

GFR Ultrasonic Flowmeter for Liquid Cooling System



Product Introduction



With the rise of technologies like cloud computing and AI, increasing computing power has led to higher chip power consumption. The liquid-cooled ultrasonic flowmeter manages and monitors the cooling system's flow rate, using sensor data for precise temperature control to ensure stable operation.

The GFR ultrasonic flowmeter, with its external clamp design, simplifies installation and avoids fluid contact, preventing downtime. It's ideal for accurately measuring small pipe flow rates.

Product Advantages

Compact size

Screen display can
be rotated in four directions

No wiring

Low power dissipation



No need to break the pipe,
simply clip on and measure

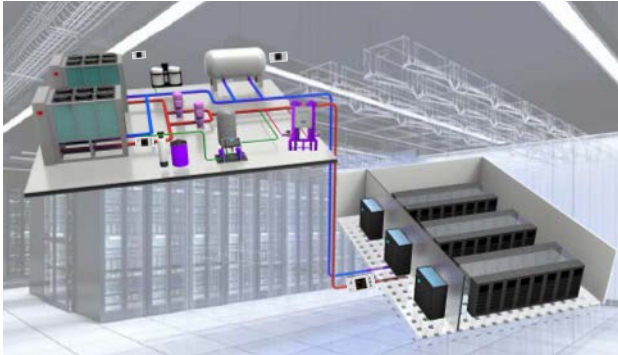
LCD color display

Long transmission distance,
Strong anti-interference ability

LoRaWAN communication
protocol is available

Scope of Application

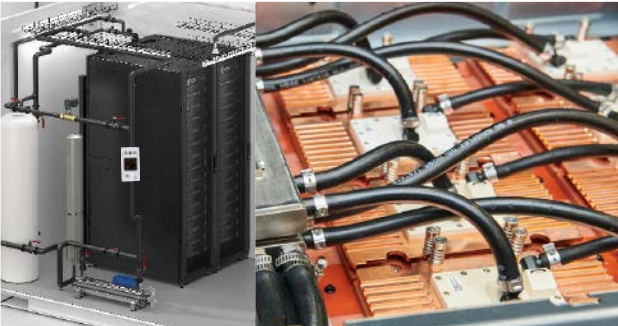
Through the collected flow data, combined with the temperature data collected by other sensors and other equipment, the temperature control and regulation data model is established to achieve accurate thermal management to maintain a constant temperature state of the heat source equipment, thus assisting the server components to achieve optimal performance.



