

# MERIT SERIES ULTRASONIC FLOW METER

High Performance Signal Processing Solution



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# MERIT 200 PNEUMATIC CONTROL LFC(AIR)

## Comprehensive Solutions Liquid Flow Controller

The comprehensive solution AIR TYPE LFC is a high-quality, high-precision semiconductor and industrial contactless LFC with built-in control valves.



### Feature

- High quality with built-in pneumatic control valves. High-precision semiconductor and industrial contactless LFC
- Various chemical solutions can be controlled (DI, nitric acid, sulfuric acid, hydrogen peroxide, hydrofluoric acid, ammonia water, SC-1, IPA)
- Protected from the external power noise and input/output RFI/EMO shielding due to power separation (CE certification)
- Easy maintenance with control power and detector integrated contact
- Built-in external output (Sol Valve On/Off and Circular Valve)
- Minimize footprint with 6-channel AMP integrated configuration

### Function

- Instantaneous control for the target flow rate
- Filtering Flow rate pulsation
- Precision flow measurement with ultrasonic wave scope function
- Providing a variety of application technologies and Maintenance tools through serial communication
- Multiple flow monitoring and control functions according to communication RS-485 (Modbus)
- High speed control response (Target Flow Rate  $\pm 2\%$  within 2 seconds)



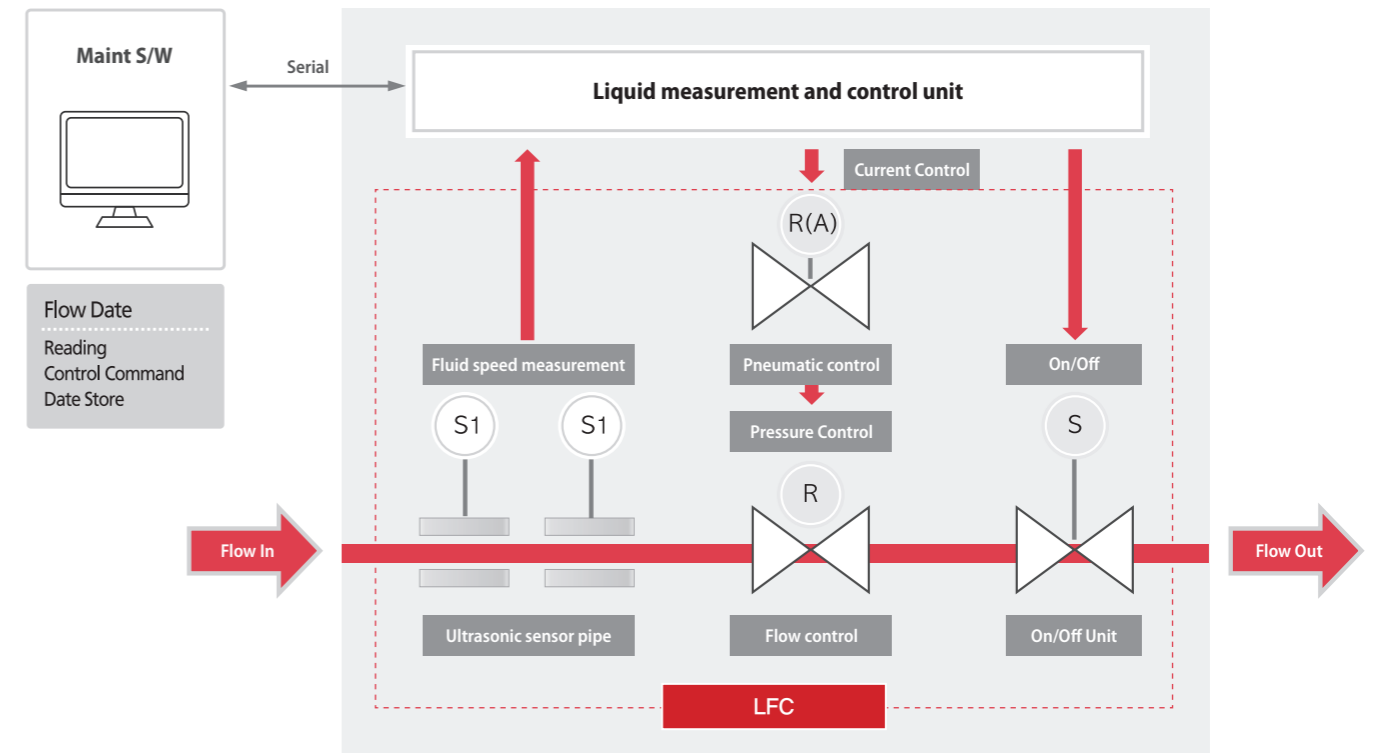
LED screen part

Aspect

Side

Upper terminal

## System Configuration Diagram



## Product Specifications

### AMP Specification

Contents	Specification
Power	DC+24V( $\pm 10\%$ )
Temperature	0 ~ 50°C
Consumption current	Approx. 25.2W(6 Channel)
Waterproof design	IP20
Communication standard	RS-485(MODBUS)
Product size(mm)	50(W) X 126(L) X 79.5(H)
Weight	293g(6 Channel)
Certified	EN 61326, 55011

### Detector Specification

Contents	Specification
Measurement target	The whole liquid
Fluid temperature (°C)	10 ~ 90°C
Fluid pressure (Mpa)	0 ~ 0.35Mpa (Internal pressure 0.5Mpa)
Range of sound waves	1000 ~ 2200m/Sec
Waterproof design	IP 65
Body & Tube Material	PFA
Standard tube area	1/4 inch, 3/8 inch, 1/2 inch, 3/4 inch
Standard Cable Length	(Relay cable) : 2M, 3M, 5M

