Integrated Heat meter Product Introduction

IHM-6000 Series Heat meter (Parameter)

1. Principle

The integrating heat meter is to measure calories consumed within a certain heating range.
The basic operating principle is to calculate energy consumption by calculating amount of heating water (or other liquid) passing for a certain time, the temperature difference(T) between the supply side and the return side measured by a pair of temperature sensors and the corresponding constant (K-factor/heat coefficient). The base formula is as follows.

$Q = K \times V \times \Delta T = K \times P \times I \times \Delta T$

Q : Calories(Kwh, Mwh)　　V : Amount of heating media passing(m^3)

P : Pulse　　ΔT : Temperature difference(℃)

I : Value per pulse(m^3)　　K : ($Kwh/m^3 \cdot ℃$) = (($Kwh/kg \cdot ℃$)/(m^3/kg))

2. Outline

This is a product to measure calories consumed. It can be installed at any place where heat is consumed such as houses, apartments and building offices.
It calculates heat delivered by comparing water being supplied and returned and is useful for heat management and energy conservation in each household.

3. Construction

- Flow gauge : Measurement of flow out water volume.
- Temperature sensor : Measuring temperature difference between water being supplied and returned.
- Operation part : Calculating data coming from the flow meter and temperature sensors by a proper formula.
- Display part : The computing part shows the calculated value.
- The semi-permanent durability of the tungsten carbide shift and the ceramic bearing.

4. "K" when the integrating heat meter is installed at the supply side.

		Temperature of turn back water ℃ Out									
		10	20	30	40	50	60	70	80	90	100
Temp. of flow in water ℃	20	1162									
	30	1160	1157								
	40	1160	1157								
	50	1160	1157	1154	1150						
	60	1159	1157	1154	1150	1145					
	70	1160	1158	1156	1152	1148	1145				
	80	1161	1159	1156	1152	1149	1145	1139	1132		
	90	1162	1161	1158	1155	1151	1146	1140	1134	1129	
	100	1163	1162	1159	1156	1152	1148	1142	1136	1131	1124
	110	1164	1163	1161	1157	1154	1149	1144	1138	1132	1125
	120	1166	1165	1162	1159	1155	1151	1145	1140	1134	1127
	130	1167	1166	1164	1161	1157	1153	1148	1142	1136	1130
	140	1169	1168	1166	1163	1159	1155	1150	1144	1139	1132

In Put

E : Kwh, Kcal (1Kwh=860Kcal)　I : Value of 1 pulse (L, ㎥)

P : Pulse　　V : Calorie operation constant

△T is temperature difference between water being supplied (T1) and returned (T2).

5. Flow Meter

- **Feature**

1) Excellent durability and sensitivity and measurement of very small flow.
2) Stable deviation in a wide range of flow.
3) Disturbance is minimized by minimizing the magnetism of the slip prevention and impeller magnets.

- **Flow rate part**

Item	Unit	20A	25A	32A
Flow rate	㎥/h	2.5	3.5	6.0
Minimum flow rate	㎥/h	0.05	0.07	0.12
Pressure	Mpa	1.6Mpa		
Operating temperature range	℃	0℃~120℃		
Accuracy		3 Class		
Dimensions (mm)	L	130	260	290
	W	86	86	86
	C	120	120	120
Connection part		Pf25	Pf32	Pf40

