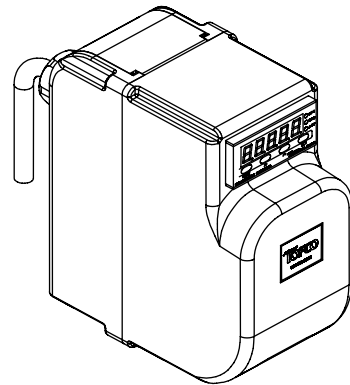


# Flow controller FLC600 Series A type integrated with indicator Instruction Manual

Before use, please read through this Instruction Manual with caution. Please always keep this Instruction Manual at hand for your quick reference when necessary.



## Specifications

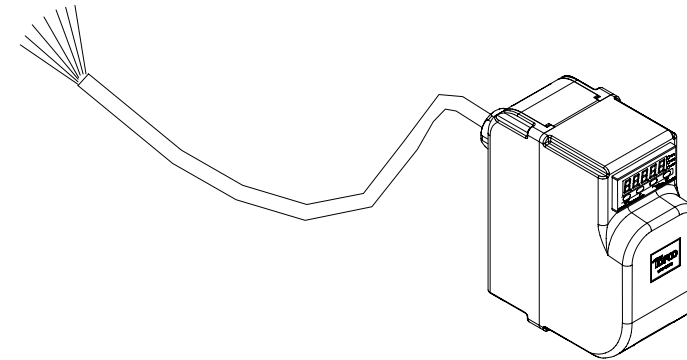
Requirements	Contents		
Name of product	Flow Controller		
Types	FLC605	FLC610	FLC620
Name of fluid	WATER		
S. gravity	1.0		
Viscosity	1.0mm <sup>2</sup> /s(1.0cp)		
Ranges of flow control	0.5 – 5L/min	1 – 10 L/min	2 – 20L/min
Flow accuracy	FS ± 5%		
Operating supply pressure	0.2 – 0.4 MPa(Gauge)		
Withstand pressure	0.5 MPa(Gauge)		
Operating control pressure	P=0.2 – 0.4 MPa(Gauge)		
Operating fluid temperature	0 – 60 ( No freeze and no condensation )		
Heat resistance	8 0		
Operating ambient temperature	0 – 50 (No freeze and no condensation)		
Pipe connection	Rc1/4, Rc3/8, Rc1/2 and R1/2		
Materials for wetted part	PPS – GF30, POM – CF20, SUS304, SCS14, HNBR, FPM, Alumina (FLC620)		
Power output section	Stepping motor		
Flow sensor	Axial-flow fin rotary type(HF-M20/30 types)		
Valve operating speed	Approx 9 sec. ( Fully opened Fully closed )		
Analog input	4-20mA (Standardized) Internal resistance:20 (35VDC 70mA)		
Analog output	4-20mA(Standardized) Less than 300 in load resistance		
Alarm contact	Two contacts ( Relay and one make-contact ) Upper/upper limits, Upper/lower limits and lower/lower limits 35VDC 0.1A at max (More than 100 thousand in life of contact)		
Display	Setting flowrate values or measured flowrate value or opening display Red LED 7 segments 5 digits		
Power supply	24VDC ± 10% Max 450mA at max. (At the time of standby: Approx 100mA)		
Dimensions	Main body	148x142x63(Rc1/4, 3/8)	
		154x142x63(Rc1/2)	
		164x142x63(Rc1/2)	
Weight	Approx 450g		

## How to wire

- Connect cables as shown below.
- For wires unnecessary to use, processing must be done not to make them short circuit



Make sure that power supply has been turned off before wiring. Otherwise it may cause an electric shock.



## Feature description

### Each mode function to set flowrate

Setting flowrate by parameter mode (It controls over targeting the flowrate values entered on the display screen)  
Setting flowrate by external analog input mode (Standard 4-20mA) (Setting flowrate is variable by external analog input and remote control can be externally performed.)  
Setting flowrate by preset mode (Easy switching can be made for maximum four kinds of setting flowrates where have been preset in terms of the connecting method of three pieces of terminals)

### Functions at full closing

A valve moves automatically to a fully closing side by setting the flowrate to 0 L or by setting the analog input to 4mA. (If setting 0 L by preset mode, it can be fully closed as well.)  
Although [bASIC] is displayed on the screen during the move to fully closing, it does not show abnormal function

### Alarm contact function

Based on the preset flowrate(2 points), it can be turned ON/OFF by relay contact. In addition, hysteresis values is settable at its option in order to protect it from chattering.

### Function of ON/OFF control

ON/OFF control can be made by ON/OFF of preset terminal. It intends to function such a high speed response as is fully closing in conjunction with the electromagnetic valve and as is repeating the setting flowrate. Such as valve is operated very often, it is useful in improvement of durability.

### Analog output function

By using analog output signal (4-20mA standardized) proportional to flowrates, the flowrate can be externally monitored, and not only improves it the yield of production, but dedicating to search for a cause of failure.

### Function of valve dead zone

It functions so as not to make the valve move more than necessary. It dedicates to improve a valve durability and to save power. In addition the range of the dead zone is adjustable at its option.

### Calibrating function of input/output

A fine adjustment can be made for the input and output at its option. For more details about the functions, see instruction manual of instantaneous flow adjustable indicator attached separately.

## To start with

FLC-600 Series is a flow controller, employing a high performance stepping motor, for cooling water with internal flowsensor. (No oil applied specification). So many functions enables you to build up a wide variety of systems. This manual contains general descriptions, specifications and instructions for installation and how to connect. Before operating the flow controller, please read this manual with caution and use it with a good understanding. And also keep this manual at hand for your quick reference when necessary.

