OVAL

GOOD DESIGN AWARD 2024

Battery-powered Clamp-on Type Ultrasonic Flowmeter for Liquid

UC-1

No piping work required

Clamp-on system (8 diameters can be measured with one model)

No wiring work required

On-site display type

No external power supply required

10-year operation with built-in battery

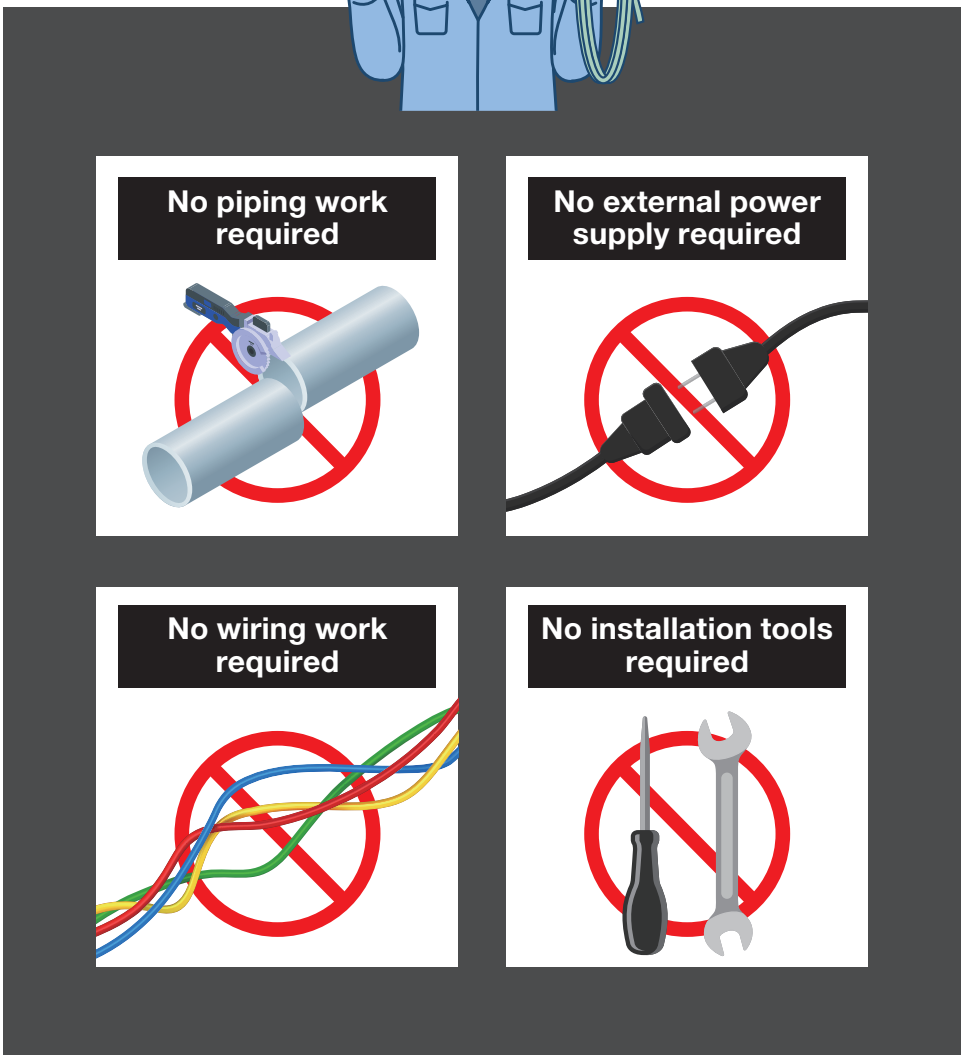
No installation tools required

Hand-tightened resin bands

Clamp-on flowmeter to the next stage

“Completely construction-free” flowmeter UC-1

Have you ever given up on installing a flowmeter because of the cost and time required for piping work?



