



Confidence, Creativity, and
Service

Ultrasonic Flowmeter for Fuel Gas

AS Series

Version 2

Measures gas consumption at high sensitivity
and high precision.

AS-40

AS-100

Wide rangeability of
1:400

Long built-in battery life

No moving parts for greater
maintainability

Easier-to-Use Ultrasonic Technology

Ultrasonic Flowmeter for Fuel Gas AS Series



Wide rangeability of 1:400
Wide rangeability of 1:400 from the sensible flow rate (measurement starting flow rate) to the maximum flow rate is achieved. This wider rangeability allows for correct measurement with low flow rate.



Long built-in battery life
This meter runs with a built-in lithium battery and no electric construction is necessary. It can continuously work over a long period of time (typically six years under normal measurement mode*).



Zero pressure loss, zero energy loss
Ultrasonic is used for the measurement principle. There is no obstacle inside the measurement tube so the pressure loss is zero, resulting in higher durability.



Enhanced logging function NEW
Eleven data log items including timestamp, temperature, pressure, momentary flow rate, accumulated flow rate, etc. can be stored for up to 2200 sets. Data retrieval interval can be set to 5 minutes to 24 hours.



Remote measurement
RS485 output in addition to unit pulses allows for remote indication and energy management.



Normal conversion function
Built-in normal conversion function is provided to indicate the gas consumption flow rate, temperature, and pressure converted into the normal state, allowing for more detailed energy management.



Easy-to-read indicator
A large-sized digital indicator is used to show the accumulated and momentary flow rates at the same time. The indicator can be rotated by 90 degrees on the spot.

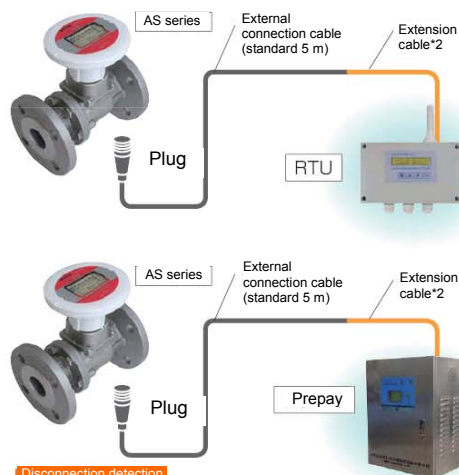


Local setting of atmospheric pressure NEW
Gas measurement with the gauge pressure in addition to the absolute pressure is now available.

*1. Design specifications under normal use conditions.



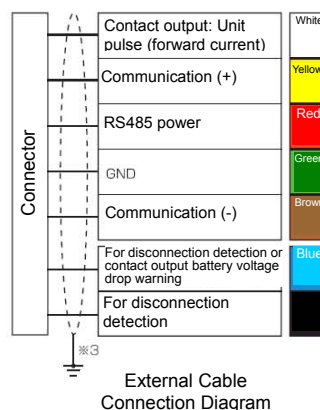
System configuration example



Disconnection detection function can be selected.

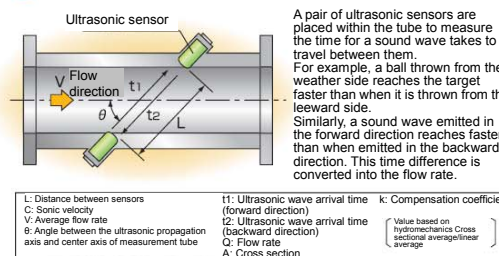
*2 Use a steel wire tube for noise prevention.

Connection between power supply and indicator



*3 The main body and GND are electrically common. Use an isolated power supply and indicator as required.

