UCF006 Ultrasonic Flowmeter

DESCRIPTION

The compact ultrasonic flow monitor UCF006 has reduced significantly the adverse effects caused by the bubbles contained in semiconductor processes by making the measuring tube straight with a negligible small pressure loss. The improved time resolution and high speed signal processing have made the measurement stable in the low flow domain compared with the conventional flowmeters. Thus, it is ideal for the semiconductor manufacturing which requires ultimate cleanliness.



APPLICATIONS

- Pure water and ultrapure water in the semiconductor manufacturing processes
- Process liquids of small and medium flow rate
- Ideal for flow measurement and control of cleaning and CMP processes

FEATURES

- **Enhanced resistance to bubbles**
  The bubbles contained in the liquid disturb the propagation
  of ultrasonic waves and cause an unstable measurement.
  By making the measuring tube straight the stable measurement has been realized.
- **Low pressure loss**
  The straight measuring tube has a negligible small pressure loss. It keeps a line pressure.
- **Saving space**
  A combined construction of a detector and a converter saves installation space.
- **Complying with**
  Cleared EMC test : EN61326-1 : 2013
  RoHS

OPERATING PRINCIPLE

Two piezoelectric transducers A and B are mounted at both ends of the measuring tube as shown in Fig.1. They emit and receive ultrasonic waves alternately and measure the traveling times tA (A to B) and tB (B to A) through the liquid. Without flow, tA is equal to tB. With flow, tA becomes shorter and tB longer in proportion to the flow rate. Thus, calculating tB - tA gives the flow rate of the liquid. tA and tB depend on the size and shape of the tube and liquid viscosity. The actual flow test data are stored in the linearizer in the converter, which enables the UCF006 to measure flow rates with high accuracy.

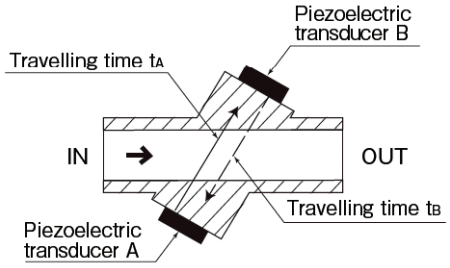


Figure 1: Operating principle

www.sps-international.com | www.sps-polos.com | www.waferhandlingsystems.com | www.esproflow.com
sales@sps-international.com | sales@sps-polos.com | sales@waferhandlingsystems.com | sales@esproflow.com

STANDARD SPECIFICATIONS

- Model code : UCF006
- Measuring fluid : Water
- Fluid temperature : 10 to 80°C
  Note : The shaded area in Fig.2 is the guaranteed temperature range.
- Ambient temperature : 0 to 50°C
  Note : The shaded area in Fig.2 is the guaranteed temperature range.
- Fluid pressure : 0 to 0.5 MPa
- Process connection : 3/8″ PFA tube end (Outside diameter ϕ 9.53, Inside diameter ϕ 6.35)
- Enclosure classification : IP65 equivalent, indoor use
- Flow range : 0 to 8000 mL/min
- Accuracy : ±2% of reading at flow rate 1700 mL/min or more
  ±34 mL/min at flow rate less than 1700 mL/min
  When measuring 20°C water
- Mass Body : Approx. 80 g
  Cable : Approx. 140 g
- Cable : Exclusive multi-core cable for UCF006
- Cable length : 5 m as standard
- Materials : PFA (Wetted parts)
- Output 1) Current output (Analog output)
  : 4 to 20 mA DC (Load resistance within 500Ω)
  2) Frequency output (Pulse output)
  : Open collector pulse, Load reting 30V DC, 10 mA, 0 to 1000 Hz
- Parameter setting : Via RS485 communication (Modbus protocol)
- Power supply : 24 V DC ±10%
- Power consumption : 38 mA or lower

