TECHNICAL GUIDANCE

Ultrasonic heat meter for small diameter

UL Series

For heating and/or cooling applications

STANDARD SPESIFICATIONS

● Measuring fluid	Water
● Diameter	DN50 , DN65 , DN80
● Pressure	PN1.6（GB9119-2000 , GB9115-2000） JIS 10K , JIS20K JIS B 2202-2012
● Fluid temperature	2℃～90℃（Max.130℃ for custom order）
● Differential temperature	3℃ ～ 88℃（Max.128℃ for custom order）
● Ambient temperature	－10℃ ～ ＋60℃
● Storage temperature	－20℃ ～ ＋70℃（with battery）

SPECIFICATIONS OF FLOW SENSOR

● Material	
Body	Stainless
Combined case	Aluminum die cast
Flange	Stainless
● Protection Code	IP68

General

Ultrasonic heat meter of UL Series is used as a meter for heating and/or cooling consumption measurement in system with water.
The meter consists of a dobule beam ultrasonic path flow sensor(UHS), a temperature sensor pair and a calculator(UHC) that calculates the energy consumption from the volume and temperature difference.

FEATURES

- Low consumption battery drive for 6years
- High endurance by selecting stainless measuring pipe
- High water proof IP68 flow sensor
- Easy display magnetical operation
- No pressure loss , no sensing obstacles in piping

SPECIFICATIONS OF CALCULATOR

● Material	Aluminium die cast
● Input	Temperature × 2ch （Temperature ：Pt500 2wire）
● Output	M-Bus（Energy rate , Volumetric flow , Total calorie , Total volume , Temperature） Total Flow Pulse (DC power supply is required)
● Display	LCD（9digits , units , icon and so on. ）
● Display items	Total volume , Flow rate , Total calorie , Energy rate , Temperature , Date
● Operation	Magnetical switch
● Power Supply	Battery (DC 3.6V , Life time 6years) Or DC power with backup battery

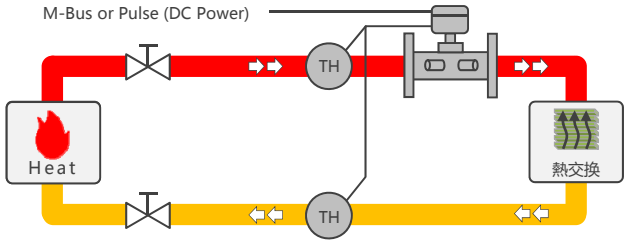
SPECIFICATIONS OF TEMPERATURE SENSOR PAIR

● Type	Pt500
● Material	Stainless
● Cable length	5m or 10m（2 wire）
● Protection tube	G1/2

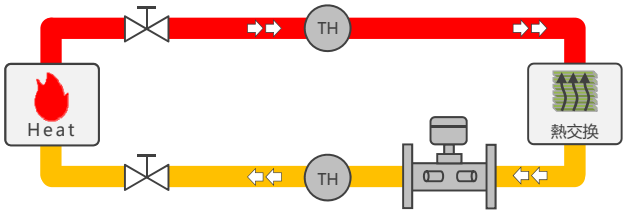
SCHEMATIC OF MEASURING SYSTEM

There are 3 kinds (6patterns) of measuring system.
Please specify the type of system when order.

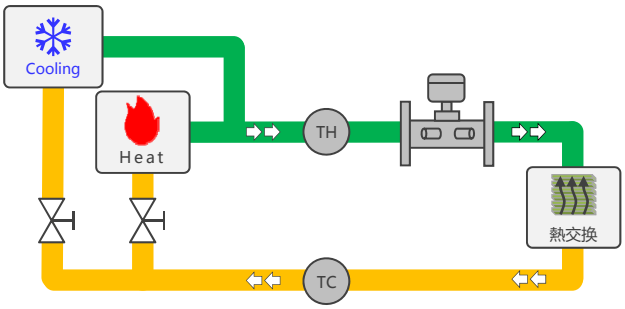
● Heating : when meter is set in forward line