Outdoor Circulating Cooling Tower Application



Cabinet-type and platform-type CDU applications



Cold Plate Technology



Immersion Technology

Suitable
pipe types

Stainless Steel, Copper

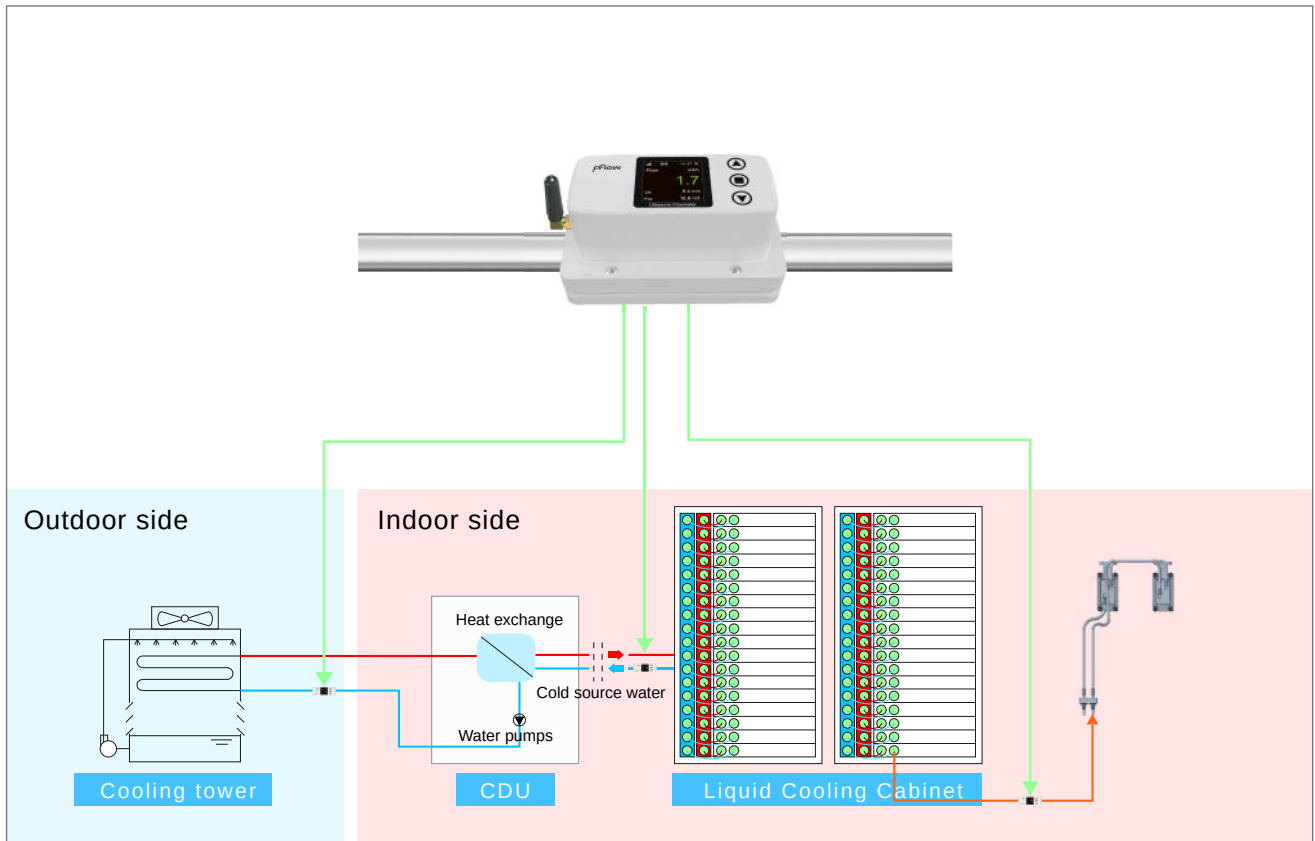


PVC, PPR

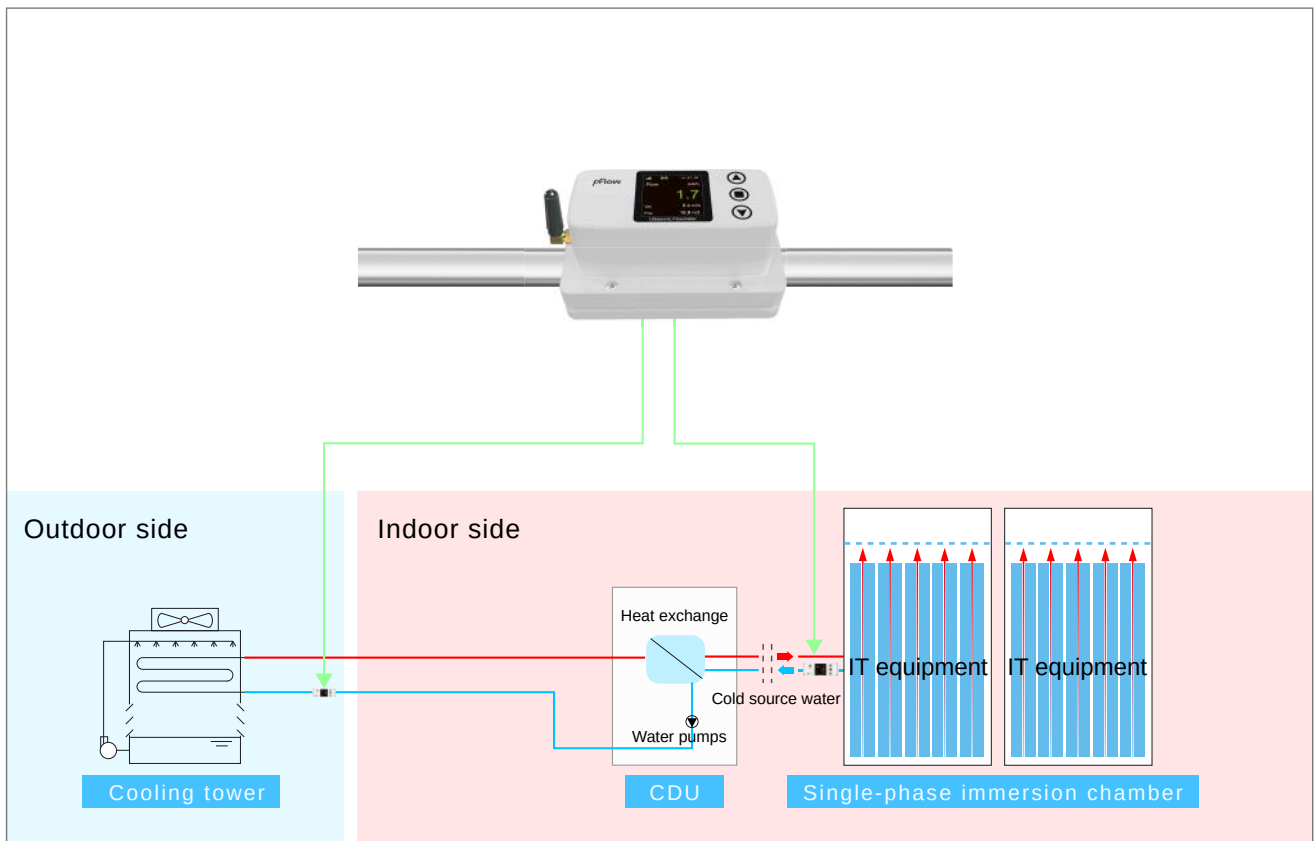


Pipe Materials	Pipe Nominal Inside Diameter	Pipe Clamps for Pipe O.D. Range		Flow Range (0.03-5m/s)
		Class A	Class B	
Stainless steel Copper PVC PPR	DN15	(18.5~22.5)mm	/	(0.02~3.5)m3/h
	DN20	(24~29)mm		(0.04~6)m3/h
	DN25	(30.5~35.5)mm	(29~34)mm	(0.05~9)m3/h
	DN32	(37.5~42.5)mm	(36~41)mm	(0.09~15)m3/h
	DN40	(49.5~54.5)mm	(48~53)mm	(0.13~23)m3/h
	DN50	(58.5~63.5)mm	(57~62)mm	(0.20~35)m3/h
Remarks: B class is realized by sticking the attached adhesive pads on both sides of the inner wall of the pipe clamp.				

