Flow Controller

FLC-US40

- Integrated flow meter and control valve for installation in narrow spaces.
- High performance stepper motor incorporated
- Fully closed to fully open (0.3s response time)
- Multi communication (with Modbus RTU, up to 31 connections)
- Flow range (1:20)
- Overshoot suppression capability
- Totalized flow volume prediction capability
- Easy operation status confirmation (8-color LED display)

Model number selection

	Connection size	Units	Max. Flow	I/O type	Error output	I/O Cable length	Comm. Cable length	Specialized item(s)
FLC-US40 -	□	- A	□	- □	□	- A □	B □	-

	Specify length (m) ✻2 m (standard)
	Specify length (m) ✻2 m (standard)
Blank	No
E	Yes
A	4 – 20 mA
F	Serial communication
Max.	Specify from Flow range
A	mL/min

Connection Size		Flow range
G08	Tube1/4″	15 – 300 mL/min
		25 – 500 mL/min
		50 – 1000 mL/min
		100 – 2000 mL/min
G10	Tube 3/8″	25 – 500 mL/min
		50 – 1000 mL/min
		100 – 2000 mL/min
		150 – 3000 mL/min
		250 – 5000 mL/min

LED

LED status

LED located on the top of this product indicates the below status.

Item		Status	LED
While in operation		Control ON	Green LED turned on
		Control OFF	Light blue LED turned on
Zero point adjustment		Adjustment in progress	Blue LED flashed
		Adjustment failed	Blue LED flashed twice
Warning	Valve life	Little life left	Orange LED flashed twice
	Flow at 0% valve position	Flow above a certain level detected at 0% valve position	Orange LED turned on
	Flow error	Measurement error	Yellow LED flashed twice
	Pressure error	Pressure insufficient	Yellow LED turned on
Error	Valve position input	No input signal detected	Red LED flashed twice
	Internal memory ※1	System halted	Red LED turned on
	Motor ※1	Motor error detected	Purple LED turned on
	Error processing ※1	Error detection timeout	Pink LED turned on / off (1 sec interval)
		Control halted	Pink LED flashed twice
	Position sensor ※1	Position sensor disconnected	Pink LED turned on
	Flow sensor ※1	Flow meter error detected	Purple LED flashed twice

※1 Flow control forced stop function. Control is forced to stop when errors occur.

