

**GENERAL**

The **UCUF Series ultrasonic flowmeter** is designed for low flow rate applications. The flowmeter consists of the UCUF Flow Sensor and SFC-710 DSP type Signal Converter. The non-wetted PFA sensor design makes it an ideal choice for semiconductor industry, where extreme cleanliness of pipe inside is of primary importance. The SFC-710 is a short-form version of the SFC-700 Converter, which is now widely accepted in the semiconductor industry, due to low bubble sensitivity.

Succeeding this feature, furthermore, the SFC-710 enables lower flow range measurements. Built-in Manual Linearizer permits fine output tuning in the very low flow region.

- ❑ New signal processing has improved anti-bubble capability of converter. Normally, ultrasonic flowmeter has difficulty in measuring fluid containing bubbles, because the bubbles interfere with ultrasonic signal passage. In virtue of high speed DSP, anti-bubble capability has been remarkably improved. (Excepting a fluid which contains dense, minute cloudy bubbles.)
- ❑ Field-proven automatic output linearizer based on kinematic viscosity of the fluid.
- ❑ Flow rate readout, zero adjustment, alarm lamp and setting buttons are easily accessible from the Converter front.
- ❑ Accuracy  $\pm 1\%$  of Reading.
- ❑ Wide range-ability of 100:1 (Typical)
- ❑ Low flow measurement down to 2 mL/min
- ❑ Measures viscous fluids up to  $4.0 \times 10^{-5} \text{ m}^2/\text{s}$
- ❑ Corrosion resistant
- ❑ Easy installation with shortened meter body
- ❑ Easy parameter setting with LCD display.

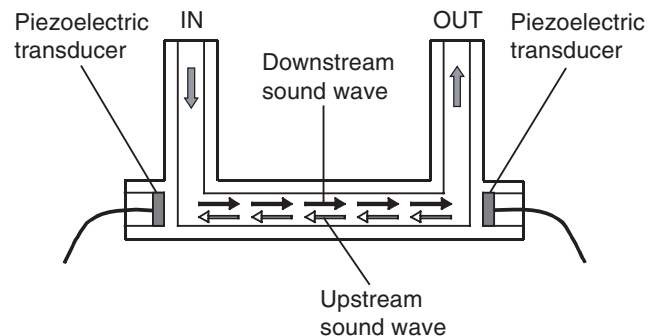
**APPLICATIONS**

- ❑ Pure water and ultra-pure water in semiconductor manufacturing plants
- ❑ Chemical Mechanical Polishing (CMP) slurries
- ❑ Chemical feedings
- ❑ Very low flow measurement of liquid



**OPERATING PRINCIPLE**

The fluid to be measured flows through the U-shaped tube. Two piezoelectric transducers, mounted at both ends of the measuring section, emit and receive an ultrasonic wave alternately. The wave propagating in direction with the fluid flow is accelerated and the wave travelling against the fluid flow is slowed. The difference in transit time of wave is proportional to the velocity of the fluid. The converter converts received ultrasonic wave signal into digital data, computes flowrate and transmits output signal. Stable transit time measurements is conducted with new signal processing, regardless fluctuation of wave signal level.



## STANDARD SPECIFICATION

Model		SFC-710		SFC-711	
Power supply		DC24V $\pm$ 10%		DC12V $\pm$ 10%	
Consumption current		90mA (When turning off the backlight)		180mA (When turning off the backlight)	
		110mA (When turning on the backlight)		220mA (When turning on the backlight)	
		300mA at start up		600mA at start up	
Output	Flow rate	Current output type 4 to 20mA (Load resistance: 500 $\Omega$ or less)	Voltage output type 0 to 10V (Source resistance: 500 $\Omega$ )	Current output type 4 to 20mA (Load resistance: 250 $\Omega$ or less)	Voltage output type 0 to 5V (Source resistance: 250 $\Omega$ )
	Totalized pulse	Open collector pulse output Load rating: DC30V, 50mA Pulse width: 0.5ms (MAX. 1000Hz), 50ms (MAX. 10Hz), 100ms (MAX. 5Hz) Pulse rate: MAX. 1000pulse/sec			
	Alarm/ Totalization Preset	Open collector output (2 points) Load rating: DC30V, 50mA Action mode: NO (Normal Open)			
Input	Sensor signal	Exclusive cable (SMB connector)			
	Totalization reset	Contact reset (One shot)			
Connector		Weidmuller (Orange)		PHOENIX (Green)	

## \* Special products

- Pulse output selection, flow rate % proportional or empty sensor contact instead of volume.
- Plus side output protection instead of minus side when signal is lost.
- Normal Close alarm contacts.
- Normal Close preset contacts.

- Sensor : UCUF-03PC, -04M, -04C, -04PC, -06C, -06PC, -10C, -15C, -20C

## • Flow Range :

Sensor Size	Flow Range L/min	
	Min.	Max.
UCUF-03PC	0~0.025	0~0.1
UCUF-04M	0~0.05	0~2.0
UCUF-04C/UCUF-04PC	0~0.05	0~3.0
UCUF-06C/UCUF-06PC	0~0.4	0~8.0
UCUF-10C	0~1.0	0~20.0
UCUF-15C	0~3.0	0~50.0
UCUF-20C	0~4.0	0~80.0

\* Coaxial connector is a connector with lock.

