 Reliability Creativity Service	Product Specifications		Ver. 2	1/6
	Ultrasonic Flow Meter for Air (External Power Supply Type)		Model	TRX [Nominal diameter] D / [Gas type] / 5P / [Degreasing process]

1. Specifications

⊙ Model TRX [Nominal diameter] D / [Gas type] / 5P / [Degreasing process]

Nominal diameter	Gas type	Degreasing process
<input type="checkbox"/> 25 (25A)	<input type="checkbox"/> C (factory air)	<input type="checkbox"/> No description (no process)
<input type="checkbox"/> 32 (32A)	<input type="checkbox"/> N (nitrogen)	<input type="checkbox"/> K (degreasing process)
<input type="checkbox"/> 40 (40A)		
<input type="checkbox"/> 50 (50A)		
<input type="checkbox"/> 65 (65A)		
<input type="checkbox"/> 80 (80A)		

Flow-rate range (Actual flow-rate) (Accuracy guaranteed scope)

Model	TRX25	TRX32	TRX40	TRX50	TRX65	TRX80
Flow rate range	±0.6 to 35	±1.1 to 65	±1.3 to 80	±2.5 to 150	±4 to 240	±5 to 300

[m³/h]

Accuracy (Actual flow-rate)

- Flow-rate measurement accuracy

Model	TRX25	TRX32	TRX40	TRX50	TRX65	TRX80	
Accuracy	±5%RD	±0.6 to 3.5	±1.1 to 6.5	±1.3 to 8	±2.5 to 15	±4 to 24	±5 to 30
	±2%RD	±3.5 to 35	±6.5 to 65	±8 to 80	±15 to 150	±24 to 240	±30 to 300

[m³/h]

- NORMAL conversion
± 2.5%RD (0.5MPa, ordinary temperature and, dry air or nitrogen)

Low flow cutoff (Actual flow rate) Can be Changeable by button operation (0 ≤ Setting value < Qmin)
[m³/h or less]


Model	TRX25	TRX32	TRX40	TRX50	TRX65	TRX80
Initial setting value	±0.1	±0.2	±0.2	±0.4	±0.6	±0.8

Response-ability Update interval : 0.5 second

Smoothing of instantaneous flow rate value by moving average method (Initial setting value: 4 times)

"⊙" are selectable items.

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Display

Main display: The following is switched and selected using the "left button".

[When forward flow display mode ^{*1)} is selected]

Accumulated flow volume (Forward flow) (m³)·Trip accumulated flow volume (Forward flow) (m³)·Instantaneous flow-rate (L/min)^{*2)}

[When reverse flow display mode ^{*1)} is selected]

Accumulated flow volume (Forward flow) (m³)·Accumulated flow volume (reverse flow) (m³)·Instantaneous flow-rate (L/min)^{*2)}

Sub display: The following is switched and selected using the "right button".

Instantaneous flow-rate (m³/h)·Pressure (kPa) (gauge pressure)·Temperature (°C)

*1) The display mode is selected by button operation.

*2) If an instantaneous flow-rate (L/min) is displayed, the main display (Accumulated flow rate) and sub display (Instantaneous flow rate (m³/h) , pressure (kPa) and temperature (°C)) are not displayed.

Number of digits displayed Main display

Accumulated flow volume (Forward flow) [m3] : 00000000.0 Nine digits
 Trip accumulated flow rate (Forward flow) [m3] : † 0000000.0 Eight digits
 Accumulated flow rate (Reverse flow) [m3] : -0000000.0 Eight digits
 Instantaneous flow rate [L/min] : 00000.00 Seven digits

Unit: Selected by button operation and communication

When NORMAL flow is selected	When standard flow is selected	When actual flow is selected
m ³ (NORMAL)	m ³ (Standard)	m ³

Note) In case actual flow display (m³) is selected for "accumulated flow volume (forward flow)", "trip accumulated flow volume (Forward flow)", and "accumulated flow volume (Reverse flow)", it is displayed to the second decimal point.

Sub display


Instantaneous flow-rate [m³/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

When NORMAL flow is selected	When standard flow is selected	When actual flow is selected
m ³ (NORMAL)	m ³ (Standard)	m ³

Pressure [kPa]: 0000.0 5 digits

Temperature [°C]: 00.0 3 digits

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Electric current output Output method : 4-20 mA Two-wire type
Power supply voltage : 24 VDC±10% Power consumption: 0.6 W or less
Output accuracy : ±0.5%FS
External load : 400 Ω or less

("Instantaneous flow-rate", "Pressure", and "Temperature" can be switched by button operation.)