Measurement principle



By putting the arrival time from the upstream to the downstream in t1 and the arrival time from the downstream to the upstream in t2,

$$t_1 = \frac{L}{C + V \cos \theta} \quad t_2 = \frac{L}{C - V \cos \theta}$$

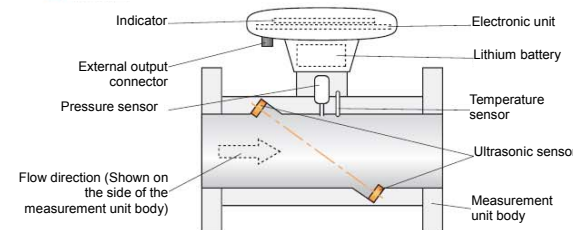
By calculating the reciprocal difference of the arrival time, the term for sonic velocity is erased and V can be obtained.

$$V = \frac{L}{2 \cos \theta} \left(\frac{1}{t_1} - \frac{1}{t_2} \right)$$

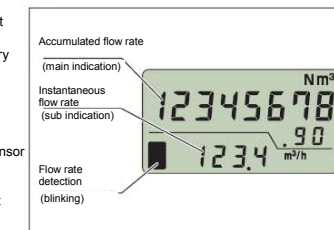
Therefore, it can be seen that there is no influence by the sonic speed. By multiplying the cross section and compensation coefficient, the flow rate Q can be obtained.

$$Q = A \cdot K \cdot V$$

Configuration diagram



Indicator



Product Specifications

Product specifications											
Model		Temperature compensation model			Temperature and pressure compensation model						
		AD-25	AS-32	AS-40	AS-50	AS-80	AS-100	AS-150	AS-200		
Caliber		25A	32A	40A	50A	80A	100A	150A	200A		
Power supply		Built-in lithium battery									
Life *1		10 years									
Target gas		Natural gas, air									
Pressure (for each pressure sensor)		Without pressure compensation:AS-L-0 Absolute sensor atmospheric pressure to 0.2 MPa Specifications:AS-L-200A-B Absolute sensor atmospheric pressure to 0.5 MPa Specifications:AS-L-500A-B Gauge pressure sensor atmospheric pressure to 0.2 MPa Specifications: AS-L-200G-B Gauge pressure sensor atmospheric pressure to 0.5 MPa Specifications: AS-L-500G-B					Without pressure compensation: AS-□-0 Absolute sensor atmospheric pressure to 0.2 MPa Specifications: AS-□-200A-B Absolute sensor atmospheric pressure to 0.5 MPa Specifications: AS-□-500A-B Absolute sensor atmospheric pressure to 1.0 MPa Specifications: AS-□-1000A-B Gauge pressure sensor atmospheric pressure to 0.2 MPa Specifications: AS-□-200G-B Gauge pressure sensor atmospheric pressure to 0.5 MPa Specifications: AS-□-500G-B Gauge pressure sensor atmospheric pressure to 1.0 MPa Specifications: AS-□-1000G-B				
		Flow rate range									
		Flow rate measurement precision *2	+5%rs(m³/h)	+0.7-7	+1.3-13	+1.6-16	+3-30	+6-60	+10-100	+24-240	+40-400
			+2%rs(m³/h)	+7-35	+13-65	+16-80	+30-150	+60-300	+100-500	+240-1200	+400-2000
		Low flow cut off (start flow rate)*3	Flow rate (m/s)	0.05 m/s or less							
Actual flow rate (m/s)	0.1		0.2	0.2	0.4	0.8	1.5	3.2	5.7		
Fluid temperature and humidity		-20 - +60°C, 90% or less									
Pressure loss		Almost zero (similar to straight tube part)									
Indicator	Accumulated flow rate	Accumulated flow rate: 00000000.0 (9 digits/m³ or Nm³)					Accumulated flow rate: 0000000000 (10 digits/m³ or Nm³)				
	Instantaneous flow rate*4	(1) Maximum indication value: ±19999Nm³/h (converted flow rate) (Two decimal placed for a value less than 200, one decimal place for a value from 200 to less than 2000, integer only for a value of 2000 or more)					(2) Maximum indication value: ±19999Nm³/h (actual flow rate)				
	Temperature*4	00.0°C (3 digits)									
	Pressure*4	0000.0kPa (5 digits)									
Output	Contact output	Open drain output: Unit pulse (forward current), pulse unit: 100,1000,10000 (L/P or NL/P)									
	Message transmission	RS485 MODBUS/RTU									
	Battery voltage drop warning output, disconnection detection function	Battery voltage drop warning is output in 24 hours after detecting the low battery state. Disconnection detection function can be selected insatd.									
	Connection method		R1	R1-1/4	GB/T9119-2000 PN1.6MPa flange						
Mounting orientation		Horizontal, vertical									
Mount location		Indoor, outdoor (protection level IP 64 or equivalent)									
Case material		Aluminum alloy			Stainless alloy						
Gas contact part material		Aluminum alloy, engineering plastic			Stainless alloy, engineering plastic						
Weight		1.8ka	1.7 ka	7.6 ka	9.6 ka	13.3 ka	13.2 ka	20.4 ka	35.4 ka		