Specifications

Product name		Flow Controller								
Drive unit		Stepper motor								
Base model		G08				G10				
Flow range (mL/min)		15 – 300	25 – 500	50 – 1000	100 – 2000	25 – 500	50 – 1000	100 – 2000	150 – 3000	250 – 5000
Flow control accuracy	Flow accuracy ※1	±1% R.D. ※10 – 100% F.S. (Min. : 2 mL/min)				±1% R.D. ※ ≦ 20% F.S. : ±0.2% F.S (Min. : 4 mL/min)				
	Flow control accuracy	±1% R.D. ※ ≦ 20% F.S. : ±0.2% F.S. (Min. : 1 mL/min)				±1% R.D. ※ ≦ 20% F.S. : ±0.2% F.S. (Min. : 2 mL/min)				
	Stability ※2	±2% R.D.※ ≦ 20% F.S. : ±0.4% F.S. (Min. : 1 mL/min)				±2% R.D.※ ≦ 20% F.S. : ±0.4% F.S. (Min. : 2 mL/min)				
	Repeatability	±1% R.D (Min. : 1 mL/min)				±1% R.D. (Min. : 2 mL/min)				
Connection sizes		TUBE 1/4" (φ6.35×4.35)				TUBE 3/8" (φ9.52×6.35)				
Orifice size		φ3			φ5	φ3		φ5		
Control pressure range		0.05 – 0.3MPa(G)	0.1 – 0.3MPa(G)							0.15 – 0.3MPa(G)
Required differential pressure		0.05MPa	0.1MPa							0.15MPa
Withstand pressure		0.5MPa(G)								
Input analog signal vs flow rate		4 mA DC: 0 mL/min, 20 mA DC: Max. flow rate specified in above Control Range								
Fluid type		DIW / Chemicals (To be discussed)								
Specific. Gravity		1.0								
Viscosity		1.0mPa・s (To be discussed)								
Fluid temperatures		10 – 90℃ ※Non-condensing (Pressure limit varies with fluid temperatures used)								
Operating temperatures		15 – 50℃ ※Non-condensing								
Wetted materials		PFA, PTFE								
Valve response time ※3		0%⟶100%: approx.0.3 sec, From setpoint to setpoint: approx.1 sec								
Setpoint input ※4		4 – 20 mA DC: input resistance 180 Ω								
Flow data output		4 – 20 mA DC: loaded resistance 300 Ω								
Control activation		Control ON / OFF (non-voltage A contact) ※ Control is activated (Control ON) when the contacts are closed. (Operated with the contacts closed normally)								
EXT1 Input		Valve forced full-open. (non-voltage A contact) ※ Valve is forcedly full-open when the contacts are closed. Have the contacts open after use. (Operated with the contacts opened, normally)								
EXT2 Input ※4		Zero point adjustment or totalized flow volume reset. (non-voltage A contact) ※ Reset is made when the contacts are closed. Have the contacts open after use. (Operated with the contacts opened, normally)								
(EX2 Error output) ※5		NPN open collector output Output applied voltage: ≦ 35 V DC Sink current: ≦ 100 mA (Vol=1.3 V)								
Reset switch ※6		Zero-point adjustment, totalized flow volume reset or button operation disabled.								
Piano Dip switch		Communication settings. (Baud rate, device address)								
Address switch		Device address settings.								
Power source		24 V DC ± 10% (Current consumption: while in operation: approx.0.3A)								
Dimensions	Body	170 mm×40 mm×142 mm ※Tube, cable and protrusions excluded.								
	Cable	I/O cable: φ6.9 mm × 2000 mm, Communication cable: φ4.8 mm × 2000 mm								
Weight		Approx.1,000g ※ Cable excluded.								

※1 Flow control accuracy doesn't include the flow accuracy of the flow sensor.

※2 Stability differs according to stability, etc. of supply pressure.

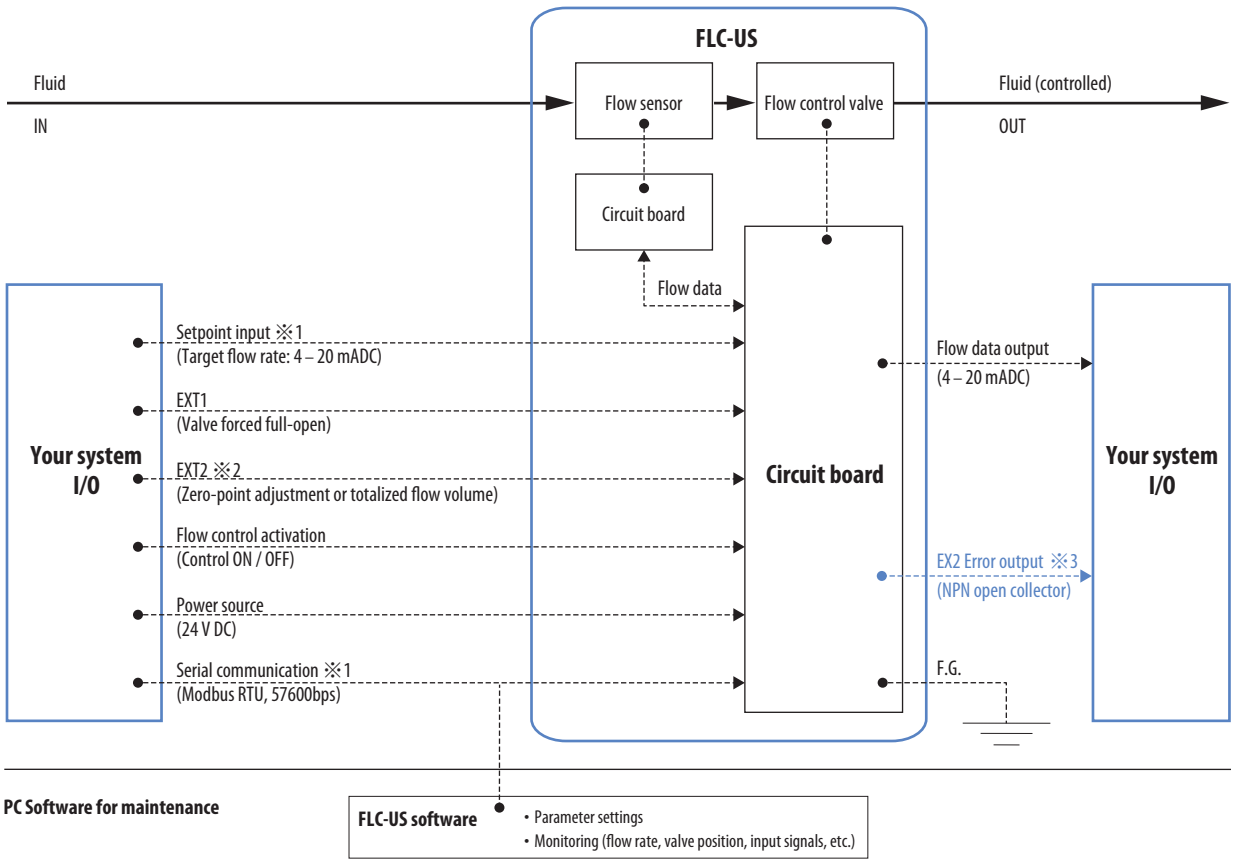
※3 100% of valve position is set at Factory.