When instantaneous flow-rate 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)

[Forward/reverse flow display mode]

Zero output current : 12.0 mA (Within low flow cutoff)
Output current lower limit : 3.5 mA (Clip at 3.5 mA)
Output current upper limit : 22.0 mA (Clip at 22.0 mA)

Full scale flow rate (Can be changed by button operation)


Model	TRX25	TRX32	TRX40	TRX50	TRX65	TRX80
Initial setting value	300	600	700	1200	2000	2500

When pressure is selected

Output method : Output as 4.0 mA: 0 MPa, 20.0 mA: 1 MPa (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 : Output as 4.0 mA: -10°C, 20.0 mA: +60°C (Fixed)
Output current lower limit : 3.5 mA (Clip at 3.5 mA)
Output current upper limit : 22.0 mA (Clip at 22.0 mA)

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Contact output Open drain output 2 channels

Output 1 : Unit pulse output (Forward flow)
 Output 2 : Unit pulse output (Reverse flow), flow rate upper and lower limit alarm output, body error output, telegram output
 (Either one is selected by button operation)
 Maximum load : 24 VDC-50 mA
 Saturated voltage when ON : 1.5 V or less
 Current when OFF : 50 μ A or less

Pulse output

Unit pulses in accordance with increase of the accumulated flow volume are output.
 Pulse unit : 100 L/P (Initial setting value)
 (Can be changed by button operation)
 Maximum output frequency: 10 Hz
 Output type: One shot or duty (Can be changed by button operation)
 One shot pulse width: 50, 100, 125, 250, 500 ms (Can be changed by button operation)
 Duty: 35 to 65%

Flow-rate upper and lower limit alarm output

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

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

Body error output

An alarm signal is output when a flow-rate measurement error, pressure value error, temperature value error or communication circuit error is detected.

Telegram statement

Measurement data are transmitted using telegrams at regular time intervals (10 minutes)


Telegram type: Asynchronous 2400 bps

Transmitted data: Accumulated flow volume (Forward flow), accumulated flow rate (Reverse flow), instantaneous flow rate, pressure, temperature and error information

Measurable fluid : Air (Mainly factory air) or nitrogen
 Working fluid temperature : -10 to +60°C, 90%RH or less
 Working pressure : 0 to less than 1MPa (Gauge pressure)
 Working environment : -10 to +60°C, 90%RH or less (There must be no condensation)
 Storage environment : -20 to +70°C (There must be no condensation)
 Power supply : 24 VDC \pm 10% Power consumption: 1.5 W or less
 Flow direction : Forward and reverse flows can be measured (Direction indicated by the arrow is forward flow.)

Connection type	Model	TRX25	TRX32	TRX40	TRX50	TRX65	TRX80
	Connection type	Taper pipe thread (Screw-in)		Wafer (Installed and tightened between JIS10K flanges)			

Installation position : Horizontal (LCD display portion faces upward) or vertical
 Pressure drop : Extremely low (Equivalent to a straight pipe)
 Protection structure : IP 64(JIS C0920: dust-proof, splash-proof type) which can be installed outdoors

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Mass

Model	TRX25	TRX32	TRX40	TRX50	TRX65	TRX80
Mass	1.5 kg	1.4 kg	1.0 kg	1.2 kg	1.4 kg	1.7 kg

Material

- Measurement portion: Engineering plastic (Such as PPS), aluminum alloy
- Outer casing : Aluminum alloy
- Sensor rubber : FVMQ (Fluoro silicone rubber)

Display portion casing : Aluminum alloy

*○ symbol indicates the gas contacting parts.

In the case of a degreasing process product, a degreasing process has been performed for gas contacting parts.

(For details, refer to "3. Degreasing process".)

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
- Centering collar (Wafer type only)
- Flange gasket (Wafer type only)
- Bolt set (Wafer type only)

Power supply / output cable (Six-core cable) [option]

◎ Cable length: □ 5 m □ 20 m

- Wire connection: Open drain output 1..... White
- Open drain output 2..... Yellow
- 4 to 20 mA output (+)..... Red
- 4 to 20 mA output (-)..... Green
- Communication Brown
- GND..... Black

Items with "◎"

	Product Specifications		Ver. 2	6/6
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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 .
- (2) Do not install the flow meter at a place with much electromagnetic noise or in corrosive atmosphere.
- (3) This product is designed for outdoor installation, but avoid areas where there is a risk of water submergence and water always splashes.
- (4) When opening or closing a valve before and after the flow meter, open or close the valve not all at once but gradually.

2-2. Piping conditions

- (1) To realize stable measurement, it is recommended to install a straight pipe portion of 20 D or more (D: nominal diameter) at the upstream and downstream sides of the flow meter.
- (2) In case large amount of mist, dust, etc., are contained in the fluid, install the flow meter by vertical piping. In the case of horizontal piping, install the flow meter so that the display part faces upward.
- (3) In case installation of the product near a pressure reducing valve or a flow adjusting valve is planned, contact us in advance.

3. Decreasing process

In the case of a degreasing process product, the followings are the degreasing processes for the gas contacting parts.

- (1) Ultrasonic cleaning degreasing process by degreasing cleaning liquid
For gas contacting parts (Other than the following specified parts), after immersion in degreasing cleaning liquid and performing ultrasonic cleaning, the cleaning liquid attached to the parts surfaces are to be removed with tap water (Running water).
- (2) Degreasing process by alcohol wiping
After wiping the following specified parts with hand towels containing alcohol, they are wiped again with hand towels containing tap water.
<Specified parts>
Ultrasonic sensor, pressure sensor unit's pressure introduction portion outside wall surface, heat shrinkable tube