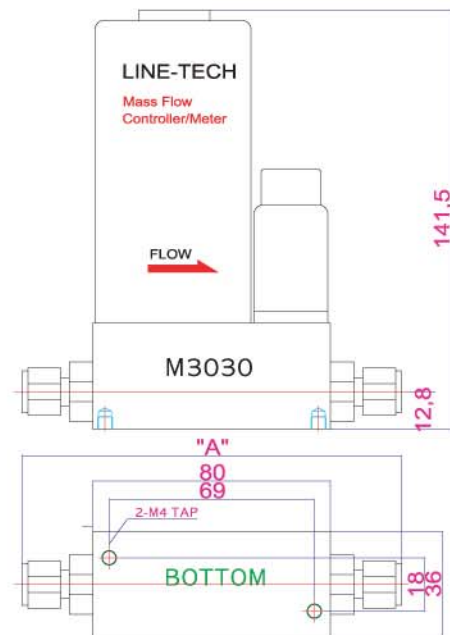
- Accurate at Low Flow
- Fast Response
- Compact Connection
- Highly Stable Removable Sensor
- High Corrosion Resistance
- Excellent Linearity
- Excellent Long-Term Stability
- Wide Pressure Range Available

M3030VA

### Specifications

Model	M3030VA
Range(N <sub>2</sub> )	0.01~30slpm
Response Time	< 2sec
Accuracy	±1% of FS
Repeatability	±0.25%
In/Out Signal	0~5Vdc or 4~20mA
Supply Power	+15 or +24Vdc, 350mA
Max Operating Pressure	< 90 bar
Max Operating Temp	0 ~ 50 °C
Leak Rate	1 x 10 <sup>-5</sup> atm. cc/sec
Control Range	3~100%

Connection	"A" Dimension(mm)
1/8" SW	126.7
1/4" SW	131.3
3/8" SW	134.3
1/4" VCR	127.8





# M2030VA

## Specifications

Model	M2030VA
Range(N2)	0.01~30slpm
Accuracy	±1% of FS
Repeatability	±0.25%
In/Out Signal	0~5Vdc or 4~20mA
Supply Power	+15 or +24Vdc, 350mA
Max Operating Pressure	< 90 bar
Max Operating Temp	0 ~ 50 °C
Leak Rate	1 x 10 <sup>-9</sup> atm. cc/sec
Control Range	3~100%

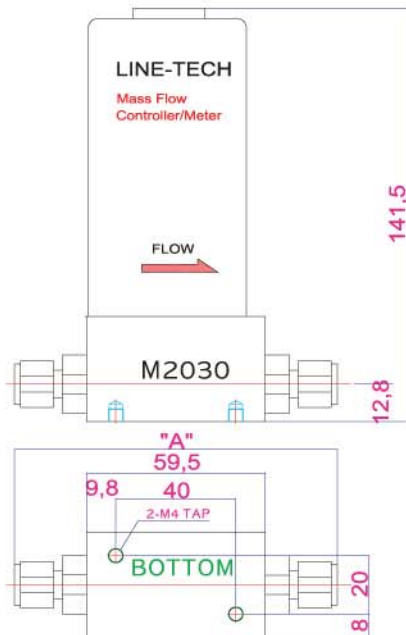
Connection	"A" Dimension(mm)
1/8" SW	106.2
1/4" SW	110.8
3/8" SW	113.8
1/4" VCR	107.3

## Mass Flow Meter

### Features

- Accurate at Low Flow
- Fast Response
- Compact Connection
- Highly Stable Removable Sensor
- High Corrosion Resistance
- Excellent Linearity
- Excellent Long-Term Stability
- Wide Pressure Range Available

M2030VA



# M3050VA

## Mass Flow Controller

### Features

- Accurate at Low Flow
- Fast Response
- Compact Connection
- Highly Stable Removable Sensor
- High Corrosion Resistance
- Excellent Linearity
- Excellent Long-Term Stability
- Wide Pressure Range Available

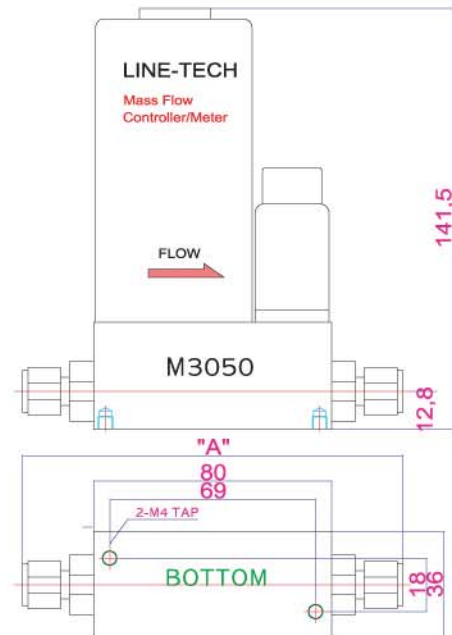
M3050VA



### Specifications

Model	M3050VA
Range(N2)	25~50slpm
Response Time	< 2sec
Accuracy	±2% of FS
Repeatability	±0.25%
In/Out Signal	0~5Vdc or 4~20mA
Supply Power	+15 or +24Vdc, 350mA
Max Operating Pressure	< 90 bar
Max Operating Temp	0 ~ 50 °C
Leak Rate	1 x 10 <sup>-9</sup> atm. cc/sec
Control Range	3~100%

Connection	"A" Dimension(mm)
1/8" SW	127
1/4" SW	132
3/8" SW	135
1/4" VCR	128



# M2050VA

## Specifications

Model	M2050VA
Range(N2)	25~50slpm
Accuracy	±2% of FS
Repeatability	±0.25%
In/Out Signal	0~5Vdc or 4~20mA
Supply Power	+15 or +24Vdc, 350mA
Max Operating Pressure	< 90 bar
Max Operating Temp	0 ~ 50 °C
Leak Rate	1 x 10 <sup>-9</sup> atm. cc/sec
Control Range	3~100%

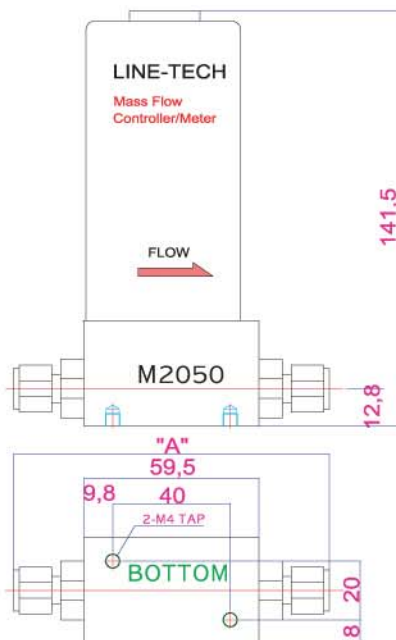
Connection	"A" Dimension(mm)
1/8" SW	106.2
1/4" SW	111
3/8" SW	114
1/4" VCR	108

## Mass Flow Meter

### Features

- Accurate at Low Flow
- Fast Response
- Compact Connection
- Highly Stable Removable Sensor
- High Corrosion Resistance
- Excellent Linearity
- Excellent Long-Term Stability
- Wide Pressure Range Available

M2050VA



# M3100VA

## Mass Flow Controller

### Features

- Accurate at Low Flow
- Fast Response
- Compact Connection
- Highly Stable Removable Sensor
- High Corrosion Resistance
- Excellent Linearity
- Excellent Long-Term Stability
- Wide Pressure Range Available

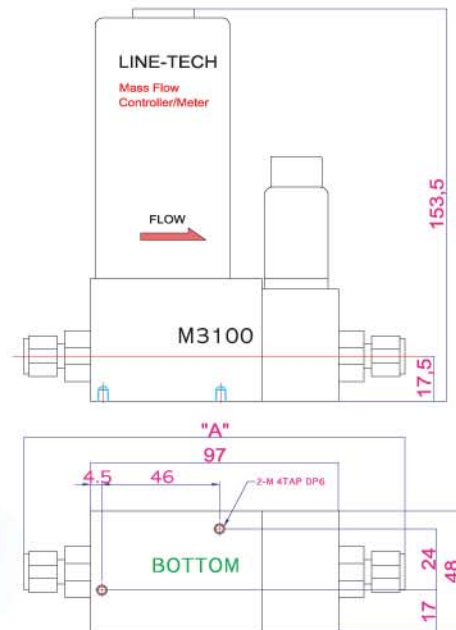
M3100VA



### Specifications

Model	M3100VA
Range(N2)	30~100slpm
Response Time	< 2sec
Accuracy	±1% of FS
Repeatability	±0.25%
In/Out Signal	0~5Vdc or 4~20mA
Supply Power	+15 or +24Vdc, 350mA
Max Operating Pressure	< 70 bar
Max Operating Temp	0 ~ 50°C
Leak Rate	1 x 10 <sup>-3</sup> atm. cc/sec
Control Range	3~100%

