TECHNICAL GUIDANCE

Converter integrated type ultrasonic flowmeter

UCM®-04A/06A RoHS compliance

ULTRASONIC COMPACT METER

OUTLINE

The UCM-04A/06A is the converter integrated type ultrasonic flowmeter for small flow that offers precise and stable flow measurement for ultra-pure water and chemicals. A compact body with a detector and converter saves installation space. The 7-segment LEDs and clear bar graph indication on the front panel allows easy reading in the field.
The wetted parts are consisting of the molded PFA specified for semiconductor industries. The simple and clean construction without any moving parts and without sealing pockets where liquids stagnate, makes the UCM-04A/06A an ideal choice for the clean process such as the semiconductor plant.
The flowmeter has the inlet and outlet tubes of standard dimensions suitable for various PFA fittings. In the services where only flow monitor has been simply used so far, the UCM-04A/06A can be applied without difficulties.

FEATURES

- ❑ Integration of detector and converter makes the piping and wiring simple.
- ❑ One consolidated body saves installation space.
- ❑ 7-segment LEDs and bar graph on the front panel makes reading easy even at dark place.
- ❑ The dedicated software makes parameter setting like alarms easier than ever.
- ❑ The meter contains ideal and clean detector.
- ❑ The hall element makes zero adjustment surely.
- ❑ The RS-485 makes parameter setting easy.
- ❑ RoHS compliance

APPLICATIONS

- ❑ Pure water and ultra-pure water services in semiconductor manufacturing plants
- ❑ Chemical feedings
- ❑ Corrosive chemicals
- ❑ Suitable for very low and low flow rate services such as cleaning equipments

STANDARD SPECIFICATION

DETECTOR SPECIFICATION

- Measuring objects : Liquids without bubbles (Exclude permeable liquid)
- Fluid temperature : 10 to 60°C
- Fluid pressure : 0 to 0.4MPa
- Sonic range : 1000 to 2200m/s
- Kinematic viscosity : 0.3 to 40mm^2/s
- Process connection : PFA tube ends
- Wetted part material : PFA
- Flow range

Model	Flow range (L/min)	
	Min.	Max.
UCM-04A	0 to 0.2	0 to 3.0
UCM-06A	0 to 1.0	0 to 8.0

- Standard accuracy

[Standard accuracy and flow range]
UCM-04A: ±1% F.S.
(±8mL/min for flow range 0 to 500mL/min or less)
UCM-06A: ±1% F.S.
(±17mL/min for flow range 0 to 1000mL/min or less)

✻ Accuracy is the one calibrated by water (20°C).
✻ Accuracy is the one for analog output.
✻ Accuracy of indication is 0.5%.

- Materials

[Materials of components]

Parts		Materials
Wetted parts	Body	PFA
	Tube	PFA
Case		Heat resistance ABS
Cable gland		Fluorocarbon rubber
Cable sheath		PVC

- Pressure loss

Pressure loss of water
(kPa) = C×Q^2
C: Pressure loss coefficient
Q: Flow rate (L/min)

Model	C
UCM-04A	4.8
UCM-06A	0.8

ELECTRICAL SPECIFICATION

- Power supply : 24V DC±10%
- Consumption current : Approx. 86mA
- Inrush current : Approx. 4.5A/2ms
- Min. driving current : Approx. 130mA
- Alarm : NPN open collector (1 point) Load rating 30V DC, 20mA or less
  High or Low alarm (N.O. or N.C.)
- Current output : 4 to 20 mA DC Load 500Ω or less
  : 4 to 20 mA DC Load 500Ω or less
- Low cut-off : 0 to 30% F.S.
- Damping time : 0s, 0.2s, 0.5s, 1s. 2s. 3s, 5s, 10s
- Status display : 7 segments display

CONSTRUCTION AND FUNCTION

- Construction : Equivalent to IP64 (Indoors use)
- Ambient temperature : 0 to 50°C
- Humidity : Less than 85% RH and no condensation
- Mounting : Panel mount
- Communication : Modbus protocol
  RS-485 Half duplex asynchronous,
  Baud rate 19200 bps,
  Multi drop Max. 32

✻ Addresses are set by configuration software.

