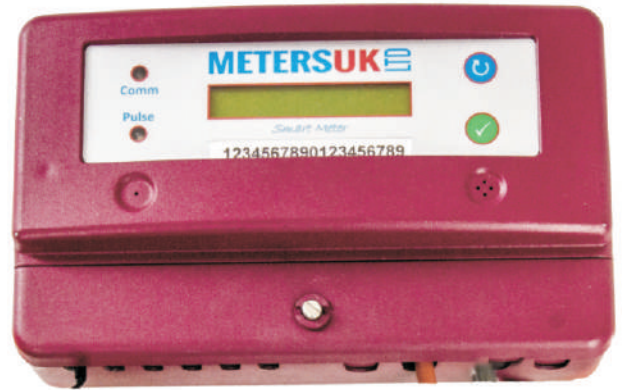


SmartHeat⁴⁵

Thermal Energy Calculating Smart Heat Meters



KEY FEATURES

- Calculates the energy used in heating or cooling systems
- The complete heat package falls within the combined component accuracy of Class 1-levels
- 'On site' programming facility and digital key option for reprogramming
- Manufactured to EN 1434 -1-1997
- Suitable for all billing applications - including Renewable Heat Incentive
- Open collector pulsed output - (with grab circuit) - as standard
- Digital high accuracy temperature sensors with ROM chip
- Sensors do not need to be in matched pairs
- M-Bus to EN13757-2/3/4 & EN1434-3 and Modbus to EN15745-2/4

PLEASE **READ THE INSTRUCTIONS**

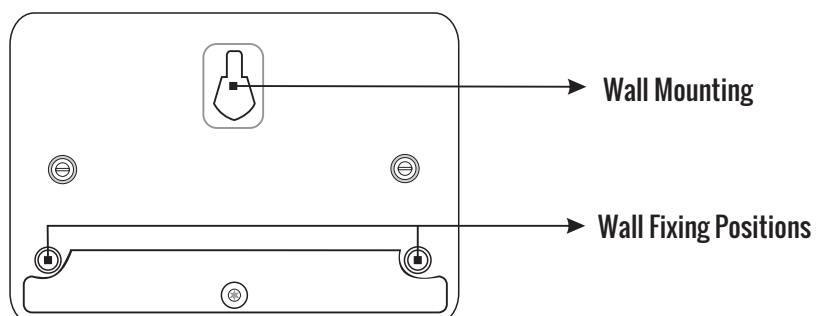
INSTALLATION INSTRUCTIONS

COMPONENTS

1. HCM45 Energy Calculating Meter
Wall Mounted
Requires Power Supply
2. 2 x Digital High Accuracy Digital DHAS sensors
3. 2 x Immersion Pockets and fittings
4. 1 x Flow Meter
5. 1 x Thermal Jacket

MOUNTING

The HCM45 is designed for wall mounting, a screw case hanging position is located at the top in the centre of the case with two wall fixing positions located under the terminal cover.



