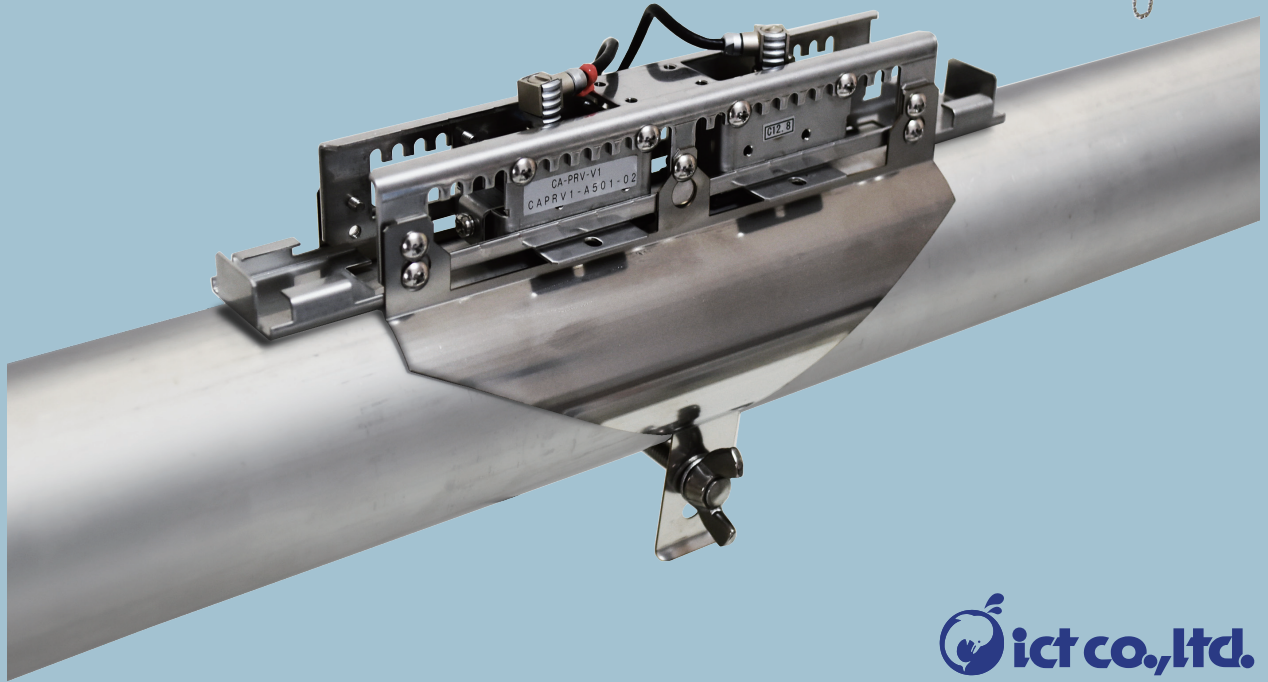


Ultrahigh Accuracy & Temperature Measurement

Caloriена®

The Clamp-on Type Ultrasonic Flow Meter



Technical Datasheet

Features

With the Caloriена, flow rate measurement from outside the pipe is made simple. One sensor unit is compatible with many different pipe sizes.

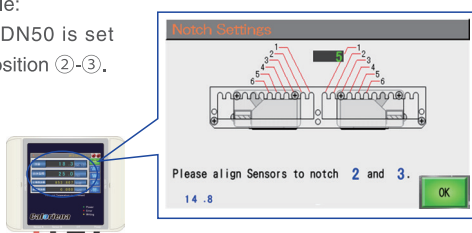
The Caloriена's ultra-high resolution (0.001 m/s) allows it to measure even the slightest of flows. With this accuracy it is possible to detect water temperature without direct contact, therefore, it can also be applied for energy management.

The scope of application is greater with Caloriена compared to that of electromagnetic flow meters.

It can be used immediately without the necessity to install multiple measuring instruments.

Sensors can be positioned by adjusting them to the notch position displayed on the monitor.

For example:
Pipe size DN50 is set
to notch position ②-③.