Connection	"A" Dimension(mm)
1/4" SW	151
3/8" SW	154
1/2" SW	156
1/4" VCR	147
1/2" VCR	153



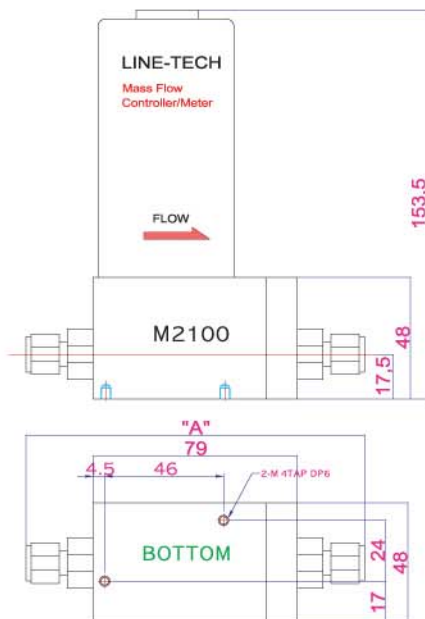


# M2100VA

## Specifications

Model	M2100VA
Range(N2)	30~100slpm
Accuracy	±1% of FS
Repeatability	±0.25%
In/Out Signal	0~5Vdc or 4~20mA
Supply Power	+15 or +24Vdc, 350mA
Max Operating Pressure	< 70 bar
Max Operating Temp	0 ~ 50 °C
Leak Rate	1 x 10 <sup>-9</sup> atm. cc/sec
Control Range	3~100%

Connection	"A" Dimension(mm)
1/4" SW	131
3/8" SW	134
1/2" SW	137
1/4" VCR	127
1/2" VCR	134



## Mass Flow Meter

### Features

- Accurate at Low Flow
- Fast Response
- Compact Connection
- Highly Stable Removable Sensor
- High Corrosion Resistance
- Excellent Linearity
- Excellent Long-Term Stability
- Wide Pressure Range Available

M2100VA



# M3300VA

## Mass Flow Controller

### Features

- Accurate at Low Flow
- Fast Response
- Compact Connection
- Highly Stable Removable Sensor
- High Corrosion Resistance
- Excellent Linearity
- Excellent Long-Term Stability
- Wide Pressure Range Available

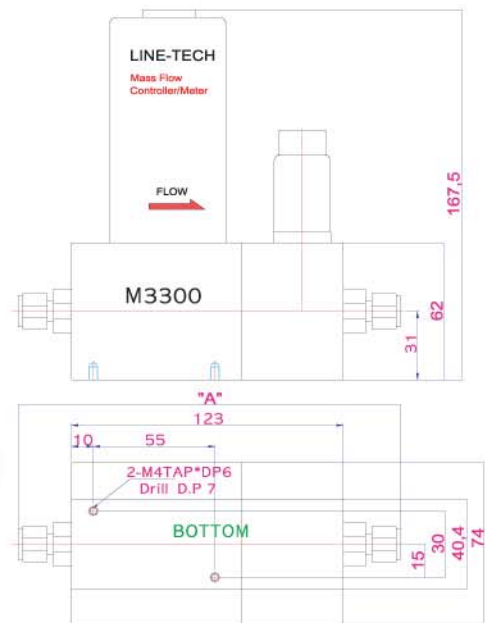
M3300VA



### Specifications

Model	M3300VA
Range(N2)	100~300slpm
Response Time	< 2sec
Accuracy	±1% of FS
Repeatability	±0.25%
In/Out Signal	0~5Vdc or 4~20mA
Supply Power	+15 or +24Vdc, 350mA
Max Operating Pressure	< 15 bar
Max Operating Temp	0 ~ 50°C
Leak Rate	1 x 10 <sup>-3</sup> atm. cc/sec
Control Range	3~100%

Connection	"A" Dimension(mm)
1/4" SW	178
3/8" SW	191
1/2" SW	181
1/4" VCR	171
1/2" VCR	178



# M2300VA

## Specifications

Model	M2300VA
Range(N <sub>2</sub> )	100~300slpm
Accuracy	±1% of FS
Repeatability	±0.25%
In/Out Signal	0~5Vdc or 4~20mA
Supply Power	+15 or +24Vdc, 350mA
Max Operating Pressure	< 90 bar
Max Operating Temp	0 ~ 50 °C
Leak Rate	1 x 10 <sup>-9</sup> atm. cc/sec
Control Range	3~100%

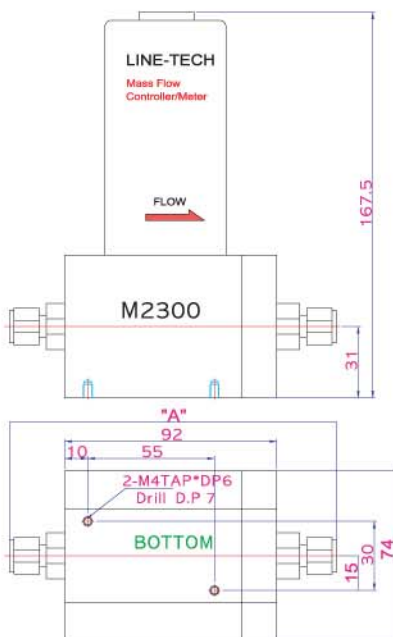
Connection	"A" Dimension(mm)
1/4" SW	144
3/8" SW	147
1/2" SW	160
1/4" VCR	140
1/2" VCR	147

## Mass Flow Meter

### Features

- Accurate at Low Flow
- Fast Response
- Compact Connection
- Highly Stable Removable Sensor
- High Corrosion Resistance
- Excellent Linearity
- Excellent Long-Term Stability
- Wide Pressure Range Available

M2300VA



# M3500VA

## Mass Flow Controller

### Features

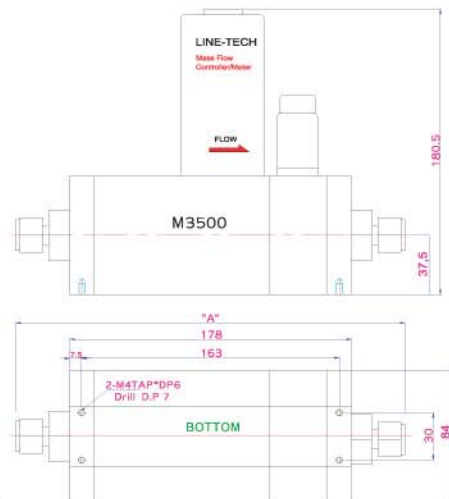
- Accurate at Low Flow
- Fast Response
- Compact Connection
- Highly Stable Removable Sensor
- High Corrosion Resistance
- Excellent Linearity
- Excellent Long-Term Stability
- Wide Pressure Range Available

M3500VA

### Specifications

Model	M3500VA
Range(N2)	300~1000slpm
Response Time	< 2sec
Accuracy	±1% of FS
Repeatability	±0.25%
In/Out Signal	0~5Vdc or 4~20mA
Supply Power	+15 or +24Vdc, 350mA
Max Operating Pressure	< 15 bar
Max Operating Temp	0 ~ 50℃
Leak Rate	1 x 10 <sup>-9</sup> atm. cc/sec
Control Range	3~100%

Connection	"A" Dimension(mm)
1/2" SW	248
3/4" SW	248
1" SW	254



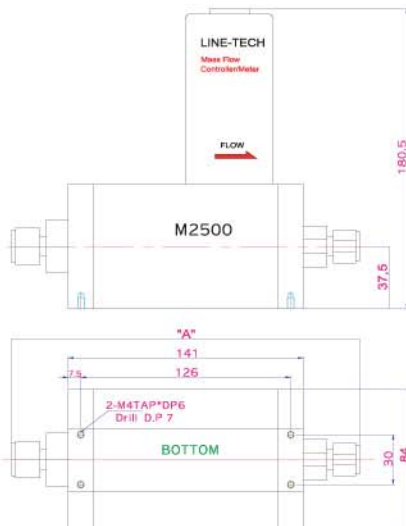


# M2500VA

## Specifications

Model	M2500VA
Range(N2)	300~1000slpm
Accuracy	±1% of FS
Repeatability	±0.25%
In/Out Signal	0~5Vdc or 4~20mA
Supply Power	+15 or +24Vdc, 350mA
Max Operating Pressure	< 90 bar
Max Operating Temp	0 ~ 50 °C
Leak Rate	1 x 10 <sup>-9</sup> atm. cc/sec
Control Range	3~100%

Connection	"A" Dimension(mm)
1/2" SW	209
3/4" SW	209
1" SW	218



## Mass Flow Meter

### Features

- Accurate at Low Flow
- Fast Response
- Compact Connection
- Highly Stable Removable Sensor
- High Corrosion Resistance
- Excellent Linearity
- Excellent Long-Term Stability
- Wide Pressure Range Available

