

# HCM4

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

### HCM4000 - Thermal Energy Calculating Meter - 230volts

#### 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

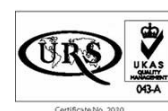


Order Code(s)

**hcm4000** ( Standard Version) With Monetary Value & Re Settable



# meters uk Ltd



[www.hcm4.com](http://www.hcm4.com)

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

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### Installation Instructions

The HCM4 consists of 3 component parts

- 1 – The HCM4 Energy Calculating Meter – Wall Mounted – Requires Power Supply
- 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

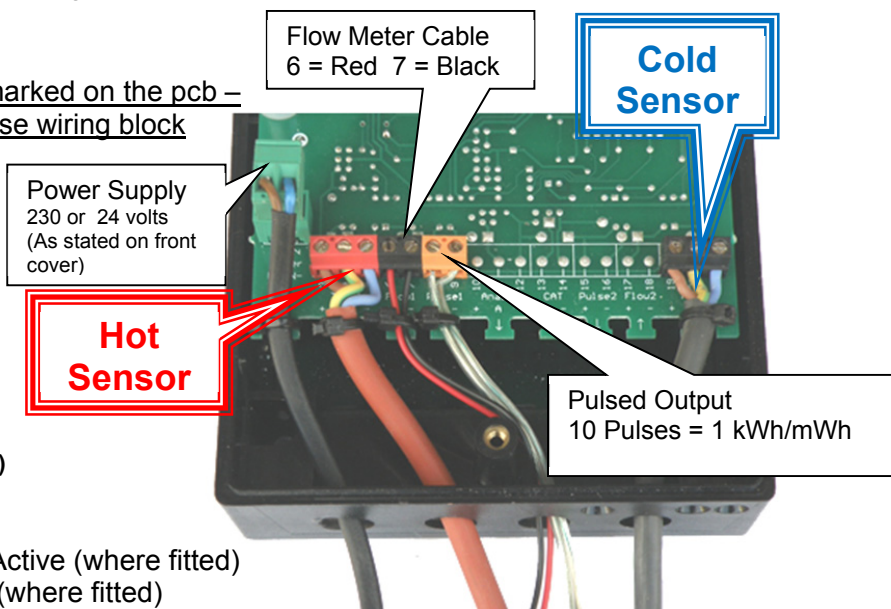
### Wiring

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

### Wiring Terminal List

- 1 = Power In (+) - 230v**  
**2 = Power In (-) - 230v**

- 3 = Sensor Hot -- Brown**  
**4 = Sensor Hot -- Green**  
**5 = Sensor Hot -- Blue**  
**6 = Flow Meter 1 (+) ( Red Wire)**  
**7 = Flow Meter 1 (-) ( Black Wire)**  
**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](http://www.hcm4.com/cat.htm)  
14 = CAT Terminal (-) – Building Alarm Terminal (where fitted) [www.hcm4.com/cat.htm](http://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**