WIRING

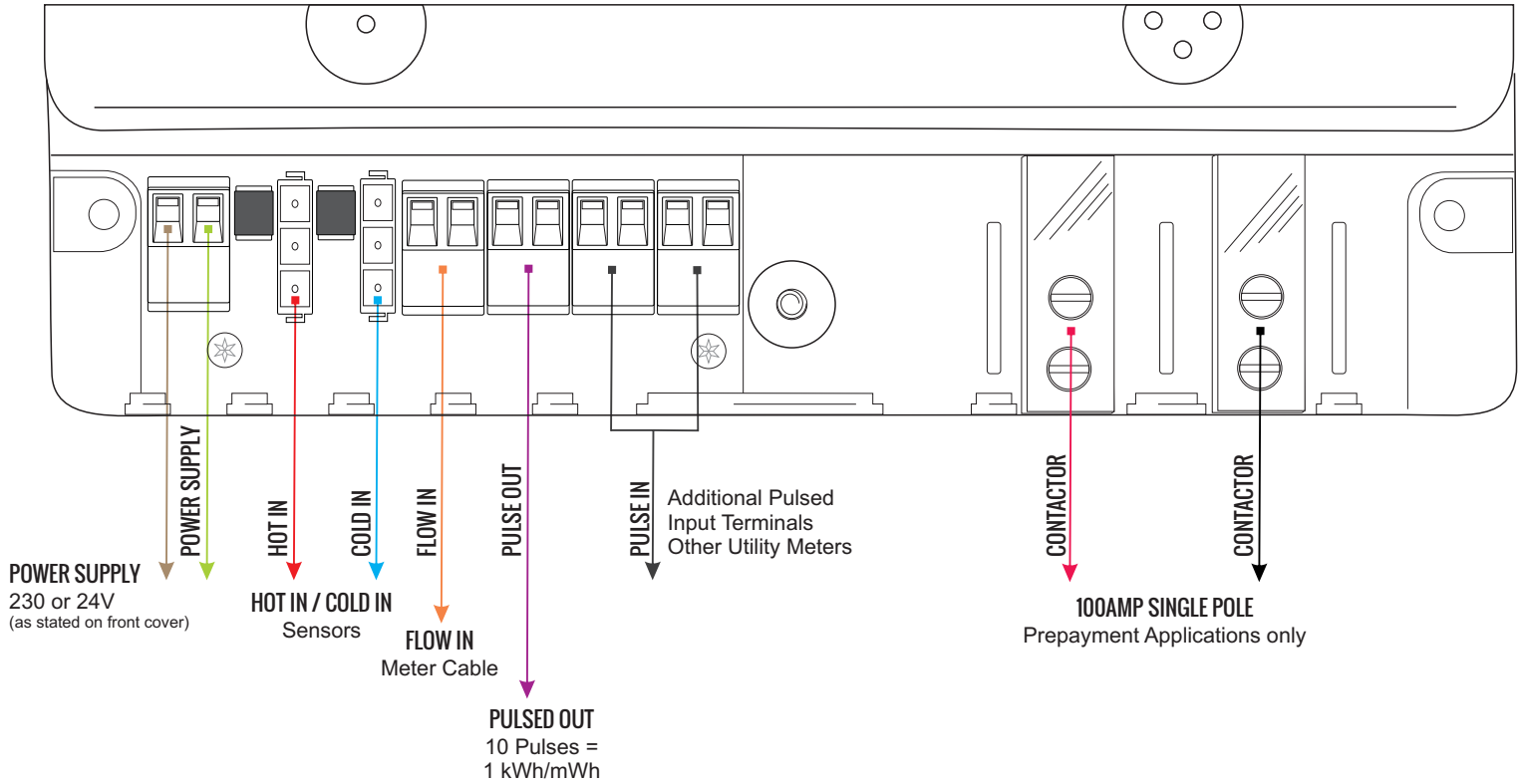
Wiring standards must conform to IEE regulations.

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

Wiring block list - Terminals are marked on the PCB

Remove Terminal Cover to expose wiring block

SURGE PROTECTION is recommended



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 either)



INSTALLATION TIP

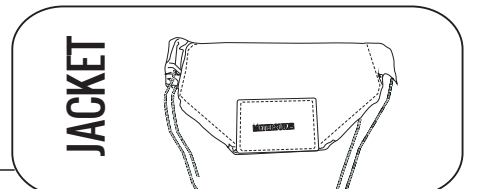
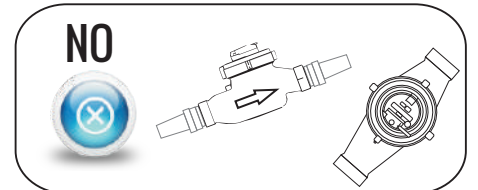
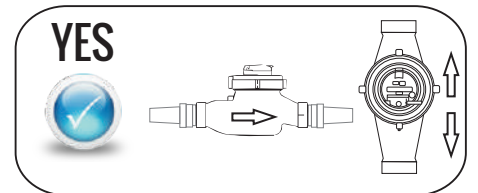
Fit sensors and wires in before powering up

FLOW METER INSTALLATION

The flow meter can be installed either horizontally (with the dial unit looking upwards) or vertically (with the dial unit looking directly outwards). But NEVER at any other angle.

The Flow meter requires 5 x the diameter of pipework before and after the meter.

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



DHAS SENSORS (Digital High Accuracy Sensors)

Are highly accurate, temperature thermometers, they are calibrated to an accuracy of 0.5°C 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 coldest pipe.