CONNECTION TABLE

	Polarity	color
Power supply	(+) 24V DC	White / Red dots
	(–) 0V	White / Black dots
Analog output	(+)	Pink / Red dots
	(–)	Pink / Black dots
Alarm output	(+)	Orange / Red dots
	(–)	Orange / Black dots
Communication	(+)	Yellow / Red dots
	(–)	Yellow / Black dots

✻ The temperature of liquid trapped inside the flowmeter may rise about 10°C compared to the atmosphere. It might cause the fluctuation of flow indication and output due to the generation of bubbles.

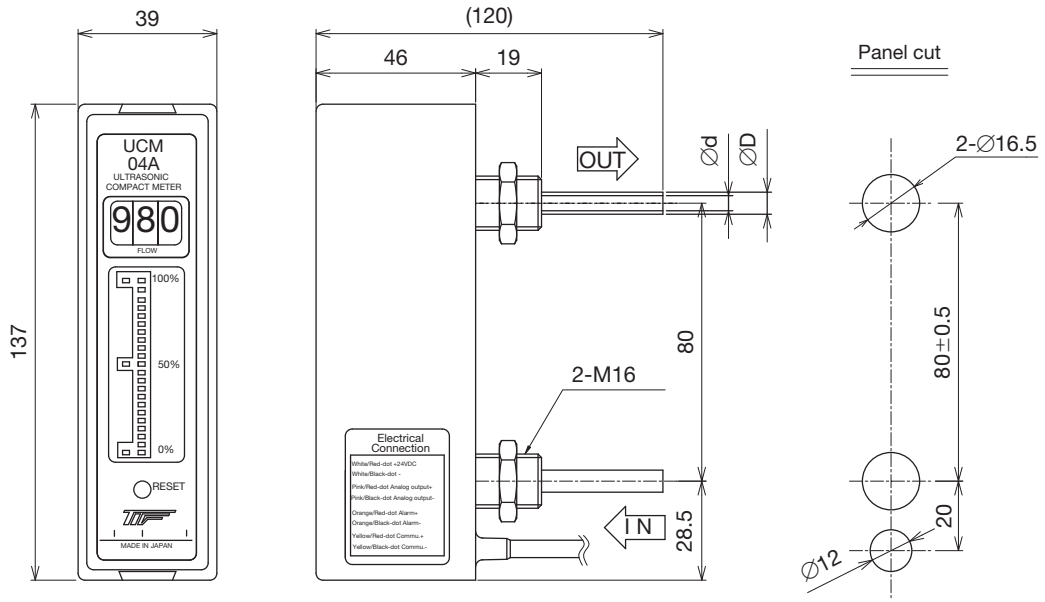
✻ The separate type (-SP) is recommended for the applications where the temperature is controlled precisely.

MODEL CODE

UCM	–□□	A	–□□□	–□	1	□□	□	□	Specifications
Tube inside diameter	04								Flow range 0 to 3L/min
	06								Flow range 0 to 8L/min
Flow range			002						0 to 200mL/min
			005						0 to 500mL/min
			010						0 to 1000mL/min
			020						0 to 2000mL/min
			030						0 to 3000mL/min
			040						0 to 4000mL/min
			050						0 to 5000mL/min
			075						0 to 7500mL/min
			080						0 to 8000mL/min
Connection size				2					6.35∅ × 4.35∅ tube (only 04A)
				3					9.53∅ × 6.35∅ tube (only 06A)
Fixed code					1				always 1
Cable length						05			5m (standard)
						10			10m
Analog output type							4		DC 4 to 20mA
							0		DC 0 to 20mA
Special requirement								(vacant)	none
								/Z	yes

✻ Add [/z] at the bottom of code if any other requirements are requested writing their description. Please consult TOKYO KEISO for their availability.

DIMENSIONS



Model	Connection tube size	Dimensions (mm)		Mass (g) (Excluding cable)
		D	d	
UCM-04A-□□□-21□□□	1/4"	6.35	4.35	160
UCM-06A-□□□-31□□□	3/8"	9.53	6.35	

SEPARATE TYPE (-SP)

CONVERTER SPECIFICATION

● Materials

[Part materials]

Parts	Materials
Case	Heat resistance ABS
Cable gland	Fluorocarbon rubber
Cable sheath	PVC
Cable sheath for detector	PTFE
Jacket	PVDF

✻ Other materials not mentioned above are the same as the integrated type.