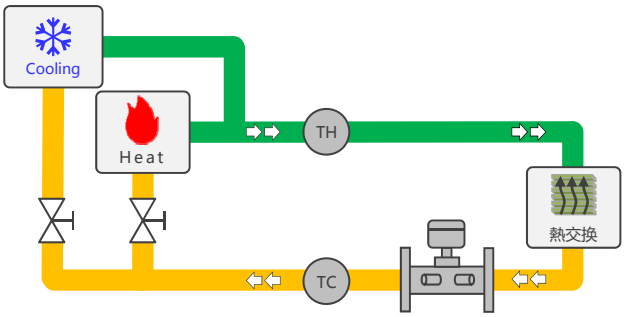
● Heating : when meter is set in return line



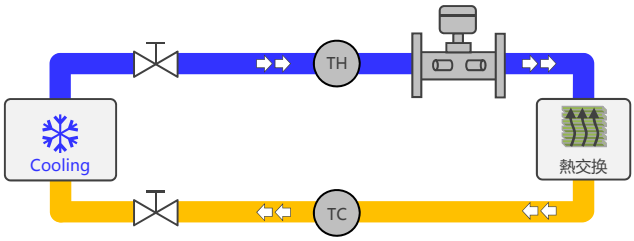
● Combined heating &cooling : when meter is set in forward line



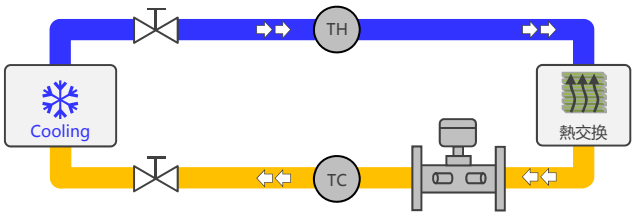
● Combined heating & cooling : when meter is set in return line



● Cooling : when meter is set in forward line



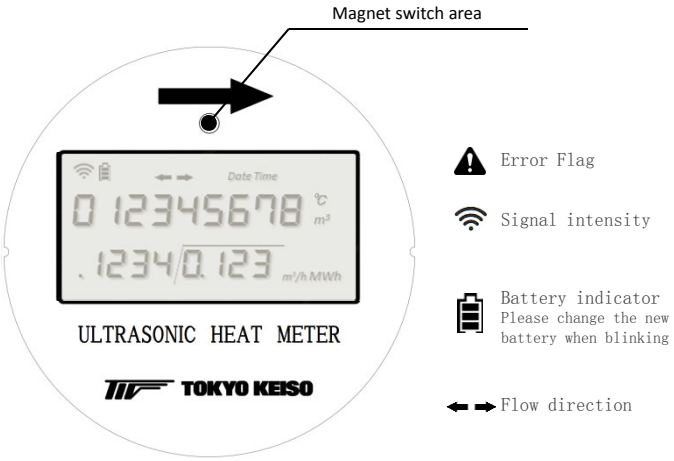
● Cooling : when meter is set in return line



RANGE OF FLOW RATE

Param. / Size	Q_s [m^3/h]	Q_p [m^3/h]	Q_i [m^3/h]	Cut off [m^3/h]	Cut off [% of Q_s]
DN50	38	15	0.3	0.064	0.17
DN65	63	25	0.5	0.106	0.17
DN80	100	40	0.8	0.170	0.17

