Heat Meter T550 Ultraheat® (UH50…)
Cold Meter T550 Ultracold® (UH50…)
T550 Flow Sensor (UH50…)

issue january 2011

Installation and Service Instructions UH 206-101m

3250 006 101 m

Note: In the following text the term Meter covers the Heat Meter as well as the Cold Meter and the Flow Sensor if not mentioned otherwise.

Safety information

- ☞ The meter is designed for circulating water of heating systems (not for drinking water!).
- ☞ Do not pick up by the electronic unit
- ☞ Be careful of sharp edges (thread, flange, measuring tube)
- ☞ Installation and removal must be performed by qualified personnel only
- ☞ Mounting and unmounting are only permitted when the system is not under pressure
- ☞ After installation, a tightness test must be conducted with cold pressure
- ☞ Only ever use under service conditions, otherwise dangers can arise and the warranty may be voided
- ☞ Breaking the security seal voids the warranty
- ☞ The 110 V / 230 V versions must only be connected by an electrician
- ☞ The meter contains Lithium batteries, so it is not allowed to dispose it wih the household waste. Return of the Lithium batteries must be carried out professionally. It is possible to return the product after use for proper disposal to the manunfacturer. Please follow the legal regulations at the shipment of Lithium batteries, which rules amongst others the declaration and the packaging of hazardous good.
- ☞ Lightning protection cannot be ensured; this must be provided by the building wiring
- ☞ Only one compartment for the power supply must be equipped – do not remove the red locking hatch

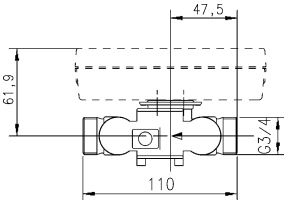
General information

The electronic unit is plugged onto an adapter plate and can be separated by pushing the volume measuring unit upward.
The packaging should be kept so that the meter can be shipped in its original packing after the calibation period has elapsed.
If the meter was not supplied with a battery connected, the current date and time must be entered during start-up (see “Parameter setting”).
The 110 V / 230 V power supply units comply with safety class II, so the line voltage does not need to be disconnected when changing the unit.
All cables must be laid at a **minimum distance of 300 mm** from power cables or radio-frequency cables.
As an ambient relative humidity < 93% at 25°C is allowed (without condensation).
By overpressure, cavitation must be avoided in the entire measuring range, i.e**. at least 1 bar at q_p** and approx. 3 bar at q_s (applies to approx. 80°C).
The meter left the factory in perfect safe condition. Calibration, maintenance, component replacement, and repairs must only be performed by trained personnel who are familiar with the hazards involved. The manufacturer will provide further technical support on request. meter safety marks that are relevant for calibration must not be damaged or removed! Otherwise the warranty and calibration validity of the device will expire.

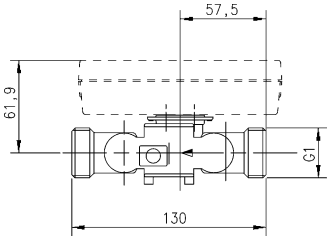
Installation

Choose the mounting location (return or flow) in accordance with the labeling on the meter. Study the table for the dimensions and check that there is enough clearance.
No inlet or outlet sections are necessary. However, if the meter is installed in the shared return of two systems, the mounting location must be a sufficient distance from the T element that forms the junction (**min. 10 × DN**) to allow the different water temperatures to mix well.
Before the meter is installed, the system must be rinsed thoroughly.
As shown in the examples on Page 2, mount the volume measuring unit horizontally or vertically between two shut-off valves in accordance with the arrow for the direction of flow. The sensors must be mounted in the same heating circuit as the volume measuring unit. For installation as a **cold meter,** see the following notes.
The sensor can be mounted in ball valves, in pockets or direct immersed. The end of the sensors must extend in any case as far as the center of the pipe cross-section. Temperature sensors and screw joints must be sealed for protection from tampering.