### Flow Range and Accuracy

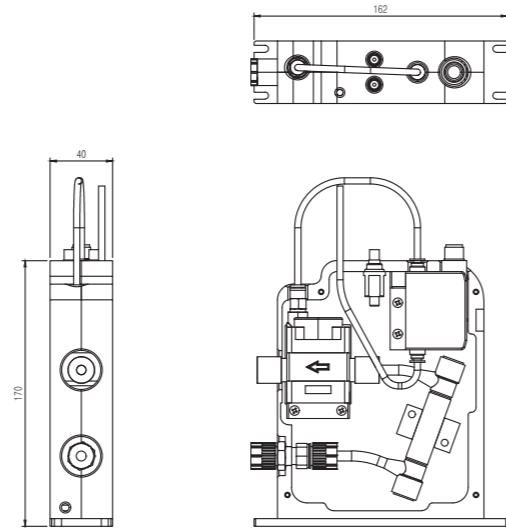
Contents	MERIT-200F		
	A02(200ml/min)	A06(600ml/min)	A20(2500ml/min)
Flow control accuracy (flow stability)	- 20 ~ 300ml/min : $\pm 3\text{ml/min}$ - 300 ~ 2500ml/min : Read Scale $\pm 1\%$		
Response Speed	- Target Flow Rate $\pm 2\%$ , Within 2 seconds		

Flow part specification

○ LR Series Circular type Liquid Flow Controller (MERIT200 Series)



LR Series Dimension drawing

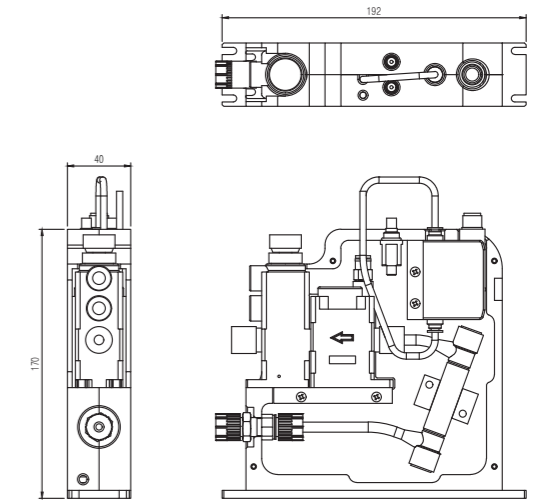


- Suitable for systems that require re-storage in the mixing tank by flowing through the bypass line to prevent high temperature, IPA, O-strips, etc., which change components when stagnant.

○ LO Serise General type Liquid Flow Controller (MERIT200 Series)

