



# 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<sup>2</sup>/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	PFA
Body	PFA
Tube	PFA
Case	Heat resistance ABS
Cable gland	Fluorocarbon rubber
Cable sheath	PVC

### ● Pressure loss

Pressure loss of water

(kPa) = C × Q<sup>2</sup>

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. 94mA
- 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.

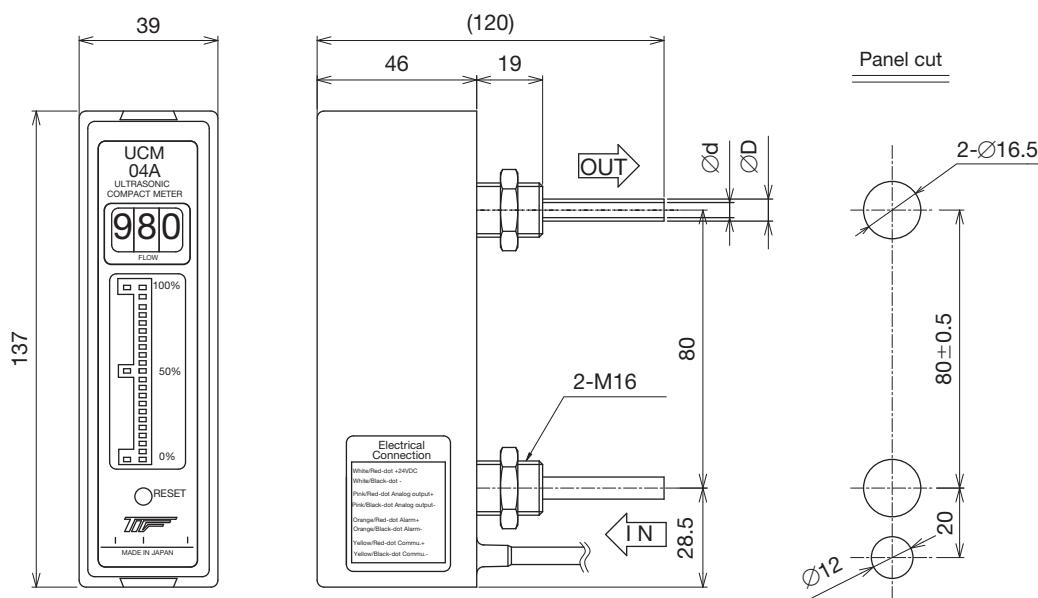
\* The separate type (-SP) is recommended for the applications where the temperature is controlled precisely.

## MODEL CODE

UCM	-	□	A	-	□	□	-	□	1	□	□	□	□	Specifications
Tube inside diameter	04													Flow range 0 to 3L/min
	06													Flow range 0 to 8L/min
														0 to 200mL/min
									002					0 to 500mL/min
									005					0 to 1000mL/min
									010					0 to 2000mL/min
									020					0 to 3000mL/min
									030					0 to 4000mL/min
									040					0 to 5000mL/min
									050					0 to 7500mL/min
									075					0 to 8000mL/min
									080					6.35Ø × 4.35Ø tube (only 04A)
										2				9.53Ø × 6.35Ø tube (only 06A)
										3				
														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.