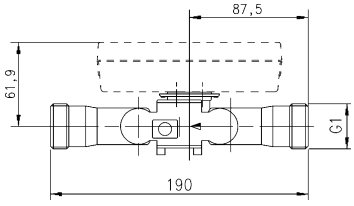
Small meters (q_p 0.6 - 2.5 m³/h)



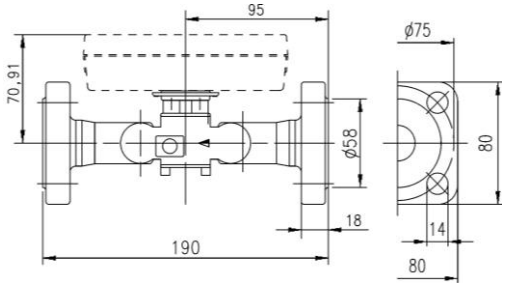
Overall length 110 mm (thread)



Overall length 130 mm (thread)



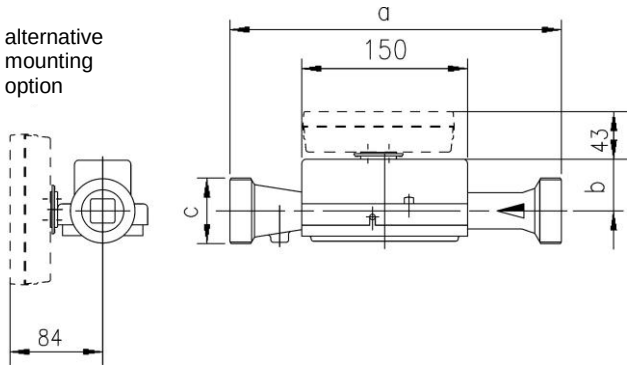
Overall length 190 mm (thread)



Overall length 190 mm (flange)

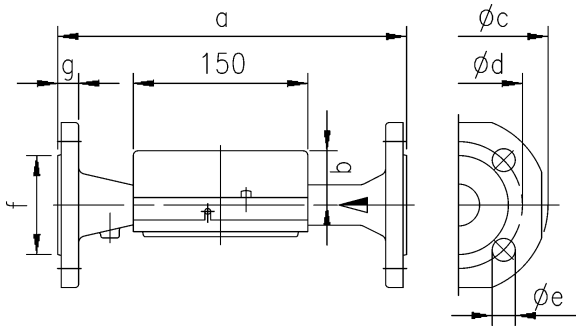
Large meters with threaded joint

alternative mounting option



Order no.	qp m³/h	PN bar	a	b	c
UH50-x45	3.5	16	260	51	G 1¼ B
UH50-x47	3.5	25	260	51	G 1¼ B
UH50-x50	6	16	260	51	G 1¼ B
UH50-x55	6	16	150	27	G 1¼ B
UH50-x60	10	16	300	48	G 2 B
UH50-x63			200		

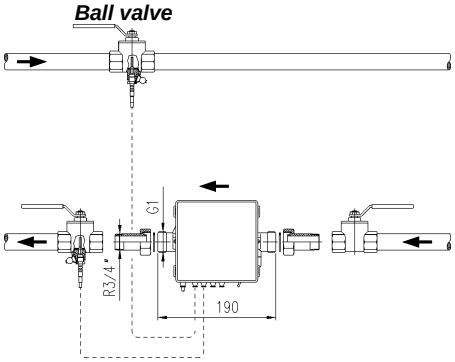
Large meters with flange joint



Order no.	qp m³/h	PN bar	DN	a	b	Øc	Ød	Øe	No. of holes	f	g
UH50-x46	3.5	25	25	260	51	115	85	14	4	68	18
UH50-x52	6	25	25	260	51	115	85	14	4	68	18
UH50-x61	10	25	40	300	48	150	110	18	4	88	18
UH50-x65	15	25	50	270	46	165	125	18	4	102	20
UH50-x69	15	25	50	200					4		
UH50-x70	25	25	65	300	52	185	145	18	8	122	22
UH50-x74	40	25	80	300	56	200	160	18	8	138	24
UH50-x82	60	16	100	360	68	235	180	18	8	158	24
UH50-x83	60	25	100	360	68	235	190	22	8	158	24

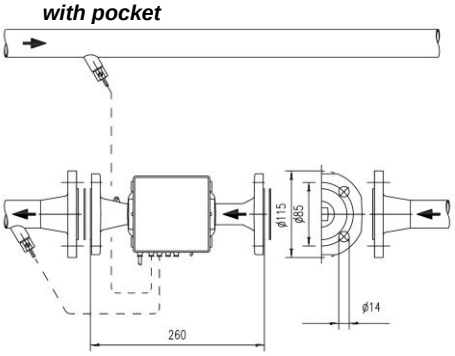
Examples of installation

Ball valve



Example of mounting with a ball valve (recommended up to DN25)