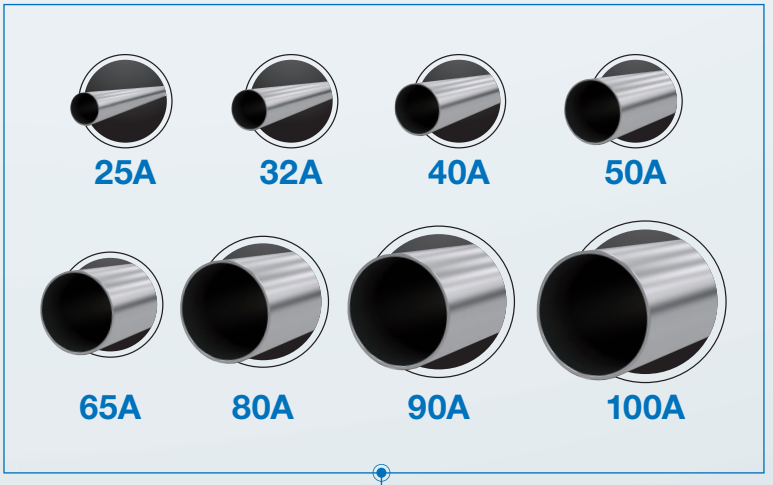
The clamp-on system

eliminates the need for construction work!

Since this flowmeter is attached to the outside of a pipe to measure the flow rate, there is no need to cut the pipe, significantly reducing piping work costs. Furthermore, there is no pressure loss due to the flowmeter, so energy and cost losses can be cut.

The clamp-on system allows installation without cutting the piping, and eight diameters of pipes from 25A to 100A can be measured with one model!

Generally, integrated clamp-on type ultrasonic flowmeters can measure one or two diameters with one model, but our UC-1 can measure eight diameters of pipes from 25A to 100A (25, 32, 40, 50, 65, 80, 90 and 100A) with one model by using its sensor position sliding mechanism.



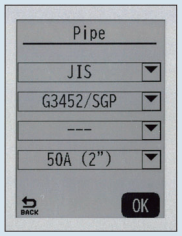
Determination of sensor sliding position by simple operation

The sensor sliding position is easily determined and displayed by simply entering piping and fluid specifications.

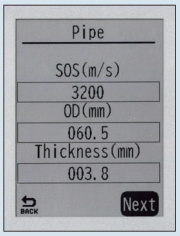
❶ Input of piping specifications

Can be set from three patterns: standards, manual input, and simple setting.

Select from standards



Select from manual input



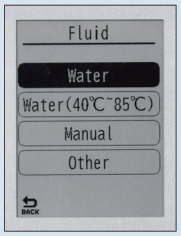
Sound velocity, outer diameter, thickness, and lining information

Select from simple setting

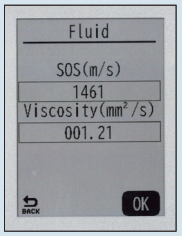
❷ Input of fluid specifications

Can be set from two patterns: preset, and manual input

Select from preset

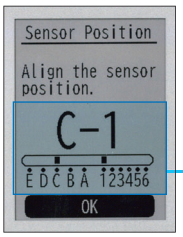


Select from manual input

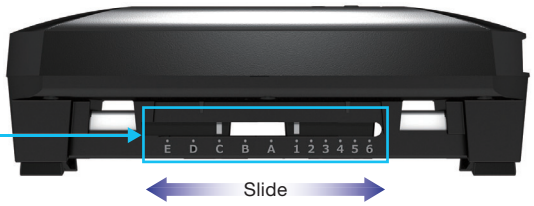


Sound velocity of fluid, and kinematic viscosity coefficient

❸ Sensor position determination



Slide the sensor to the displayed sensor position and attach the flowmeter to the piping.



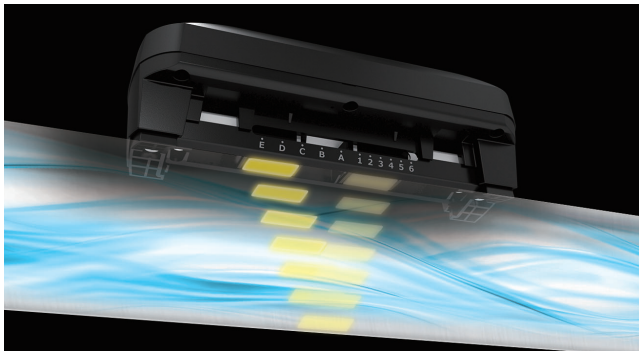
Flow direction can be changed without removing the flowmeter

Flow direction can be easily changed by operating the display screen without removing the flowmeter even after it has been attached to the piping.