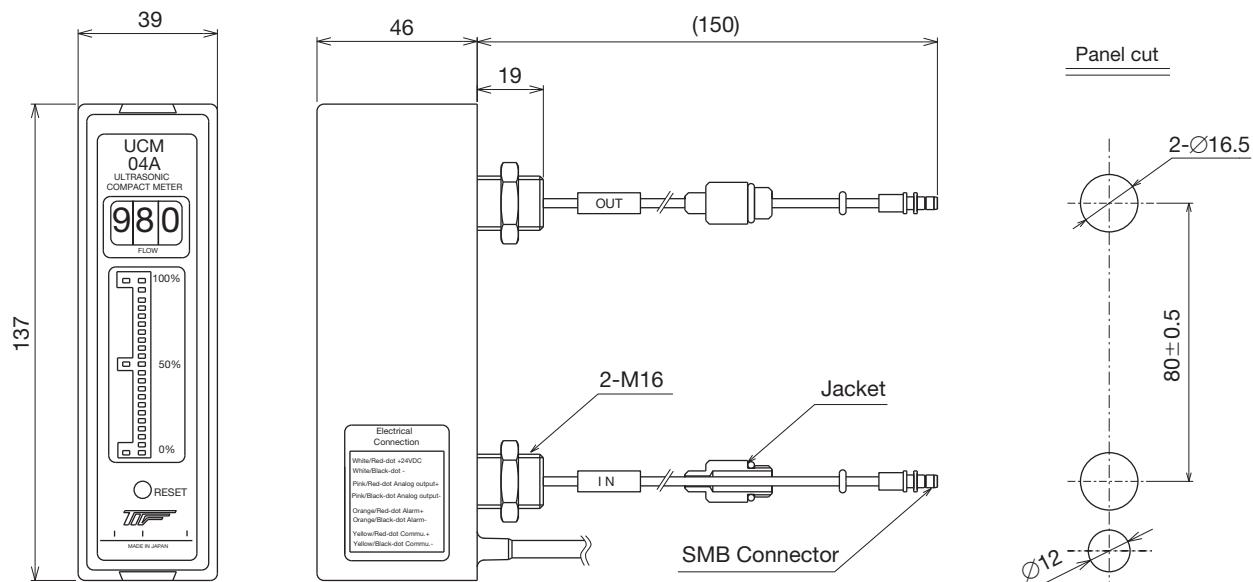
**MODEL CODE**

UCM	-□□	A	-□□□	-1	□□	□	-SP	□	Specification	
Detector size	04								UCUF-04M	
			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	

## ● 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

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

## 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

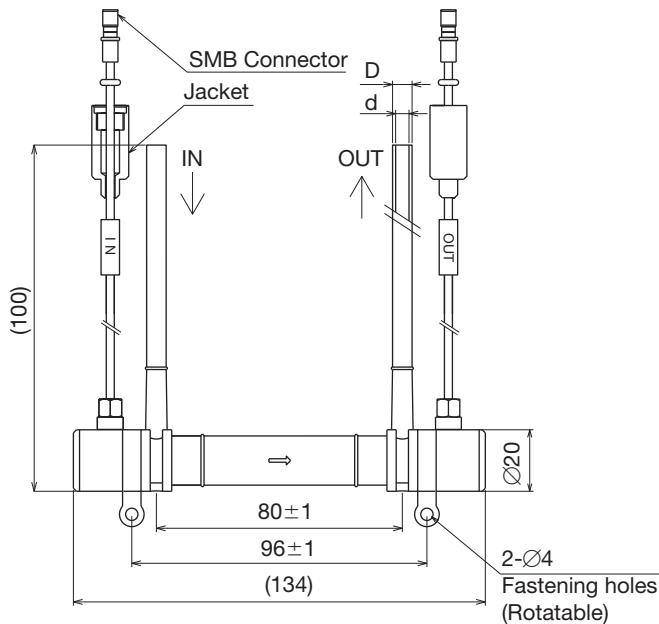
\* Standard cable length is 5m. The extension cable is available up to 30m.

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

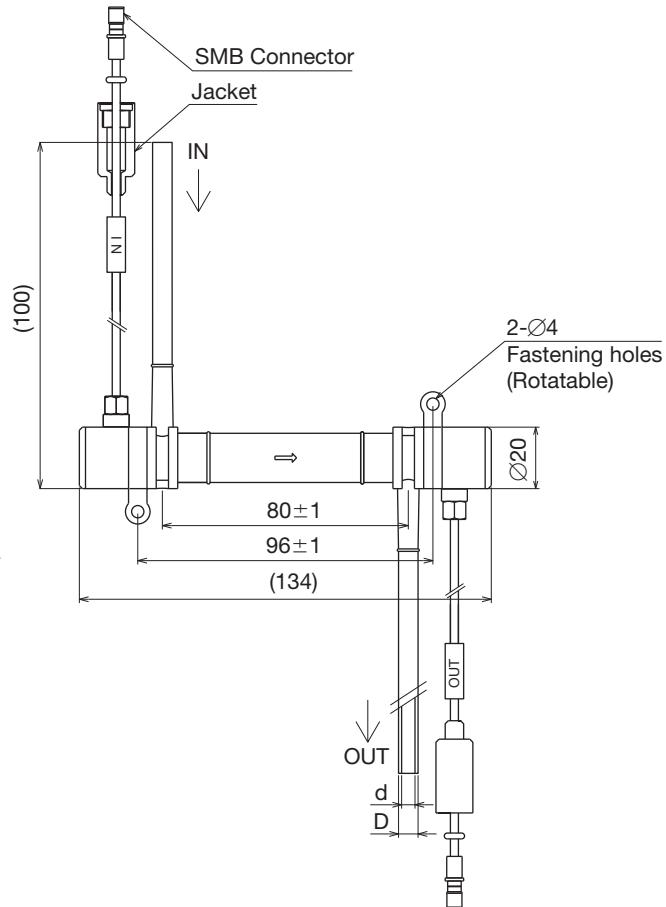
\* Add [/z] at the bottom of code if any other requirements are requested writing their description. Please consult TOKYO KEISO for their availability.