Welded sleeve with pocket

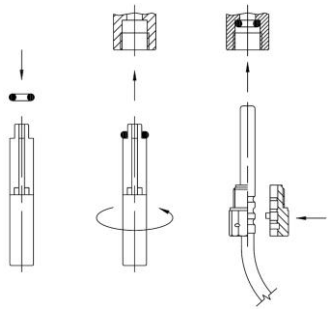


Example of mounting with pockets (recommended for > DN25)

Hint for mounting adapter set (sensor direct immersed)

For meters with temperature sensor 5,2x45 mm a mounting set is enclosed. Hereby the sensor can be installed direct immersed e.g. in a mounting element or a ball valve.

Mounting advice (see figure): Install O-ring with enclosed fit-up aid/fit-up pen in the mounting point. Take both halves of the plastic bolting and put them around the 3 gaps of the sensor, compress and screw in until bedstop (hand-screwed, fastening torque 3 – 5 Nm).

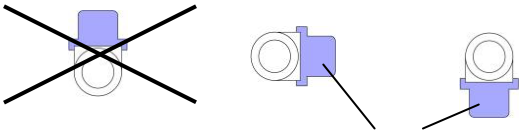


Mounting adapter set

Mounting as a cold meter

When mounting a **cold meter** or **combined heat/cold meter**, make sure the black cover on the measuring tube is oriented to the side and downward (because of water condensation). The immersion sleeves should also be mounted to the side or downwards.

The electronic unit must be separated from the flowrate measuring tube and, for example, mounted on the wall (split mounting). Make sure that condensed water cannot run along the connected pipes into the electronic unit (building a loop downwards).



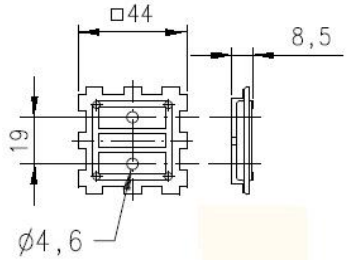
cover of flow sensors

Allowed position of the cold meter

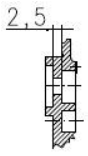
Electronic unit

The ambient temperature of the electronic unit must not exceed 55°C. Direct sunlight must be avoided.

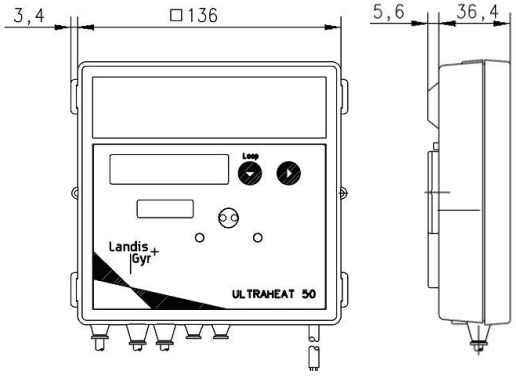
For water temperatures between 10°C and 90°C, the electronic unit can remain on the volume measuring unit or be mounted on the wall (split mounting). On the wall or on the volume measuring unit, the adapter plate can be oriented to make it easy to read the display. To remove the electronic unit, push the housing upward and remove. The adapter plate for wall mounting can now be unscrewed or the electronic unit simply rotated and pushed back into the required position until it latches.



Adapter plate (top view)



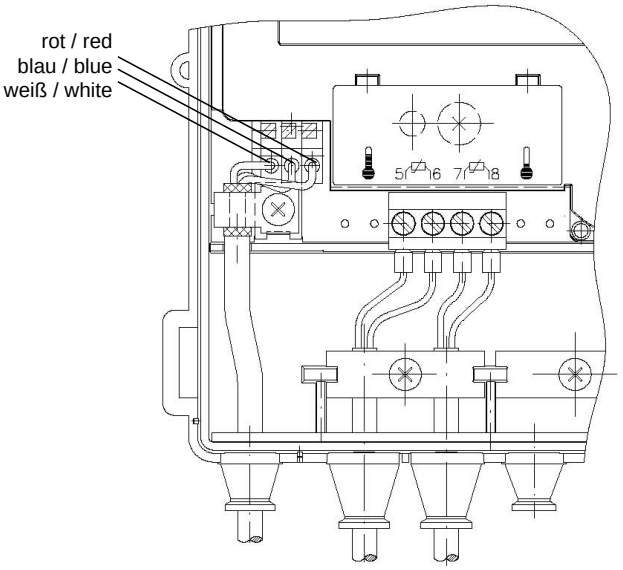
Adapter plate (cross-section)



For water temperatures below 10°C or above 90°C, the electronic unit must be fixed on the wall (split mounting). For this purpose, remove the electronic unit from the adapter plate, unscrew the adapter plate from the volume measuring unit, and screw to the wall with plugs. Push the electronic unit on again.