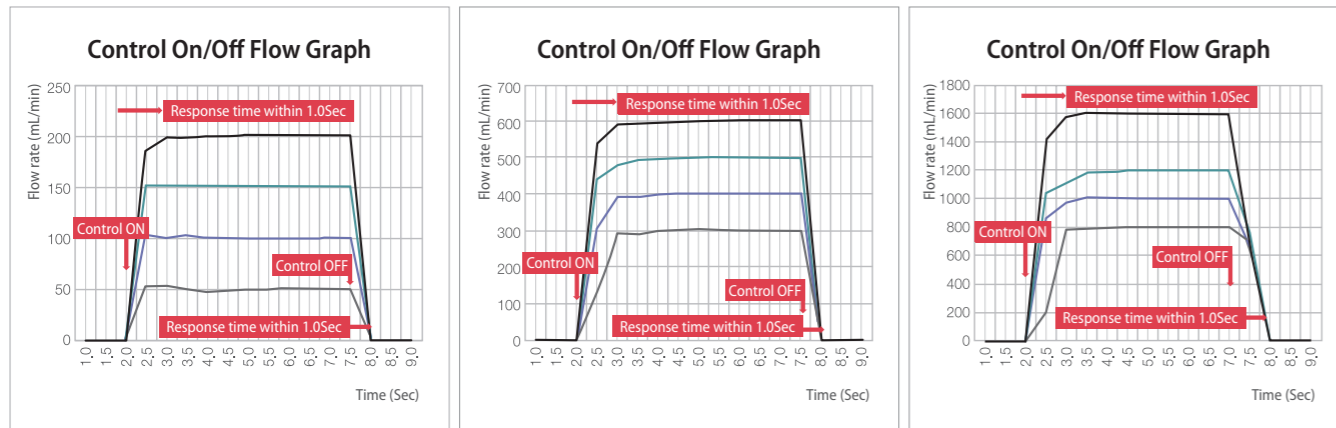


LO Serise Dimension drawing



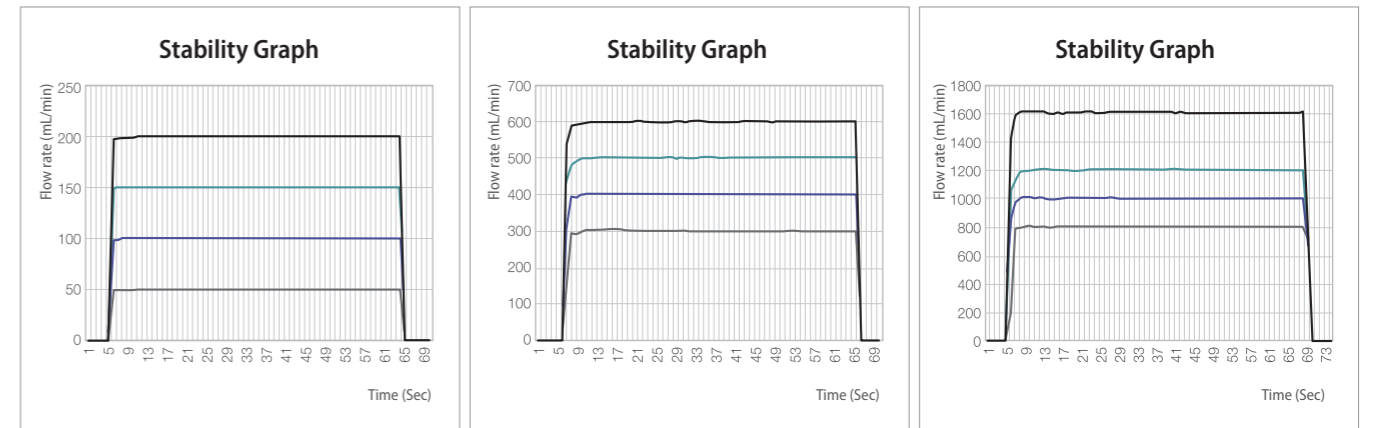
- The Suck Back Valve ensures that residual liquid is sucked back at the end of the nozzle when the discharge is off.
- Suitable for use when the residual liquid should not drip into the material surface when the swing nozzle discharge is off.

○ Flow Control Response Liquid Flow Controller (MERIT200 Series)



- A graph showing the flow control response characteristics at discharge on/off.
- The sampling time is 0.25 sec

○ Flow Control Response Liquid Flow Controller (MERIT200 Series)



- A graph showing the flow control response characteristics at discharge on/off.
- Data discharged for 1 minute, and the sampling time is 1 sec.



## MERIT 300 ELECTRONIC CONTROL LFC

### Comprehensive Solutions Liquid Flow Controller

The comprehensive solution MOTOR TYPE LFC is a high-quality, high-precision semiconductor and industrial non-contact LFC with built-in control valves.



### Feature

- High-quality, high-precision semiconductors with built-in control valves as the industrial contactless LFCs
- Various chemical solutions can be controlled (DI, nitric acid, sulfuric acid, hydrogen peroxide, hydrofluoric acid, ammonia water, SC-1, IPA)
- Protected from the external power noise and input/output RFI/EMO shielding due to power separation (CE certification)
- Easy maintenance with control power and detector integrated contact
- Built-in external output (Sol Valve On/Off and Circular Valve)
- Stable ultra-precision flow control by using an encoder of an electric needle valve
- Mechanical Damper and Sensor (High limit, Low limit, ORG) built-in for stability and precision

### Function

- Instantaneous control for the target flow rate
- Filtering Flow pulsation
- Precision flow measurement with ultrasonic wave scope function
- Providing a variety of application technologies and Maintenance tools through serial communication
- Monitoring Valve opening rate and ultra-precision flow control through encoder
- High speed control response (Target Flow Rate  $\pm 2\%$  within 2 seconds)



