

## Compact Heat Meters



### Features

- Compact design
- Simple operation
- Pulsed output or M-bus options

### Specification

#### Water Meter

Temp. range	5 to 90°C
Nominal pressure	10bar
Installation:	
Return	Standard
Flow	On request
Cable length	15cm
Nominal flow ( $q_p$ ):	
15mm	0.6 or 1.5m <sup>3</sup> /h
20mm	2.5m <sup>3</sup> /h
External thread:	
15mm	G $\frac{3}{4}$ "
20mm	G1"
Dimensions:	
15mm	110mm face to face
20mm	130mm face to face

#### Temperature Sensors

Sensor element	PT500 (to DIN IEC 60751)
Sensor lead length	1.5 or 3m
Diameter	5mm
Installation:	
Return	Integrated flow sensor
Flow	$\frac{3}{4}$ " or 1" Ball valve with pocket

#### Heat Meter

Temp. range	1 to 130°C
Temp. resolution	0.01°C
Display type	8 digit LCD
Energy display	MWh
Data storage	Non-volatile memory, once daily
Power supply	3V Lithium battery
Battery life	6+1 years
Output pulse	Max. operating voltage 35Vdc, 120mA max Pulse width 125ms
Conformity:	EN1434 Class C, MID
Ambient temp.	0 to 55°C
Protection	IP54

### Product Codes

#### MW-CHM-1

Compact heat meter with 0.6m<sup>3</sup>/h nominal flow,  
15mm nominal diameter (DN)

#### MW-CHM-2

Compact heat meter with 1.5m<sup>3</sup>/h nominal flow,  
15mm nominal diameter (DN)

#### MW-CHM-3

Compact heat meter with 2.5m<sup>3</sup>/h nominal flow,  
20mm nominal diameter (DN)

#### Output options (add to above code)

- A Pulsed output
- B M-bus output

#### Sensor length (add to part code)

- 7 1.5m Sensor pair
- 8 3m Sensor pair

#### Accessories

#### MW-BV-1

Replacement  $\frac{3}{4}$ " ball valve

#### MW-BV-2

Replacement 1" ball valve

### Start Of Operation

- Slowly open the shut-off valves
- Check for leakage and proper functioning
- Clean the calculator

After confirming that the heat meter is functioning properly, insert and tighten the sealing wires for the temperature sensors and the heat meter itself.

When replacing a meter at the end of a verification period note the meter readings and the serial numbers of the old and new meters.

Please also check the following points:

- Is the heat meter the appropriate size?
- Is the heating system in operation?
- Are the shut-off valves open?
- Is the heating system clear (dirt filters not clogged)?
- Are the temperature sensors sealed with wires (to avoid tampering)?
- Is the directional arrow on the flow sensor in the correct direction?
- Is a flow volume displayed?
- Is a plausible temperature difference displayed?
- For instruments with two external temperature sensors, is the forward flow sensor (red) in the forward flow and the return flow sensor (blue) in return flow pipe?
- For instruments with a built-in return flow temperature sensor, is the flow sensor mounted in the return flow?

### Display

The calculator has a liquid crystal display with 8 digits and special characters. The values that can be shown are divided into three display loops.

All data is retrieved using the key next to the display. The standard display has been set to permanently show the total heat quantity consumed since the meter was put into operation.

At the start you are automatically in the main loop. By pressing the key longer than 4 seconds you change to the next loop. Keep the key pressed until you reach the desired information loop.

To change the information display within a loop, simply give a short press to the key. In this way, you can scan all the information in the loop.

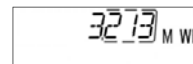
After one minute of non-use, the display returns to the total heat quantity, the standard display.

### Display Information

All the information is displayed in four easy to read loops.