A meter with a **removable control cable** may be separated during the installation. When installation is done be sure that only paired parts (volume part, calculator) are connected together and in correct order.

The control cable must not be extended!



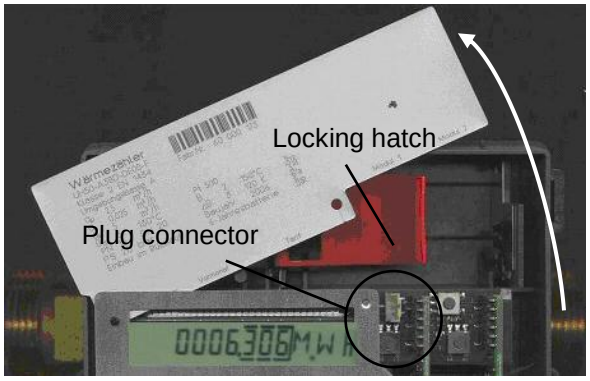
Power supply

The meter can be powered either with a battery or via power supply modules. The 110 V / 230 V power supply modules are encapsulated and comply with safety class II. The modules can be retrofitted or upgraded at any time.

In the standard version, a battery is inserted in the factory. This must not be opened. It must not come into contact with water or be exposed to temperatures exceeding 80°C. Used batteries must be disposed of at suitable waste disposal facilities.

In a special version, a power supply module can be installed. In the 110 V AC and 230 V AC versions, a cable is brought out in the factory that must be connected to the line voltage accordingly. The 24 V AC/DC version has terminals instead of a cable.

The 110 V or 230 V power supply unit must be fuse-protected with 6 A near to the meter and protected from tampering.



Insert the battery

Press the four side tabs of the housing cover inward and remove the cover. Then turn the label plate counterclockwise until you feel it has gone as far as it will go.

Swing open the red locking hatch to expose the relevant battery compartment (left compartment for 2x “AA” or “C”, right compartment for “D”).

Insert the battery into the relevant compartment of the electronic unit with the correct polarity as marked.

Turn the label plate back clockwise into its original position.

Note: “AA” and “C” size batteries are snapped into a holder.

In case of a meter's return via airfright the battery ("C" and "D" cell) has to be generally dismounted and forwarded separately from the meter.

Mounting the power supply module

Instead of the battery, a power supply module (110 V / 230 V with connected cable, 24 V with terminals) can also be installed. This is done by moving the red locking hatch to the left to open the right-hand compartment for the power supply module. Remove the right-hand outside rubber sleeve upward, pull out the plugs and thread the connecting cable (line voltage) of the module through the sleeve. Insert the module in the upper right-hand corner of the electronic unit and re-insert the sleeve with the cable from above. Connect the conductors as labeled. Plug the other connecting cable (low voltage) onto the plug connector on the circuit board.

Note: For the 24 V AC/DC version, cable with a diameter greater than 5.0...6.0 mm should not be used!

☞ **The 110 V / 230 V versions must only be connected by an electrician!**

When replacing a unit after the calibration period has elapsed, swing out the power supply module with the cable and sleeve, mount the new meter, and re-insert the module. Because it complies with safety class II, the line power supply does not have to be disconnected.