CJ128-2000

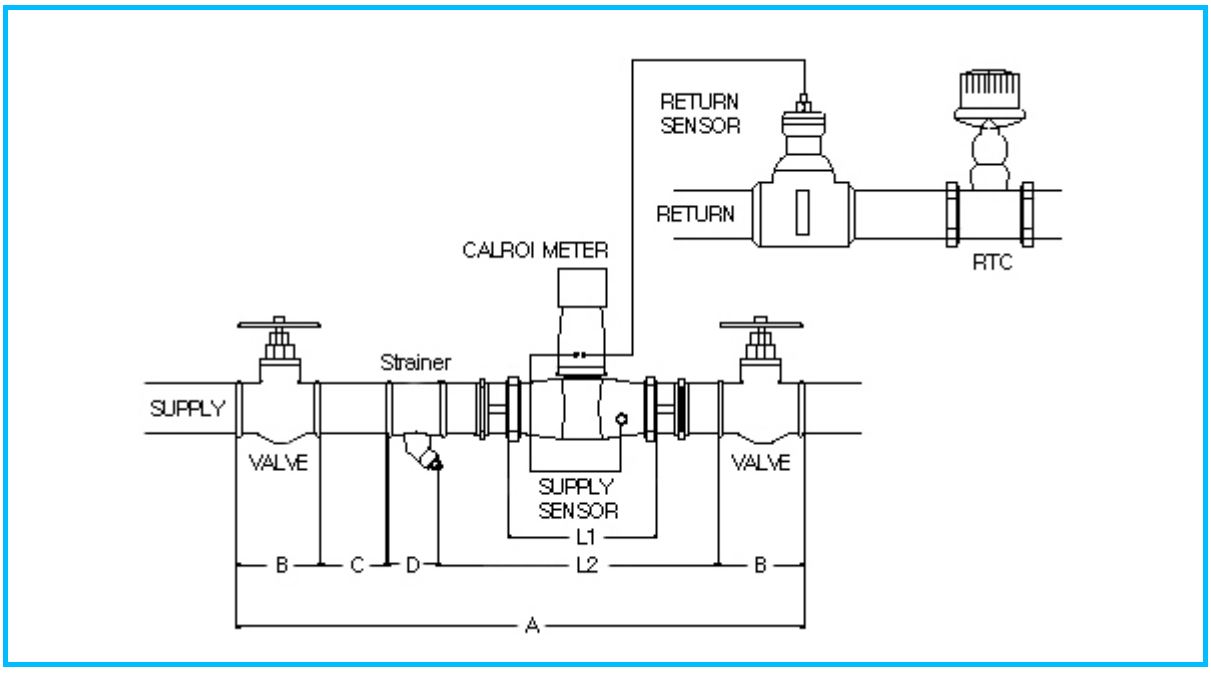
- **Operation part**

Item	Standard
Temperature difference range	3℃ ~ 40℃
Ambient Temperature	-25℃ ~ 55℃
Voltage	3.6V Lithum Battery
Highest Display	9,999,999 Mwh
Lowest Display	1Kwh(0.001Mwh)
Unit flow rate	0.1L/Pulse