LCD DISPLAY



ACCURACY

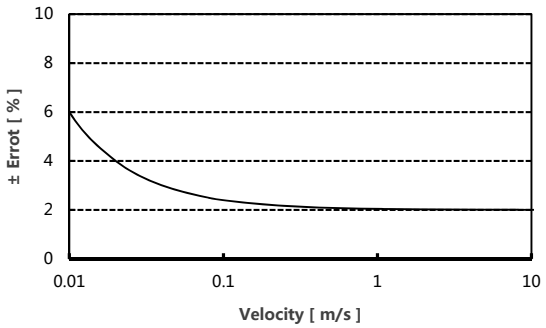
● Energy rate

CLASS 2 in accordance with JJG225-2001

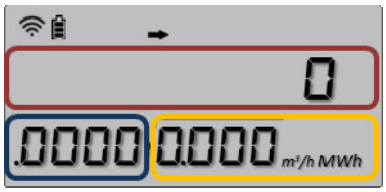
● Flow rate

$E = (2 + 0.02 \times qp \div q) [\%]$

qp : typical flow rate q : measuring flow rate



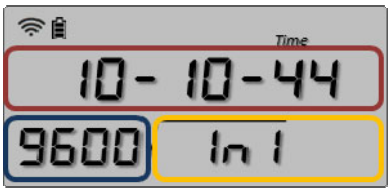
Display contents



Integer part of total energy
Unit: MWh

Decimal part of total energy
Unit: MWh

Flow rate※1 Unit: m³/h



Current time
The displayed time is 10:10:44.

Communication baud rate
The display example is 9600bps.

The order is Start bit, Parity bit and Stop bit.
The display example 1n1 is Start bit 1, Parity n(one) and Stop bit 1.

Integer part of total flow
Unit: m³

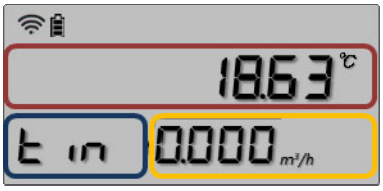
Decimal part of total flow
Unit: m³

Flow rate※1
Unit: m³/h

Current date
The displayed date is December 13, 2018.

Slave address number

Low cut off flow rate
Unit: m/s
The display example is 0.010m/s.



Temperature of forward line
Unit: ℃

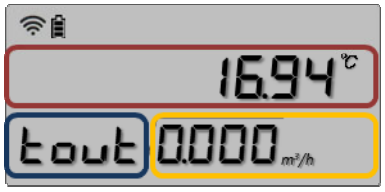
Forward line means “tin”

Flow rate※1
Unit: m³/h

Equipment factory code number

Software version number

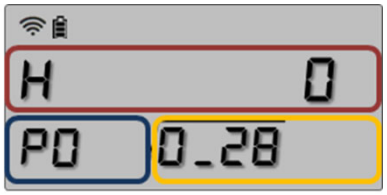
Battery voltage
The display example is 3.09volts.



Temperature of return line
Unit: ℃

Return line means “tout”

Flow rate※1
Unit: m³/h



Cumulative operating time
Unit: Hour

Number of displayed menu

Factory reference value for signal parameters, used for developers.

Display contents

Integer part of total energy for cooling
Unit: MWh

Decimal part of total energy for cooling
Unit: MWh

"Cool" means cooling energy supply

Energy rate
Unit: kW

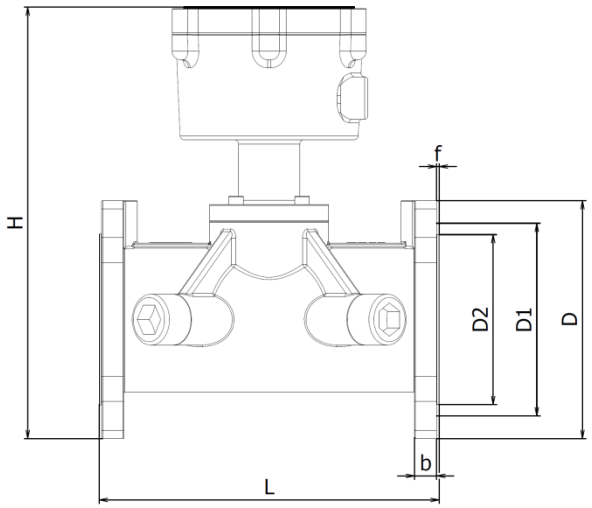
N/A

Flow rate※1
Unit: m³/h

※1 : Indicate 3rd decimal place less than 10m³/h,
2nd decimal place less than 100m³/h,
1st decimal place over than 100m³/h