Interfaces of the electronic unit

The UH50 meters are equipped with an optical interface per EN 62056-21:2002 as standard. Moreover, up to two of the following communication modules can be used for remote reading:

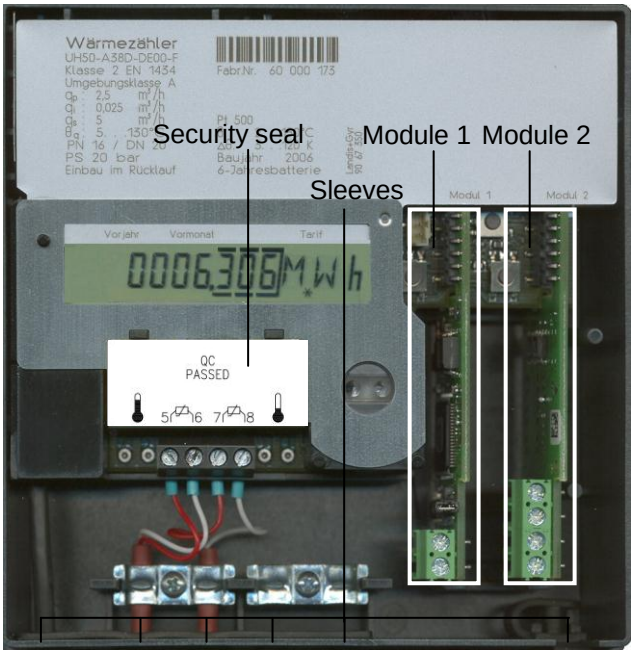
- Pulse module (pulses for quantity of energy / volume / unit status / tariff register 1 / tariff register 2; isolated, bounce-free)
- CL module (passive 20 mA current loop per EN 62056-21:2002)
- M-bus module per EN 1434-3, fixed and extended, variable protocol (also for coupling with a suitagle heating controller)
- M-bus module G4
- M-bus module G4 MI with 2 pulse inputs
- Analog module
- Radio module

These modules are have no effect on consumption metering and can therefore also be replaced at any time without violating the security seal.

Communication modules

In the lower right-hand area, up to two communcation modules can be installed in the factory.

At a later installation the necessary ESD protection measures has to be considered.



For further technical details and data on the module, see the technical documentation.

Terminals

2-pole and 4-pole terminals are used for connecting external cables to the modules.

Strip-back length 5 mm

Connection capacity

- rigid or flexible, 0.2 - 2.5 mm²
- flexible with end ferrules, 0.25 - 1.5 mm²
- conductor sizes 26 - 14 AWG

Multiple-conductor connection (2 conductors of same cross-section)

- rigid or flexible, 0.2 – 0.75 mm²
- flexible with end ferrules without plastic sleeve, 0.25 – 0.34 mm²
- flexible with TWIN ferrules with plastic sleeve, 0.5 – 0.75 mm²

Recommended screwdriver:

- 0.6 x 3.5 mm

Tightening torque: 0.4 Nm

Permissible combinations of modules

Only in slot 1 allowed:

- M-bus module mith 2 pulse inputs

Only in slot 2 allowed:

- pulse module with fast pulses
- radio module

Only one CL module may be used!

The analog module is not possible in module slot 2, when the meter has a power supply module 110 V / 230 V.

All other combinations are allowed.

Installing a communication module

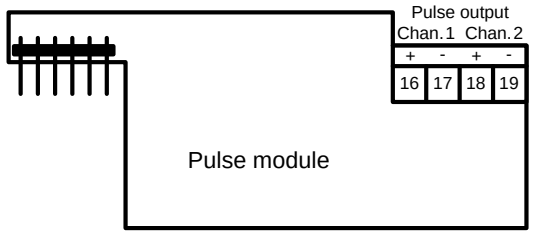
The communication modules are connected via a 6-way reaction-free connector so that installation or replacement is possible at any time.

Put the communication module in the correct position, carefully insert it into the two guide slots, and push it in.

For connection with the external cable, strip the sleeve to ensure the correct cross-section of the connecting cable. Feed the cable through the sleeve from outside, strip it back and connect it. A cable shield must not be connected to the meter.

Unsure you use the correct slot for the modules and comply with the permissible combinations.

Pulse module



Display in LCD **CE**, **C2**, **CV**, **CT** or **RI**
(depending on output mode, see below)

The pulse module permits the output of pulses that can be derived from the quantity of heat, the volume, tariff register 1 or tariff register 2. Two channels are available whose functions can be parameterized with the PappaWin software.

Output takes the form of standard pulses or “fast pulses”. The pulse duration is identical for channel 1 and channel 2.

Note: If two pulse modules are plugged, please note the restrictions (see above)!