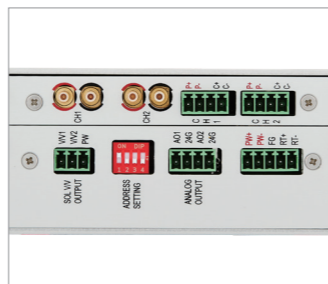
LED screen part



Aspect

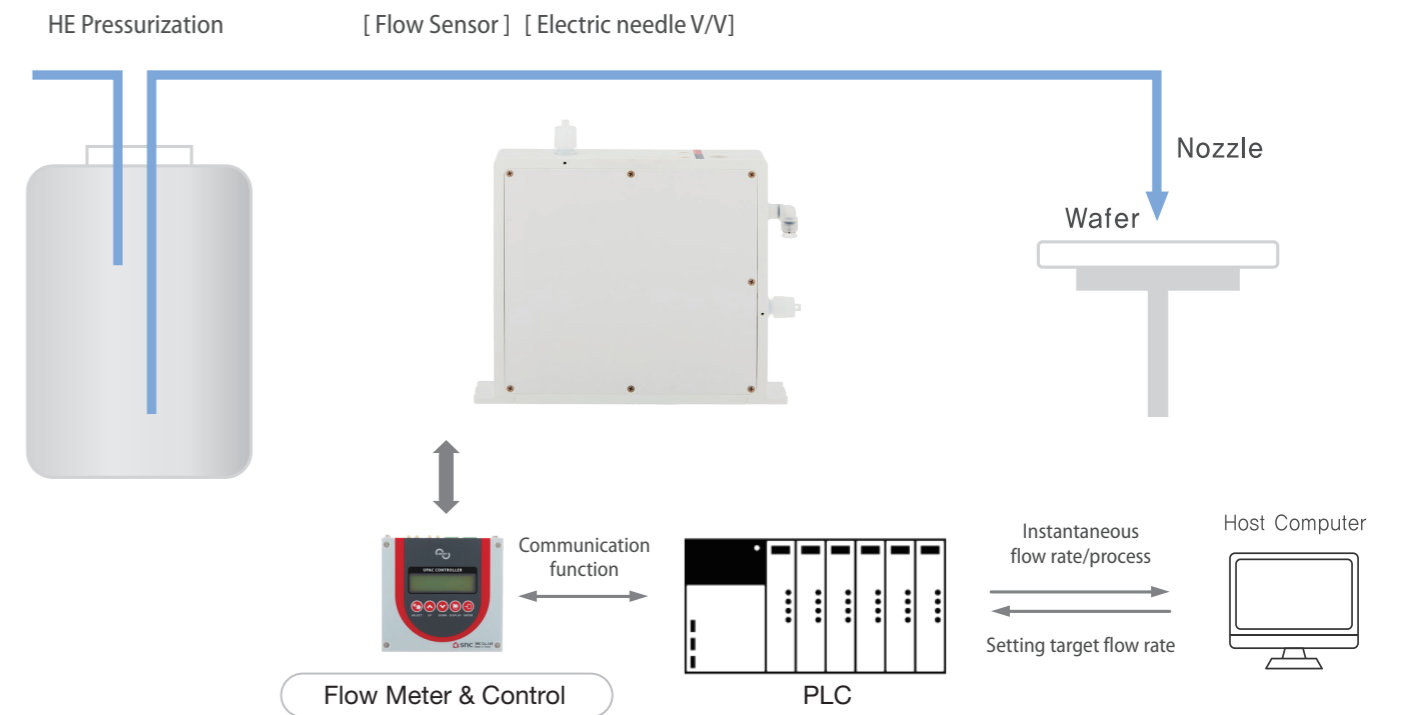


Back



Upper terminal

### System Configuration Diagram



### Product Specifications

#### AMP Specification

Contents	Specification
Power	DC+24V( $\pm 10\%$ )
Temperature	0 ~ 50°C
Consumption current	Approx. 25.2W(6 Channel)
Waterproof design	IP20
Communication Address Settings	Set up to 24 units
Communication standard	RS-485(MODBUS)
Product size(mm)	50(W) X 126(L) X 79.5(H)
Weight	3.6kg(Based on 24 channels)
Certified	EN 61326, 55011, 61000

#### Detector Specification

Contents	Specification
Measurement target	The whole liquid
Electric power area	Stepping Motor
Fluid temperature (°C)	10 ~ 90°C
Fluid pressure (Mpa)	0 ~ 0.35Mpa(Internal pressure 0.5Mpa)
Range of sound waves	1000 ~ 2200m/Sec
Waterproof design	IP 65
Body & Tube Material	PFA
Standard tube area	1/4 inch, 3/8 inch, 1/2 inch, 3/4 inch
Standard Cable Length	(Relay cable) : 2M, 3M, 5M

#### Flow Range and Accuracy

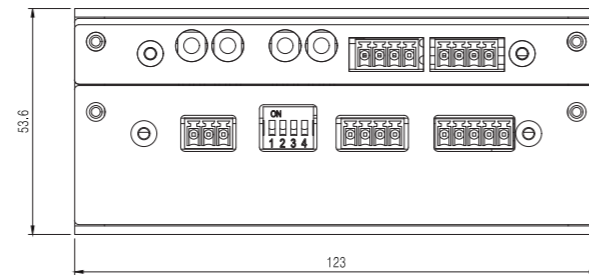
Contents	MERIT-300F		
	100ml/min	500mL/min	2500mL/min
Flow control accuracy (flow stability)	- 10 ~ 800ml/min : $\pm 10\text{ml/min}$ - 800 ~ 2500ml/min : Full Scale $\pm 1\%$		
Response Speed	- Target Flow Rate $\pm 10\%$ , Within 2 seconds		

## AMP Appearance and Dimensions

### AMP Liquid Flow Controller (MERIT300 Series)



AMP Dimension drawing



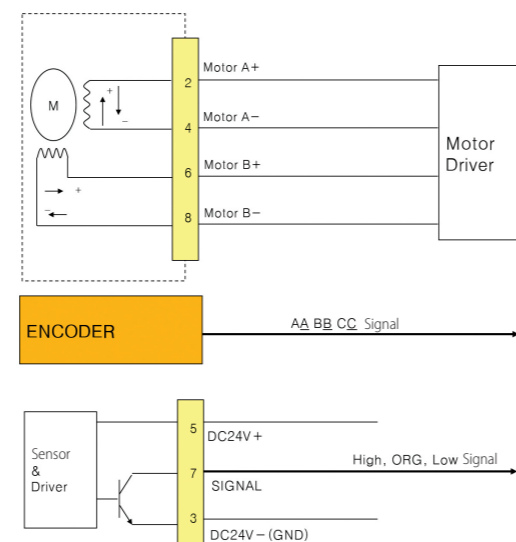
- The front of the AMP is equipped with an LCD and an input key, allowing simple operation and flow monitoring without a additional PC. Multichannel footprint is compact structure compared to the total number of channels.
- For AMP installation, use the M4 TAP on the side A. (Please select the bolt length within 8mm for the AMP tightening.) If the bolt is more than 8mm long, it may interfere with the internal PCB.)
- It is recommended to open the upper side radiator during installation.
- Slide pack structure for the installation is recommended. The contact connector for the fluid reservoir is located on the back, which can cause inconvenience when maintaining the fixture.