M2500VA





# 02 DIGITAL MFC/MFM ❖❖

Mass Flow Controller  
& Meter



NEW TECHNOLOGY &  
NEW VALUABLE CREATION

Technology

Innovation

Partnership

[www.line-tech.co.kr](http://www.line-tech.co.kr)

# DIGITAL MFC/MFM

Mass Flow Controller  
& Meter

## DIGITAL Mass Flow Controller & Mass Flow Meter

### Mass Flow Controller Specifications

Model	FULL SCALE N2(slpm)	ACCURACY (% FS)	REPEATABILITY (%)	RESPONSE TIME(sec)	IN/OUT SIGNAL (Vdc / mA)	SUPPLY POWER (Vdc)	OPERATING PRESSURE(psia)	OPERATING TEMP. (°C)
MD30C	0.010~30	±2.0	±0.25	<1	0~5 or 4~20	+15 or +24	5~1300	0~50
MD100C	30~100	±2.0	±0.25	<1	0~5 or 4~20	+15 or +24	30~1000	0~50
MD300C	100~300	±2.0	±0.25	<1	0~5 or 4~20	+15 or +24	45~240	0~50
MD500C	300~1000	±2.0	±0.25	<1	0~5 or 4~20	+15 or +24	60~240	0~50

### Mass Flow Meter Specifications

Model	FULL SCALE N2(slpm)	ACCURACY (% FS)	REPEATABILITY (%)	RANGE	IN/OUT SIGNAL (Vdc / mA)	SUPPLY POWER (Vdc)	OPERATING PRESSURE(psia)	OPERATING TEMP. (°C)
MD30M	0.010~30	±2.0	±0.25	50 : 1	0~5 or 4~20	+15 or +24	5~1300	0~50
MD100M	30~100	±2.0	±0.25	50 : 1	0~5 or 4~20	+15 or +24	30~1000	0~50
MD300M	100~300	±2.0	±0.25	50 : 1	0~5 or 4~20	+15 or +24	45~1300	0~50
MD500M	300~1000	±2.0	±0.25	50 : 1	0~5 or 4~20	+15 or +24	60~1300	0~50

# MD30C

## Mass Flow Controller

### Features

- Accurate at Low Flow
- Fast Response
- Compact Connection
- Highly Stable Removable Sensor
- High Corrosion Resistance
- Excellent Linearity
- Excellent Long-Term Stability
- Wide Pressure Range Available
- Digital Communication : RS-232C

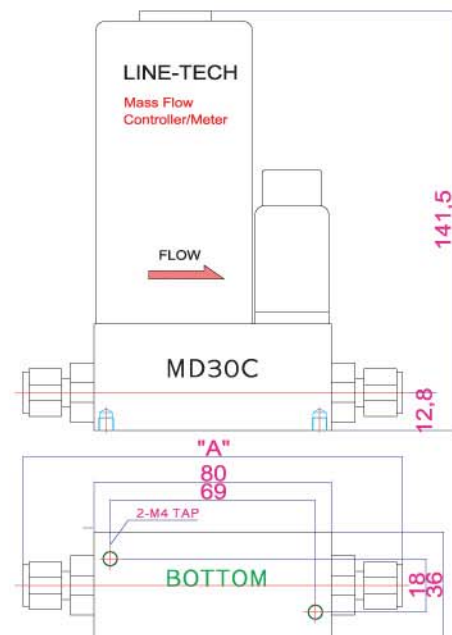
MD30C



### Specifications

Model	MD30C
Range(N <sub>2</sub> )	0.01~30slpm
Response Time	< 1sec
Accuracy	±0.2% of FS
Repeatability	±0.25%
In/Out Signal	0~5Vdc or 4~20mA
Supply Power	+15 or +24Vdc, 350mA
Max Operating Pressure	< 90 bar
Max Operating Temp	0 ~ 50 °C
Leak Rate	1 x 10 <sup>-3</sup> atm. cc/sec
Control Range	3~100%

Connection	"A" Dimension(mm)
1/8" SW	126.7
1/4" SW	131.3
3/8" SW	134.3
1/4" VCR	127.8





# MD30M

## Specifications

Model	MD30M
Range(N2)	0.01~30slpm
Accuracy	±0.2% of FS
Repeatability	±0.25%
In/Out Signal	0~5Vdc or 4~20mA
Supply Power	+15 or +24Vdc, 350mA
Max Operating Pressure	< 90 bar
Max Operating Temp	0 ~ 50 °C
Leak Rate	1 x 10 <sup>-9</sup> atm. cc/sec
Control Range	3~100%

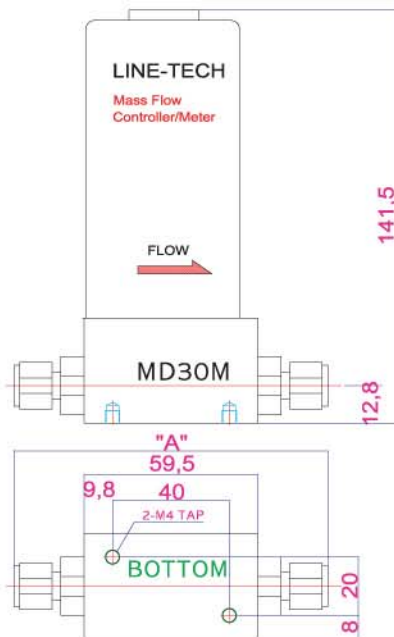
Connection	"A" Dimension(mm)
1/8" SW	106.2
1/4" SW	110.8
3/8" SW	113.8
1/4" VCR	107.3

## Mass Flow Meter

### Features

- Accurate at Low Flow
- Fast Response
- Compact Connection
- Highly Stable Removable Sensor
- High Corrosion Resistance
- Excellent Linearity
- Excellent Long-Term Stability
- Wide Pressure Range Available
- Digital Communication : RS-232C

MD30M



# MD100C

## Mass Flow Controller

### Features

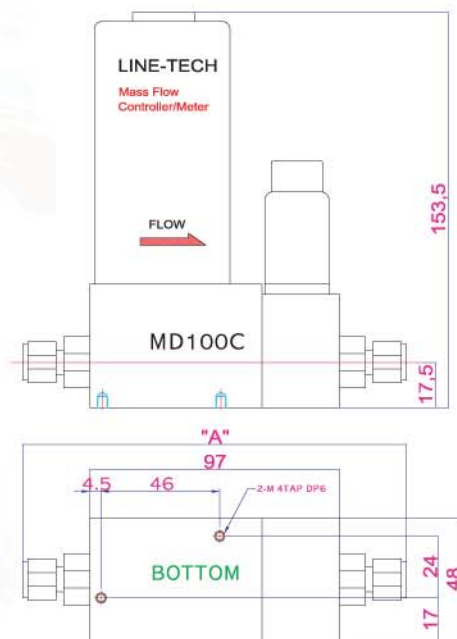
- Accurate at Low Flow
- Fast Response
- Compact Connection
- Highly Stable Removable Sensor
- High Corrosion Resistance
- Excellent Linearity
- Excellent Long-Term Stability
- Wide Pressure Range Available
- Digital Communication : RS-232C

MD100C

### Specifications

Model	MD100C
Range(N <sub>2</sub> )	30~100slpm
Response Time	< 1sec
Accuracy	±0.2% of FS
Repeatability	±0.25%
In/Out Signal	0~5Vdc or 4~20mA
Supply Power	+15 or +24Vdc, 350mA
Max Operating Pressure	< 70 bar
Max Operating Temp	0 ~ 50°C
Leak Rate	1 x 10 <sup>-9</sup> atm. cc/sec
Control Range	3~100%

Connection	"A" Dimension(mm)
1/4" SW	151
3/8" SW	154
1/2" SW	156
1/4" VCR	147
1/2" VCR	153



# MD100M

## Specifications

Model	MD100M
Range(N2)	30~100slpm
Accuracy	±0.2% of FS
Repeatability	±0.25%
In/Out Signal	0~5Vdc or 4~20mA
Supply Power	+15 or +24Vdc, 350mA
Max Operating Pressure	< 90 bar
Max Operating Temp	0 ~ 50 °C
Leak Rate	1 x 10 <sup>-9</sup> atm. cc/sec
Control Range	3~100%

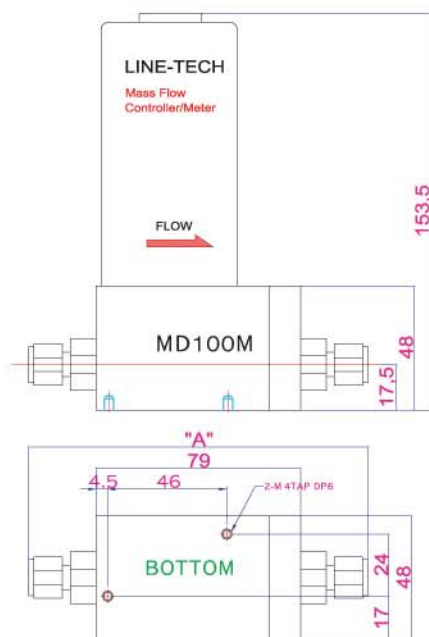
Connection	"A" Dimension(mm)
1/4" SW	131
3/8" SW	134
1/2" SW	137
1/4" VCR	127
1/2" VCR	134