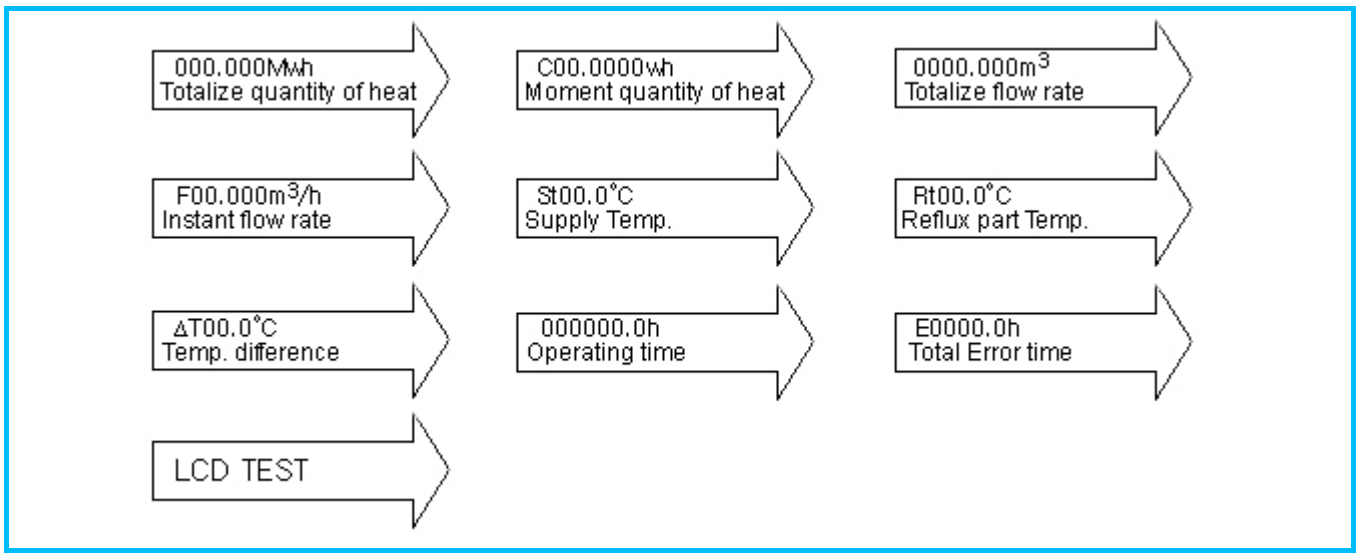
- **Temperature sensor**

Temperature sensor	PT 500
	Red tube on the supply side and black tube on the return side.
	Length of the sensors on the supply and the return side: 1.5mm