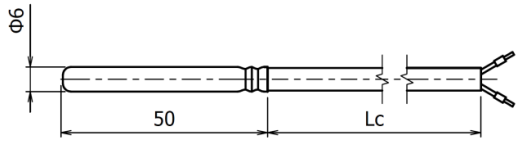
DIMENSIONS

- Flow meter (UHS & UHC)

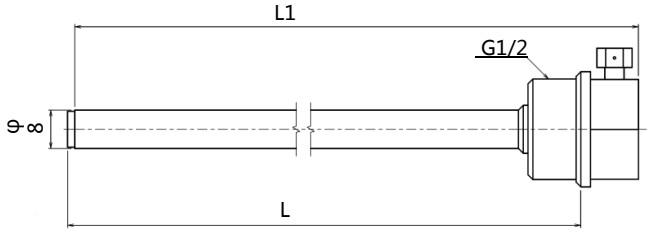


DN	Pressure [Mpa]	D [mm]	D1 [mm]	D2 [mm]	F [mm]	b [mm]	L [mm]	H [mm]	Weight [kg]
DN50	1.6	165	125	99	3	20	200	270	11
DN65	1.6	185	145	118	3	20	200	280	12
DN80	1.6	220	180	132	3	20	225	310	15

- Temperature sensor



2-wire (Lc=5m, 10m)



Length	L1[mm]	95	130	168	223
	L [mm]	85	120	155	210

Protection cover

MODEL CODE

● Flow Snsor

UHS660 - □□□□□

◆Size
- DN50 (2″) **0 F**
- DN65 (2″ 1/2) **0 S**
- DN80 (3″) **0 E**

◆Pressure(GP9119-2000, GP9115-2000)
- PN1.6 (DN50, DN65, DN80) **C**

◆Material
- Stainless(DN50, DN65, DN80) **S**

◆Sensor Cable Length [m]
- Combined Unit (Max.90℃) — **0**

● Calculator

UHC660 - □□□□□ - □□□□□

◆Size
- DN50 (2″) **0 F**
- DN65 (2″ 1/2) **0 S**
- DN80 (3″) **0 E**

◆Interface Baud Rate[bps]
- M-Bus 2400 **M**
- Pulse(DCpower supply is required) **P**

◆Enersy mesurement system
- Heating in forward line **0 F**
- Heating in return line **0 R**
- Cooling in forward line **C F**
- Cooling in return line **C R**
- Cooling anad Heating in forward line (Hot line when heating) **S F**
- Cooling anad Heating in return line (Cold line when heating) **S R**

◆Temeperature Sensor
- Pt500 (φ6mm) **1**

◆Temperature sensor cable length
- 5m (2-wire) 【Standard】 **E**
- 10m (2-wire) **F**

◆Temperature sensor protection cover length
- stainless 85mm(DN50, DN65, DN80) **K**

◆Power
- DC3.6V Battery **1**
- DC power (10V - 32V) and DC3.6V Battery for backup **3**

◆Energy unit
- MWh **3**

◆Option
- Standard(none additional feature) **0**

APPROVAL

中 华 人 民 共 和 国

计 量 器 具 型 式 批 准 证 书

PATTERN APPROVAL CERTIFICATE OF THE MEASURING INSTRUMENTS OF THE PEOPLE'S REPUBLIC OF CHINA

日本 TOKYO KEISO CO.,LTD. ：

根据《中华人民共和国计量法》及相关规定和技术要求，下列计量器具经型式评价合格，现予批准。

According to the Law on Metrology of the People's Republic of China and the relevant regulations, the pattern of measuring instruments applied for pattern approval have been approved.

计量器具名称及型号：

Name and type of the measuring instruments:

超声波热能表(UL（UHC660+UHS660）型)

规格:DN50，DN65，DN80

计量器具的技术指标见型式注册表。

The technical specifications of the measuring instruments are described in the pattern registration list.

型式批准的标志与编号：

The mark and identification numbers of the pattern approval:

批准时的附件：

批 准 人
Approval signature

批准部门
Approval authority

批准日期
Approval date

This product acquires a model approval book (CPA) for measures of People's Republic of China.

- **This product specially sales in People's Republic of China.**
- **The description of this product is subject to change without notice.**

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