## Mass Flow Meter

### Features

- Accurate at Low Flow
- Fast Response
- Compact Connection
- Highly Stable Removable Sensor
- High Corrosion Resistance
- Excellent Linearity
- Excellent Long-Term Stability
- Wide Pressure Range Available
- Digital Communication : RS-232C

MD100M



# MD300C

## Mass Flow Controller

### Features

- Accurate at Low Flow
- Fast Response
- Compact Connection
- Highly Stable Removable Sensor
- High Corrosion Resistance
- Excellent Linearity
- Excellent Long-Term Stability
- Wide Pressure Range Available
- Digital Communication : RS-232C

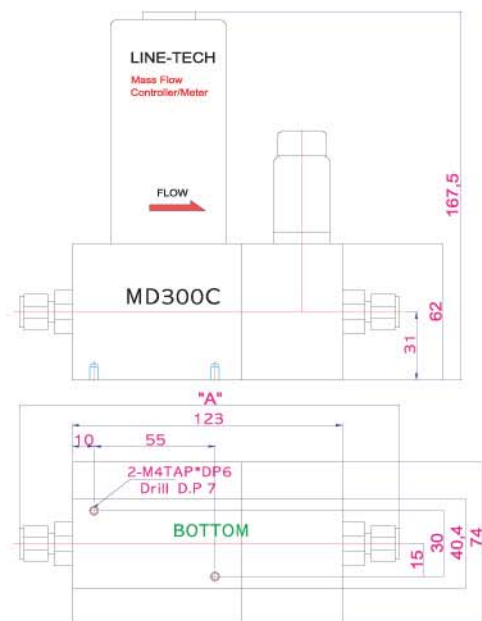
MD300C



### Specifications

Model	MD300C
Range(N <sub>2</sub> )	100~300slpm
Response Time	< 1sec
Accuracy	±0.2% of FS
Repeatability	±0.25%
In/Out Signal	0~5Vdc or 4~20mA
Supply Power	+15 or +24Vdc, 350mA
Max Operating Pressure	< 15 bar
Max Operating Temp	0 ~ 50°C
Leak Rate	1 x 10 <sup>-9</sup> atm. cc/sec
Control Range	3~100%

Connection	"A" Dimension(mm)
1/4" SW	178
3/8" SW	191
1/2" SW	181
1/4" VCR	171
1/2" VCR	178



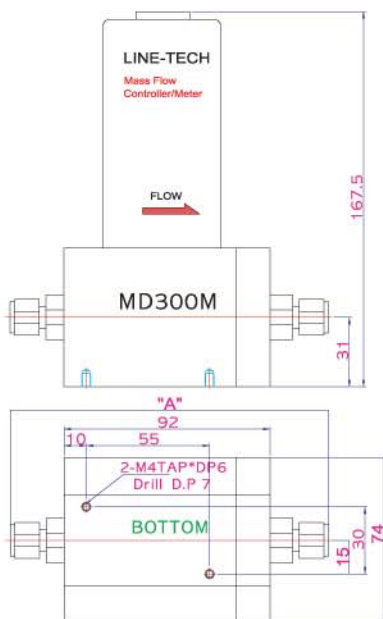


# MD300M

## Specifications

Model	MD300M
Range(N2)	100~300slpm
Accuracy	±0.2% of FS
Repeatability	±0.25%
In/Out Signal	0~5Vdc or 4~20mA
Supply Power	+15 or +24Vdc, 350mA
Max Operating Pressure	< 90 bar
Max Operating Temp	0 ~ 50℃
Leak Rate	1 x 10 <sup>-3</sup> atm. cc/sec
Control Range	3~100%

Connection	"A" Dimension(mm)
1/4" SW	144
3/8" SW	147
1/2" SW	160
1/4" VCR	140
1/2" VCR	147



## Mass Flow Meter

### Features

- Accurate at Low Flow
- Fast Response
- Compact Connection
- Highly Stable Removable Sensor
- High Corrosion Resistance
- Excellent Linearity
- Excellent Long-Term Stability
- Wide Pressure Range Available
- Digital Communication : RS-232C

MD300M



# MD500C

## Mass Flow Controller

### Features

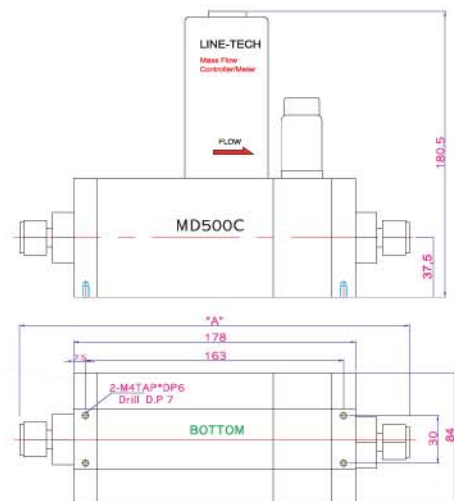
- Accurate at Low Flow
- Fast Response
- Compact Connection
- Highly Stable Removable Sensor
- High Corrosion Resistance
- Excellent Linearity
- Excellent Long-Term Stability
- Wide Pressure Range Available
- Digital Communication : RS-232C

MD500C

### Specifications

Model	MD500C
Range(N2)	300~1000slpm
Response Time	< 1sec
Accuracy	±0.2% of FS
Repeatability	±0.25%
In/Out Signal	0~5Vdc or 4~20mA
Supply Power	+15 or +24Vdc, 350mA
Max Operating Pressure	< 15 bar
Max Operating Temp	0 ~ 50°C
Leak Rate	1 x 10 <sup>-9</sup> atm. cc/sec
Control Range	3~100%

Connection	"A" Dimension(mm)
1/2" SW	248
3/4" SW	248
1" SW	254

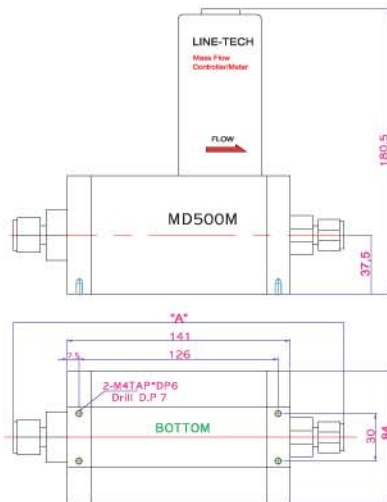


# MD500M

## Specifications

Model	MD500M
Range(N2)	300~1000slpm
Accuracy	±0.2% of FS
Repeatability	±0.25%
In/Out Signal	0~5Vdc or 4~20mA
Supply Power	+15 or +24Vdc, 350mA
Max Operating Pressure	< 90 bar
Max Operating Temp	0 ~ 50 °C
Leak Rate	1 x 10 <sup>-9</sup> atm. cc/sec
Control Range	3~100%

Connection	"A" Dimension(mm)
1/2" SW	209
3/4" SW	209
1" SW	218



## Mass Flow Meter

### Features

- Accurate at Low Flow
- Fast Response
- Compact Connection
- Highly Stable Removable Sensor
- High Corrosion Resistance
- Excellent Linearity
- Excellent Long-Term Stability
- Wide Pressure Range Available
- Digital Communication : RS-232C