Application System Schematic

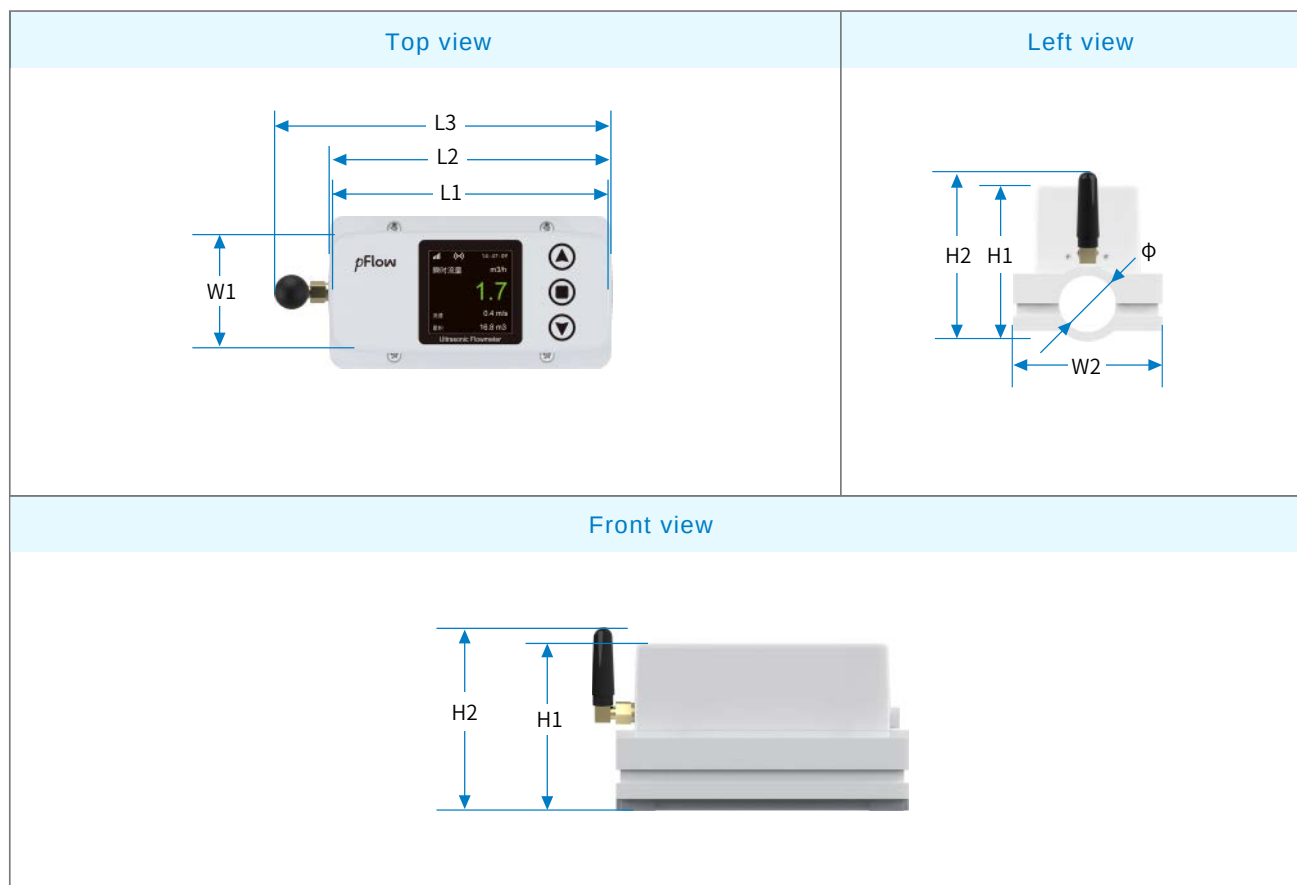


*Technical Principle of Cold Plate Liquid Cooling Systems



*Technical Principle of Immersion Liquid Cooling Systems

Product Size

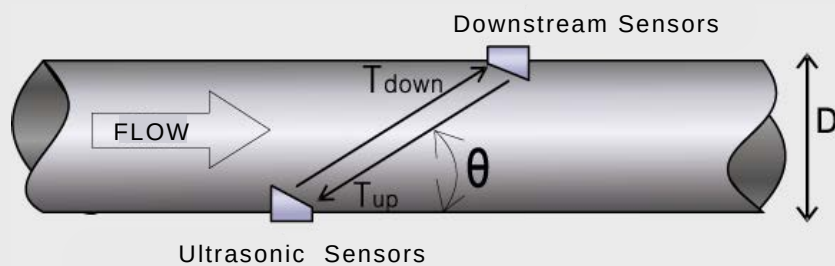


Dimension comparison table								Unit (mm)
Pipe Nominal Inner Diameter	W1	W2	L1	L2	L3	H1	H2	ϕ
DN15	42	42	96	110	120.5	63	68.8	22.5
DN20	42	59.5	96	110	120.5	69.5	75.3	29
DN25	42	59.5	96	110	120.5	76	81.8	35.5
DN32	42	64.5	96	110	120.5	83	88.8	42.5
DN40	42	76.5	96	110	120.5	95	100.8	54.5
DN50	42	85.5	96	110	120.5	104	109.8	63.5

Working Principle

The GFR ultrasonic flowmeter uses transit time measurement. An ultrasonic signal propagates through the fluid, with the speed increasing downstream and decreasing upstream. By measuring the difference in transmission times in both directions, the flow rate of the fluid is determined.

The flow rate of a fluid varies across different locations in a pipe, with the center having a faster flow than near the pipe wall. This flow velocity distribution can be represented by the cross-sectional distribution. By setting up the flow meter and accounting for this distribution, the average flow rate can be calculated. From the average flow rate and the pipe's cross-sectional area, the volume flow rate of the fluid can be derived.



$$V = \frac{MD}{\sin 2\theta} \times \frac{\Delta T}{T_{up} \cdot T_{down}}$$

Remark

V: Fluid velocity

M: Number of ultrasonic reflections

D: Pipe diameter

θ : The angle between the ultrasonic signal and the fluid

T_{up} : Time for the downstream transducer to transmit a signal to upstream

T_{down} : The time when the upstream transducer transmits a signal downstream

$\Delta T = T_{down} - T_{up}$