Components

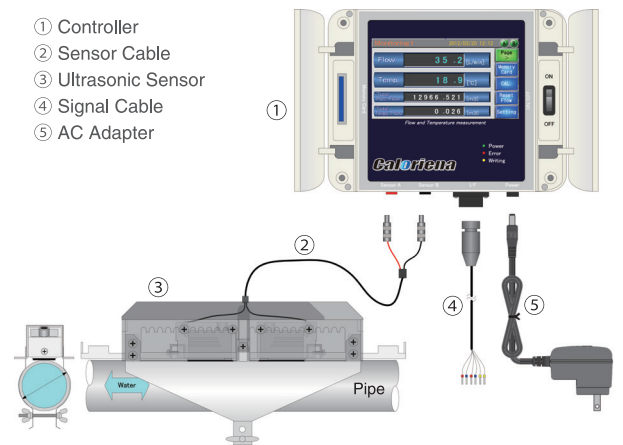
Controller unit

The controller unit is connected to the ultrasonic sensor via sensor cables. It is used to set parameters (pipe information, measurement method, output method) by touch panel.

Sensor Unit

The Sensor unit consists of the ultrasonic sensors and a mounting bracket. It can be easily attached to any pipe by 1 butterfly screw.

- ① Controller
- ② Sensor Cable
- ③ Ultrasonic Sensor
- ④ Signal Cable
- ⑤ AC Adapter



■ General Specifications

• Measurement

Measurement Method	Transit-time measurement
Measurement Requirements	Full pipe with no air bubbles, solid particles or impurities.
Target Liquids	Water, Pure water, Juice, Milk etc.
Installation Method	Clamp-type with mounting bracket or Velcro Strap 1 screw for pipes ≤DN100 Velcro Straps for pipes ≥DN125
Flow Velocity Range	0.000 ~ ±10.0 [m/sec] Depends on pipe diameter
Minimum Flow Velocity Resolution	0.003 [m/sec] / @50A Depends on pipe size and mounting bracket
Flow Rate Accuracy	V0-Type ±1.5%/RD (Velocity ≥ 0.5 [m/sec]) ±3.0%/RD (Velocity ≤ 0.5 [m/sec])
	V1 and V2-Type ±0.6%/RD (Velocity ≥ 0.5 [m/sec]) ±2.0%/RD (Velocity ≤ 0.5 [m/sec])
	Depends on pipe size
Repeatability	V0-Type ±2%
	V1 and V2-Type ±1%

• Pipe

Pipe Material	Stainless steel (SST, AISI, SUS), Polyvinyl chloride (PVC), Carbon steel (SGP), Vinyl chloride (VU), Polyethylene (PE), etc.
Pipe Diameter	DN6 ~ DN300 (1/8" ~ 12") Mounting bracket differs with pipe size

(*1) This function automatically detects pipe thickness when pipe inner diameter cannot be determined.

Pipe Thickness *1 Auto Detection	Accuracy to actual pipe thickness within ±20% or 0.2mm (accuracy)
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• Temperature

(*2) This function measures the water temperature.

Temperature Range *2	0.0 ~ 50.0 [°C] Does not apply to resin pipes
Temperature Measurement Method	Velocity-temperature relationship Applicable to V1 and V2 sensors and water only
Temperature Resolution	0.1 [°C]
Temperature Accuracy	±1.0 [°C] (up to 50.0 [°C])

■ Controller Specifications

Physical dimensions	H130-W160-D60 Excluding protrusions
Weight	Approx. 1kg Excluding sensor and cables
Enclosure Base Material	ABS resin
Installation	Screw or DIN rail
Operating Temperature Range	0 ~ 45°C Without condensation
Storage temperature	-10 ~ 60°C
Power supply	DC12V (DC5V ~ DC26V)
Power consumption	Approximately <5VA
User Interface	4.3" color touch panel (LCD) QVGA (480×272)
	Bluetooth For mobile device application

• Output

Analog Output	[Ch.1] Flowrate DC4 ~ 20mA (DC 0 ~ 24mA) Programmable Max resistance 500Ω
	[Ch.2] Velocity (±5.000m) or Water temperature (0~100°C) Selectable DC0 ~ 5V
Digital Output (PhotoMOS Relay) DC30V 1A	[Ch.1] Positive flow rate pulse or Negative flow rate pulse
	[Ch.2] Measurement Error

• Data

Recording Media	SD Card (MAX 2GB)
Data Format Storage	CSV format onto inserted SD card User sets writing frequency
Computer Communication Interface	RS485(Modbus RTU) 9,600~38,400bps (Optional with SD)
Internal Memory	Nonvolatile memory Internal FRAM
Date and Time	Built in Circuit board Battery replacement unnecessary. Lasts up to a week fully charged. Monthly lag by 30s