MD500M



# FC-050S

**High Pressure, Gas or Liquid Flow Controller**

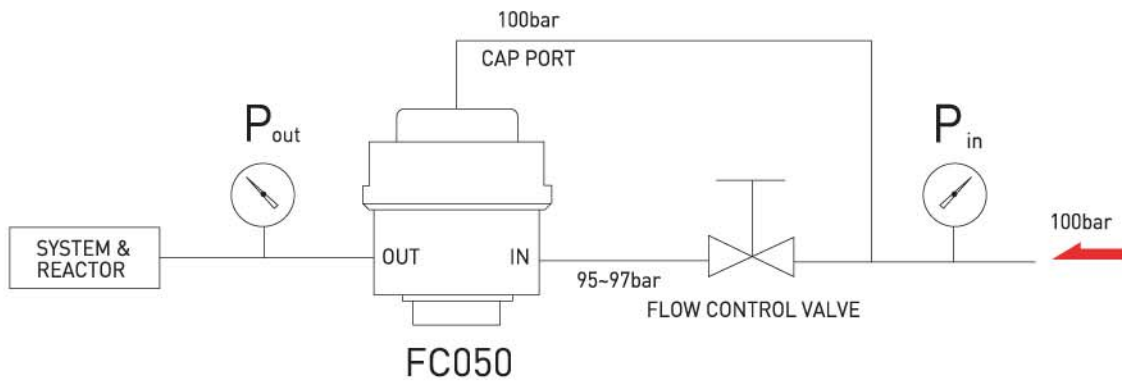
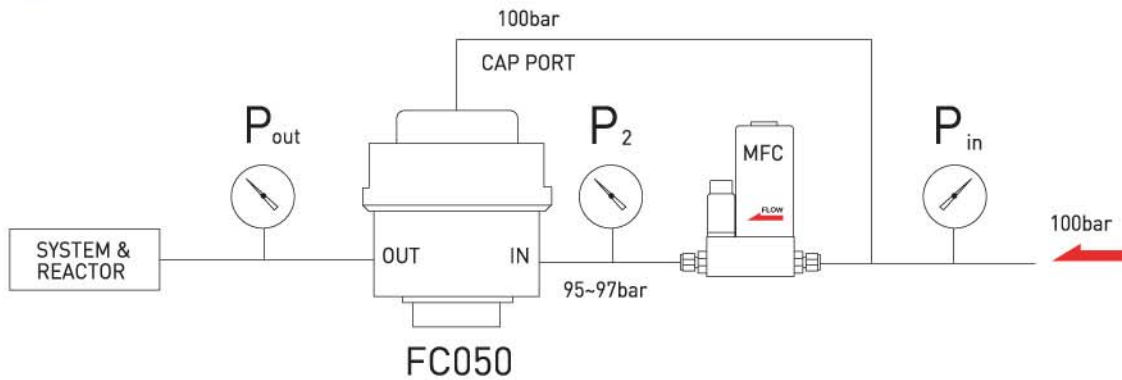
## Features

- Auto control Differential Pressure : 3~5 Barg
- Gas Flow Range : 25sccm~50slpm
- Operating Perssure Range : 15~300 Barg
- Required Differential Perssure : 15 Barg
- Operating Temperature Range : -20~30°C
- Application : Corrosion Resistant

FC-050S



## Application





# PR-030

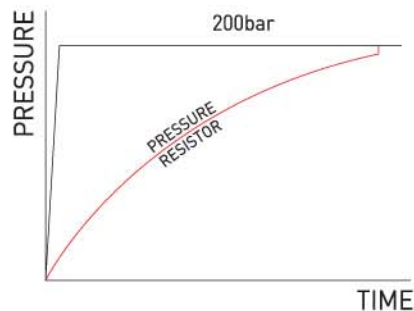
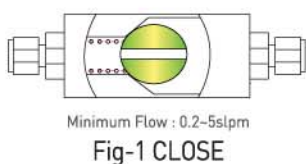


## Product for Pressure Shock

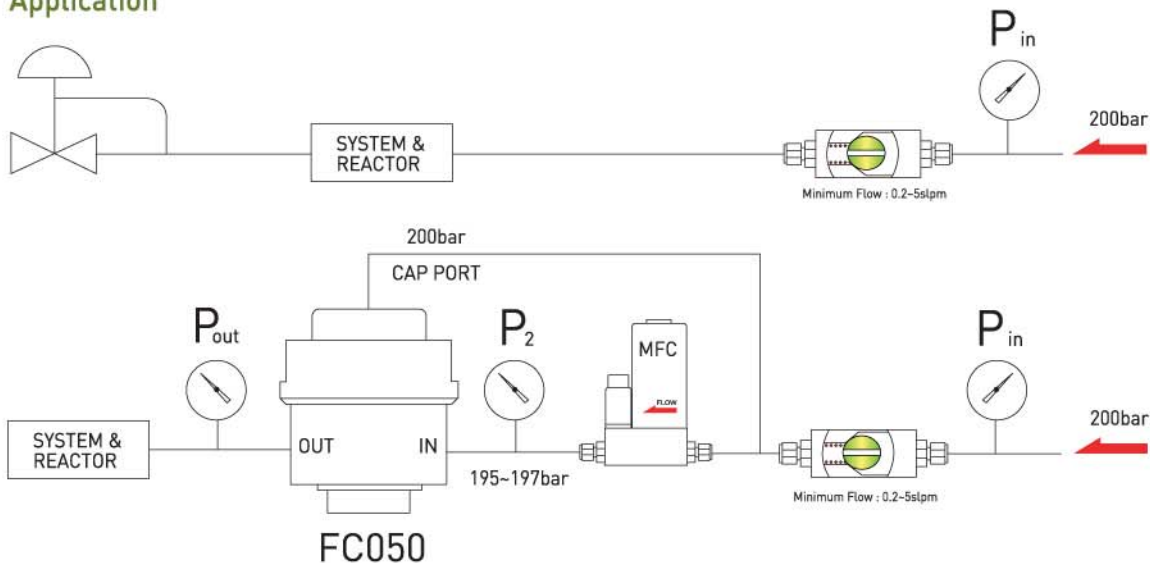
### Pressure Resistor

- Auto Close Differential Pressure : > 15 Barg
- Auto Open Differential Pressure : 0.5~8 Barg
- Max Gas Flow Range : 30slpm
- Max Operating Pressure : < 300 Bar
- Close Gas Flow Range : < 0.3~5slpm
- Required Differential Pressure : 15 Barg
- Operating Temperature Range : -20~100°C
- Applocation : Corrosion Resistant

PR-030



## Application



# Standard Flow Measurement System



## Features

excellent accuracy  
wide measurement range  
miniaturization  
convenient mobility  
simplification of installation

Description	Specification
Sonic nozzle system	Nozzle bank and 14 sonic nozzle
Flow range	0.02 SLM ~ 2,000 SLM
Flow control unit	Regulator (0~6 Bar)
Pressure control unit	Valve (high pressure)
Pressure sensor	2 Channel (up and down stream)
System uncertainty	$\pm 0.2\%$





## M-series Installation MANUAL

All model's inlet and outlet connection standards are V.C.R male type and S.W.G. Install the equipment with consideration to the given structure and strength conditions. Be sure to clean the pipe's inside by blowing high-pressured gas before connecting to MFC/MFM.

### 1.

#### Cautions When Installing

- ① Check the gas flow direction.
- ② When using corrosive or inflammable gas, completely rid the system of moisture or leakage with N<sub>2</sub> gas before the usage.
- ③ Do not install the equipment in the presence of possible mechanical damage or vibration.

#### **⚠ Warning!**

MFC must be installed and operated knowing that its valve is not applicable to stop the flow completely.

### 2.

#### MFC/MFM Operation

##### Warming Up Time

- ① After installing, warm up the equipment for 45 minutes to stabilize the temperature of the sensor.
- ② Before supplying gas, adjust the zero point to less than 0.2%.
- ③ Supply gas.
- ④ Check for any leakage.
- ⑤ Operate.

##### Setting Up the Zero Point.

- The zero point may change depending on the surrounding's temperature or installation structure.
- Approximately 45 minutes after supplying power, when installed according to the correct environment and application conditions, set up the final zero point.



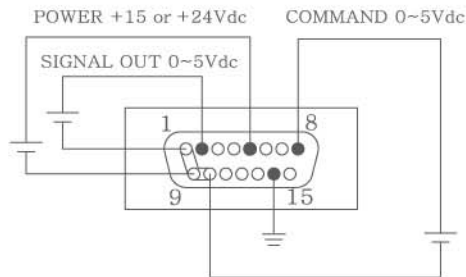
### Voltage In/Out Electric Connection

PIN NO	Function	Color	PIN CONNECTION	
			MFC	MFM
1	Command Ground	Green	⊙	⊙
2	0~5Vdc Flow Signal Output	Brown	●	●
3	Not Used	X		
4	4~20mA Flow Signal Output	Black		
5	+15 or +24vdc Power Supply	Red	●	●
6	Not Used	X		
7	4~20mA Flow Command Input	Gray		
8	0~5vdc Flow Command Input	Yellow	●	
9	Power Ground	White	⊙	⊙
10	Signal Output Ground	Blue	⊙	⊙
11	+5 Vdc Reference Output	X		
12	Valve Override	X		
13	Not Used	X		
14	Shield	X	◐	◐
15	Not Used	X		

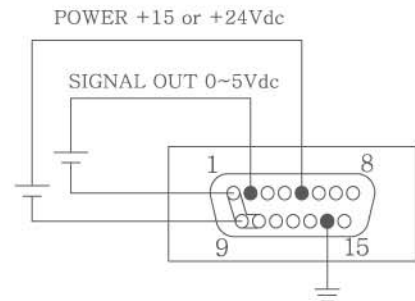
Fig-1 ⊙ Interconnected within P.C.B.

