

HCM4

Thermal Energy
Calculating Meter Systems For
'The Digital Age'

HCM4000 - Thermal Energy Calculating Meter - 230 volts

With Pulsed Output

Calculates The Energy Used In Heating or Cooling Systems
KWh & Monetary Read Outs (£ \$ €)
Digital High Accuracy Sensors
Strap On Pockets
'On Site' Programming Facility
Manufactured to ISOEN 1434 Parts 1 to 6

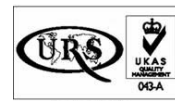


Order Code(s)

hcm4000 (Standard Version) With Monetary Value & Re Settable
hcm4000hp As above but High Precision Version



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INSTALLATION INSTRUCTIONS

HCM4

Thermal Energy Calculating Meter Systems For 'The Digital Age'

Installation Instructions

The HCM4 consists of 3 component parts

- 1 – The HCM4 Energy Calculating Meter
- 2 – A Set (of two) Digital High Accuracy Digital DHAS sensors
- 3 – A Set (of two) 'Strap On' Pockets – The temperature sensor bulbs can be strapped directly onto the pipe work .

Mounting

The HCM4 is designed for wall mounting, a screw case hanging position is located at the top centre of the case with two wall fixing positions located under the terminal cover

Wiring

Wiring block list -- terminals are marked on the pcb –
Remove Meter front cover to expose wiring block

Wiring Terminal List

- 1 = Power In (+) -Either Mains 230v (110v USA) or 24v**
2 = Power In (-) - Either Mains 230v (110v USA) or 24v

3 = Sensor Hot -- Brown

4 = Sensor Hot -- Green

5= Sensor Hot -- Blue

6 = Flow Meter 1 (+) (The red led on front of case flashes when it receives a pulse from the flow meter)

7 = Flow Meter 1 (-)

8 = Pulsed Output 1 (+)

9 = Pulsed Output 1 (-)

10 = Analog Output (4 -20 mA) 1 Active (where fitted)

11 = Analog Output (4 - 20 mA) 2 (where fitted)

12 = Analog Output (4 - 20 mA Passive (where fitted)

13 = CAT Terminal (+) –Building Alarm Terminal (where fitted) www.hcm4.com/cat.htm

14 = CAT Terminal (-) – Building Alarm Terminal (where fitted) www.hcm4.com/cat.htm

15 = Pulsed Output 2 (+) -- (where fitted)

16 = Pulsed Output 2 (-) -- (where fitted)

17 = Flow Meter 2 (+) -- (where fitted)

18 = Flow Meter 2 (-) -- (where fitted)