## Safety precaution

**Warning** This is the safety-alert symbol which indicates the potential for suffering from the physical harm such as an electric shock, burn and such which might be caused, if not compliant with instructions described here.

**Caution** This is the safety-alert symbol which indicates the potential to lead to a failure of product, if not compliant with instructions described here.

## Caution

### As to piping

- Blow air into pipe(Flashing) and make it clean in order fully to get rid of chip, oil contents, dirt deposited inside.
- When piping, prepare with two wrenches to make up pipe, one for applying it to the hexagonal part of fitting, and other to the joint so as not to exert any additional force on the plastic resin of the main body.
- Do not blow air directly to the Flow Controller by using an air gun.(It may cause damage to the internal flowsensor.)
- Do not use in any wrong flow direction.
- Do not use in any wrong installation posture.

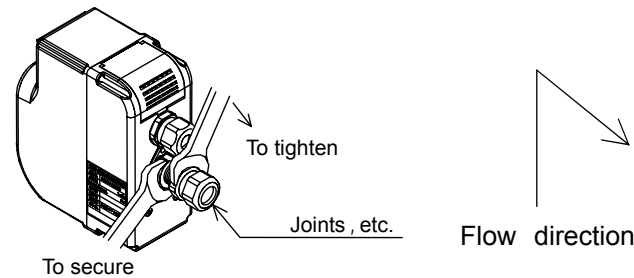
## Caution

### As to water source

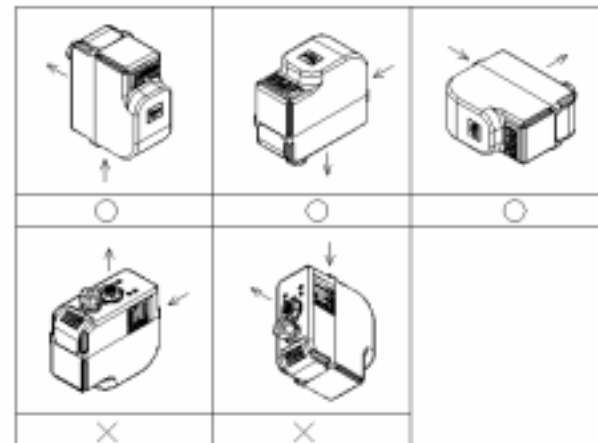
- Install a strainer with 100mesh or more to supply side near in the vicinity of this flow controller.
- Do not flow fluid containing air bubbles at all times.
- Do not use in the environment where pulsates at all times.

## How to make up pipe

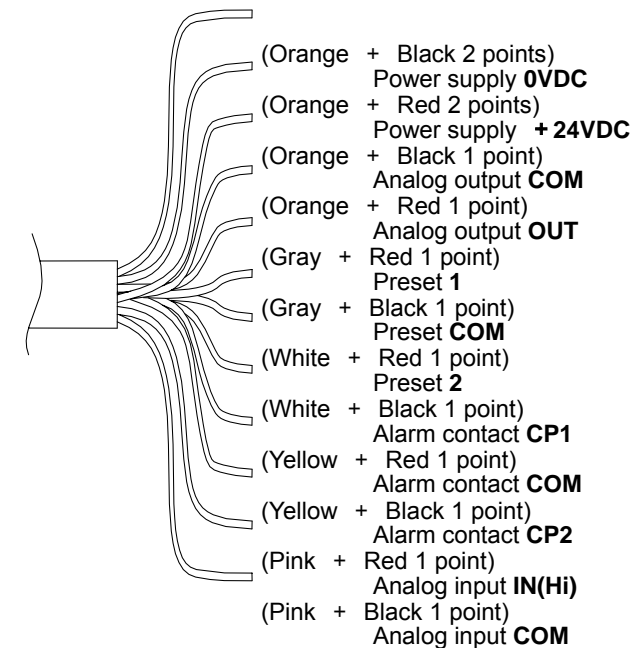
- When piping, prepare with two wrenches to make up pipe, one for applying it to the hexagonal part of fitting, and other to the joint so as not to exert any additional force on the plastic resin of the main body.
- Care and connect so as not to mistake a flow direction
- When using a sealing tape, wind it around the thread so as to leave one and half or two thread heads.



- Installation postures call attention, when installing.



## Wiring diagram



## Error display

Error No.	Contents	Measures and actions
E r 02	Failure of memory which performs to backup the setting contents	It is needed to repair hardware or to replace it.

## Caution

### Storage location

- Avoid storing under the following environment.
- Storing in locations where are filled fully with sea breeze and corrosive gas.
- Storing in a location where is subjected to direct sunlight.
- Storing for a long period in locations where is in any other temperature than between 5 and 35 and in humidity between 45% and 85%.

### As to installation

- Install in a location where does not splash water.
- Install in locations where are not subjected to direct sunlight and sea breeze.
- Install in locations where is in humidity between 45% and 85% and condensation of humidity will not occur.
- Install in a location where corrosive gases are not present.
- Install in a location where is less mechanical vibration.
- Install the choke coil (Noise filter) and the like more than 0.29mH/1kHz, when wiring. (A good result will be appeared, specifically where there may be an electromagnetic field and noise.)

## Warning

### As to handling

- In no event should flow controller be used at more than max operating temperature and pressure resistance.
- Use the same serial number as the controller and the valve.
- Operate in the environment where freezing will not occur.
- Use power supply more than 24VDC ± 10% and 0.45A.
- In no event shall this controller be disassembled.(If disassembled, it shall not covered by warranty).
- Do not allow foreign materials to mix into fluid (Such as sealing tape).