## High Performance Electric Needle Valve

### Precision flow control by the encoder Liquid Flow Controller (MERIT300 Series)



Dimension drawing

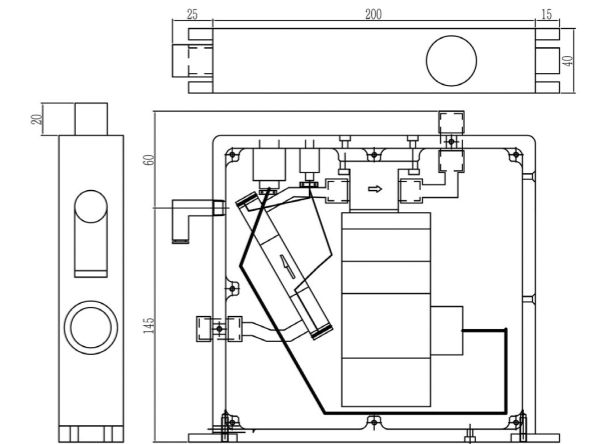


## Flow part specification

### LR Serise Circular type Liquid Flow Controller (MERIT300 Series)

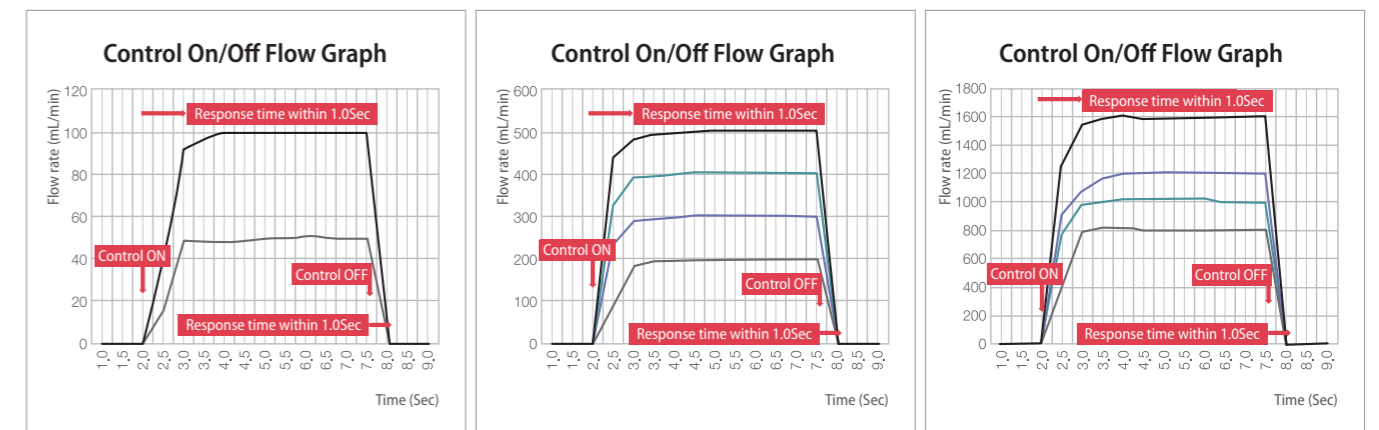


LR Series Dimension drawing



- Suitable for systems that require re-storage in the mixing tank by flowing through the bypass line to prevent high temperature, IPA, O-strips, etc., which change components when stagnant.

### Flow Control Response Liquid Flow Controller (MERIT300 Series)



- A graph showing the flow control response characteristics at discharge on/off.
- The sampling time is 0.25 sec

## MERIT 400 PINCH VALVE TYPE LFC

### Comprehensive Solutions Liquid Flow Controller

The LFC for SLURRY is a high-quality, high-precision semiconductor and industrial contactless Ultrasonic Flow METER.



#### Feature

- High-quality, high-precision semiconductors and industrial contactless Ultrasonic Flow Meter applications
- Built-in pinch valve optimized for slurry control
- Measurement and control of various solutions (DIW, tungsten, ceria, silica, hydrogen peroxide, hydrofluoric acid, ammonia water, etc.)
- RFI/EMI shielding of external power supply noise and input/output due to power separation
- Built-in alarm output (measurement & control alarm)
- High speed control responsiveness: Target Flow Rate  $\pm 2\%$  within 1.5 seconds (with encoder)
- Compatibility design with advanced CMP equipment LFC products enables one-on-one replacement (AMAT, EVARA)

#### Function

- Target volume fast precision instantaneous flow control
- Total flow value integration
- Flow rate pulsation filtering
- Using Encoder to monitor the aperture ratio (up and down alarms, etc.) and precisely control it
- Error prevention and precision flow measurement with ultrasonic wave scope function
- Maintenance tool for PC communication for Setup and A/S
- Communication RS-485 (Modbus) provides simultaneous (six) LFC control
- ANALOG Input / Output Control Available (current or voltage)



