Calculator T550 Ultraheat®(UC50…)
Calculator T550 Ultracold®(UC50…)

Issue: October 2011

Installation
and Service Instructions UC 209-101b

3280 009 101 b

Note: In the following term calculator covers the heat meter calculator as well as cold meter calculator and the combined heat/cold meter calculator if not mentioned otherwise.

Safety information

- ☞ Installation and removal must be performed by qualified personnel only
- ☞ 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 calculator contains Lithium batteries, so it is not allowed to dispose it with 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 manufacturer. 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 calculator is plugged onto an adapter plate and can be separated by pushing the volume measuring unit upward.
The packaging should be retained so that the calculator can be shipped in its original packing after the calibration period has elapsed.
If the calculator 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.
An ambient relative humidity < 93% at 25°C is allowed (without condensation).
The calculator 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. Calculator 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

Define mounting place (hot or cold side) and the pulse value of the flow sensor.

The **mounting place** and the **pulse value** of flow sensors with pulse output must correspond to the in the calculator set values (see LOOP 2).

Service loop 2 („LOOP 2“)

In the service loop 2, the **installation details** are displayed.

LOOP 2	Head of the loop
POS cold	Mounting place of the flow sensor cold side or hot side
POS hot	
PI000 1,000 L/I	Pulse value

At a **heat meter** or a combined heat/cold meter the mounting place of the flow sensor cold side is equivalent to return flow.

At a **cold meter** the mounting place of the flow sensor hot side is equivalent to return flow.

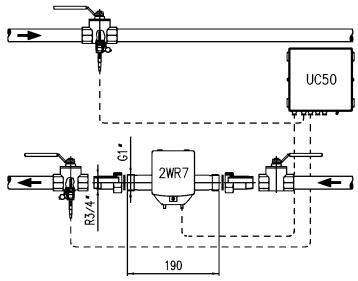
Attention: Calculators with one-time adjustable pulse value and adaptable mounting place being characterized by:

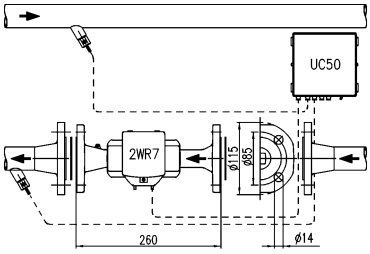
At calculators with one-time adjustable pulse value, the pulse value **must** be adjusted during commissioning in accordance with the flow sensor and the mounting place must be checked!
As long as not the pulse value has be set, the calculator not cumulated energy and volume.
The mounting place can be adapted and fully locked by entering the pulse value.

(see „Parameterization of pulse value and mounting place of the flow sensor”)

Parameterization of pulse value and mounting place of the flow sensor

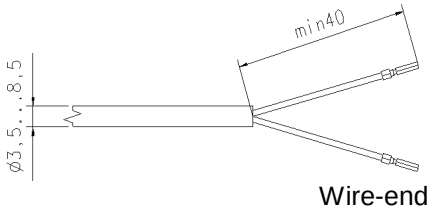
Examples of installation





Temperature sensors connection

The temperature sensors must correspond with the data on the dial plate.
The temperature sensors must have an own certification and must be installed at the same circuit such as the flow sensor.
The cable length for temperature sensors is limited to 10 m.
For installation the temperature sensors the 2nd and 3rd sleeve from the left must be cut, if necessary, to fit 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.



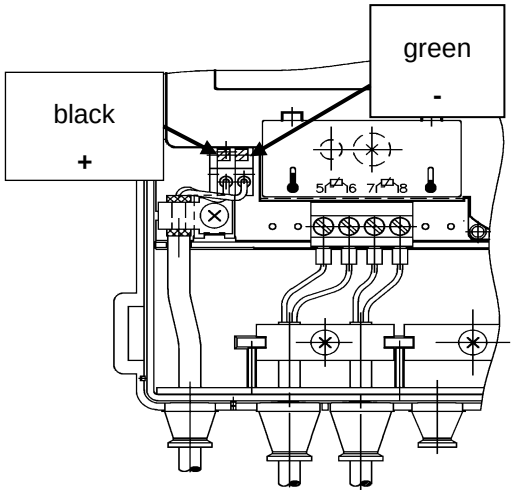
Wire-end ferrules

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 tamper. The end of the sensors must suffice at least by the middle of the pipe cross section.