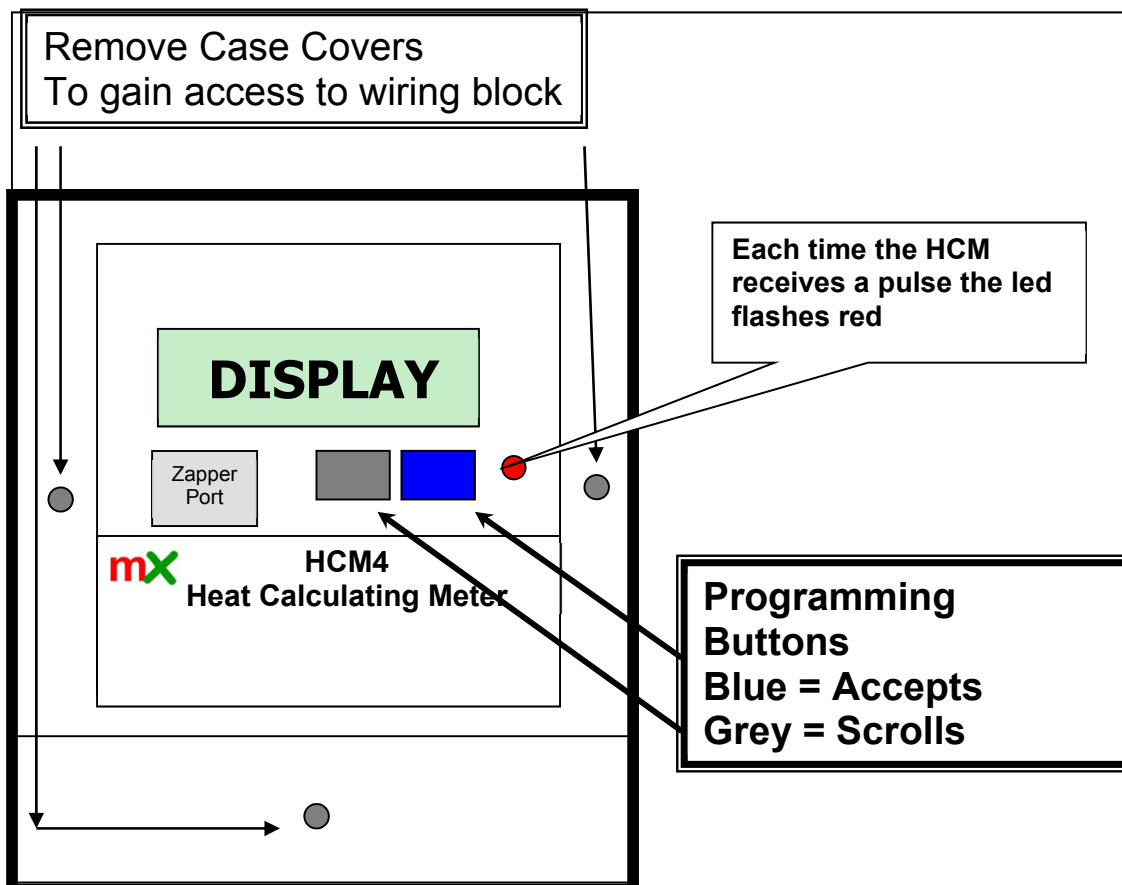


**Installation Tip**  
Fit sensors and wire in  
before powering up

Notes - Red/Hot Blue/Cold DHAS Sensors are located in exactly the same wiring position on PCB regardless of Heating or Chilled Circuit (same position for both)  
The LED to the right of the blue button flashes red each time a pulse is received from the flow meter

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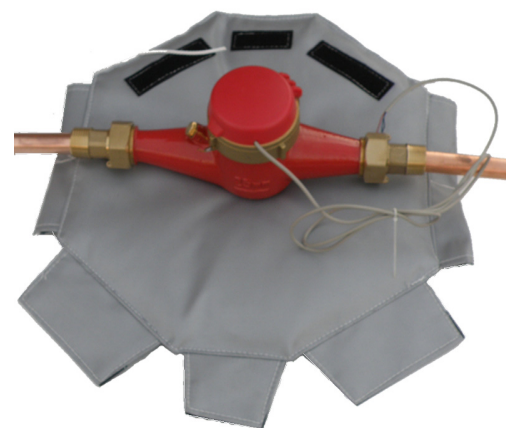


## Installation

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

**It is recommended that the flow meter when in a heating circuit is fully insulated with a Thermal Jacket**



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

### 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 flexible.

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

Heating Circuit = Flow   Chilled Circuit = Return

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

Heating Circuit = Return   Chilled Circuit = Flow

### DHAS Sensors ( Digital High Accuracy Sensors )

DHAS Sensors are highly accurate, calibrated temperature sensors, their unique design ensures they can be easily strapped onto the pipe work. The sensors have individual serial numbers located on the cable, 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

### LD ( Long Distance ) Temperature Sensors

All versions of HCM's, owing to their digital design, have the unique ability to be able to read data securely with 100% accuracy over long distances, Temperature sensors that can measure accurately for distances up to 200 metres.

Sensors can be purchased in the following sizes –

Order Code 404020 5metres

Order Code 404030 10 metres

Order Code 404040 50 metres

Order Code 404050 100 metres

Order Code 404060 150 metres

Order Code 404070 200 metres

( other sizes by request)

### Programming Heat Calculator

#### **WHEN PROGRAMMING THE SYSTEM**

#### **MUST BE OPERATIONAL**

#### **(ie Heating or Cooling on)**

At Boot up - Sequence

Matrix Metering

HCM4000 Version No 2.3

Boot Up –

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

#### 1<sup>st</sup> 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)



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

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## Thermal Energy

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**2<sup>nd</sup> Screen Set (Billing Preference) 2/a**



**Resettable Energy**

Billing in KWh's

Screen 2/b

If this option chosen

**Resettable Money**

Billing in Monetary Value

See Page 7  
For full  
explanation

**Cost 000.p KWh**



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

**Heating System**

Heating/Central Heating/Hot Water

**Cooling System**

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

**5<sup>th</sup> 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 )

Pulse value of meters uk Ltd	Flow Meters	Pipe Size	Pulse Value
		15mm/20mm/25mm	1
		30mm/40mm	10
		50mm to 150mm	100
		200mm	1000

**END OF PROGRAMMING**  
**THE HCM4 NOW AUTOMATICALLY SCROLLS**  
**THROUGH THE SETTINGS**

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6th Screen Set



**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 ..**

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

See Page 8  
For full explanation

**Operational Data**

Default Screen



**RM      £ 050.25**

**RE      45697.1 KWh**

Resetable Money

Resetable Energy KWh/MWh

**Total**

**TE    000000.0 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

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**Temperature  
Return**

tr	78.8C
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Temperature in the return pipe

**Flow**

F1	354.87 m3/h
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Total flow in metres cubed per hour      1 m3h = 3.6 litres

### 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](http://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 Resistance 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

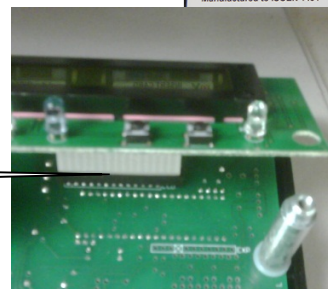
ERROR 4    Only 1 sensor connected

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 Incorrectly 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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## Thermal Energy

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#### EXPLANATIONS & FAQ's

(Ref 2<sup>nd</sup> 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 2<sup>nd</sup> 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 (9<sup>th</sup> 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](http://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



#### 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](http://www.meters.co.uk/policy.htm)

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## 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



## Thermal Jackets

[www.hcm4.com](http://www.hcm4.com)