※4 Some parameter settings are required at Factory. Not available with "E" selected.

※5 Available if "E" at Error output is selected. Type of error is selectable, so contact us for more detail.
Zero-point adjustment or totalized flow volume reset is not usable. Use Reset switch or operate via RS-485.

※6 Some parameter settings are required at Factory.

System diagram

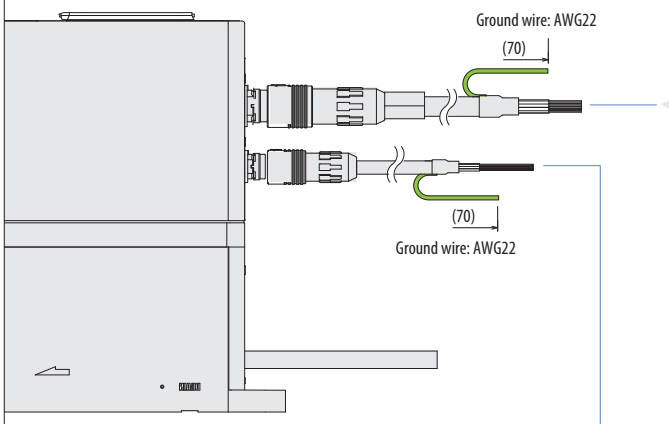


※1: The setpoint input (target flow rate setting) can be made from "analog input signal" or "serial communication". This setting is made at Factory, so inform us of which input you prefer to use when ordering. With the serial communication (FLC-US software, etc.), you are allowed to change your settings after purchase.

※2: EXT2 input is selectable between "zero-point adjustment" and "totalized flow volume reset". This setting is made at Factory, so inform us of which input you prefer to use when ordering. With the serial communication (FLC-US software, etc.), you are allowed to change your settings after purchase.With "E" selected, zero-point adjustment or totalized flow volume rest is not available. Use Reset switch or operate via RS-485.

※3: NPN open collector output, which is available if "E" at Error output is selected. You can select from available errors on your own via serial communication such as using the exclusive Software made for FLC-US40.