#### Main loop A1:

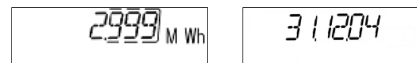
1. Total heat quantity in MWh - standard display



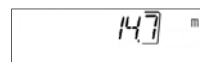
2. Segment test



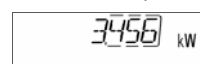
3. Last reading date alternating with heat quantity from last reading date



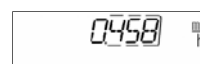
4. Total volume since installation in m³



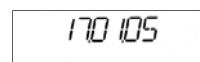
5. Current power on kW



6. Current flow in m³/h



7. Current date



8. Error message alternating binary and hexadecimal display

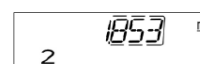


#### Technical loop A2:

1. Maximum power in kW



2. Maximum flow in m³/h



## Technical Overview

The MW-CHM range of compact heat meters consist of a water meter, two matched high accuracy temperature sensors, and a heat meter integrator. The microprocessor-controlled calculator has a large, easy-to-read display that constantly shows the energy used. Additional measurement and instrument data can be easily displayed by scanning three display loops. The integrated non-volatile E<sup>2</sup>PROM automatically stores the meter data once a day. It is possible to view the last 15 monthly values from the display.

## General Information

The valid standard for the application of heat meters is EN 1434, parts 1 + 6. The regulations for electrical installations are to be observed.

The heat meter left the factory in conformance with all applicable safety regulations. All maintenance and repair work is to be carried out only by qualified and authorized technical personnel.

All details and specifications listed on the data sheet of the heat meter must be adhered to.

The seals and locking wires required for the verification of the heat meter mustn't be damaged or removed – otherwise the verification and guarantee of the instrument no longer apply.

All electrical connections must be laid at a **minimum distance of 20 cm** to sources of electromagnetic interference (switches, controllers, pumps, etc.) In addition, all instrument connections must be laid at a **minimum distance of 5 cm** to other current-carrying wires.

The temperature sensor cables must not be kinked, rolled up, lengthened or shortened.

To protect against damage and dirt the heat meter should only be removed from the packaging directly before installation.

To clean the heat meter (only if necessary) use a slightly moist (not dripping wet!) cloth.

According to the weights and measures regulations on verification, the verification period in Germany for heat meters is 5 years.

## General Information (continued)

If several heat meters are installed in one unit, care must be taken to ensure that all the meters have the same installation conditions.

Pay attention to the mounting location of the heat meter: return flow pipe unless the optional forward flow version was ordered

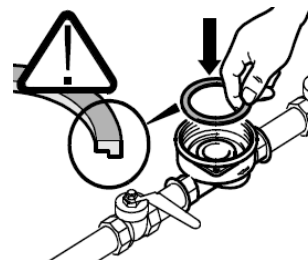
Close shut-off valves

Remove overflow flange on the EAS using a size 22 wrench.

Remove old profile gasket.

Check sealing surfaces and threads for imperfections or dirt, and if necessary, clean with a suitable cleansing liquid.

Place the new profile gasket in the EAS with the flat surface pointing up.



Lubricate the external thread of the flow sensor with a thin layer of food safe silicone grease.

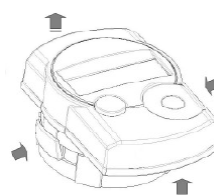
Check that the O-ring on the outlet of the flow sensor is in the correct position.

Screw in the heat meter tightly by hand and then tighten additionally to the **metallic** end stop.

Rotate the calculator into the correct reading position.

### Note:

In order to simplify mounting in a narrow installation space the calculator MW-CHM can be removed from the flow sensor. To separate the calculator press on the side surfaces shown in the illustration and carefully lift off the top part of the housing.



Display Loops (continued)

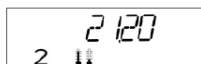
3. Forward flow temperature in °C



4. Return flow temperature in °C



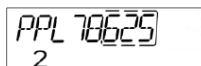
5. Temperature difference



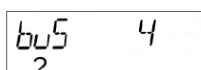
6. Days in operation since verification



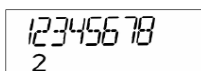
7. Pulse value: pulses per litre



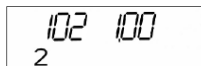
8. M-bus address



9. Serial number of heat meter

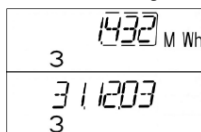


10. Error message

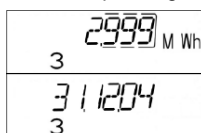


Statistic loop A3:

1. Heat quantity at next to last reading date alternating with that reading date



2. - 16. 15 Monthly reading values alternating with the corresponding reading dates\*



\* Up to the end of the month the consumption and reading date for that month will be shown as 0.