HEATING CIRCUIT - RETURN **CHILLED CIRCUIT - FLOW**

A

They do not have to be a matched pair

B

They can be cut in length without effecting callibration

C

They **CANNOT** be increased in length by adding additional cable*

** Specially manufactured Long Distance Cables are available (see below)*

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.

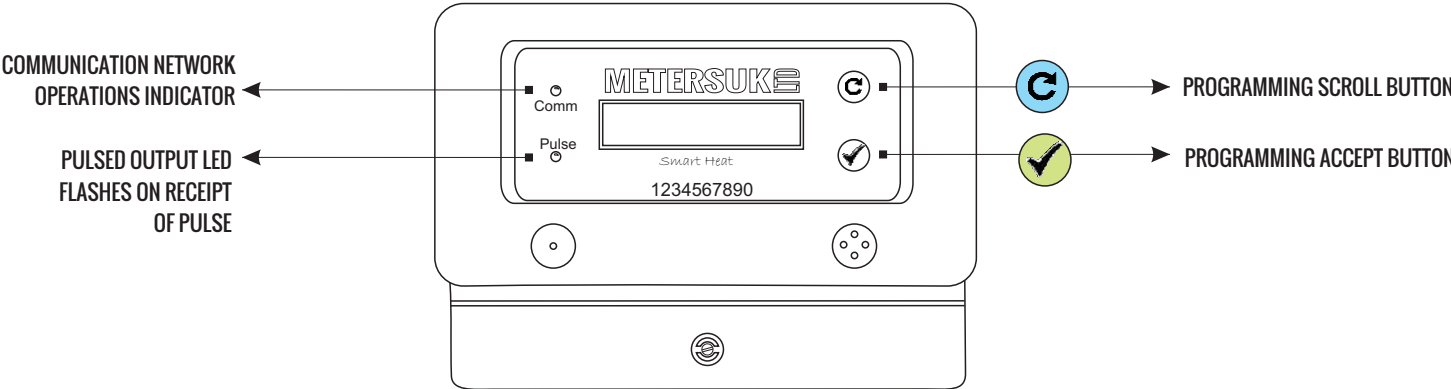
Sensors can be purchased in the following sizes.

- Order No. 404020 : 5 meters
- Order No. 404030 : 10 meters
- Order No. 404040 : 50 meters
- Order No. 404050 : 100 meters

Other sizes available upon request.

PROGRAMMING THE HEAT CALCULATOR

When programming the SmartHeat meter, **the unit must be plugged in and OPERATIONAL ie. switched on !**



PROGRAMMING SEQUENCE

Bootup

meters uk Ltd

HCM4500 Version No

The following **FOUR** options come up in sequence. You need to choose the correct option according to the system you have installed



NEXT / SCROLL



ACCEPT / OK

SCREEN 1

Setting of Energy unit. Total Billing Counter, either KILOWATT hours (standard) or MEGAWATT hours (commercial)

ENERGY IN KWh

ENERGY IN MWh

SCREEN 2

What type of system is it ? Heating/Central Heating/Hot Water or Cooling/Chilled/Air Conditioning

HEATING SYSTEM

COOLING SYSTEM

SCREEN 3

Where is the water meter located. RETURN flow (standard) or FLOW pipe.

METER IN RETURN

METER IN FLOW

SCREEN 4

Water meter pulse value. Selectable pulse value: 1, 10, 100, 1000 litres per pulse. ie. F10 = 10 litres of water per pulse
The pulse value is always located on the meter. Pulse Values for Meters UK Ltd water meters :

L/pulse = 0001

PIPE SIZE
15 - 25 mm

PULSE VALUE
0001

L/pulse = 0010

30 - 40 mm

0010

L/pulse = 0100

50 - 125mm

0100

L/pulse = 1000

150 - 200mm

1000

L/pulse = Other

OTHER

If 'Other' then 4 digit number - (0000 not allowed).

FLUID SETTINGS

Fluid = Water

Fluid = E Glycol

Fluid = P Glycol

Fluid = V Glycol

ETHYLENE GLYCOL

PROPYLENE GLYCOL

VEGETABLE GLYCERINE

If any of these are chosen then Concentrate Levels need to be entered.