*1. Design specifications under normal use conditions.

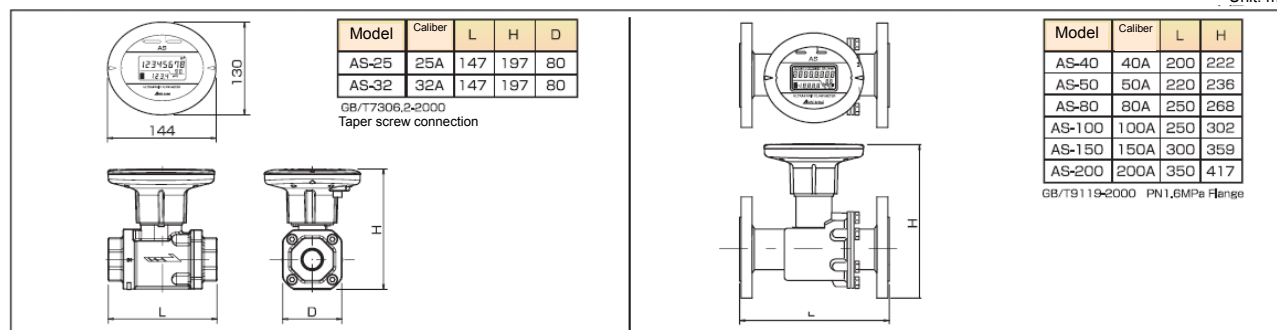
*2. The flow rate measurement range is ±5% RS: Inclusive and not inclusive and ±2% RS: Inclusive for both ends.

*3. When the flow rate is less than 0.25% of the maximum flow rate, the momentary flow rate is indicated as 0 m³/h. For the normal conversion type, the value is cut at the normal conversion flow rate in 0.05 m/s units.

*4. Automatically switched in every 4 seconds.

External dimensions

Unit: mm



Conversion table for actual flow rate and standard flow rate (for absolute pressure 0.54 MPa at 30°C)

	AS-40(40A)	AS-50(50A)	AS-80(80A)	AS-100(100A)	AS-150(150A)	AS-200(200A)
	Maximum	Maximum	Maximum	Maximum	Maximum	Maximum
Actual flow rate (m³/h)	80	150	300	500	1200	2000
Standard flow rate (Nm³/h)	382	716	1432	2385	5726	9543

[Formula]

$$\text{Standard flow rate (Nm}^3/\text{h)} = \frac{\text{Absolute temperature at 20}^\circ\text{C (273.15K+20K)}}{\text{Absolute temperature of use temperature (273.15K+t)}} \times \frac{\text{Absolute pressure of use pressure (P)}}{\text{Absolute pressure at 1 atm (0.10133 MPa)}} \times \text{Actual flow rate (Nm}^3/\text{h)}$$

Specifications in this catalog are as of November 2014.



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This catalog uses soy ink and recycled paper.

Note

The product specifications are subject to change without notice for improvement. If you have a catalog or material which is not up-to-date, contact us for the latest catalog or material or for the detailed information.

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1.3

GK-AS-000