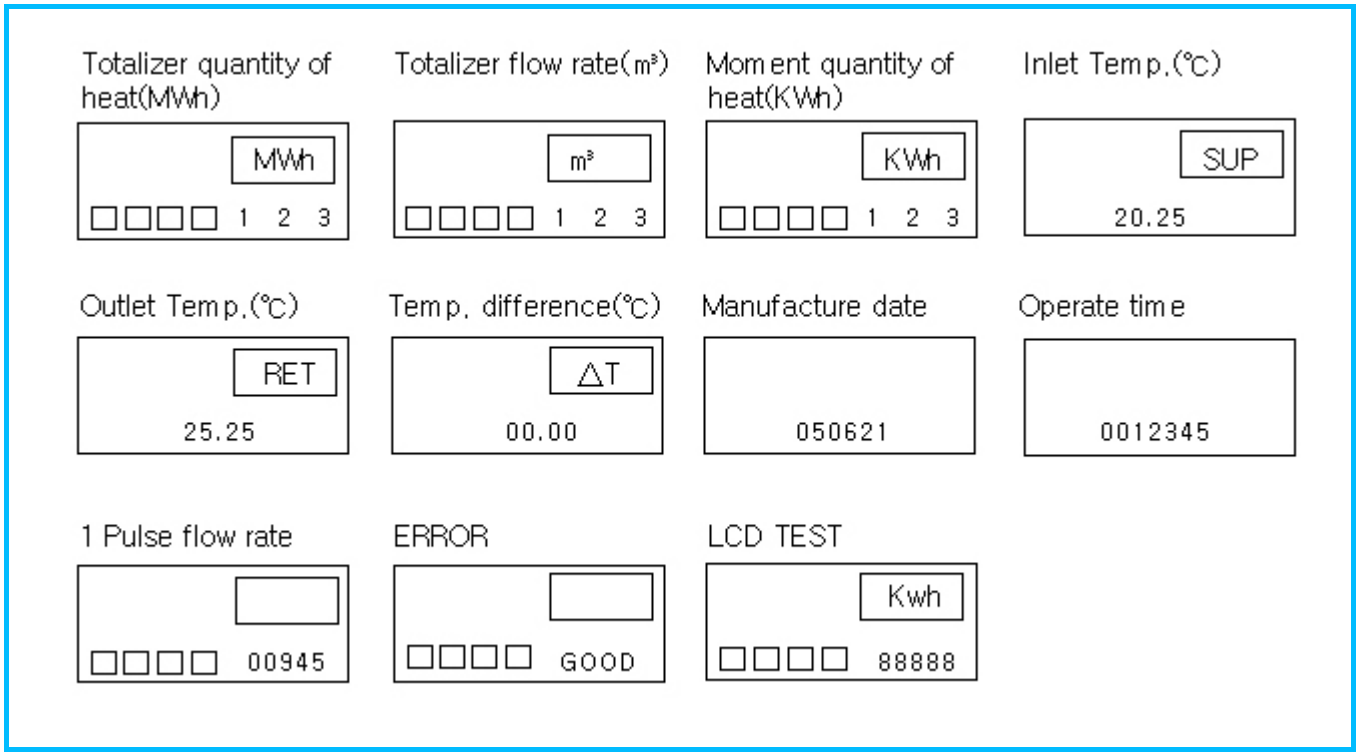
6. Standard piping diagram



7. Indication part Display



8. LCD Display (Use value)



- **Special function**

1. Mode changing is controlled by the mode switch installed on the front side.
   If a mode signal is recognized at mode 0, it is converted to 1 with new data displayed.
   (Data at mode 0 through 9 are displayed.)
2. Any mode other than mode 0 returns to mode 0 if there is a pulse signal from the flow meter part or 11 seconds have elapsed.
3. Error display is displayed as 'Good' or 'Error'. In normal condition, no display appears.
   If there arises any problem, 'SUP' or 'RET BAT' shows up.
4. When flow changes by a pulse signal, the flow signal **(>>>)** moves.

- **Installation and Cautions Matters**

1. Installation place

1) Select a location convenient for installation, meter reading and maintenance and secure a sufficient space.

2) Install the unit away from rain, wind, humidity, dust and direct sun light.

3) The computing part should be installed for meter reading in a place convenient.

4) Install a conduit to protect the cable connecting between the computing part and the indicating part. After installation, put a protection plug at each end to prevent any foreign matter from entering the conduit.

2. Installation cautions matters

1) Before installing the calorimeter, install auxiliary components first.
Accessory equipment : Union, Nut, Sensor, Pocket, Strainer, Install box.

2) Prepare a pipe with the same length and diameter as those of the calorimeter main unit, install the pipe tentatively in the place of the flow meter part, and allow the water flow through it.

3) Clean up inside of the pipes with every valves open. Flush inside of the pipes by passing through thermal media after eliminating air in the pipes when you clean up the pipes.

4) Depending on the quality of hot water, replace the pipe several times and check the condition of foreign matter.

5) Before installing the calorimeter, open the filter and clean it.

6) For the installation of the indicating part, use a standard box.

7) When installing the flow meter, check the direction of flow and make sure that the meter is in a horizontal position.

8) When installing the sensor, put it in a sensor pocket, make sure that water flows, and fix the pocket tightly. Afterwards, attach a sealing sticker. Then attach the seal sticker.

9) When connecting cables between the computing and indicating part, make sure that the color of each cable coincides.

3. Handling notice matters

1) Do not give vibration or any impact to the unit during transportation or storage.

2) Do not carry the product holding a cable. (Carry it duly packed in the packing box.)

4. Other

Check the condition of hot water every year and clean the filter.

9. Pipe LAYOUT and installation

- **Selection of installation place**

It is recommended that the unit is installed in a place sufficiently safe and free of freezing and humidity.