LED screen part



Aspect

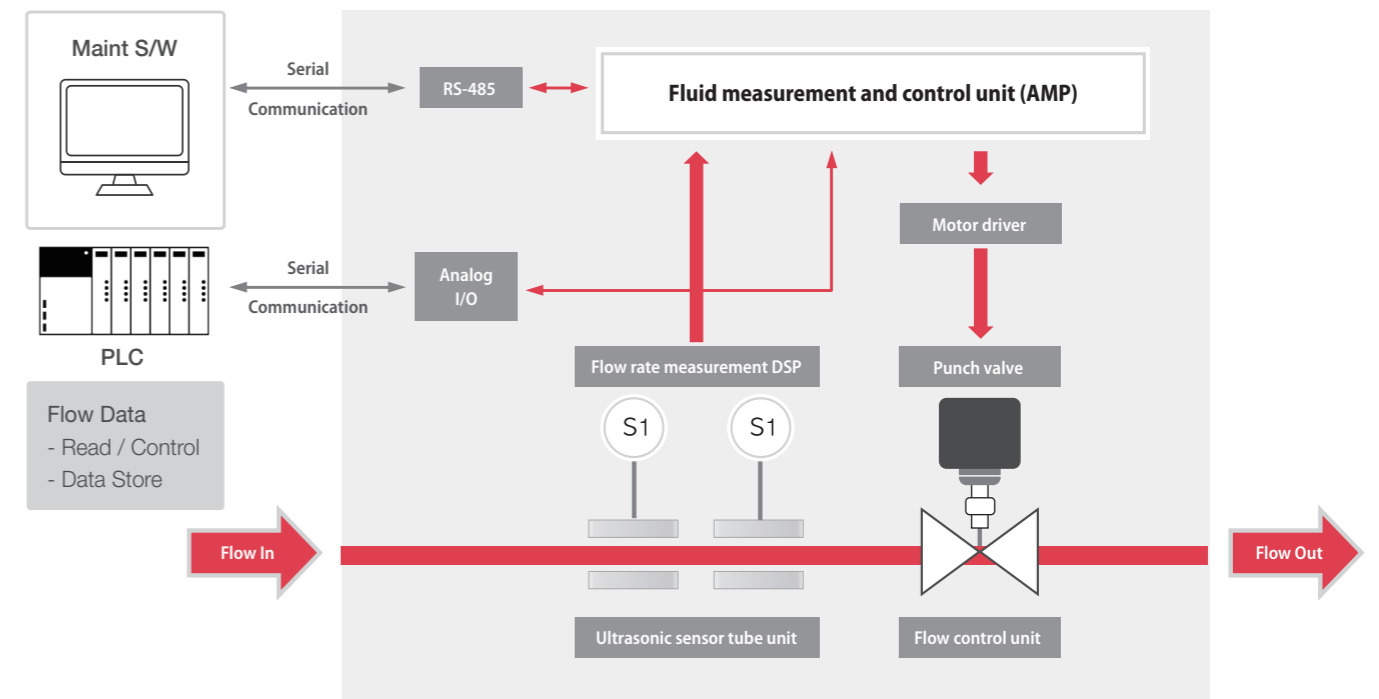


Right side



Left side

### System Configuration Diagram



### Product Specifications

#### ○ LFC Specifications (Integrated)

Contents	Specification	Contents	Specification
Power	DC+24V( $\pm 10\%$ )	Fluid temperature (°C)	10 ~ 90°C
Power consumption	4.8W (Based on consumption current of 200mA)	Fluid pressure (Mpa)	0 ~ 0.35Mpa (Internal pressure 0.5Mpa)
Communication standard	RS-485(MODBUS), Analog I/O	Internal waterproofing	IP65
Product size(mm)	70(W) X 230(D) X 114(H)	Tube Material	PFA, Gore-tex(Pinch valve)
Weight	1310g	Appearance material	FM PVC(White)

#### ○ Flow Range and Accuracy

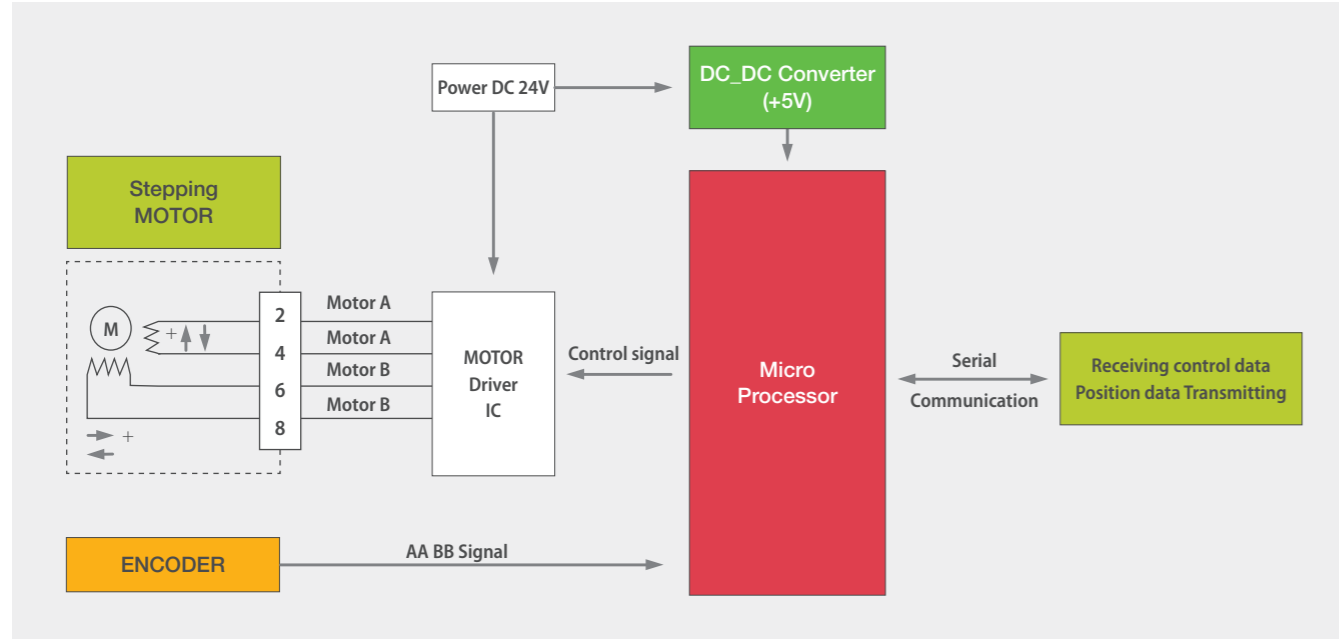
Contents	250 ml/min	500 ml/min
Fluid	Mixed abrasive solution such as DIW, Silica, Ceria, W (Tungsten)	
Flow range	25 ~ 250 mL	50 ~ 500 mL
Minimum Unit	0.1 mL/min	
Accuracy	300 mL Less than: $\pm 3\text{ml}$ / 300 mL More than: $\pm 1\%$	
Response Speed	Within 1.5 Sec (Target Flow Rate $\pm 2\%$ within 2 seconds)	