### Voltage Command and Output Connection

#### Mass Flow Controller



#### Mass Flow Meter



### VOLTAGE COMMAND AND OUTPUT CONNECTION





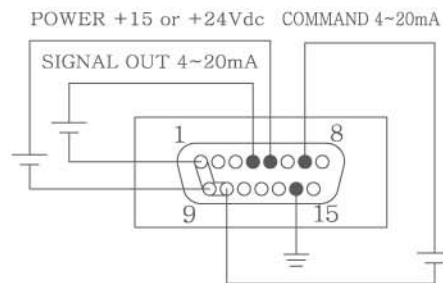
## Current In/Out Electric Connection

PIN NO	Function	Color	PIN CONNECTION	
			MFC	MFM
1	Command Ground	Green	⊙	⊙
2	0~5Vdc Flow Signal Output	Brown		
3	Not Used	X		
4	4~20mA Flow Signal Output	Black	●	●
5	+15 or +24vdc Power Supply	Red	●	●
6	Not Used	X		
7	4~20mA Flow Command Input	Gray	●	
8	0~5vdc Flow Command Input	Yellow		
9	Power Ground	White	⊙	⊙
10	Signal Output Ground	Blue	⊙	⊙
11	+5 Vdc Reference Output	X		
12	Valve Override	X		
13	Not Used	X		
14	Shield	X	◐	◐
15	Not Used	X		

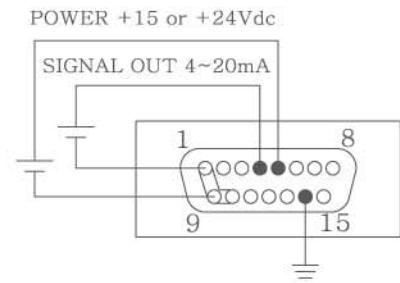
Fig-2 ⊙ Interconnected within P.C.B.

## Current Command and Output Connection

### Mass Flow Controller



### Mass Flow Meter



## CURRENT COMMAND AND OUTPUT CONNECTION



## Voltage In/Out Electric Connection

PIN NO	Function	Color	PIN CONNECTION	
			MFC	MFM
1	Command Ground	Green	⊙	⊙
2	0~5Vdc Flow Signal Output	Brown	●	●
3	Not Used	X		
4	4~20mA Flow Signal Output	Black		
5	+15 or +24vdc Power Supply	Red	●	●
6	Not Used	X		
7	4~20mA Flow Command Input	Gray		
8	0~5vdc Flow Command Input	Yellow	●	
9	Power Ground	White	⊙	⊙
10	Signal Output Ground	Blue	⊙	⊙
11	+5 Vdc Reference Output	X		
12	Valve Override	X		
13	RS485 +		★	★
14	Shield	X	◐	◐
15	RS485 -		★	★

Fig-3 ⊙ Interconnected within P.C.B.

## Digital Communication : (PIN13,15)

RS 232C Communication

Baud rate : 19200bps

Data : 8Bit

Stop Bit : 1Bit

Parity : None



## Current In/Out Electric Connection

PIN NO	Function	Color	PIN CONNECTION	
			MFC	MFM
1	Command Ground	Green	⊙	⊙
2	0~5Vdc Flow Signal Output	Brown		
3	Not Used	X		
4	4~20mA Flow Signal Output	Black	●	●
5	+15 or +24vdc Power Supply	Red	●	●
6	Not Used	X		
7	4~20mA Flow Command Input	Gray	●	
8	0~5vdc Flow Command Input	Yellow		
9	Power Ground	White	⊙	⊙
10	Signal Output Ground	Blue	⊙	⊙
11	+5 Vdc Reference Output	X		
12	Valve Override	X		
13	RS485 +		★	★
14	Shield	X	◐	◐
15	RS485 -		★	★

Fig-4 ⊙ Interconnected within P.C.B.

## Digital Communication : (PIN13,15)

RS 232C Communication

Baud rate : 19200bps

Data : 8Bit

Stop Bit : 1Bit

Parity : None

Use of the Conversion TABLE

$$\text{Actual gas flow rate} = \text{Output reading} \times \frac{\text{Factor of the gas}}{\text{Factor of the calibrated gas}}$$

**Example 1**

The controller is calibrated for nitrogen.  
 The desired gas is carbon dioxide.  
 The output reading is 75 sccm when carbon dioxide is flowing.  
 Then  $75 \times 0.78 = 58.50$  sccm

in order to calculate the conversion factor for a gas mixture, the following formula should be used.

$$\text{Sensor Conversion Factor Mixture} = \frac{100}{\frac{P1}{\text{Sensor Conversion Factor 1}} + \frac{P2}{\text{sensor conversion Factor 2}} + \frac{Pn}{\text{sensor conversion Factor n}}}$$

Where, P1 = percentage(%) of gas 1 (by volume)  
 P2 = percentage(%) of gas 2 (by volume)  
 Pn = percentage(%) of gas n (by volume)

**Example 2**

The desired gas is 20% Helium(He) and 80% Chlorine (Cl) by volume.  
 The desired full scale flow rate of the mixture is 20 slpm.  
 Sensor conversion factor for the mixture is

$$\text{Mixture Factor} = \frac{100}{\frac{20}{1.39} + \frac{80}{0.83}} = 0.903$$

Air equivalent flow =  $20/0.903 = 22.15$  slpm air





	Source J-836-D-508 Rev.b	Formula	Gasfactor	Orifice factor	Density(kg/m)	Recommended	Allowed	Not recommended
1	1,1,2-Trichloro-1,1,2-Trifluoroet(f113)	C2CL3F3	0.231	2.520	7.920	Buna	-	Viton/Buna/Kalrez
2	1,1-Difluoro-1-Chloroethane	C2H3CLF2	0.341	1.957	4.776	Buna	-	-
3	1,1-Difluoroethane	CH3CHF2	0.415	1.536	2.940	Kalrez	-	-
4	1,1-Difluoroethylene	CH2:CF2	0.458	1.512	2.860	Teflon	-	-
5	1,2-Dibromotetrafluoroethane(f114B2)	C2Br2F4	0.215	2.905	10.530	Teflon	Viton/Buna/Kalrez	Epdm
6	1,2-Dichloroethane(Ethylene dichloride)	C2H4CL2	0.382	1.879	4.419	Kalrez	-	-
7	1,2-Dichlorotetrafluoroethane(f114)	C2CL2F4	0.231	2.449	7.479	Buna	Epdm	-
8	1,3-Butadiene	C4H6	0.354	1.413	2.491	Viton	Teflon-Kalrez	Buna/Epdm
9	1,1,1,2-Tetrafluoroethane(R134A)	C2H2F4	0.307	1.908	4.556	Epdm		
10	1,1,2,2-Tetrafluoroethane(R134)	C2H2F4	0.295	1.908	4.556			
11	1,2-Propylene Oxide	C3H6O	0.348	1.440	2.594			
12	1-Butene	C4H8	0.294	1.435	2.503	Viton	Kalrez	Buna/Epdm
13	1-Pentene, 4-Methyl	C6H12	0.200	1.733	3.758			
14	2,2 Dichloro - 1,1,1 - Trifluoroethane	C2HCL2F3	0.259	2.336	6.829			
15	2,2-Dimethylpropane	C(CH3)4	0.247	1.613	3.244	Buna	-	-
16	2-Chloro-1,1,1,2-Tetrafluoroethane(R124)	C2HClF4	0.027	2.207	6.094			
17	2-Chlorobutane	C4H9CL	0.234	1.818	4.134			
18	2-Methyl-1,3-Butadiene	C5H8	0.247	1.559	3.042			
19	3-Methyl-1-butene	C5H10	0.252	1.584	3.127	-	-	-
20	Acetonitrile	C2H3N	0.510	1.211	1.833			
21	Acetylene(Ethyne)	C2H2	0.615	0.970	1.173	Viton	Epdm/Buna/Teflon-K	-
22	Acrolein	C3H4O	0.362	1.415	2.054			
23	Air	Air	0.998	1.018	1.293	Viton	Epdm/Buna/Teflon-K	-
24	Allene	C3H4	0.478	1.199	1.787	Buna	-	-
25	Ammonia	NH3	0.786	0.781	0.771	Epdm/Teflon	Buna/Teflon	Viton
26	Argon	Ar	1.395	1.195	1.784	Viton	Epdm/Buna/Teflon-K	-
27	Arsine	AsH3	0.754	1.661	3.478	Teflon-Kalrez	-	-
28	Benzene	C6H6	0.294	1.670	3.488			
29	Borane	H3B	0.778	0.703	0.618			
30	Boron Trichloride	BCL3	0.443	2.044	5.227	Teflon-Kalrez*	Viton	-
31	Boron Trifluoride	BF3	0.579	1.569	3.025	Teflon-Kalrez	Viton	-
32	Bromine	Br2	0.800	2.388	7.136			
33	Bromine Pentafluoride	BrF5	0.287	2.502	7.806	Teflon	Kalrez	Viton/Epdm/Buna
34	Bromine Trifluoride	BrF3	0.439	2.214	6.108	Teflon	Kalrez	Viton/Epdm/Buna
35	Bromotrifluoroethylene	C2BrF3	0.326	2.397	7.165	Viton	Buna	-
36	Bromotrifluoromethane(f13B1)	CBrF3	0.412	2.303	6.615	Buna	Epdm	Viton/Kalrez
37	Butane	C4H10	0.257	1.467	2.593	Viton	Buna/Kalrez	Epdm
38	Carbon Dioxide	CO2	0.740	1.255	1.977	Buna	Kalrez	Viton/Epdm