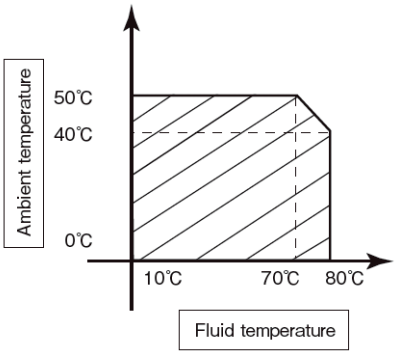
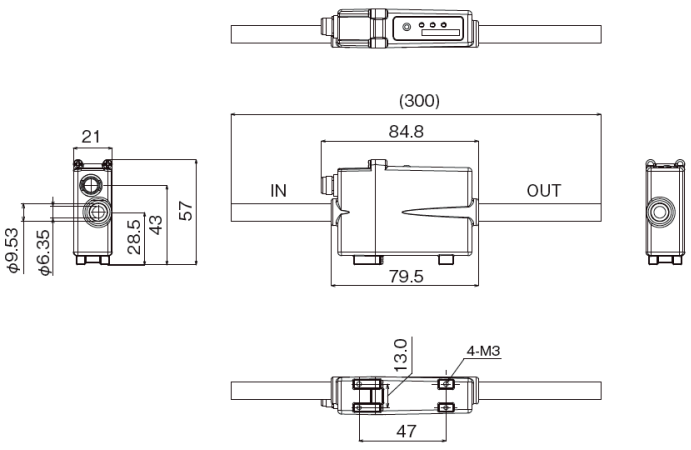
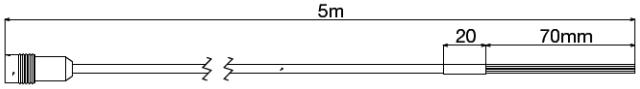


Figure 2: Guaranteed temperature range

DIMENSIONS

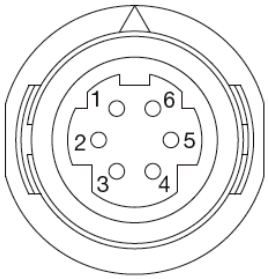


CABLE DIMENSIONS



PIN ASSIGN

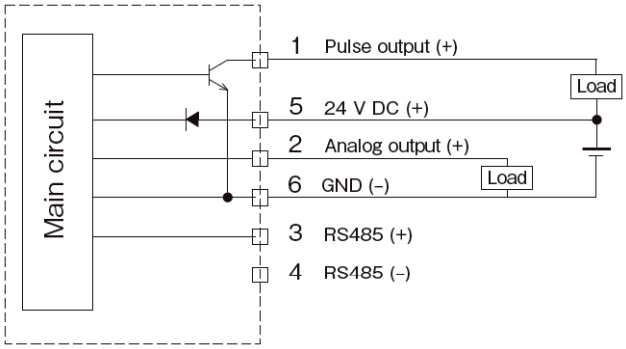
Pin No.	Function	Color
1	Pulse output (+)	Blue
2	Analog output (+)	Green
3	RS485 (+)	Orange
4	RS485 (−)	Yellow
5	24 V DC (+)	Red
6	GND (−)	Brown



MODEL CODE

UCF006	−□□□	□	Specifications
Flow range	030		0 to 3000 mL/min
	040		0 to 4000 mL/min
	080		0 to 8000 mL/min
Special spec.		(Blank)	Not provided
		/Z	Provided

CIRCUIT DIMENSIONS



CAUTIONS ON INSTALLATION

- To stable measurement, do not bend the connecting tube during installation.
- To stable measurement, stabilize the liquid temperature within ±5°C.
- Install the flow monitor so that no bubbles stay in the measuring tube.
- Keep the measuring tube filled with liquids. Although the flow monitor can be installed with horizontal, vertical, or slant tubing, it is recommended to select a position for easy self-draining.
- Install a control valve downstream of the flow monitor, if necessary.
- Install the flow monitor away from noise sources such as power relays and solenoid valves.
- Lay the signal cable away from power cables of high voltage or current.
- Install the flow monitor with at least 60 mm upstream and 40 mm downstream, straight runs from the monitor edge faces.
- Adjust the zero point again when the fluid temperature fluctuates 10°C or more.

*Specification is subject to change without notice.

www.sps-international.com | sales@sps-international.com
www.sps-polos.com | sales@sps-polos.com
www.waferhandlingsystems.com | sales@waferhandlingsystems.com
www.esproflow.com | sales@esproflow.com