19 = Sensor Cold -- Brown

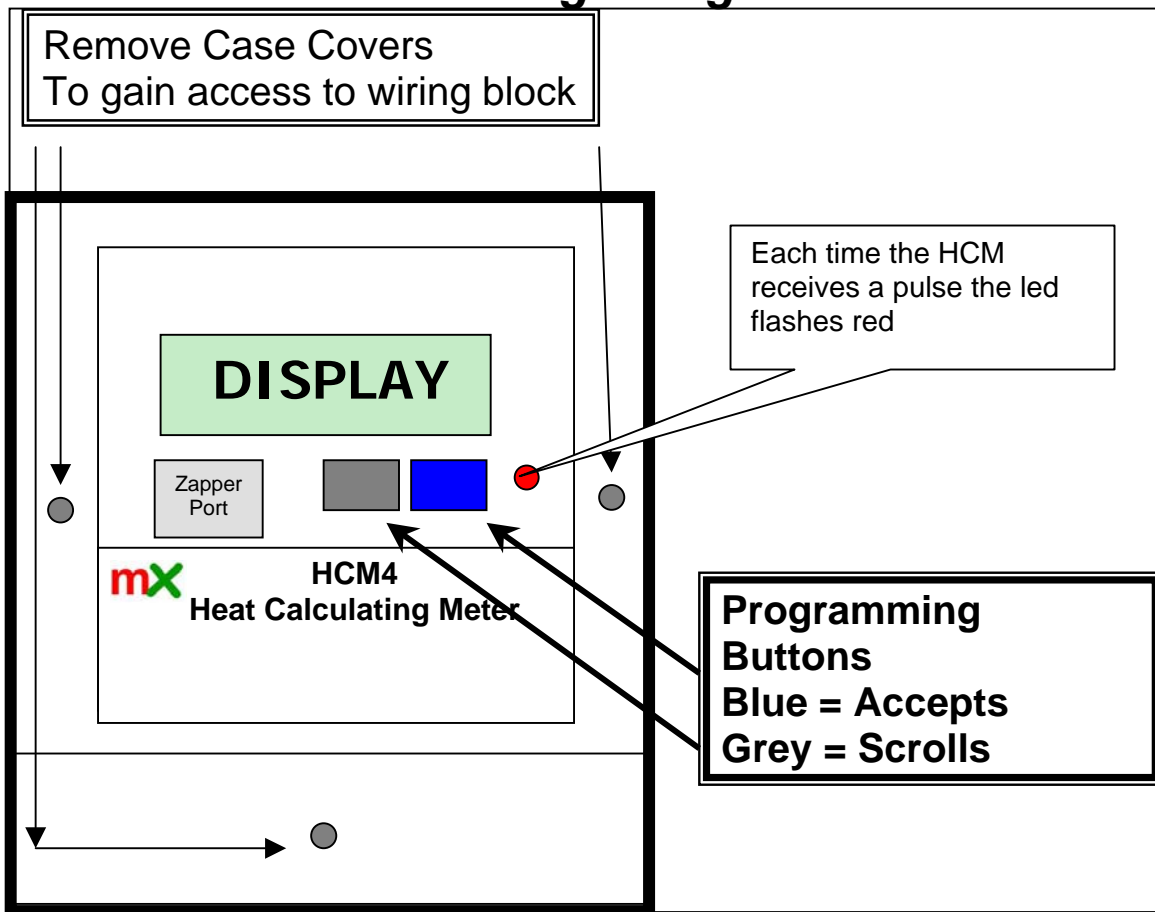
20 = Sensor Cold – Green

21 = Sensor Cold -- Blue



Installation Tip
Fit sensors and wire in
before powering up

Thermal Energy Calculating Meter Systems For 'The Digital Age'



Installation

Remove HCM4 cover and install all wiring leaving the **connection of either mains supply 230v or 24v**

Wiring standards must conform to IEE regulations

It is recommended to use shielded cable manufactured to BS4360 Class 5 or VDE0295 Class 5

DHAS Sensors (Digital High Accuracy Sensors)

Are highly accurate, temperature thermometers, they are calibrated to an accuracy of 1.0% and a calibration certificate is included with each sensor set.

DHAS are highly efficient, and

The **Red Coloured Sensor**, should always be located in the hottest pipe

Heating Circuit = Flow Chilled Circuit = Return

The **Black Coloured Sensor**, should always be located in the coolest pipe

Heating Circuit = Return Chilled Circuit = Flow



Standard DHAS Sensors can be cut /trimmed without losing accuracy and added to up to a distance of 10 metres. Above that distance LD version sensors should be used these have a maximum range of 200 metres

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DHAS Sensors (Digital High Accuracy Sensors)

DHAS Sensors are highly accurate, calibrated temperature sensors, they are designed to fit into pockets which onwardly fit into the pipe work. The sensors have individual serial numbers located on the sealing tags, and a calibration certificate is supplied with each set.

Unlike other similar products DHAS sensors are both flexible and reliable. And are extremely installer friendly

A – They do not have to be a matched pair

B – They can be cut in length without effecting calibration

C – They can be added too. (to a maximum of 10 metres) – And up to 200 metres with the LD Version www.hcm4.com/LD

Programming Heat Calculator

WHEN PROGRAMMING THE SYSTEM MUST BE OPERATIONAL

(ie Heating or Cooling on)

At Boot up - Sequence

Matrix Metering
HCM4000 Version No 2.7

Boot Up –

Is split into 4 sections each section scroll (Left/Grey Button) and Accept with (Right/Blue Button)



Installation Tip
Buttons
Left/Grey = Scroll
Right /Blue = Accept

1st Screen Set (Setting of Energy Unit)

Energy in KW/KWh

Energy in MW/MWh

Total Billing Counter either Kilowatt hours (standard) or Megawatt Hours (commercial)

2nd Screen Set (Billing Preference) 2/a



Resetable Energy

Billing in KWh's

If this option chosen

Resetable Money

Billing in Monetary Value

Screen 2/b

Cost 000.p KWh

See Page 8
For full
explanation



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Thermal Energy Calculating Meter Systems For 'The Digital Age'

3rd Screen Set (What type of system is it)

Heating System

Cooling System

Heating/Central Heating/Hot Water

Cooling/Chilled/Air Conditioning

4th Screen Set (Where is the flow meter located)

Meter in Return

Meter in Flow

Where is the flow/water meter located – Return pipe (standard) or Flow pipe

5th Screen (Pulse value from Water Meter)

F1 0001 L/pulse

F1 0100 L/pulse

Pulse value selectable 1,10,100,1000 litres per pulse

Example F10 = 10 litres of water per pulse

(The pulse value is always located on the meter)

END OF PROGRAMMING THE HCM4 NOW AUTOMATICALLY SCROLLS THROUGH THE SETTINGS

6th Screen Set

Really
Important

Reject Settings

Accept Settings

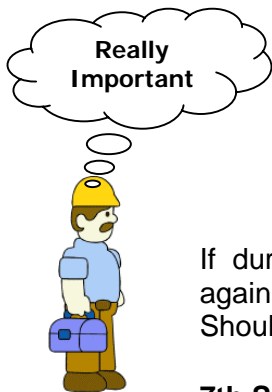
THIS STAGE IS VERY IMPORTANT

If during the auto scroll you are unsure of the setting – press Reject Settings and start again

Should you be sure the settings are correct - press Accept Setting

7th Screen

Hold to Save ..