Product Model

Format of Selection

Model : GFR

Format: GFR - A - B

Model	Description of Transmitter
GFR	Model Name: GFR Ultrasonic Flowmeter
	Velocity Range: 0.03m/s~5.0m/s
	Accuracy: 2.0% (0.3m/s~5m/s Standard) *
	Repeatability: 0.4%
	Communication Interface: RS485, Support Protocol and MODBUS Protocol
	LoRa Communication: Maximum Transmit Power: 22dBm
	Temperature: -40C~85 C
	LoRaWAN communication protocol is available
	Medium: Water
	IP Rating: IP54
	Power Supply: 10~36VDC/500mA
	Keyboard: 3 touch keys
	Enclosure Material: PC(Polycarbonate)
	Display: 1.54 TFT-LCD Colorful Display. Resolution: 240*240
	Temp: Ambient Temperature: -10 C~50 C
	Fluid Temperature: 0 C~60 C
	Transmitter: All-in-one
	Transducer: Clamp On Type
	Cable: φ5 six-core cable, Standard Length: 2m
A	LoRa Frequency Selection
1	EU868 Frequency: 863000000~865400000, unit Hz
2	US915 Frequency: 902300000~914900000, unit Hz
3	CN779 Frequency: 780100000~786500000, unit Hz
4	EU433 Frequency: 433775000~434665000, unit Hz
5	AU915 Frequency: 915200000~927800000, unit Hz
6	CN470 Frequency: 470300000~489300000, unit Hz
7	AS923(HK) Frequency: 920000000~925000000, unit Hz
B	Pipe Size
Measurement Range	DN15, DN20, DN25, DN32, DN40, DN50

Selection Example: Model: GFR Series; Specification: GFR-1-DN15

For Example: [Model: GFR Series; Specification: GFR, EU868 Frequency, DN15]

*The accuracy obtained through Gentos flow standard device may vary due to factors such as the type of pipeline used, the type of fluid being measured, temperature variations, etc.



Noted: Products have been configured with application industry options at the factory, and the data center corresponds to EM (Equipment Matching).

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