Parameter setting for standard pulses

Output mode		Output value
Chan.1	**CE** (count energy)	Pulses for quantity of heat
	C2 (count tariff 2)	Pulses for tariff register 2
Channel 2	**CV** (count volume)	Pulses for volume
	CT (count tariff 1)	Pulses for tariff register 1
	RI (ready indication)	Pulses for the operating states "Ready / Fault"

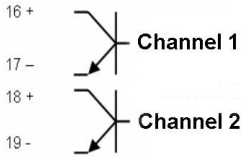
Parameter setting for “fast pulses” *)

Channel 1	Channel 2
CE (count energy)	**CV** (count volume)
	- (no function)
CV (count volume)	**CV** (count volume)
	- (no function)
CE / CV **) (count energy / count volume)	**CV** (count volume)
	- (no function)

*) fast pulses have to be set via the service software
**) automatic output of the higher pulse rate

Labeling	pulse module
Type	open collector
Voltage	maximal 30 V =
Current	maximal 30 mA
Dielectric strength	500 V_{rms} against ground
Classification	OB (per EN 1434-2)
Voltage drop	approx. 1.3 V at 20 mA
Classification	OC (per EN 1434-2)
Voltage drop	approx. 0.3 V at 0.1 mA

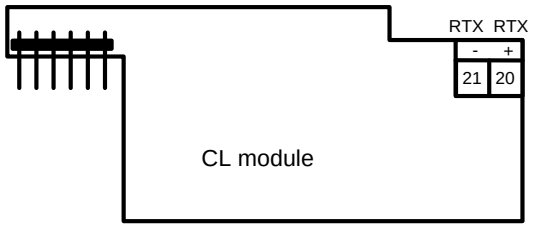
Output connection (standard version):



A special version of the pulse module is available with an Opto-MOS output.

Advantages: low voltage drop and polarized (bipolar).

CL module

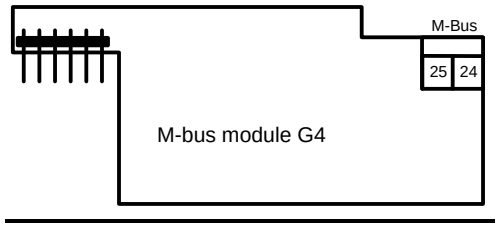


Display in LCD **CL** (current loop)

The CL module can be used to set up a point-to-point link enabling the heat meter to be read remotely, for example, at the front door.

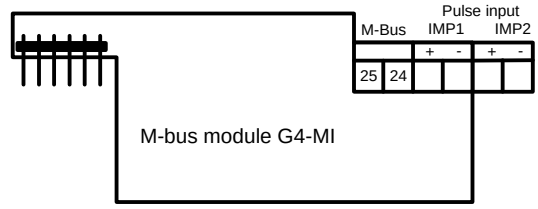
Standard	per EN 1434-3
Type	passive current loop
Baudrate	2400 Baud, fest
Isolation	galvanic
Polarity	yes
Voltage	30 V maximal
Current	30 mA maximum
Voltage drop	< 2 V at 20 mA
Literature	TKB 3415

M-bus module G4



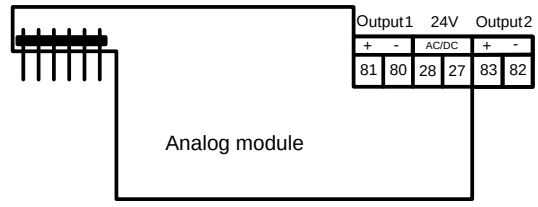
Display in LCD MB, G4 alternating
Please read the appropriate instructions manual for more information (included to the meter/module).

M-bus module G4 MI with 2 pulse inputs



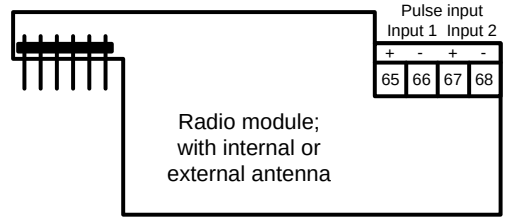
Display in LCD MI, G4 alternating
Please read the appropriate instructions manual for more information (included to the meter/module).

Analog module



Display on LCD **AM** (analog module)
Please read the appropriate instruction manual for more information (enclosed).

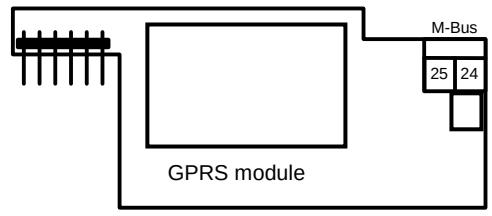
Radio module



Display on LCD **RM** (radio module)

Please read the appropriate instruction manual for more information (included to the meter/module).