Thermal Energy Calculating Meter Systems For *'The Digital Age'*

You will need to hold the Blue/Right button down firmly for 10secs – the buzzer will sound continuously

Last screen

Saved

At this point all the settings are saved

Operational Data



Default Screen

See Page 8
For full explanation

RM £ 050.25

Resettable Money

RE 45697.1 KWh

Resettable Energy KWh/MWh

Total

TE 0000000.0 KWh

Total consumption in KWh's (or MWh'S) Nine digits + One 1/10 (NOT reset table)

**Instantaneous
Energy**

IE 23 KW

The amount of energy being consumed in the circuit NOW

**Temperature
Flow**

tf 78.8C

Temperature in the flow pipe

**Temperature
Return**

tr 78.8C

Temperature in the return pipe

Flow

F1 354.87 m3/h

Total flow in metres cubed per hour 1 m3h = 3.6 litres

Thermal Energy Calculating Meter Systems For *'The Digital Age'*

To Change Settings

Once passed screen set no 7 – the only way to access the settings is with a Zapper Unit
Reference www.hcm4.com/zapper.htm

Outward Pulse Data – Open Collector

- Maximum Operating Voltage 45vdc
- Clamp circuit interjection 65vdc
- 500watt Power Dissipation Limit - Max Current 10amp
- Reverse Connection Protection 6vdc
- Pulse Width 50 ms
- DC Forward Current 0.6v
- Rise And Fall Max 18 micro Secs
- Isolation Résistance 5 x 10/10 ohms
- Isolation Voltage 5 kV
- Collector Remitter Saturation Voltage 0.4volts
- Operating temperature range -55c to 130c

Outward Pulse Value

10 pulses per KWh (if set for KWh's)

OR

10 pulses per MWh (if set for MWh's)

Error Codes

- Act as a 'Que' in the software to inform of potential problems. When an 'ERROR' occurs the HCM4's buzzer operates.



ERROR 1 No sensors connected or shorted to 5volts

ERROR 2 Data shorted to 0 volts

ERROR 3 Data transmission error

ERROR 4 Only 1 sensor connected

ERROR 5 Not a pair (either 2 hot or two cold connected)

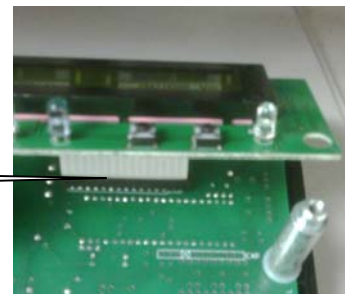
FREEZING Temperature in pipes or below 1c NEGATIVE DELTA T The sensors are likely too be the wrong way round



Power Failure = Either – Sensors Inccorectly wired - **Check Wiring**
Or - Damaged Sensors – **Replace**



Display – Dim or Showing Blocks Only = Display Dislodged
Pull display out of its socket and replace carefully



Display Socket

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EXPLANATIONS & FAQ's

(Ref 2nd Screen Setting) Reset able Energy (A) or Monetary Value (B)

This offers the option of either having the default screen showing as :-

A Energy -- Shown as KWh (standard applications) or MWh (Commercial Applications)

B Monetary Value -- Shows the value as real money !!!

Q1 -- Can I reset the screens

A1 -- Yes with a zapper unit

Q2 -- Do I lose all the data at reset

A2 -- No the system integrity is kept, the 2nd screen in operation retains the total usage since start and is not resettable

Q3 -- What security of settings are there

A3 -- Once the settings have been saved (9th Screen) they cannot be tampered with

Q4 -- How can I change the settings and monetary values?

A4 -- Security is important for this reason we have developed a zapper unit

The zapper www.hcm4.com/zapper.htm unit will open the software for settings and monetary value resetting. The company registers each zapper unit sold

Q5 -- What is shown on the screen when in operation

A5 -- The current total which can be reset – either KWh's or Monetary value



LD (Long Distance) Temperature Sensors

Temperature sensors that can measure accurately for distances from 5 metres up to 200 metres – can be supplied for this product

Guarantee

All products are guaranteed on a return to base basis only, for a period of 12 months from dispatch date. No compensation can be offered, relating to consequential loss.

Where HCM4 Calculators are installed, not using Meters UK water/flow meters

This could alter the known operational criteria, and effect the product integrity. The company reserve the rights to refuse claims where deemed correct.

This product is sold subject to the company Despatch, Guarantee & Returns Policy only www.meters.co.uk/policy.htm

HCM4 – Enclosures

Order Code VW302517

Size H 300x W 250x D 170 – External

H 270x W 240x D 130 – Internal

Plexiglass Viewing Window to BS EN 100

- ✓ High Quality
- ✓ Heavy Duty
- ✓ Suitable for both Internal & External Mounting
- ✓ High Impact Resistant
- ✓ IP67 Rated



www.hcm4.com