 Reliability Creativity Service	<b>Product Specifications</b>	Ver. 9		1/4
	<b>Ultrasonic Flow Meter for Fuel Gas (External Power Supply 24 VDC Type)</b>	Model	UX [Nominal diameter] - [Pressure] DC - [Flow direction] - [Gas type]	

## 1. Specifications

◎ Model UX [Nominal diameter] - [Pressure] DC - [Flow direction] - [Gas type]

Nominal diameter	Pressure	Flow direction	Gas type
<input type="checkbox"/> 40	<input type="checkbox"/> 0 (Type without pressure sensor)	<input type="checkbox"/> L (Left to right)	<input type="checkbox"/> 13A (city gas 13A)
<input type="checkbox"/> 50	<input type="checkbox"/> 100 (Type with pressure sensor)	<input type="checkbox"/> R (Right to left)	<input type="checkbox"/> PRO (propane)
		<input type="checkbox"/> D (Downward)	<input type="checkbox"/> BTN (butane)
		<input type="checkbox"/> U (Upward)	<input type="checkbox"/> N2 (nitrogen)
			<input type="checkbox"/> AR (argon)

### Connection diameter

Model	UX40	UX50
Connection diameter	Rc1 · 1/2	Rc2

### Flow range (Actual flow)

[m<sup>3</sup>/h]

Model	UX40	UX50	
Gas type	13A, PRO, BTN, N2, AR	13A, N2, AR	PRO, BTN
Flow range	+1.6 to 80	+3.0 to 150	+3.0 to 80

### Accuracy

• Flow measurement accuracy (Actual flow)

[m<sup>3</sup>/h]

Model	UX40	UX50	
Gas type	13A, PRO, BTN, N2, AR	13A, N2, AR	PRO, BTN
Accuracy	±0.5%FS	+1.6 to 8.0	+3.0 to 15.0
	±1.0%FS		+3.0 to 15.0
	±4.0%RD*	+8.0 to 80	+15.0 to 150
			+15.0 to 80

\* In case a distance from an elbow of minimum 10D in the upstream side and 5D in the downstream side of the meter can be secured: ±2.0%RD

• Conversion accuracy

±1.5%RD (at 100 kPa, 23°C)

Conversion standard temperature  
 Conversion standard pressure

: -10 to +60°C (In unit of 1°C)

: 0.00 to 10.00 kPa (In unit of 0.01 kPa ,  
 gauge pressure)

Atmospheric pressure under working environment : 0.0 to 200.0 kPa (In unit of 0.1 kPa,  
 absolute pressure)

Low flow cutoff In case the measurement flow is lower than Qcut, 0 m<sup>3</sup>/h is displayed for instantaneous flow.


Qcut (can be changed by button operation and communication)

Model	UX40	UX50
Initial setting value	+0.3	+0.6

Unit: Correlated to unit of sub display value

Response-ability Instantaneous flow display 0.5 second (Smoothing by moving average method  
 value (initial setting value: 4 times))  
 Pressure display value 0.5 second (Smoothing by moving average method  
 (initial setting value: 10 times))  
 Temperature display value 0.5 second

"◎" are selectable items.

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Display

Main display : The following is switched and selected using the "left button".  
Accumulated flow volume (m<sup>3</sup>)·Trip accumulated flow volume (m<sup>3</sup>)

Sub display : The following is switched and selected using the "right button".  
Conversion flow type Instantaneous flow (m<sup>3</sup>/h)·Pressure (kPaG)·Temperature (°C)  
Actual flow type Instantaneous flow (m<sup>3</sup>/h)·Working gas pressure setting value (kPaG)·Temperature (°C)

Number of digits displayed

Main display

Forward accumulated flow volume [m<sup>3</sup>] : 00000000.0\* 9 digits  
Forward trip accumulated flow volume [m<sup>3</sup>] : 卜 0000000.0\* 8 digits

Unit: Selected by button operation and communication

When NORMAL flow is selected	When standard flow is selected	When actual flow is selected
NORMAL m <sup>3</sup>	Standard m <sup>3</sup>	m <sup>3</sup>

\*When Actual flow display (m<sup>3</sup>) is selected, "Forward accumulated flow volume" and "Forward trip accumulated flow volume" are displayed with 2 decimal places.

Sub display

Instantaneous flow [m<sup>3</sup>/h]: 000.00 (less than 1000) 5 digits  
0000.0 (1000 or more and less than 10000) 5 digits  
00000 (10000 or more) 5 digits

Unit: Selected by button operation and communication

When NORMAL flow is selected	When standard flow is selected	When actual flow is selected
NORMAL m <sup>3</sup> /h	Standard m <sup>3</sup> /h	m <sup>3</sup> /h


Pressure [kPa] : 0000.0 (Type with pressure sensor) 5 digits  
000.00 (Type without pressure sensor) 5 digits

\* In the type without pressure sensor, the working gas pressure setting value is displayed.

Temperature [°C]: 00.0 3 digits

Contact output Nch open drain output 2 channels

- Pulse output Nch open drain output 1 channel  
Pulse unit : 1000 L/P (Initial setting value) (Can be changed by button operation)  
(Can be changed to 10, 100, 1000 and 10000 L/P)  
Maximum load : 26.4 VDC·50 mA  
Duty : 20 to 80%  
Saturated voltage when ON : 1.5 V or less  
Current when OFF : 50 μA or less  
Maximum frequency : 10 Hz

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• Alarm output Nch open drain output 1 channel

Accumulated value upper limit alarm and flow upper or lower limit alarm  
(Either one is selected by button operation)

Accumulated value upper limit alarm

When the accumulated flow volume for 1 h becomes higher than the set accumulated flow volume upper limit value, an alarm signal is output.