MODEL CODE

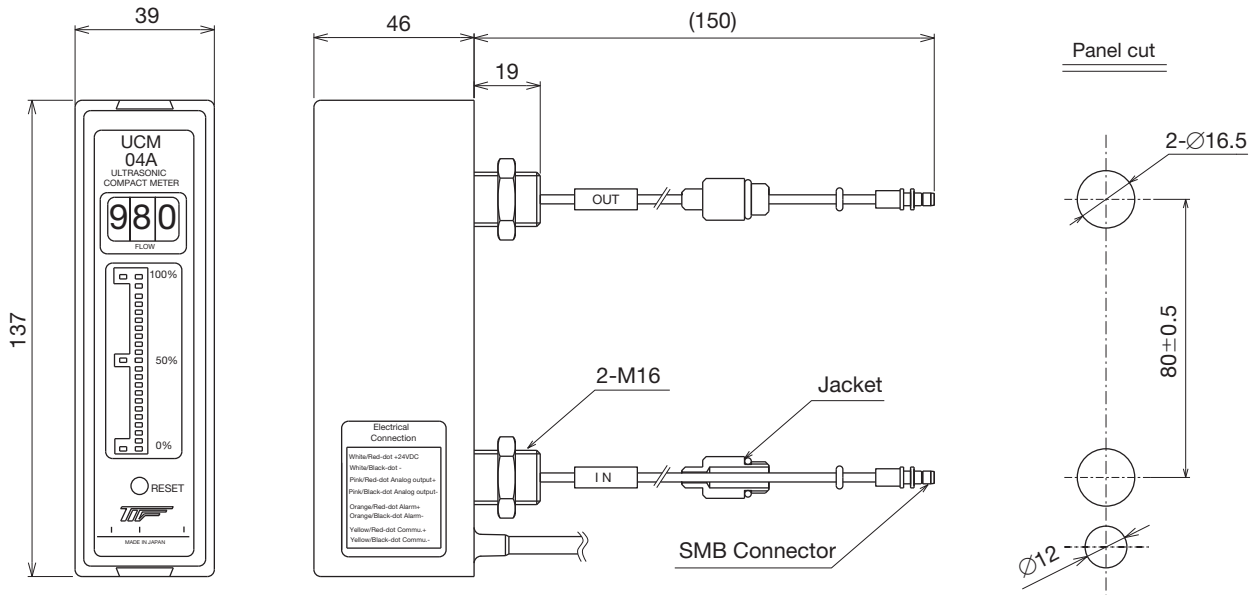
UCM	–□□	A	–□□□	–1	□□	□	–SP	□	Specification
Detector size	04								UCUF–04M
Flow range			002						0 to 200mL/min
			005						0 to 500mL/min
			010						0 to 1000mL/min
			020						0 to 2000mL/min
			030						0 to 3000mL/min
Fixed code				1					always 1
Cable length					05				5m (standard)
					10				10m
Analog output type						4			4 to 20mA
						0			0 to 20mA
Fixed code							–SP		always –SP
Special requirement								(vacant)	none
								/Z	yes

✻ Only the detector type UCUF-04M suitable for separate type (-SP) is applied.

✻ Only SMB connector with jacket is available for connector type.

✻ Add [/z] at the bottom of code if any other requirements are requested writing their description. Please consult TOKYO KEISO for their availability.

CONVERTER DIMENSION



Model	Mass (g) (Excluding cable)
UCM-04A-□□□-1□□□-SP	130

DETECTOR SPECIFICATION [UCUF-04M (UCM Version)]

● Materials

[Part materials]

Parts		Materials
Wetted parts	Body	PFA
	Tube	PFA
Sensor cover		PP
Cable fitting		PP
Cable sheath		PTFE
Sensor cap		PFA
Fixing bands		PFA
Jacket		PVDF

✻ Other materials not mentioned above are the same as the integrated type.

