

EC type-examination certificate UK/0126/0155

issued by:

The National Measurement Office
Notified Body Number 0126

In accordance with the requirements of the Measuring Instruments (Non-Prescribed Instruments) Regulations 2006 which implement, in the United Kingdom, Council Directive 2004/22/EC, this EC type-examination certificate has been issued to:

meters uk Ltd
Whitegate
White Lund Trading Estate
Lancaster
Lancashire
England
LA3 3BT

in respect of a Heat Meter Calculator Sub Assembly, designated the HCM4, and having the following characteristics:

Mechanical environment class:	M1
Electromagnetic environment class:	E2
Temperature range ambient:	-10 °C to +55°C
Humidity:	Condensing

The necessary data (principal characteristics, alterations, securing, functioning etc) for identification purposes and conditions (when applicable) are set out in the descriptive annex to this certificate.

Issue Date: 17 December 2013
Valid Until: 16 December 2023
Reference No: TS17/0002



Signatory: G Stones
for Chief Executive

Descriptive Annex

1 INTRODUCTION

The HCM4 is a heat meter calculator sub assembly for use in heating or cooling systems. It is designed function with a flow meter and pulse inputs from 2 high accuracy digital temperature sensors, as detailed in section 4.

2 FUNCTIONAL DESCRIPTION

2.1 Measurement of the temperatures

The flow and return temperatures are read from the temperature sensors every second in direct digital format with a cyclic redundancy check value attached. The validity of the data is tested against the cyclic redundancy check value. The readings are in degrees Celsius to the nearest 0.1 degrees.

2.2 Calculation of the enthalpies

The flow and return enthalpies are calculated every second using the temperature measurements. The enthalpies are calculated using a combination of lookup tables at 1 degree intervals and linear interpolation between stored values. The enthalpies are calculated in kilojoules per kilogram to the nearest 4 decimal places.

2.3 Calculation of the density

The density at the flow meter is calculated every second using the temperature measurement from the appropriate temperature sensor. The density is calculated using a combination of lookup tables at 1 degree intervals and linear interpolation between stored values. The density is calculated in kilograms per cubic metre to the nearest 3 decimal places.

2.4 Measurement of the flow rate

The flow rate is determined by measuring the time between pulses from the flow meter to the nearest millisecond. This time is used along with the defined number of litres per pulse to calculate the current flow rate in cubic metres per second.

2.5 Calculation of the instantaneous power

The instantaneous power is calculated every second by multiplying together the enthalpy difference, density and flow rate. The formula for this is $\text{kJ/kg} * \text{kg/m}^3 * \text{m}^3/\text{s}$
 $= \text{kJ/s} = \text{kW}$.

2.6 Integration of the power over time to determine the energy

The total accumulated energy is updated every second by adding 1/3600 of the current instantaneous power.

3 TECHNICAL DATA

Mechanical environment class:	M1
Electromagnetic environment class	E2
Temperature range ambient	10 °C to +55°C
Humidity	Condensing
Temperature input Range	1 °C to 127 °C
ΔT (Min)	1 °C
ΔT (Max)	126 °C
Resolution Temperature	0.1 °C
Resolution MW h or kW h	0.1
Max Display MW h or kW h	9999999.9 (8 Digit Display)
Power supply	230 V

4 PERIPHERAL DEVICES AND INTERFACES

4.1 Interfaces

The instrument may have the following interfaces:

4.1.1 Flow Meter Input

Accepts mechanical contact or open collector switching.

Minimum Pulse Width 10ms.

Maximum Voltage from HCM4 = 30 volts (Typical 24v)

Minimum Activation Current 1mA

Maximum Contact Resistance 4K7

4.1.2 Temperature Sensor Inputs

1 wire connection (0v – 5v – Data)

Data is clamped to 5v maximum and uses the 1 wire Communication Protocol

4.2 Peripheral devices

The instrument may be connected to any compatible peripheral device that has been issued with a Type Examination certificate by a Notified Body responsible for Annex B (MI-004) under Directive 2004/22/EC in any Member State and bears the CE marking of conformity to the relevant directives.

5 APPROVAL CONDITIONS

The certificate is issued subject to the following conditions:

5.1 Legends and inscriptions

5.1.1 The instrument bears the following legends:

- 'CE' marking
- Supplementary metrology marking
- Notified body identification number
- Serial number
- Manufacturers mark or name
- Certificate number

5.2 Software

The following software version is approved:

Version number 2.8

The version number is displayed on start up.

6 LOCATION OF SEALS AND VERIFICATION MARKS

The three securing screws are wired and sealed as shown in figure 1.

7 SUPPORTING DOCUMENTATION

7.1 P01139 – MID Checklist
P01139 – Welmec 7.2 Software Checklist
Documentation File – TS17/0002/4

8 ALTERNATIVES

8.1 There are as yet no alternatives.

9 ILLUSTRATIONS

Figure 1 HCM4 and Sealing arrangement

10 CERTIFICATE HISTORY

ISSUE NO.	DATE	DESCRIPTION
UK/0126/0155	16 December 2013	Type examination certificate first issued.



Figure 1 HCM4 and Sealing arrangement