- **Caloric pipe LAYOUT plan**

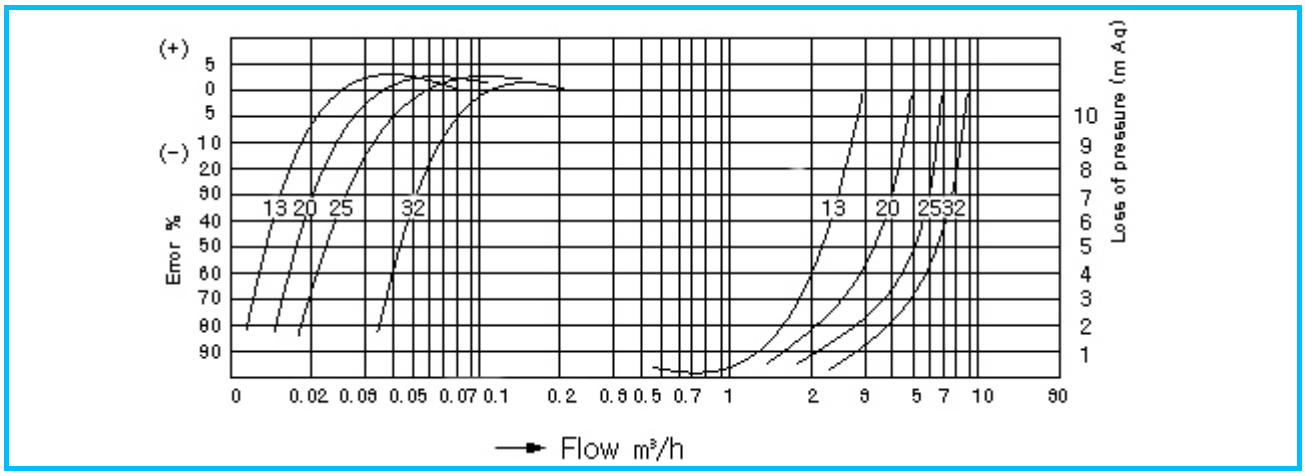
The flow meter part needs straight pipes at least 5D on the upstream and 3D on the downstream and horizontal installation is recommended.

- **Electric wire pipe installation**

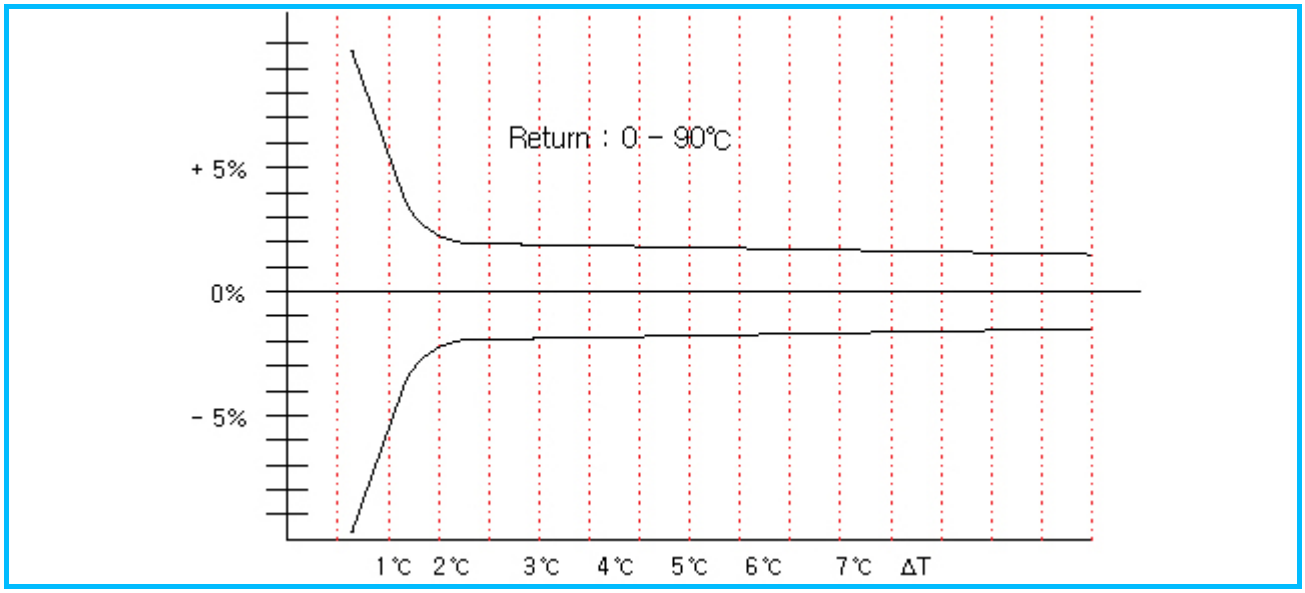
A conduit should be installed between the computing and indicating part and should be made as short as possible.

10. Characteristics

- **Flow meter performance curve**



- **Computing error a curve**



- **Battery Life**