Sensor Specifications

Sensor	Ultrasonic
Bandwidth Frequency	2MHz~5MHz
Installation	Mounting bracket with butterfly screws / Velcro straps
Connector Cables	Coaxial cable (50Ω)
Connector	LEMO-0
Bracket Material	SUS304
Water Resistance Cover	Silicone Rubber (Hardness 70)
Water Resistance	IP55 (With cover on)
Operating Temperature	0~80°C (Standard) 0~120°C (High Temp.)
Sensor Types & Pipe Compatibility	[V0] DN6~20 [V1] DN25~100 [V2] DN80~300

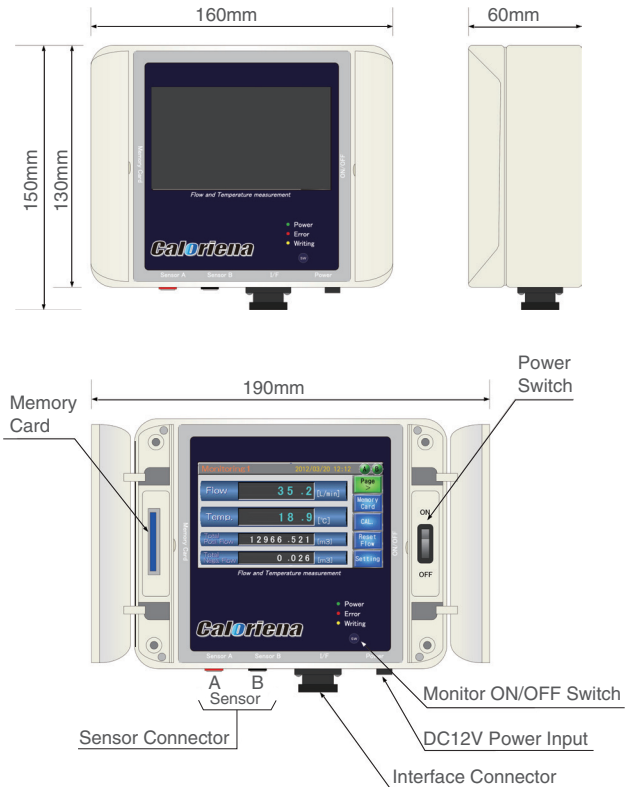
Data Display

Flowrate Units	[L/sec] [L/min] [L/hr] [m³/sec] [m³/min] [m³/hr] Programmable
Velocity	Range (±10.000 [m/sec]) Fixed
Temperature	Range (0~50 [°C]) Fixed
Total Pos. Flow	Range (0~999999.999 [m³]) Does not subtract negative flowrate
Total Neg. Flow	Range (0~999999.999 [m³]) Does not subtract positive flowrate

Measurement Range

Pipe Size	Flow Velocity Resolution [m/sec]		Working Range [m/sec]	Max Flowrate [L/min]	
DN6	0.008		±10.000	±34	
DN15	0.008		±10.000	±165	
DN25	0.005		±10.000	±188	
DN32	0.004		±5.000	±226	
DN50	0.003		±10.000	±612	
DN80	V-1	V-2	±5.000	V-1	V-2
	0.002	0.003		±1,400	±2,700
DN100	V-1	V-2	±5.000	±2,350	
	0.002	0.003			
DN125	0.002		±5.000	±3,680	
DN150	0.002		±5.000	±5,000	
DN200	0.002		±5.000	±8,860	
DN250	0.001		±5.000	±13,570	
DN300	0.001		±5.000	±19,270	

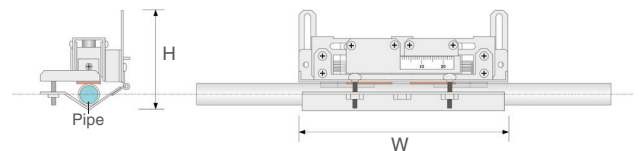
Controller Dimensions



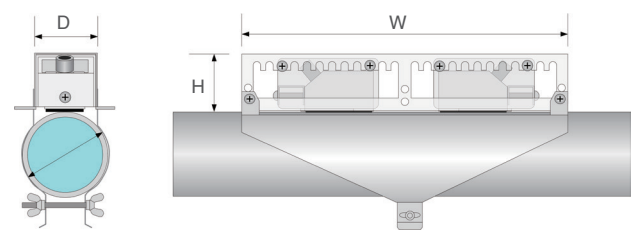
Sensor Dimensions

Installation Examples

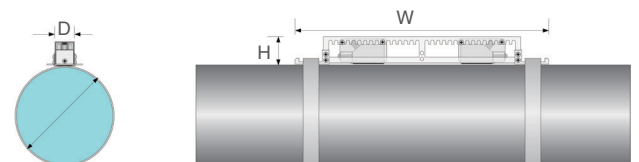
[V0-Type]
W: 100mm H: 40mm Pipe: DN6 (ø10.5)