※ Note : CO2      5bar ↑      Kalrez Set      /      10bar ↑      Kalrez O-ring  
Teflon seat

**Gas Sealing**  
Selection and Gas Factor

Source J-836-D-508 Rev.b	Formula	Gasfactor	Orifice factor	Density(kg/m)	Recommended	Allowed	Not recommended	
39	Carbon Disulfide	CS2	0.638	1.650	3.393	Viton	Kalrez	Buna/Epdm
40	Carbon Monoxide	CO	0.995	1.000	1.250	Viton	Buna/Epdm/Kalrez	-
41	Carbon Tetrachloride	CCL4	0.344	2.345	6.860	Viton	Kalrez	Buna/Epdm
42	Carbon Tetrafluoride (f14)	CF4	0.440	1.770	3.926	Viton	Kalrez	-
43	Carbonyl Fluoride	COF2	0.567	1.555	2.045	Viton	-	-
44	Carbonyl Sulfide	COS	0.680	1.463	2.680	Viton	-	-
45	Chlorine	CL2	0.876	1.598	3.214	Viton	Kalrez	Buna/Epdm
46	Chlorine Dioxide	CLO2	0.693	1.554	3.011	Viton	Kalrez	Buna/Epdm
47	Chlorine Trifluoride	CLF3	0.433	1.812	4.125	Kalrez	-	Viton/Buna/Epdm
48	Chlorodifluoromethane (f22)	CHCLF2	0.505	1.770	3.906	Epdm	Kalrez	Viton/Buna/Epdm
49	Chloroform (Trichloromethane)	CHCL3	0.442	2.066	5.340	Viton	Kalrez	Buna/Epdm
50	Chloropentafluoroethane (f115)	C2CLF5	0.243	2.397	7.165	Epdm	-	Buna
51	Chlorotrifluoroethylene	C2CLF3	0.337	2.044	5.208	Teflon	-	-
52	Chlorotrifluoromethane (f13)	CCLF3	0.430	1.985	4.912	Kalrez	-	-
53	CIS-2-Butene	C4H8	0.320	1.435	2.503	Buna	-	-
54	Cyanogen	[CN]2	0.498	1.366	2.322	Kalrez	-	-
55	Cyanogen Chloride	CLCN	0.618	1.480	2.730	Kalrez	-	-
56	Cyclobutane	C4H8	0.387	1.413	2.491	Buna	-	-
57	Cyclopropane	C3H6	0.505	1.224	1.877	Buna	-	-
58	Deuterium	D2	0.995	0.379	0.177	Viton	-	-
59	Diborane	B2H6	0.448	1.000	1.235	Kalrez	-	-
60	Diboromodifluoromethane(f12B2)	CBr2F2	0.363	2.652	8.768	Viton	-	-
61	Dichlorodifluoromethane (f12)	CCL2F2	0.390	2.099	5.492	Buna	-	Viton/Teflon/Kalrez/Epdm
62	Dichloroethylene	C2H2Cl2	0.397	1.860	4.329			210
63	Dichlorofluoromethane (f21)	CHCL2F	0.456	1.985	4.912	Kalrez	-	Viton/Buna/Epdm
64	Dichloromethane	CH2Cl2	0.522	1.741	3.793			
65	Dichlorosilane	SiH2CL2	0.442	1.897	4.506	Kalrez	-	-
66	Diethylamine	C4H11N	0.222	1.616	3.266			
67	Diedthylsilane	C4H12Si	0.183	1.775	3.940			
68	Difluoromethane (f32)	CF2H2	0.627	1.360	2.411			
69	Dimethylamine	[CH3]2NH	0.370	1.269	2.013	Kalrez	-	-
70	Dimethylether	[CH3]2O	0.392	1.281	2.055	Viton	Buna/Epdm/Kalrez	-
71	Dimethylsulfide	C2H6S	0.357	1.489	2.775			
72	Dimethylzinc	C2H6Zn	0.234	1.846	4.262			
73	Disilane	Si2H6	0.332	1.493	2.779	Teflon	-	-
74	Ethane	C2H6	0.490	1.038	1.357	Viton	Buna/Kalrez	Epdm
75	Ethanol	C2H6O	0.394	1.282	2.057			
76	Ethyl chloride	C2H5CL	0.408	1.516	2.897	Viton	Buna/Kalrez	Epdm



Source J-836-D-508 Rev.b	Formula	Gasfactor	Orifice factor	Density(kg/m)	Recommended	Allowed	Not recommended	
77	Ethylacetylene	C <sub>4</sub> H <sub>6</sub>	0.365	1.384	2.388	Buna	-	-
78	Ethylene	C <sub>2</sub> H <sub>4</sub>	0.619	1.000	1.261	Viton	Buna/Kalrez	Epdm
79	Ethylene Oxide	C <sub>2</sub> H <sub>4</sub> O	0.589	1.254	1.965	Kalrez	-	Viton/Buna/Epdm
80	Fluorine	F <sub>2</sub>	0.924	1.163	1.695	Metal	-	-
81	Fluoroform (f23)	CHF <sub>3</sub>	0.529	1.584	3.127	Kalrez*	-	-
82	Germanium Tetrachloride	GeCL <sub>4</sub>	0.268	2.766	9.574	Kalrez*		
83	Germanium Tetrafluoride	GeF <sub>4</sub>	0.356	2.303	6.636			-
84	Germanium Tetrahydride(Germane)	GeH <sub>4</sub>	0.559	1.654	3.423			
85	Halothane (R123B1)	C <sub>2</sub> HBrCLF <sub>3</sub>	0.257	2.654	8.814			
86	Helium	He	1.386	0.378	0.178	Viton	Buna/Epdm/Kalrez	-
87	Hexafluoroacetone	C <sub>3</sub> F <sub>6</sub> O	0.219	2.434	7.414	-	-	-
88	Hexafluorobenzine	C <sub>6</sub> F <sub>6</sub>	0.632	2.577	8.309			
89	Hexafluorobutadiene	C <sub>4</sub> F <sub>6</sub>	0.213	2.405	7.236			
90	Hexafluoroethane (f116)	C <sub>2</sub> F <sub>6</sub>	0.255	2.219	6.139	Buna	-	-
91	Hexafluoropropylene (HFP)	C <sub>3</sub> F <sub>6</sub>	0.249	2.312	6.663	Buna	-	-
92	Hexamethyldisilane (HMDS)	[CH <sub>2</sub> ] <sub>6</sub> Si <sub>2</sub>	0.139	2.404	7.208	Kalrez	-	-
93	Hexamethyldisiloxane	C <sub>6</sub> H <sub>18</sub> OSi <sub>2</sub>	0.110	2.408	7.251			
94	Hexane	C <sub>6</sub> H <sub>14</sub>	0.204	1.757	3.847	Viton	Buna/Kalrez	Epdm
95	Hexylamine	C <sub>6</sub> H <sub>15</sub> N	0.158	1.901	4.519			
96	Hydrogen	H <sub>2</sub>	1.008	0.269	0.090	Viton	Buna/Epdm/Kalrez	-
97	Hydrogen Bromide	HBr	0.987	1.695	3.645	Viton	Epdm/Kalrez	Buna
98	Hydrogen Chloride	HCL	0.983	1.141	1.639	Epdm	Kalrez	Buna
99	Hydrogen Cyanide	HCN	0.744	0.973	1.179	Kalrez	-	-
100	Hydrogen Fluoridey	HF	0.998	0.845	0.893	Kalrez	-	Viton/Buna/Epdm
101	Hydrogen Iodide	HI	0.953	2.144	5.789	Kalrez	-	-
102	Hydrogen Selenide	H <sub>2</sub> Se	0.837	1.695	3.613	Kalrez	-	-
103	Hydrogen Sulfide	H <sub>2</sub> S	0.850	1.108	1.539	Teflon/Kalrez	Epdm	Viton/Buna
104	Iodine Pentafluoride	IF <sub>5</sub>	0.283	2.819	9.907	Teflon	-	Viton/Buna/Epdm
105	Isobutane	C <sub>4</sub> H <sub>10</sub>	0.260	1.440	2.596	Kalrez*	-	-
106	Isobutane	C <sub>4</sub> H <sub>8</sub>	0.289	1.435	2.503	Kalrez*	-	-
107	Isopentane	C <sub>5</sub> H <sub>12</sub>	0.211	1.605	3.222	-	-	-
108	Krypton	Kr	1.382	1.729	3.708	Viton	-	-
109	Methacrolein	C <sub>4</sub> H <sub>6</sub> O	0.313	1.582	3.13			
110	Methane	CH <sub>4</sub>	0.763	0.763	0.717	Buna/Viton	Kalrez	Epdm
111	Methanol	CH <sub>4</sub> O	0.609	1.609	1.431			
112	Methyl Bromide	CH <sub>3</sub> Br	0.646	1.834	4.236	-	-	-
113	Methyl Chloride	CH <sub>3</sub> CL	0.687	1.347	2.308	Kalrez	-	Viton/Buna/Epdm
114	Methyl Fluoride	CH <sub>3</sub> F	0.761	1.102	1.518	-	-	-

