



TECHNICAL GUIDANCE

ULTRASONIC FLOWMETER

UCUF-P series

for Low Flowrate Applications **UCUF-03P**

OUTLINE

The UCUF (Ultra-Clean Ultrasonic Flowmeter) series Ultrasonic Flowmeter is designed for very low flowrate applications. Diameter of measuring tube is available in 3mm, and setup of 25mL/min (minimum full scale) can be made.

The flowmeter consists of the UCUF flow detectors and its associated signal converter SFC-750. The non-wetted detector design, constructed of PFA material, makes the UCUF series an ideal choice for semiconductor industry, where the extreme cleanness of pipe inside is required.



FEATURES

- ❑ Suitable for low flowrate measurement
 - Flow range: Min. 0 to 25mL/min
 - Max. 0 to 100mL/min
- ❑ All wetted parts made of PFA
 - Extremely low contamination with ions or particles
- ❑ Accuracy: ± 2 mL/min
- ❑ Corrosion resistant
- ❑ Easy installation with compact meter body

APPLICATIONS

- ❑ Pure water and ultra-pure water in semiconductor manufacturing plants
- ❑ Chemical feeds
- ❑ Highly corrosive chemicals
- ❑ 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, generate and receive an ultrasonic wave alternately. The wave travelling with the fluid is accelerated and the wave travelling against the fluid is slowed. The difference in transit time of wave is proportional to the velocity of the fluid.

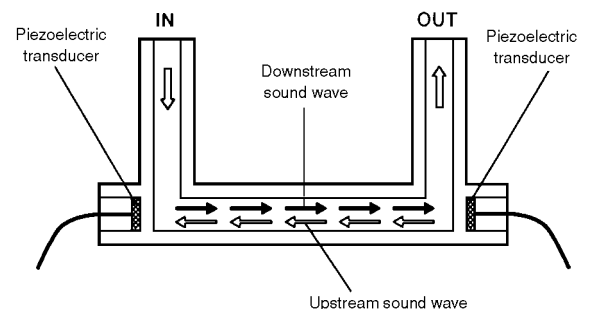


Figure 1. Operating Principle

SPECIFICATIONS

Flow detector

| | |
|---------------------------|-----------------------------------|
| Measurable Fluid | : Liquids with no bubbles |
| Fluid Sound Speed | : 1000 to 2200 m/s |
| Fluid Temperature | : 10 to 60 °C |
| Fluid Pressure | : 0 to 0.5 MPa |
| Fluid Kinematic Viscosity | : 0.8 ~ 2.0mm ² /s |
| Process Connection | : PFA Tube End (Refer to Table 1) |
| Material (Wetted part) | : PFA |
| Enclosure Classification | : IP65 |
| Flow Range | : Refer to Table 1 |

Table 1. Flow Range and Connecting Tube Size

| Model | Flow Range(mL/min) | | Connecting Tube Size |
|----------|--------------------|------------|----------------------|
| | Min. Range | Max. Range | |
| UCUF-03P | 0 ~ 25 | 0 ~ 100 | 3/8" |

Accuracy : Refer to Table 2

Table 2. Accuracy

| Model | Flowrate(mL/min) | Accuracy(mL/min) |
|----------|------------------|------------------|
| UCUF-03P | 0 ~ 100 | ±2 |

※ Note: Accuracy statement is based on water calibration

Pressure Loss :

$$\text{Pressure Loss for Water (kPa)} = C \times Q^2$$

where C : Factor (Refer to Table 3)
 Q : Flowrate (L/min)

Table 3. Pressure Loss Factor

| Model | C |
|----------|------|
| UCUF-03P | 6.28 |

Signal Cable : Two 5m Coaxial Cables
 Note : Extension Cables available up to 30m

Material : Refer to Table 4

Table 4. Materials of Flow Detector

| Parts Name | | Material |
|---------------|------|----------|
| Wetted Part | Body | PFA |
| | Tube | PFA |
| Sensor Cover | | PP |
| Cable Fitting | | PP |
| Cable Sheath | | PVC |

MODEL CODE

Flow Detector

| Model Code | | | | Description |
|------------|------|---------|---|---------------------|
| UCUF | -□□ | □ | □ | |
| Meter Size | -03P | | | 3mm |
| Connector | | C | | SMB w/ lock |
| Shape | | (Blank) | | Standard (U shaped) |
| | | Z | | "Z" shaped |

* In case of special specifications required, put "Z" at the end of Code Number, and describe contents separately.
 (Contact Tokyo Keiso in advance about manufacturing possibility)

Flow Converter

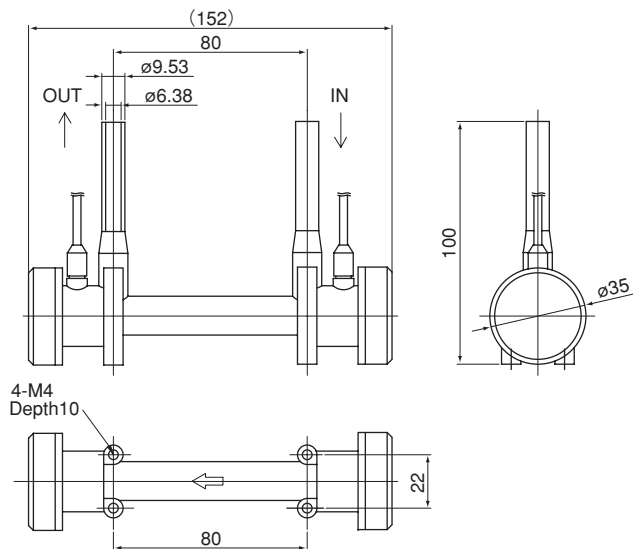
| Model Code | Description |
|------------|---|
| SFC-750 | Improved anti-bubbles capability / DSP type / Without display |

CAUTIONS ON INSTALLATION

- Installation area for Flow Detector: Select the area of pipe where no air or gas bubbles exist in the flow.
- Mounting of Flow Detector: Recommend to install detector vertically with upward flow, in order to prevent deposit of slurry or bubbles in low flowrate conditions.
- Location of Control Valve: If a flow control valve is installed in the piping, it should be located on the downstream side of the flow detector to keep the fluid pressure high. The high fluid pressure will prevent the formation of bubbles in the flow.
- Noise Suppression: All electrical noise sources near the flowmeter, such as power relays or solenoid valves, should be fitted with a surge suppressor.
- Signal Cable Wiring: Keep signal cables away from high voltage or high current power cables to avoid induced electrical noise.

OUTLINE DIMENSIONS (Detector)

UCUF-03P



* Specification subject to change without notice

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