TECHNICAL GUIDANCE

Suitable for flow measurement in ultraclean manufacturing processes

SFC4000

UCUF Converter for ultrasonic flowmeters

OUTLINE

The **UCUF** series ultrasonic flowmeter is designed for measuring small flow rates of ultra-pure water and chemical liquids. All wet parts are made of special grade PFA molds and have no moving parts or sealing mechanism such as an O-ring which would accumulate liquid components. The simple and smooth construction leaves no residues and is ideal for processes such as semiconductor manufacturing which requires ultimate cleanliness.

The SFC4000 is a panel-mount type converter for the **UCUF** series ultrasonic flowmeter. Using state-of-the-art technologies such as Digital Signal Processing and Tokyo Keiso tuning, the converter has reduced significantly the adverse effects caused by the bubbles contained in semiconductor and chemical liquid handling processes. The SFC4000 has display, setting, and communication functions. While checking the status on the display, operators can perform centralized control via MODBUS communication.

FEATURES

- ❑ Enhanced resistance to bubbles
  The conventional ultrasonic flowmeters used to have difficulties in measuring fluids containing bubbles because the bubbles disturb the propagation of ultrasound waves.
  By checking the received ultrasound waves and evaluating the effects of bubbles, the DSP technology and our accumulated field experiences have eliminated the abnormal output caused by bubbles. Thus the SFC4000 has improved significantly the resistance to bubbles by reviewing the signal processing method of the ultrasonic waves compared with the conventional models.
- ❑ Panel-mount type with an indicator
  The SFC4000 is equipped with display and setting functions. It can display instantaneous flow rates, totalized flow rates, and various statuses. Various settings can be checked and changed with simple operations.
- ❑ Communication function
  RS-485 MODBUS communication is available.
  Operators can monitor flow rates and set various settings via communication.
- ❑ Various outputs
  Analog output of instantaneous flow rates (selectable depending on models)
  Pulse output of frequency pulse or totalized pulse.
  Alarm output of instantaneous flow rate upper / lower alarm and totalization preset alarm (total 2 sources).
- ❑ High-viscosity fluids with a kinematic viscosity of up to 40 mm^2/s
- ❑ Accuracy: In combination with UCUF series detectors
  ±1% of readings (at a flow velocity of 1 m/s or more)
- ❑ CE Marking

STANDARD SPECIFICATIONS

Measuring objects / fluid specifications (with UCUF detectors)

- Measuring fluids: Liquids
- Fluid temperature: 5 to 90°C
- Fluid acoustic velocity: 400 to 2500 m/s
- Fluid kinematic viscosity: 0.3 to 40 mm^2/s

• Applicable flow detectors and flow ranges

Model	Flow range (L/min)		Connecting tube size
	Min.	Max.	
UCUF-04K	0 to 0.05	0 to 3.0	3/8″
UCUF-06K	0 to 0.4	0 to 8.0	3/8″
UCUF04E	0 to 0.05	0 to 3.0	3/8″
UCUF06E	0 to 0.4	0 to 8.0	3/8″
UCUF-04M	0 to 0.05	0 to 2.0	1/4″
UCUF-06M	0 to 0.4	0 to 8.0	3/8″
UCUF-10K	0 to 1.0	0 to 20.0	1/2″
UCUF-15K	0 to 3.0	0 to 50.0	3/4″
UCUF-20K	0 to 4.0	0 to 80.0	1″
UCUF-10M	0 to 1.0	0 to 20.0	1/2″
UCUF-15M	0 to 3.0	0 to 50.0	3/4″
UCUF-20M	0 to 4.0	0 to 80.0	1″

Power supply voltage	24 V DC±10%
Consumption current	Max. 110 mA (with LCD backlight on) Approx. 200 mA (At start up)
Ambient conditions	Temperature: 0 to 50°C Humidity: 30 to 80%RH (no condensation)
IP rating	IP20 (indoor use)
Case material	ABS resin (black)
Mass	Approx. 200g
Installation	Panel mounting
Indicators	Orange LED for alarm LCD with backlight (two 16-character lines) for instantaneous flow rate, totalized flow rate, and various statuses Backlight turns off in 10 min (configurable).
Setting function	Panel switch × 4 Various functions of the flowmeter can be set.
Conformity standards	EMC: EN 61326-1, EN 61326-2-3 RoHS2 (2011/65/EU)