## Gas Sealing

Selection and Gas Factor

Source J-836-D-508 Rev.b	Formula	Gasfactor	Orifice factor	Density(kg/m)	Recommended	Allowed	Not recommended	
115	Methyl Mercaptan	CH4S	0.588	1.313	2.146	-	-	-
116	Methyl Silane	CH6Si	0.393	1.283	2.061			
117	Methyl Trichlorosilane (MTS)	CH3CL3Si	0.267	2.310	6.675			
118	Methyl Vinyl Ether	C3H6O	0.377	1.435	2.567	Kalrez	-	-
119	Methylacetylene	C3H4	0.473	1.196	1.782	Kalrez	-	-
120	Monoethanolamine	C2H7NO	0.305	1.477	2.728			
121	Monoethylamine (CH3CH2NH2)	C2H7	0.359	1.269	2.013	Kalrez	-	-
122	Monomethylamine	CH3NH2	0.565	1.067	1.420	Kalrez	-	-
123	Neon	Ne	1.398	0.847	0.902	Viton	Buna/Epdm/Kalrez	-
124	Nickel Carbonyl	Ni(CO)4	0.212	2.371	7.008	-	-	-
125	Nitric Acid	HN03	0.491	1.500	2.814			
126	Nitric Oxide	NO	0.995	1.030	1.339	Kalrez*	Viton	-
127	Nitrogen	N2	1.000	1.000	1.251	Viton	Buna/Epdm/Kalrez	-
128	Nitrogen Dioxide	NO2	0.758	1.713	2.052	Kalrez	-	-
129	Nitrogen Trifluoride	NF3	0.501	1.598	3.168	Teflon	Kalrez	-
130	Nitrogen Trioxide	N2O3	0.443	1.649	3.389	-	-	-
131	Nitrosyl Chloride	NOCL	0.644	1.529	2.913	Kalrez	-	-
132	Nitrous Oxide	N2O	0.752	1.259	1.964	Buna	-	-
133	Octofluorocyclobutane	C4F8	0.169	2.672	8.933	-	-	-
134	Octofluorotetrahydrofuran	C4F8O	0.165	2.777	9.644			
135	Octofluorocyclobutane	C4F8	0.169	2.672	8.933			
136	Oxygen	O2	0.988	1.067	1.429	Viton	Epdm/Kalrez	Buna
137	Oxygen Difluoride	OF2	0.672	1.388	2.402	-	-	-
138	Ozone	O3	0.738	1.310	2.138	Viton	Epdm/Kalrez	Buna
139	Pentafluoroethane	C2HF5	0.287	2.070	5.360			
140	Pentane (n-Pentane)	C5H12	0.212	1.605	3.222	-	-	-
141	Perchloryl Fluoride	ClO3F	0.448	1.905	4.571	-		
142	Perfluoro-2-Butene	C4F8	0.268	2.672	8.933	-	-	-
143	Perfluorobutane	C4F10	0.738	2.918	10.610	-	-	-
144	Perfluoromethyl - Vinylother (PMVE)	PMVE	0.296	2.029	5.131	-	-	-
145	Perfluoropropane	C3F8	0.179	2.591	8.396	-	-	-
146	Phosgene	COCL2	0.504	1.881	4.418	Kalrez	-	-
147	Phosphine	PH3	0.783	1.100	1.517	Kalrez	-	-
148	Phosphorous Oxychloride	POCl3	0.327	2.340	6.847			
149	Phosphorous Pentafluoride	PF5	0.346	2.109	5.620	-	-	-
150	Phosphorous Trifluoride	PF3	0.495	1.770	3.906	-	-	-
151	Propadiene	C3H4	0.439	1.196	1.789			
152	Propane (same as CH3CH2CH3)	C3H8	0.343	1.274	2.008	Viton	Buna/Kalrez	Epdm





	Source J-836-D-508 Rev.b	Formula	Gasfactor	Orifice factor	Density(kg/m)	Recommended	Allowed	Not recommended
153	Propylene [Propene]*	C3H6	0.401	1.234	1.875	Viton	Kalrez	Buna/Epdm
154	Rhenium Hexafluoride	ReF6	0.230	3.279	13.410	-	-	-
155	Silane	SiH4	0.625	1.070	1.440	Kalrez	-	-
156	Silicon Tetrachloride	SiCL4	0.310	2.462	7.579	Teflon-Kalrez	-	-
157	Silicon Tetrafluoride	SiF4	0.395	1.931	4.648	Teflon	-	-
158	sulfur Dioxide	SO2	0.728	1.529	2.858	EPDM	Kalrez/Teflon	Buna/Viton
159	sulfur Hexafluoride	SF6	0.270	2.348	6.516	Epdm/Teflon	Buna	Kalrez
160	sulfur Tetrafluoride	SF4	0.353	1.957	4.776	-	-	-
161	sulfur Trioxide	SO3	0.535	1.691	3.575	-	-	-
162	Sulfuryl Fluoride	SO2F2	0.423	1.931	4.648	-	-	-
163	Tetrachloromethane	CCL4	0.344	2.345	6.858	-	-	-
164	Tetraethylsilane	C8H20Si	0.111	2.270	6.445	-	-	-
165	Tetrafluoroethylene [TFE]	C2F4	0.361	1.905	4.526	Buna	-	Kalrez
166	Tetrafluorohydrazine	N2F4	0.367	1.926	4.624	-	-	-
167	Tetramethylsilane	C4H12Si	0.183	1.775	3.94	-	-	-
168	Titanium Tetrachloride	TiCl4	0.296	2.602	8.47	-	-	-
169	Toluene [C6H5]	CH3	0.234	1.814	4.115	-	-	-
170	Trans-2-Butene	C4H8	0.291	1.435	2.503	-	-	-
171	Trichlorofluoromethane (f11)	CCL3F	0.374	2.244	6.281	Teflon	-	Buna/Epdm/Kalrez
172	Trichlorosilane	SiHCL3	0.329	2.201	6.038	Viton/Kalrez	-	-
173	Trifluoroethane	C2H3F3	0.333	1.732	3.753	-	-	-
174	Trifluoropropene	C3H3F3	0.286	1.852	4.289	-	-	-
175	Trimethyl Aluminum	C3H9Al	0.259	1.604	3.219	-	-	-
176	Trimethylamine	[CH3]3N	0.316	1.467	2.639	Kalrez	-	-
177	Trimethylgallium	C3H9Ga	0.237	2.025	5.123	-	-	-
178	Trimethyloxyborane (TMB)	B[OCH3]3	0.300	1.929	4.638	-	-	-
179	Trimethylsilane	C3H10Si	0.235	1.627	3.313	-	-	-
180	Tungsten Hexafluoride	WF6	0.227	3.264	13.280	Teflon	-	-
181	Uranium Hexafluoride	UF6	0.220	3.548	15.700	Teflon	-	-
182	Vinyl Bromide	C2H3Br	0.524	1.985	4.772	-	-	-
183	Vinyl Chloride	C2H3CL	0.542	1.492	2.788	Viton	Kalrez	Buna/Epdm
184	Vinyl Fluoride	C2H3F	0.576	1.281	2.046	Kalrez	-	-
185	Water Vapor	H2O	0.861	0.802	0.804	-	-	-
186	Xenon	Xe	1.383	2.180	5.851	Viton	Buna/Epdm/Kalrez	-
187	Z "gas mixture in volume"	mixgas	0.742	1.216	1.851	-	-	-





# Mass Flow Controller & Meter

Analogue Mass Flow Controller / Meter

Digital Mass Flow Controller / Meter



[www.line-tech.co.kr](http://www.line-tech.co.kr)

806, Daedeok-daero, Yuseong-gu, Daejeon, Korea

**Tel** 82-42-624-0700 **Fax** 82-42-638-2211 **E-mail** [linetech@line-tech.co.kr](mailto:linetech@line-tech.co.kr)



**LINETECH** Mass Flow Controller & Meter



806, Daedeok-daero, Yuseong-gu, Daejeon, Korea

**Tel** 82-42-624-0700

**Fax** 82-42-638-2211

**E-mail** [linetech@line-tech.co.kr](mailto:linetech@line-tech.co.kr)