Concentrat 05%

Concentrat 10%

Concentrat 15%



Concentrat 75%

PLEASE NOTE:

Read the following instructions carefully as once these settings are accepted they cannot be changed without a Digital Key.

SCREEN 5

Once the above information has been entered the meter will automatically scroll through the settings. You can now ACCEPT or REJECT the settings.

If at any time during the AUTO SCROLL you are UNSURE of the setting, press REJECT SETTINGS and start again. You must be sure that the settings are correct.




NEXT / SCROLL



ACCEPT / OK

SCREEN 6

You will need to hold the BLUE BUTTON  down firmly for 10 seconds. During this time the buzzer will sound continuously.



SCREEN 7

The settings are now saved.



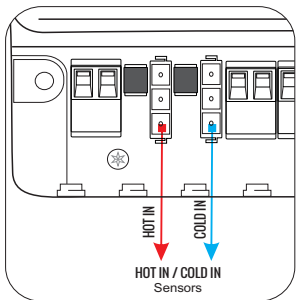
TO REVIEW SETTINGS

Hold both the Blue and Green buttons down together for 5 seconds to review the settings in the system.



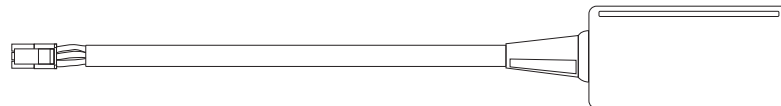
TO CHANGE SETTINGS

Once the settings have been saved (Screen 6), they cannot be changed unless you purchase a Digital Key (Reset) tool.



Switch off meter and replace either temperature sensor with the digital key with the correct area code (meter's area code is displayed on power up).

Switch the meter back on and the digital key is automatically detected and the meter will go into the settings menu. Once all the new settings have been entered and saved the meter will instruct you to switch it off. Once the meter has been switched off, remove the Digital Key and replace it with the temperature sensor, which was initially removed. Replace the panel and switch the meter back on.



DIGITAL RESET KEY

OPERATIONAL DATA

HE	0.0 KWh
-----------	----------------

Default Screen

HE = Heat Energy

Total consumption in Kwh's or Mwh's.

IP	23 KW
-----------	--------------

IP = Instantaneous Power

Amount of power being consumed NOW

FT	78.8C
-----------	--------------

FT = Flow Temperature

Temperature in the flow pipe

RT

78.8C

RT = Return Temperature*Temperature in the return pipe*

FR

354.87 m3/h

FR = Flow Rate*Total flow in meters cubed per hour*

OUTWARD PULSE DATA OPEN COLLECTOR

Maximum Operating Voltage	45vdc
Power Dissipation Limit	
Reverse Connection Protection	6vdc
DC Forward Current	0.6v
Isolation Resistance	5 x 10 ohms
Collector Remitter Saturation Voltage	0.4volts
Clamp circuit injection	65vdc
Maximum Current	10amp
Pulse Width	50 ms
Rise and Fall Ma	18 micro sec's
Isolation Voltage	5 kv
Operating Temperature Range	-55°C to 130°C

OUTWARD PULSE VALUE 10 pulses per kWh (if set for kWh's) or 10 pulses per mWh (if set for mWh's)

ERROR CODES

Error codes act as a 'Que' in the software to inform of potential problems. When an 'ERROR' occurs the HCM45's buzzer operates.

ERROR 1	No sensors connected or data shorted to 5 volts
ERROR 2	Data Shorted to 0 volts
ERROR 3	Data transmission error
ERROR 4	Hot Sensor faulty or wiring swopped around
ERROR 5	Cold Sensor faulty or wiring swopped around
FREEZING	Temperature in pipes or below 1°C
REVERSE ENERGY	Cold Sensor is warmer than hot sensor

GUARANTEE

All products are guaranteed on a return to base basis only, for a period of 12 months from dispatch date. No compensation will be offered, relating to consequential loss, where HCM45 Calculators are installed, without using Meters UK flow meters. This could alter the known operational criteria and effect the product integrity. The company reserves the right to refuse claims where deemed correct. This product is sold subject to the company Dispatch, Guarantee & Returns Policy only.