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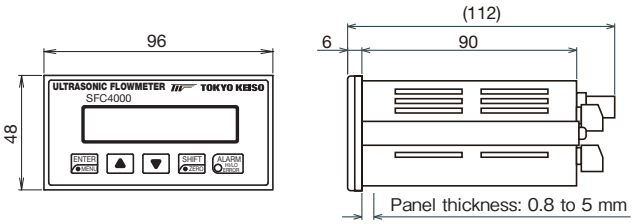
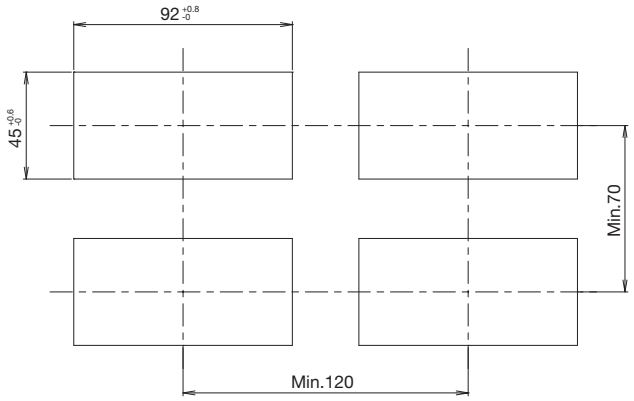
Input	Sensor signal	BNC connector × 2 (dedicated cables needed)
	Totalization reset	Contact input (reset when short)
Output	Instantaneous flow rate	Current output type: 4–20 mA (load resistance: 500Ω or less) Voltage output type: 0–10 V, 0–5 V or 1–5 V (load resistance: 1MΩ or more)
	Pulse	Open collector output, load rating: 30 V DC, 20 mA or less Frequency pulse output, totalized pulse output, or FAULT output (selectable) • Frequency pulse output: Pulse rate max. 1000 Hz (at the time of full scale output), duty ratio 1:1 • Totalized pulse output: Outputs flow rate unit pulse The value of 1 pulse can be set by the combination of the following multipliers and units. • Multiplier: ×0.1, ×1, ×10, ×100 • Unit: mL, L, m^3 • FAULT output: Outputs when abnormality of the converter or detector is detected. NO/NC selectable
	Alarm	Open collector output (two points), load rating: 30 V DC, 20 mA or less Instantaneous flow rate alarm (upper/lower) and totalization preset alarm (A/B) (total 2 sources). NO/NC selectable
Terminal block		Detachable plug-in type clamp terminal × 3
Communication		RS-485, protocol: MODBUS RTU (Max. 32 units can be connected.)
Flow rate adjustment	Low cutoff	0 to 25%FS
	Linearization	Automatic compensation based on kinematic viscosity Manual linearizer can be added (broken-line approximation with up to 20 points).

DIMENSIONS



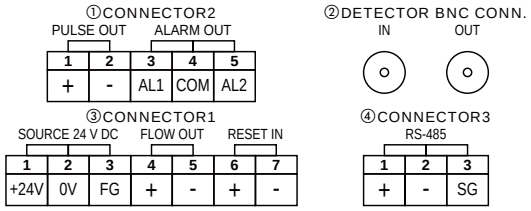
Panel cutout



MODEL CODE

SFC4000 —	□	Description
Instantaneous flow rate output	0	4 – 20 mA
	1	0 – 10 V
	2	0 – 5 V
	3	1 – 5 V

TERMINAL ARRANGEMENT



①CONNECTOR 2

Terminal No.	Terminal name	Description
1	PULSE OUT (+)	Pulse output
2	PULSE OUT (–)	
3	ALARM1 OUT (AL1)	Alarm output
4	ALARM1, 2 OUT (COM)	
5	ALARM2 OUT (AL2)	

②DETECTOR BNC CONN.

Terminal	Color	Polarity	Description
IN	Red	Inflow (upstream)	Sensor signal input
OUT	Black	Outflow (downstream)	

③CONNECTOR 1

Terminal No.	Terminal name	Description
1	SOURCE 24 V DC (+24V)	Power supply 24 V DC±10%
2	SOURCE 24 V DC (0V)	
3	SOURCE 24 V DC (FG)	Grounding
4	FLOW OUT (+)	Flow rate output
5	FLOW OUT (–)	
6	RESET IN (+)	Totalization reset input
7	RESET IN (–)	

④CONNECTOR 3

Terminal No.	Terminal name	Description
1	RS-485 (+)	RS-485 communication
2	RS-485 (–)	
3	RS-485 (SG)	

* Specification is subject to change without notice.

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