## DETECTOR DIMENSIONS

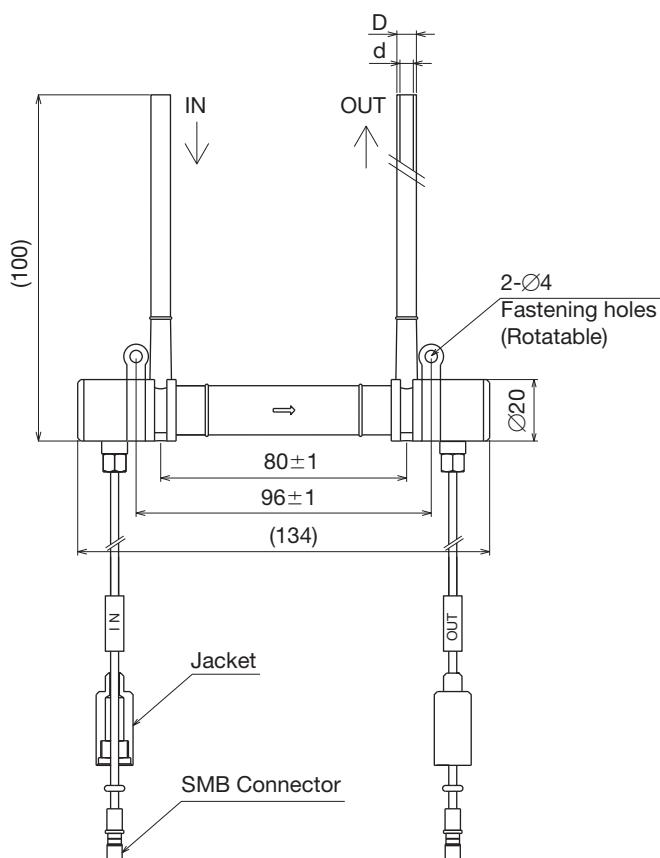
## UCUF-04M-UN (Standard)



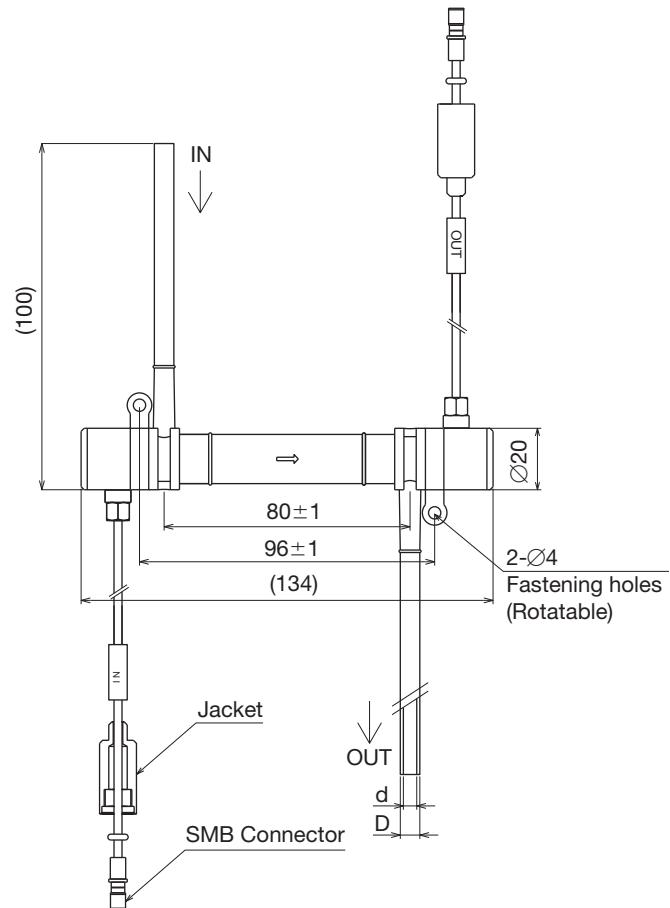
## UCUF-04M-ZN



UCUF-04M-UW



UCUF-04M-ZW



Model	Connection tube size	Dimensions (mm)		Mass (g) (Excluding cable)
		D	d	
UCUF-04M-□□	Ø1/4"	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 may generate 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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