GPRS module



Display on LCD: MB or MB,G4 alternating

Consider the short instructions manual (attached to the meter/module)!

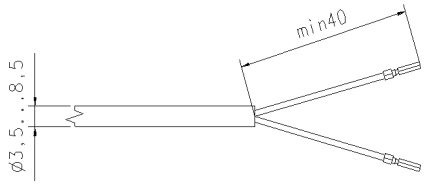
A detailed manual is in the internet available.

Factory-installed sensors

Do not disconnect, shorten, or extend the cables of factory-installed sensors.

Sensors installed by the customer

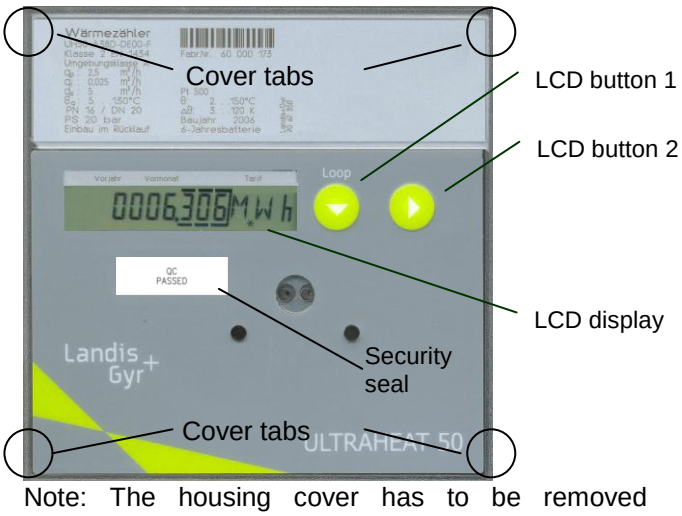
If removable sensor types are used, they must have an own certification!
In the case of sensors provided by the customer (max. cable length 5 m – an extension is impermissible!), the 2nd and 3rd sleeve from the left must be cut to ensure the correct cable cross-sections.
Unlatch the housing cover by pressing in the side tabs and remove it. Route the cable of the flow sensor from outside through the 2nd sleeve, the cable of the return sensor through the 3rd sleeve. Strip back both cables as shown in the diagram.



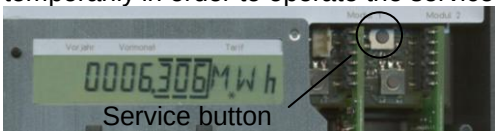
Wire-end ferrules

Connect the conductors as shown on the circuit diagram printed on the unit. The 2-wire connection is always made at terminals 5/6 and 7/8 (also when a meter is provided for 4-wire connection).
No cable shield must be connected to the meter. Then inset the sensors in the pockets, ball valves, or T-elements and seal against tampering.
If an error message “F8” is shown, it can be reset via the parameter setting menu (see following).
Replace the housing cover and press it in gently until you hear all the tabs latch.

Parameter setting



Note: The housing cover has to be removed temporarily in order to operate the service button.



Setting the date / time

Units with a power supply unit or new battery connected in situ may start directly in the setting menu for the date and time.

D 10.05.06	Enter the date
T 10.59.59	Enter the time
No-------	Return to normal mode (manual)

Press LCD button 1 repeatedly until the required value is shown. Then press LCD button 2. Change the value for the date or time as described under *Performing parameter setting*.

Calling the parameter setting function

Press the service button for about 3 s. The LCD shows the display PRUEF----.

In this state, you can parameterize the tariffs and fast pulses using the PappaWin software.

Caution: For fast pulses in battery operation, a D cell is required.

LCD button 1 advances the display.

PRUEF----	Call test mode
PArA-----	Call parameter setting mode
No-------	Return to normal mode (manual)

Press LCD button 1 repeatedly until "PArA" is shown. Then press LCD button 2.