(The accumulated flow volume upper limit value can be set by communication.)

\*The 1 h measurement is started when the power supply is turned on.

Flow upper and lower limit alarm output

When the instantaneous flow becomes higher or lower than the set flow, an alarm signal is output.

(The alarm output upper and lower limit flow and alarm judgment value hysteresis width can be set by button operation.)

Current output Output method : 4 to 20 mA Discharge method  
Output accuracy :  $\pm 0.1$  mA (Flow measurement accuracy, temperature measurement accuracy and pressure measurement accuracy are excluded)  
External load : 400  $\Omega$  or less  
(“Instantaneous flow”, “Pressure” and “Temperature” can be switched by a button operation and communication.)

When instantaneous flow is selected

[Forward flow display mode]

Zero output current : 4.0 mA (reverse flow to low flow cutoff)

Output current lower limit : 4.0 mA (clip at 4.0 mA)

Output current upper limit : 22.0 mA (clip at 22.0 mA)

Full scale flow (Can be changed by button operation and communication)

Model	Conversion flow type		Actual flow type	
	UX40	UX50	UX40	UX50
Initial setting value	300	600	80	150

Unit: Correlated to unit of sub display value

When pressure is selected (Conversion flow type only)

Output method : 4.0 mA: 0 kPa, 20.0 mA: 100 kPa (Fixed)

Output current lower limit : 4.0 mA (Clip at 4.0 mA)

Output current upper limit : 22.0 mA (Clip at 22.0 mA)

When temperature is selected

Output method : 4.0 mA:  $-10^{\circ}\text{C}$ , 20.0 mA: output as  $+60^{\circ}\text{C}$  (Fixed)

Output current lower limit : 2.0 mA (Clip at 2.0 mA)

Output current upper limit : 22.0 mA (Clip at 22.0 mA)

Communication Communication method : Half duplex communication method (RS485 communication)

Communication speed : 4800 bps, 9600 bps (Allowable range:  $\pm 1.0\%$ )


Synchronization system : Asynchronous

Bit configuration : 8 bits, no parity, stop bit length 1 bit

Bit transmission order : Order from b0 to b7 (Low order prioritized sending)

Error control : CRC

\*For the detailed communication specifications, download the communication specifications from our website.

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Measurable fluid	City gas (13A), butane (butane 70%, propane 30%), propane (propane 98%, butane 2%), nitrogen, argon								
Working fluid temperature	-10 to +60°C								
Working pressure	0 to 100 kPa (Gauge pressure)								
Working ambient temperature	-10 to +60°C 90%RH or less (There must be no condensation)								
Storage ambient temperature	-20 to +70°C 90%RH or less (There must be no condensation)								
Power supply	24 VDC (21.6 to 26.4 VDC) Power consumption: 2 W or less								
Protection structure	IP 64 (JIS C0920: dust-proof, splash-proof type) which can be installed outdoors								
Flow direction	Free in upward, downward, left to right, and right to left (Direction indicated by arrow is forward flow)								
Installation position	Horizontal or vertical (Cannot be installed with the position that the display portion faces downward or the cable introduction portion faces upward)								
Pressure drop	500 Pa or less (Air, standard atmospheric pressure, at maximum flow)								
Mass	<table border="1"> <thead> <tr> <th>Model</th> <th>UX40</th> <th>UX50</th> </tr> </thead> <tbody> <tr> <td>Mass</td> <td>4.6 kg</td> <td>6.2 kg</td> </tr> </tbody> </table>			Model	UX40	UX50	Mass	4.6 kg	6.2 kg
Model	UX40	UX50							
Mass	4.6 kg	6.2 kg							
Material	<ul style="list-style-type: none"> <li>○ Measurement portion:Engineering plastic (PPS etc.)</li> <li>○ Outer casing:Stainless alloy</li> <li>○ Sensor rubber : FVMQ (Fluoro silicone rubber)</li> <li>Display portion casing :Aluminum alloy</li> <li>*○ symbol indicates the gas contacting parts.</li> </ul>								
Standard working period	10 years (At ambient temperature of 20°C and ambient humidity of 65%RH) *10 years is not the warranty period.								
Accessories	M4 Hexagonal wrench, sunshade cover(Optional Accessories)								
Others	CE marking, UKCA marking, RoHS Directive compliant								

## 2. Precautions in handling

### 2-1. Installation environment

- (1) Although the high weather-proof electronic display is adopted, in case of installation at a place subjected to direct sunlight, provide a sunshade.
- (2) Do not install the flow meter at a place with much electromagnetic noise, in corrosive atmosphere, or with high humidity liable to cause dew condensation.
- (3) This product is designed for outdoor installation, but avoid areas where there is a risk of water submergence and water always splashes.
- (4) The GND (signal ground) is connected to the casing. Take the following measures, as necessary.
  - For DC24V type, use an insulation type power supply.
  - Install a pulse isolator to isolate signals between the flow meter and a receiver.
  - Use an insulating bolt, insulating washer, etc., to isolate the casing and pipes.
- (5) The meters do not conform to ATEX (explosion-proof) directive (2014/34/EU).

### 2-2. Piping conditions

- (1) In case propane or butane is the fluid to be flown, make sure to use the flow meter under conditions that the fluid does not become oil mist state due to re-liquefaction, etc.
- (2) Even though the meter is installed indoor, it cannot be installed with the position that the display portion faces downward or the cable introduction portion faces upward.
- (3) When installing it at the upstream or downstream of the governor, install it 10D or more away from

the governor.