Cables and wires



I/O Cable (AWG26×12C, OD φ6.9)

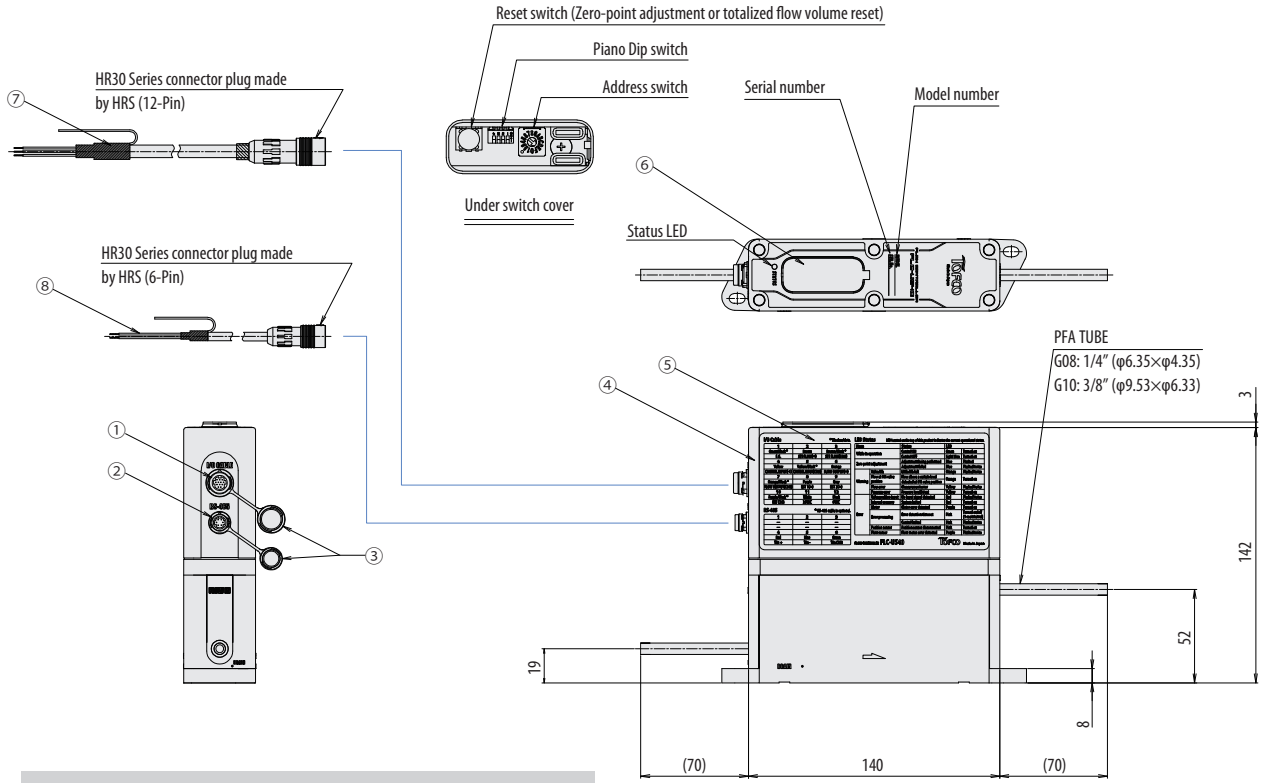
White	24 V DC: Power source (+)
Black	0 V DC: Power source (COM)
Brown	SET FLOW (+): Setpoint input (4 – 20 mADC)
Brown / Black	SET FLOW (COM): Setpoint input (COM)
Yellow	CONTROL INPUT (+): Flow control input (+)
Yellow / Black	CONTROL INPUT (COM): Flow control input (COM)
Purple	EXT 1 (+): Valve forced full-open
Gray	EXT 2 (+): Zero-point adjustment / Totalized flow volume reset ※
Purple / Black	EXT (COM): EXT (COM)
Orange	FLOW OUTPUT (+): Flow output (4 – 20 mADC)
Orange / Black	FLOW OUTPUT (COM): Flow output (COM)
Green / Black	F.G.: Frame ground

Communication cable (AWG26×3C, OD φ4.8)

Blue	TRx - : RS-485 communication
Red	TRx + : RS-485 communication
Green	TRx COM: RS-485 communication

※ Changeable to Error output

Outline drawing



Materials

No.	Part name	Material	Remarks
1	I/O connector	PPS etc.	
2	Communication connector	PPS etc.	
3	Cap	CR	
4	Body case	PBT	
5	Label	—	
6	Switch cover	PP	
7	I/O connector cable	—	Gray / 2 m
8	Comm. connector cable	—	Black / 2 m

Installation orientation