[V1-Type]
W: 148mm H: 28mm D: 25.5mm Pipe: DN25 (ø34.0)



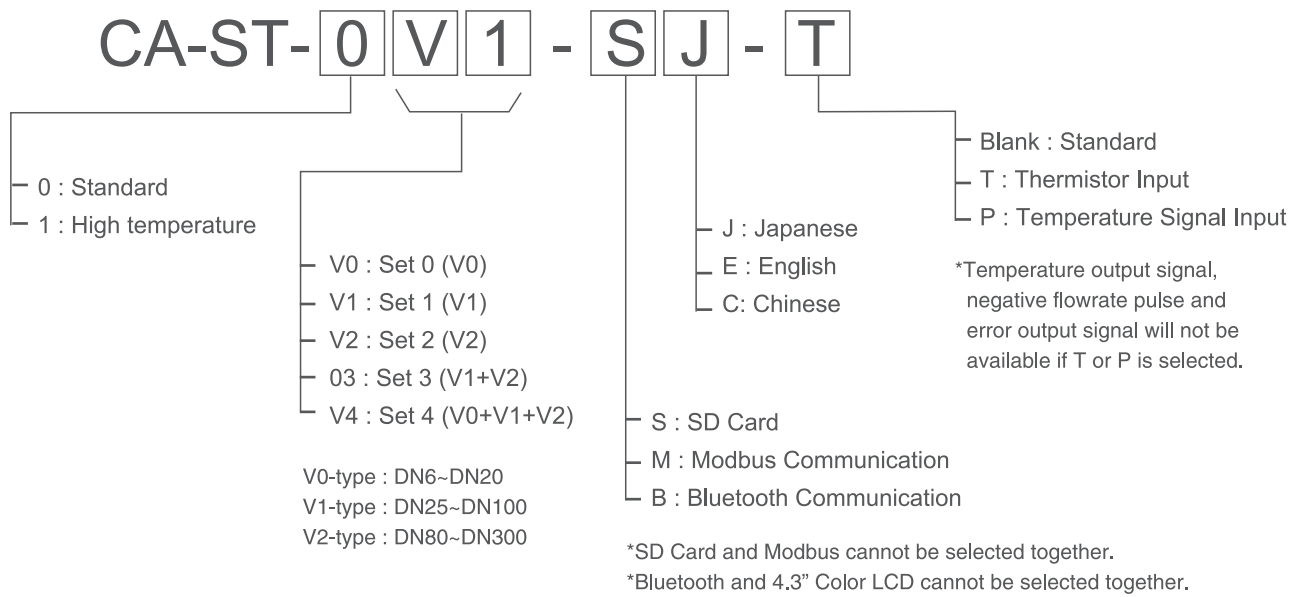
[V2-Type]
W: 250mm H: 28mm D: 25.5mm Pipe: DN100



[Water Resistant Cover]
Comes in Various Sizes

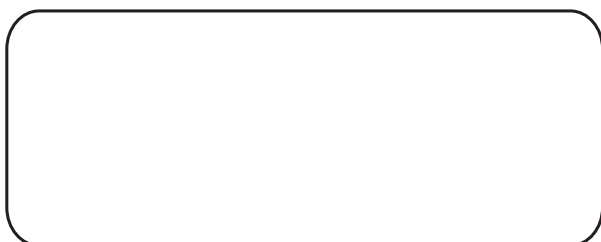


■ Model Type



This manual shows the specifications and details as of May 2nd 2016, and may be subject to change without notice. Furthermore, the Caloriena may not be compatible with your installment environment or pipe material. Please contact our dealer prior to purchasing the Caloriena to ensure compatibility. We also provide the Caloriena on lease to ensure compatibility prior to purchase.

Contact



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