- Sound Velocity of Fluid : 1000 to 2200 m/s
- Kinematic Viscosity :  $0.3 \times 10^{-6}$  m<sup>2</sup>/s to  $4.0 \times 10^{-5}$  m<sup>2</sup>/s

**SFC-710 Signal Converter**

- Model Number Break Down :
  - SFC-710- X1 X2
  - X1 : 1 for 4, 6, 10 mm Sensor
    - : 2 for 15, 20 mm Sensor
  - X2 : 0 for 4-20mA
    - : 1 for 0-10V
- Output :
  - 1) 4 to 20 mA
    - Load resistance : 0 to 500 ohms or
    - 0 to 10V (Source resistance : 500 ohms)
    - Damping time constant : 0.2 to 10s
  - 2) Scaled Pulse
    - Open collector / 30VDC, 50mA Max.
    - Pulse width : 0.5 ms (Max. 1000 Hz), 50 ms (Max. 10 Hz),
    - 100 ms (Max. 5 Hz)
    - (Selectable per pulse rate at full scale)
    - Pulse rate : 10 to 1000 pps at full scale
  - 3) Flow rate alarm / Total preset function
    - Open collector / 2 points
    - 30VDC, 50mA Max.
    - Indication : LED, visible from front side
    - Relay action : NO (Normal Open)
- Low Cut-off : 0 to 30% of full scale
- Display : LCD / 2 line 16 digital alphanumeric  
(with / without back light)
- Alarm indicator : 1 LED, LCD (Hi or Lo)
- Data Entry : By 4 key switches in front panel
- Linearizer : Automatic  
: Manual / 15 line-segment approximation
- Data Back-Up : Parameters and Total counts by  
EEPROM
- Zero Adjustment : Accessible from front panel
- Power Supply : 24VDC  $\pm$ 10%
- Power Consumption : 100mA w/ back light, 80mA w/o back  
light (300mA / starting)
- Ambient Condition : 0 to 50 °C / 30 to 80% RH
- Installation : Panel mounting
- Enclosure Classification : IP20 (Indoor Use)
- Materials : Panel ; ABS  
Housing ; Aluminum alloy
- Color : Panel ; Gray  
Housing ; Black
- Mass : Approx. 380 g

**TERMINALS**

SFC-71	□	–	□	□	Description
Power supply	0				DC24V
	1				DC12V
Sensor connection	–	1			UCUF-03, 04, 06, 10
		2			UCUF-15, 20
Analog output			0		4~20mA
			1		0~10V
			2		0~5V
			*		Special

## SMB connector

Terminal	Polarity	Description
White	Inlet side	Sensor signal input
Black	Outlet side	

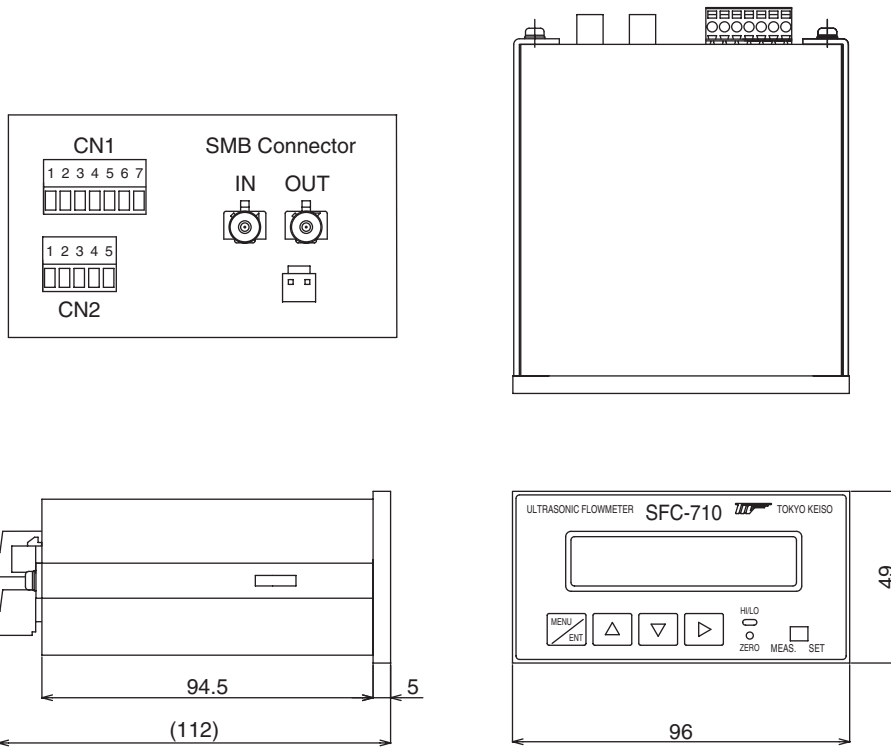
## Connector 1

1	+	Power supply (DC24V)
2	–	
3	FG	Grounding
4	+	Current output (DC4 to 20mA)
5	–	
6	+	Reset pulse input for totalizer
7	–	

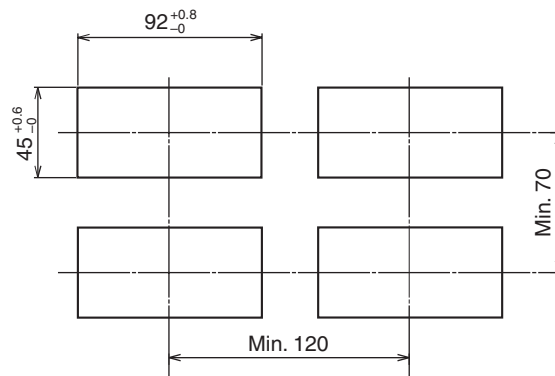
## Connector 2

1	+	Pulse output
2	–	
3	+	Alarm (Hi) / Total Preset (HH)
4	–	Alarm common
5	+	Alarm (Lo) / Total Preset (H)

OUTLINE DIMENSIONS



Panel cut



\* Specification subject to change without notice

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