● Pressure loss

Pressure loss of water (kPa) = $C \times Q^2$

(kPa) = $C \times Q^2$

C: Pressure loss coefficient

Q: Flow rate (L/min)

Model	C
UCUF-04M	4.5

MODEL CODE

UCUF	−□□	M	−□	□	□	Specification
Nominal size	04					4mm
Shape			U			U tube (standard)
			Z			Z type
Cable outlet direction				N		Same as tube outlet side (standard)
				W		Other sides of IN/OUT tube outlets
Special requirement					(vacant)	none
					/Z	yes

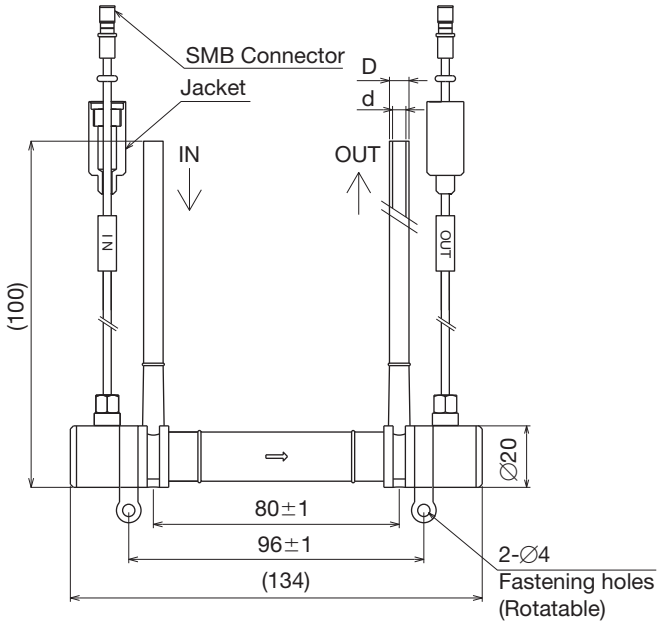
✻ Standard cable length is 5m. The extension cable is available up to 30m.

✻ Only SMB connector with jacket is available for the connection with the UCM Separate type.

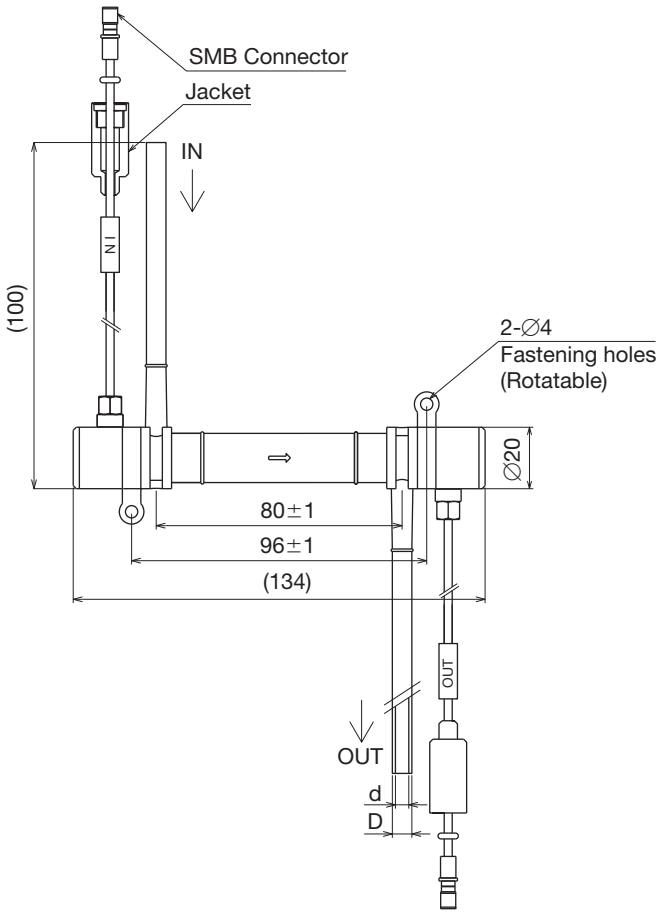
✻ Add [/z] at the bottom of code if any other requirements are requested writing their description. Please consult TOKYO KEISO for their availability.