#### ○ I/O Cable Specification

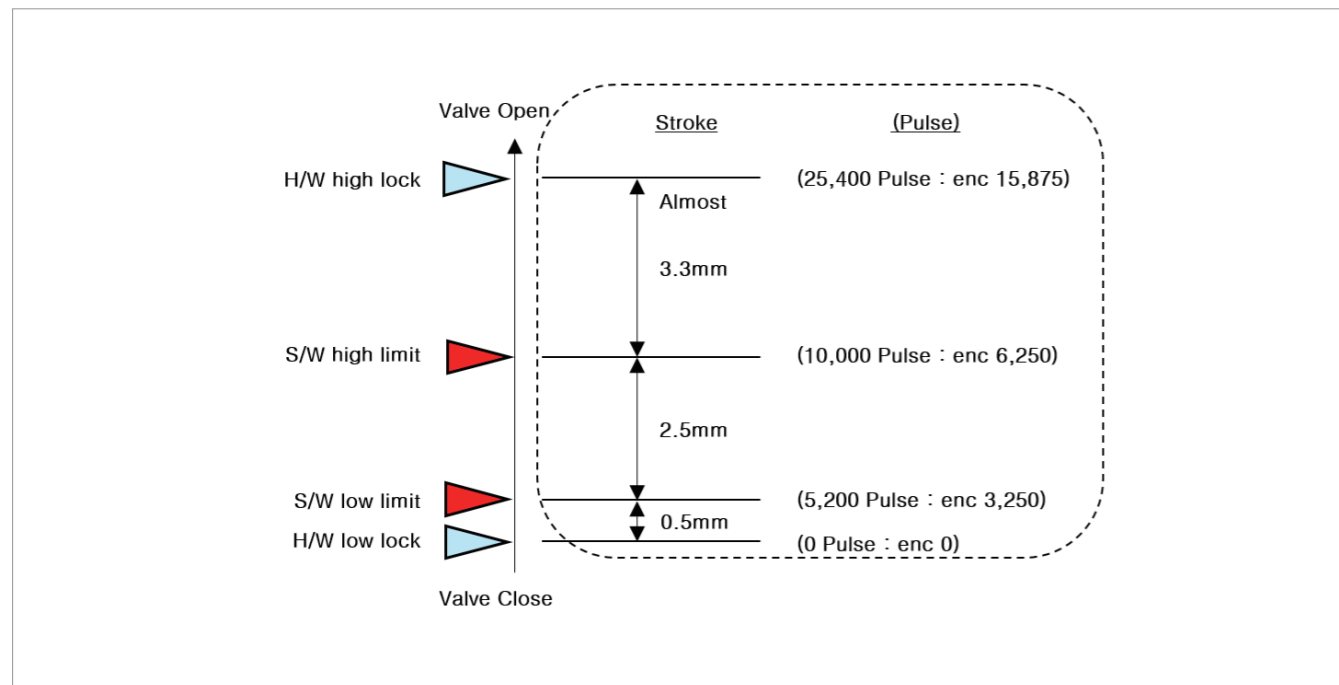
Sortation	Length(m)	Wire Spec.	Note
I/O Cable	5.0m	PVC AWG #26	

## High Performance Electric Pinch Valve

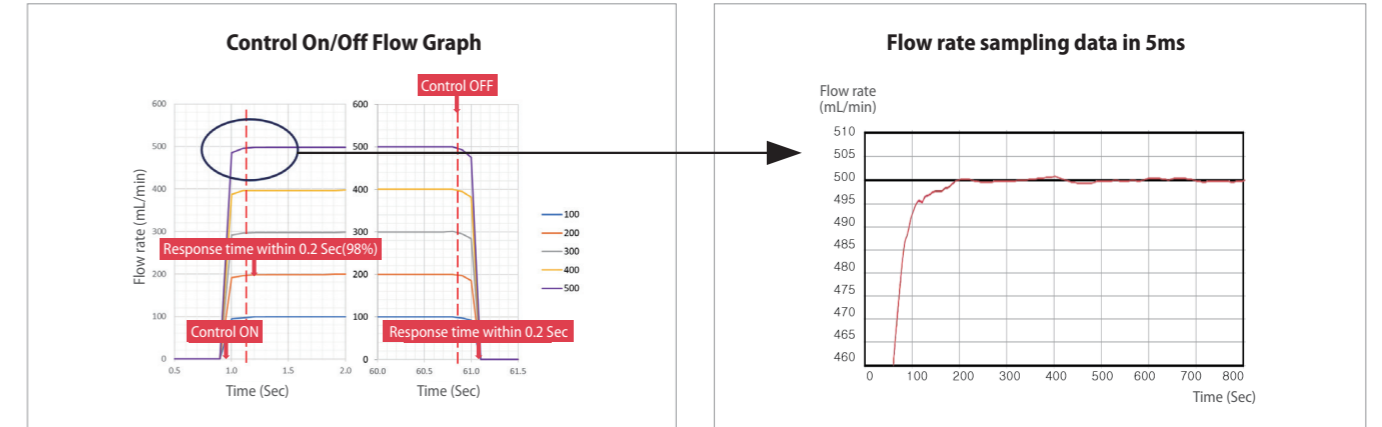
### ○ Precision flow control by the encoder Liquid Flow Controller (MERIT400 Series)