Measurement principle (ultrasonic wave propagation time difference system)

Ultrasonic waves are transmitted from the sensor. The transmitted ultrasonic waves propagate slower when they go against the flow, and faster when they follow the flow. Ultrasonic waves are transmitted and received alternately across the fluid in the pipe diagonally, and the difference in the propagation times between two ultrasonic waves is converted to a flow rate.

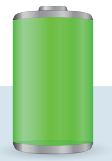
Since ultrasonic waves propagate by penetrating materials, the flow rate inside a pipe can be measured by attaching this flowmeter to the outside of the pipe.



Built-in battery enables long-term operation!

Built-in battery powered operation (battery life: 10 years※) eliminates the need for an external power supply, reducing electrical work costs.

※: Battery life varies depending on the operating environment. Also, the product life is the same as the battery life.

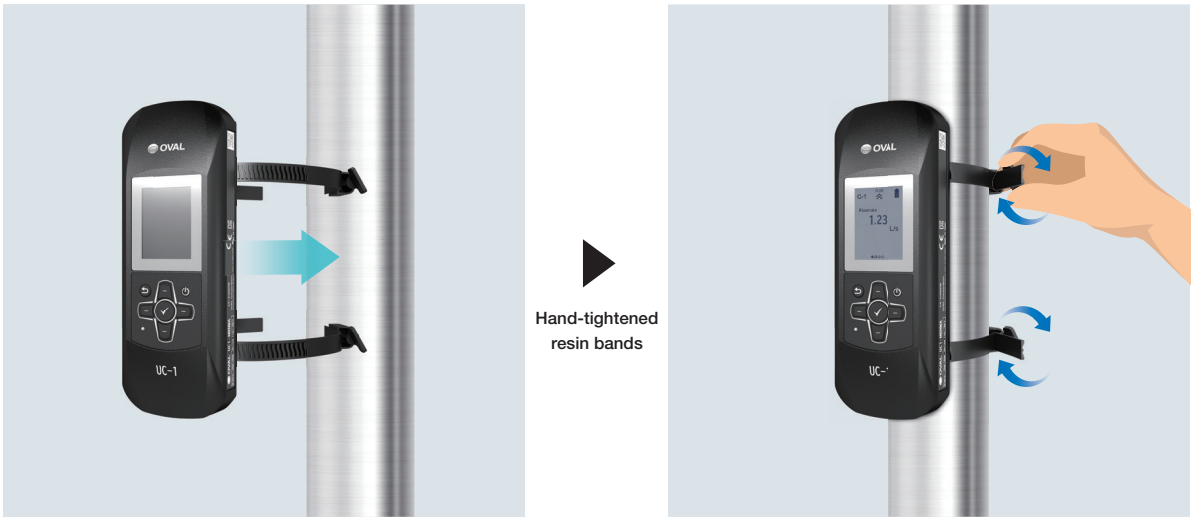


Consumption of the built-in battery can be checked on the flowmeter display.

Flowmeter display

Hand-tightened resin bands eliminate the need for installation tools such as screwdrivers!

Since no fixing metal fittings and grease are required, anyone can easily attach the flowmeter with only the flowmeter UC-1 and the accompanying attachment bands.
Since the bands are made of resin, there is no risk of injury such as cutting your hand. General metal bands can also be used.



