

# HCM4

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

## HCM4009 - Thermal Energy Calculating Meter - 230 volts

With Pulsed Output

- Calculates The Energy Used In Heating or Cooling Systems kWh /mWh
- Digital High Accuracy Sensors
- Strap On Pockets
- 'On Site' Programming Facility
- Manufactured to ISOEN 1434 Parts 1 to 6
- Ethylene Glycol Concentration Programmable



Order Code(s)  
hcm4009      Re Settable – Display



# meters uk Ltd



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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 or 24v**  
**2 = Power In (-) - Either Mains 230v or 24v**

**3 = Sensor Hot -- Brown**

**4 = Sensor Hot -- Green**

**5 = Sensor Hot -- Blue**

**6 = Flow Meter 1 (+)**

**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](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)**

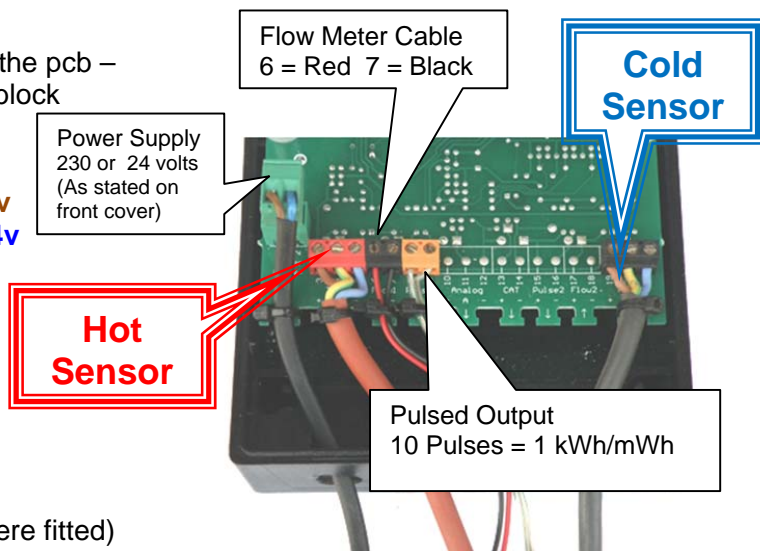
**17 = Flow Meter 2 (+) -- (where fitted)**