DETECTOR DIMENSIONS

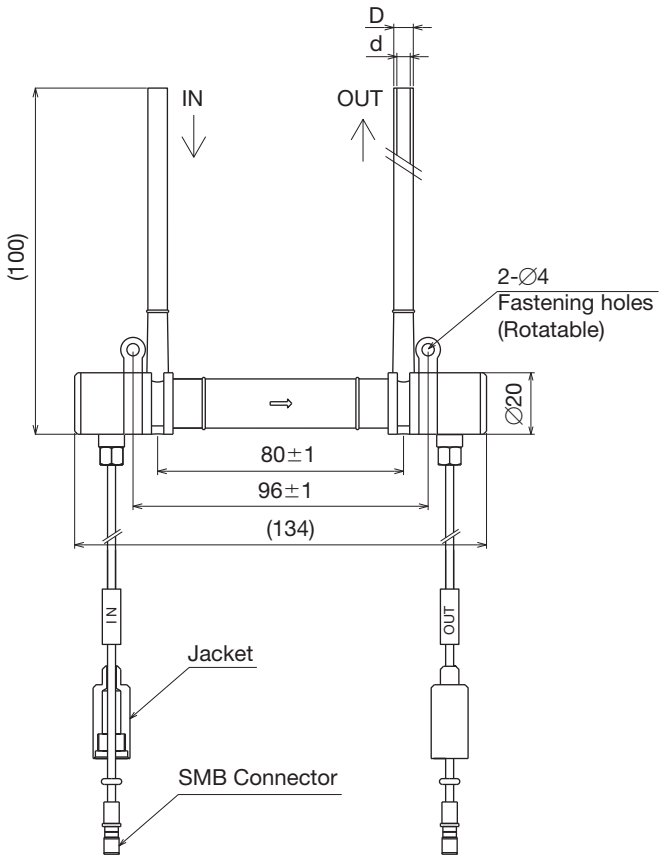
UCUF-04M-UN (Standard)



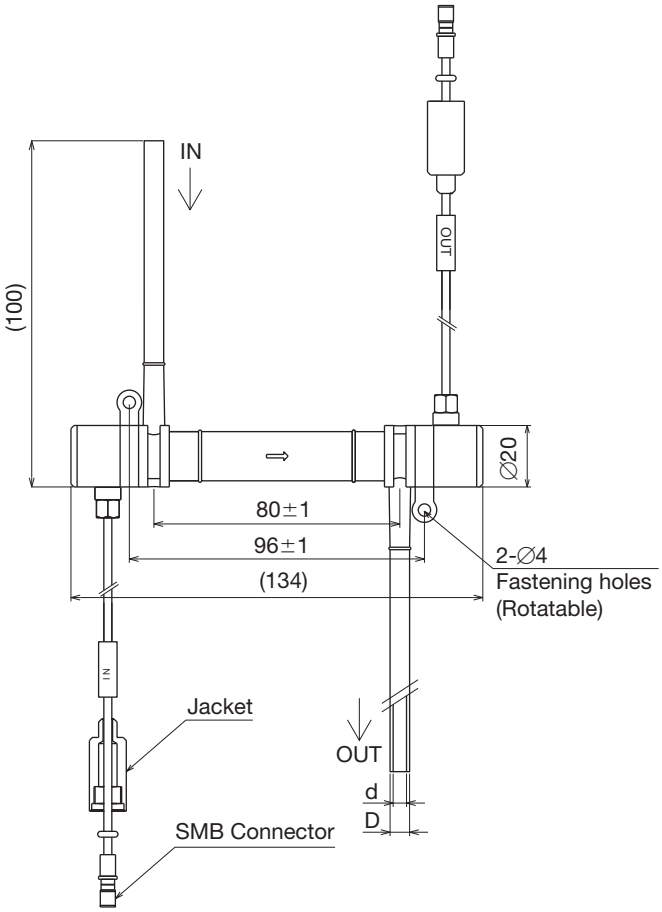
UCUF-04M-ZN



UCUF-04M-UW



UCUF-04M-ZW



Model	Connection tube size	Dimensions (mm)		Mass (g) (Excluding cable)
		D	d	
UCUF-04M-□□	∅1/4"	6.35	4.35	60

NOTES ON INSTALLATION

- ❏ Avoid the fluids containing bubbles. The bubbles cause adverse affects for precise measurement.
- ❏ The detector and pipe are fully occupied with liquid. You may install the meter in either piping horizontally, vertically or slantwise, but install the bottom face of the detector tube vertically.
  Arrange the piping so that liquid inside meter is easily drained.
- ❏ Install the flow control valve downstream of meter, if required, to avoid adverse effects caused by the bubbles generated at downstream of control valve.
- ❏ Install the detector and converter away from power relays and solenoid valves that maygenerate noises.
- ❏ Lay the signal cable away from the power cables with high voltage and current.

* Specification is subject to change without notice.

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