### ○ Preventing breakage with S/W Limit and H/W Lock Liquid Flow Controller (MERIT400 Series)

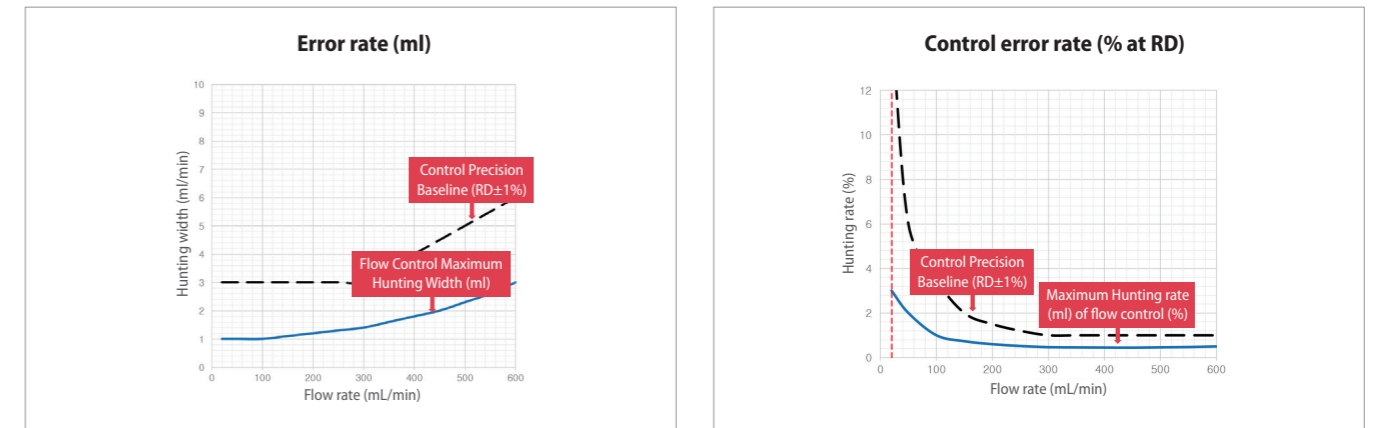


### ○ Characteristics of Flow Control Response at on/off discharging Liquid Flow Controller (MERIT400 Series)



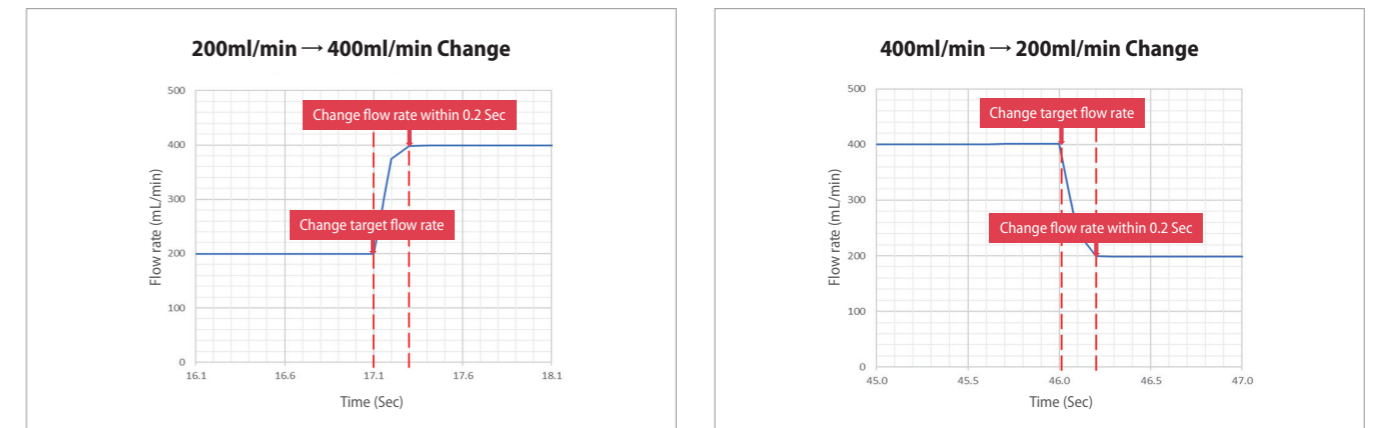
• Data discharged for 1 minute and sampling time 0.1 sec

### ○ Flow Control Stability Graph Liquid Flow Controller (MERIT400 Series)



• Based on the supply pressure of 0.2 MPa

### ○ Graph of control response characteristics when target flow rate changes during discharging Liquid Flow Controller (MERIT400 Series)



• Change target flow rate 200 ▶ 400 ▶ 200 (mL/min) during discharging

• Sampling time 0.1 sec