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

**19 = Sensor Cold -- Brown**

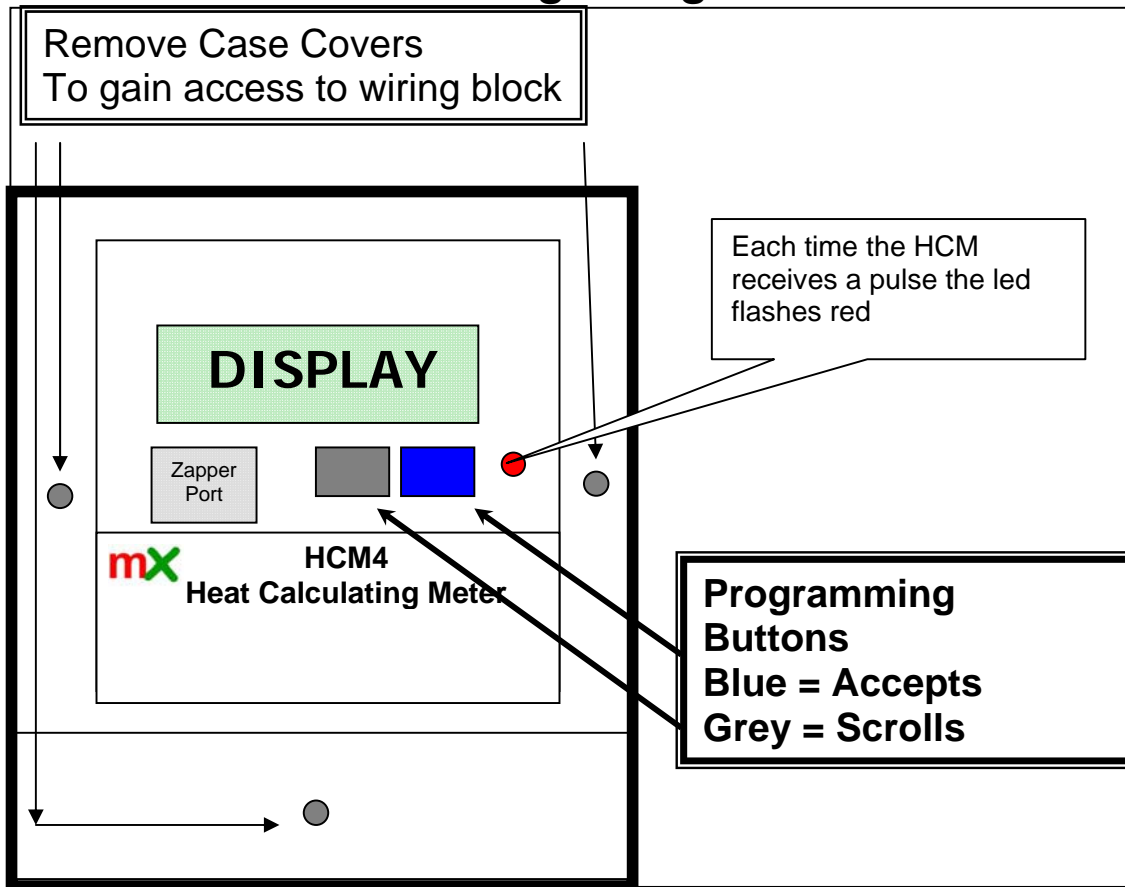
**20 = Sensor Cold – Green**

**21 = Sensor Cold -- Blue**



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

## 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

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



# HCM4

## 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

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. Long Distance versions are available from 5 metres to a maximum range of 200 metres.

### DHAS Sensors ( Digital High Accuracy Sensors )

DHAS Sensors are highly accurate, calibrated temperature sensors, they are designed to directly strap onto the pipework – ( Immersion Pockets are not required) The sensors have individual serial numbers , 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 – Log distance versions are available And up to 200 metres with the LD Version

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

### Programming Heat Calculator

### **WHEN PROGRAMMING THE SYSTEM MUST BE OPERATIONAL**

(ie Heating or Cooling on)



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

At Boot up - Sequence

Matrix Metering -HCM4009 Version No 1.1- Ethylene Glycol

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)

### 2<sup>nd</sup> Screen Set (What type of system is it)

Heating System

Cooling System

Heating/Central Heating/Hot Water

Cooling/Chilled/Air Conditioning

# HCM4

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

3rd 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

4<sup>th</sup> Screen Set ( 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

5<sup>th</sup> Screen Set ( Glycol Concentration)

Glycol Conc 5%

Glycol Conc 35%

The percentage of Brine/Glycol/Anti freeze in the system from 5% to 35%

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

6th Screen Set

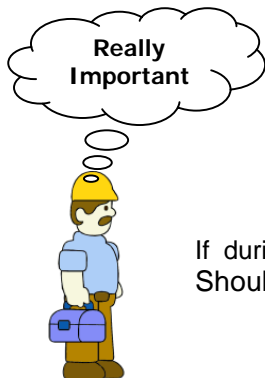
Really  
Important

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



# HCM4

Thermal Energy  
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7th Screen Set

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

## Operational Data



Default Screen

RE 45697.1 KWh

Resettable Energy KWh/MWh – (This screen can be re set with a reset zapper)

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 58.8C

Temperature in the return pipe

Flow

F1 354.87 m3/h

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

# HCM4

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

### To Change Settings

Once passed screen set no 6 – 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 200 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 to be the wrong way round

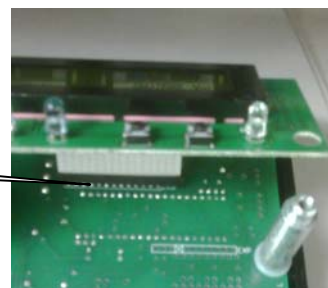


**Power Failure** = Either – Sensors Incorrectly wired - **Check Wiring**  
Or - Damaged Sensors – **Replace**



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

Display Socket



# HCM4

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

### EXPLANATIONS & FAQ's

(Ref 2<sup>nd</sup> Screen Setting ) Reset able Energy

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

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



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

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 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 – KWh's

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

## HCM4 – Enclosures

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

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