UC-1 Specifications

Item		Description			
Piping※1	Nominal size	25-100A (8 diameters can be measured with one model)			
	Type	Metal pipes (SUS, SGP, etc. under Sch40) and resin pipes (PVC, etc.) in accordance with JIS/ASME standards			
	Lining	None, or polyethylene, vinyl chloride, etc.			
Metering objects※1	Type	Liquids in general (hot water, cold water, oils, etc.)			
	Temperature range	–20 to +85°C (with derating for operating ambient temperature)			
Metering system		Ultrasonic wave propagation time difference system			
Metering range		0.03 to 10 m/s			
Flow range※2 (Reference flow speed: 0.03 to 10 m/s)		Supported diameter		Flow range	
		Nominal size A	Nominal size B	Min. flow rate [m^3/h]	Max. flow rate [m^3/h]
		25A	1B	0.07	22.80
		32A	1 1/4B	0.12	38.92
		40A	1 1/2B	0.16	52.28
		50A	2B	0.26	85.22
		65A	2 1/2B	0.42	139.73
		80A	3B	0.59	195.25
		90A	3 1/2B	0.78	258.41
		100A	4B	0.99	331.63
Metering cycle		1s			
Metering accuracy※3, 4		±3.0% of RD (10 to 100% of max. flow rate), ±0.3% of FS (0.3 to 10% of max. flowrate)			
Repeatability※3		±1.0%			
Operating ambient temperature		–20 to +60°C (key operation below 0°C is not covered by operation guarantee)			
Operating ambient humidity		90% or less (however, no condensation inside the housing)			
Protection class		IP65 (available for outdoor use, but direct sunlight must be avoided)			
Power supply		Dedicated battery (manganese dioxide lithium primary battery)			
Battery life		Battery life: Approx. 10 years※5 (when measuring in stationary position, in energy saving mode, and at an average ambient temperature of 25°C)			
Output Select from 2 types	None (UC1-MBN)	No external output			
	No-voltage contact output (UC1-MBC)	NPN open collector			
		Applied voltage and current	Max. voltage: 26.4VDC, Max. current: 0.25A		
		Number of channels	3 channels		
		Functions (Set optionally from the functions listed on the right)	(1) Normally open, (2) Normally closed, (3) Alarm (output when any of 4 to 10 occurs), (4) Upper limit alarm, (5) Lower limit alarm, (6) Battery voltage reduction, (7) No echo received, (8) Reverse flow, (9) Maximum flow rate exceeded, (10) Accumulated pulse output disabled, (11) Error, (12) Accumulated pulse output (pulse width: 10 to 100ms… Default value: 10 ms)		
Display	Display	Graphic liquid crystal (reflective liquid crystal), Resolution: 240 × 320			
	Menu operation	Flowmeter parameters and operation can be set with the up, down, right, left, enter and return keys.			
	Measured values	Measured value display can be set manually in four directions.			
		Instantaneous flow rate	Max. 4 digits (decimal point position is automatically determined by pipe diameter and unit)		
		Accumulated flow rate	m^3	Pipe inner diameter: 56.05 mm or less…6 digits in integer part and 2 digits in decimal part	
				Pipe inner diameter: over 56.05 mm…7 digits in integer part and 1 digit in decimal part	
			L, and others	8 digits in integer part	
		Conversion to money amount	Flow rate is converted to an arbitrary money amount and displayed (default setting: function OFF)		
			Unit: 3-digit alphabetic characters	6 digits in integer part (value obtained by multiplying an arbitrary coefficient by the accumulated flow rate)	
	Measurement screen update cycle (during energy saving mode)※6	None	Set from the following 2s, 10s, 1min, 5min, 10min (initial value: 2s)		
		No-voltage contact output			
	LED	Red × 1 point (flashes when alarm occurs, and lights up when error occurs)			
Materials	Housing	Polycarbonate and glass filler (20%)			
	Fittings	Polyamide (PA66)			
Approx. weight		No output: Approx. 450g, No-voltage contact output: Approx. 460g			

※1: Homogenous liquid through which ultrasonic waves propagate and which does not contain a large amount of air bubbles (Measurement may not be possible depending on the piping material or diameter, or sound velocity of the liquid)

※2: The above flow ranges are reference values for Sch10S size according to JIS G 3459: Stainless Steel Pipes.
The actual flow range varies depending on the inner diameter of the pipe used.

※3: Guaranteed values based on our inspection environment
Errors may occur depending on the type and condition of the customer's piping, type of fluid, fluid temperature, etc.

※4: Accuracy when electrical noise is applied to the cable (under EN/IEC 61000-4-6 environment of EN/IEC 61326-1) is as follows (only for no-voltage contact pulse specification). ±6.0% of RD (10 to 100% of max. flow rate), ±0.6% of FS (0.3 to 10% of max. flow rate)

※5: Battery life varies depending on the operating conditions. (the above is not a guaranteed value)

※6: When key operation is performed, update is performed every 1 second regardless of output specifications (if no key operation is performed for a certain period of time, the flowmeter automatically shifts to the energy saving mode).

(Note) This product cannot be used in explosionproof areas. In addition, it cannot be used for "transaction and certification" purposes.

OVAL Corporation
3-10-8 Kamiochiai, Shinjuku-ku, Tokyo 161-8508
Phone: +81 3-3360-5121 FAX: +81 3-3365-8605
https://www.oval.co.jp/english

CAT.No.CBE011E-1

2410 - - - - 2410(2000)S