The following parameter settings are possible:

FB +	Reset error message F8 (only displayed if F8 is pending)
Ma +	Reset the maxima
Fd +	Reset the missing time and the flowrate measuring time
SD 31.05.--	Enter the yearly set day (day and month) *)
SD 31.--.--	Enter the monthly set day (day) *)
D 10.05.06	Enter the date (day, month, year) *)
T 10.59.59	Enter the time (hour, minute, second) *)
K 12345678	Enter the property number, 8-digit (also M--bus secondary address)
AP1 0	Enter the M-bus primary address for module 1 (0..255) *)
AP2 0	Enter the M-bus primary address for module 2 (0..255) *)
Modul 1-1 CE Modul 1-1 C2	Select the first module function for module 1 (CE or C2)
Modul 1-2 CV Modul 1-2 CT Modul 1-2 RI	Select the second module function for module 1 (CV or CT or RI)
Modul 2-1 CE Modul 2-1 C2	Select the first module function for module 2 (CE or C2)
Modul 2-2 CV Modul 2-2 CT Modul 2-2 RI	Select the second module function for module 2 (CV or CT or RI)
MP 60 mn	Select the maxima measuring period: 7.5-15-30-60 min / 3-6-12-24 h
No-------	Return to normal mode

*) It is up to the user to ensure that only meaningful values are entered. No plausibility check is made and "incorrect" values can be applied (month > 12 etc.)

Note: The functions for modules 1 and 2 are also offered if no or any other module is plugged.
In this way, the meter can be parameterized before the modules are fitted.

The required size is selected with the LCD button 1 and activated with the LCD button 2.

Note: Parameter setting can be exited by pressing the service button again ("escape function"). In this case, the last valid value is displayed unchanged.

Performing parameter setting

LCD button 2 is used to change the blinking digit step by step or reset error F8 or the maxima. LCD button 1 applies the value set in the blinking digit. The next digit to the right of this then blinks, can be set again with the LCD button 2 and can be applied with LCD button 1. As the final acknowledgment of a display line, a star symbol is briefly displayed.

If incorrect entries are made, parameter setting be performed again.

Completing parameter setting

Parameter setting mode is exited:

- by pressing LCD button 2, when the display shows No-------
- Automatically after 15 hours

Start-up

Replace the housing cover and press it in gently until you hear all the tabs latch. Open the shut-off valves. Check the heating system for tightness and vent it carefully.

No more than 100 s later, message F0 will disappear. After that, check that the displays for flowrate and temperaures are plausible. Vent the system until the flowrate display is stable. Adjust the system with the flowrate display (updated in the flowrate timebase).

Seal the sensors. Attach user seals to the electronic unit and the sensors.

Read and note down the meter readings for quantity of energy, volume, operating time, and missing time.

We recommend resetting the maxima and the missing time (see parameter setting).

Error messages on incorrect mounting:

FL nEG	Meter was mounted the wrong way round, against the intended direction flow
dIFF nEG	Temperature sensors were swapped round during mounting or connection

Note: During a system stoppage, these messages may appear although mounting was correct.

Displays

The function of the display is described in detail in the "Operating Instruction" (enclosed).

Error messages

The meter constantly performs self-diagnostics and can display various error messages.

Error code:	Error / action to be taken:
F0	No flow; Air in measuring unit / pipe, vent pipe
F1	Interruption of flow sensor
F2	Interruption of return sensor
F3	Electronic for temperature evaluation defective
F4	Battery empty; replace!
F5	Short-circuit flow sensor
F6	Short-circuit return sensor
F7	Fault in the internal memory
F8	F1, F2, F3, F5 or F6 pending for longer than 8 hours. No more measurements are performed.
F9	Error in the electronics

Message F8 has to be reset in parameter setting mode (manually, PappaWin). All other error

messages are cleared automatically once the error has been corrected.

Notes

- All regulations on the use of meters must be observed.
- Cavitation in the system must be avoided.
- Meters up to DN25 may only be installed with directly immersed sensors according to German calibration law!
- Shorten the bush sleeve in this way, that it sorrounds the cable densely.
- Install the unit in such a way that no water can enter the electronic unit during operation.
- User seals may only be removed by authorized persons for service purposes and must be replaced afterwards.
- No later than 30 seconds after installation, the meter detects the plugged modules automatically and is ready for communication or pulse output.
- The type of modules plugged can be displayed in the service loop depending on how the display is parameterized.
- For fast pulses, the parameters must be set accordingly with the PappaWin software.
- Up-to-date versions of all instructions can be found in the Internet at **www.landisgyr.com**

Landis+Gyr GmbH
Humboldtstr. 64
D-90459 Nuremberg
Germany