Error Codes

When the instrument detects an error, the standard display changes to include the error symbol and error number alternating with the regular standard display, total heat quantity. There are seven possible causes of error, and they can appear in combination with each other, depending on the situation.

The occurring error is shown on the LCD in the format "Err xx". The "xx" stands for the error no., shown in hexadecimal form.

For example, Err 08 -> scanning coil fault

Error Code							
Left digit				Right digit			
Error code	Check sum fault	E <sup>2</sup> PROM fault	Reset	Error code	Scanning coil Fault	Ref-sensor fault	rf-Sensor fault
1x			X				X
2x	X				X	X	
3x	X	X			X	X	X
4x	X			X			
5x	X	X		X			X
6x	X	X		X	X	X	
7x	X	X	X	X	X	X	X
8x				X			
9x		X	X				X
Ax	X		X	X	X	X	
Bx	X	X	X	X	X	X	X
Cx	X			X			
Dx	X		X	X			X
Ex	X	X		X	X	X	
Fx	X	X	X	X	X	X	X

Check sum fault:

Description

The configuration of the instrument stored in the E<sup>2</sup>PROM is not correct.

Effect

No calculations are carried out. The registers for flow and energy are not being updated.

Possible cause

Defective component.

## Error Codes (continued)

### **E<sup>2</sup>PROM fault:**

#### *Description*

No communication with the E<sup>2</sup>PROM.

#### *Effect*

After a reset, the instrument is without function.

#### *Possible cause*

Defective component.

### **Reset:**

#### *Description*

The calculator electronics have been reset.

#### *Effect*

The measurements since the last storage of data in the E<sup>2</sup>PROM are lost (max. one day).

#### *Possible cause*

EMC.

### **Coil fault:**

#### *Description*

The scanning is not functioning properly.

#### *Effect*

No calculations are carried out. The registers for flow and energy are not being updated (no new data is being stored).

#### *Possible cause*

Coil shorted out; connecting cable between calculator housing and flow sensor damaged.

### **ref-sensor fault:**

#### *Description*

Error during the reference measurement.

#### *Effect*

No calculations are carried out. The registers for flow and energy are not being updated (no new data is being stored).

#### *Possible cause*

A defect on the calculator circuit board.

### **rf-sensor fault:**

#### *Description*

The return flow temperature sensor is defective.

#### *Effect*

No calculations are carried out. The registers for flow and energy are not being updated (no new data is being stored).

#### *Possible cause*

Sensor cable severed; sensor cable shorted out.

## Error Codes (continued)

### **rf-sensor fault:**

#### *Description*

The forward flow temperature sensor is defective.

#### *Effect*

No calculations are carried out. The registers for flow and energy are not being updated (no new data is being stored).

#### *Possible cause*

Sensor cable severed; sensor cable shorted out.

## Pulsed output

The potential-free contact available as a built in option (state when ordering) is an electronic switch for flexible use (class A0 according to EN1434), which outputs the counting pulses of the heat meter. The pulse output closes, corresponding to the pulse value of the flow sensor (see the identification plate on the instrument) for a duration of 125 ms. If several pulses are output during a measurement, the interval between two pulses is likewise 125 ms. As long as the nominal and boundary values of the contact are taken into consideration, the user is free to define his contact data within a wide range. A wide variety of data acquisition instruments can be connected to the contact outputs. The lifetime of the battery for heat meters with potential-free contact outputs is at least 6 years plus one year storage.

#### Pulse values:

- Heat: standard: 1kWh/pulse, or optionally
- Volume: standard: 100 l/pulse