Replace the housing cover and press it in gently until you hear all the tabs latch.

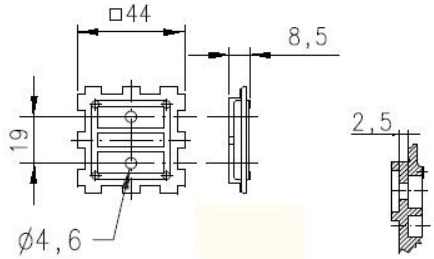
Connection of flow sensor

The flow sensor must be installed at the same circuit as the temperature sensors. When a polarity dependent pulse transmitter is used, take care of the correct orientation. The reference potential must be connected on the right site (-), the positive voltage must be connected on the left spring-type terminal (+).The cable must be fixed to the outer sheath with a clamp for stain relief. If the line has a shielding braid, the shielding braid covering can be pushed over the counter covering of the cable and be connected by a clamp. The cage clamp terminals can be used for cable cross-section of 0.5-1.5mm² (solid or stranded). In order to preserve the IP protection class of the housing, the outside diameter of the cable sheath shall be between 3.7 and 4.4 mm.

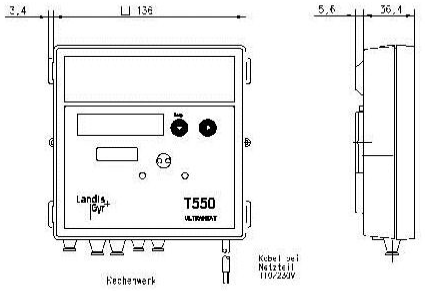


Mounting of the calculator

The ambient temperature of the calculator must not exceed 55°C. Avoid direct sunlight.
The adapter plate can be mounted, for example, on the wall with wall plugs. Then the calculator can be pushed upward and locked in position.



Adapter plate: top view Cross-section



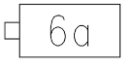
Power supply

The calculator 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 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.

The year of manufacture is characterised by:

*2011

The battery lifetime is characterised for example by:



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.

“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.

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.

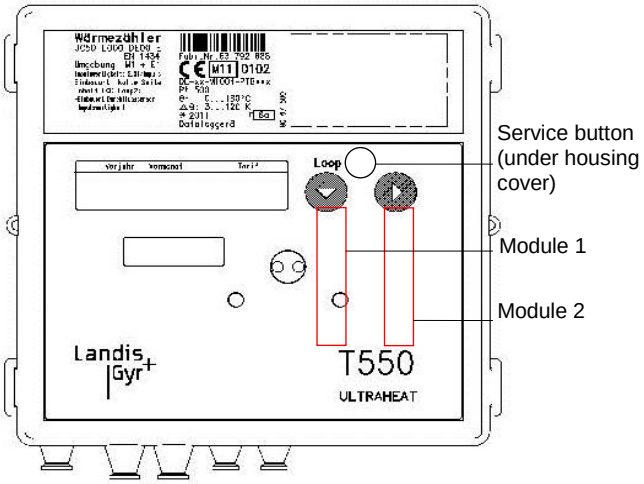
Interfaces of the electronic unit

The UC50 calculator is 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 G4
- M-Bus module G4 MI with 2 pulse inputs
- Analog module
- Radio module 434 MHz
- GSM module
- GPRS module
- NTA/OMS module 868 MHz
- Zigbee module

Plugging 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 have to be considered!



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 calulator.

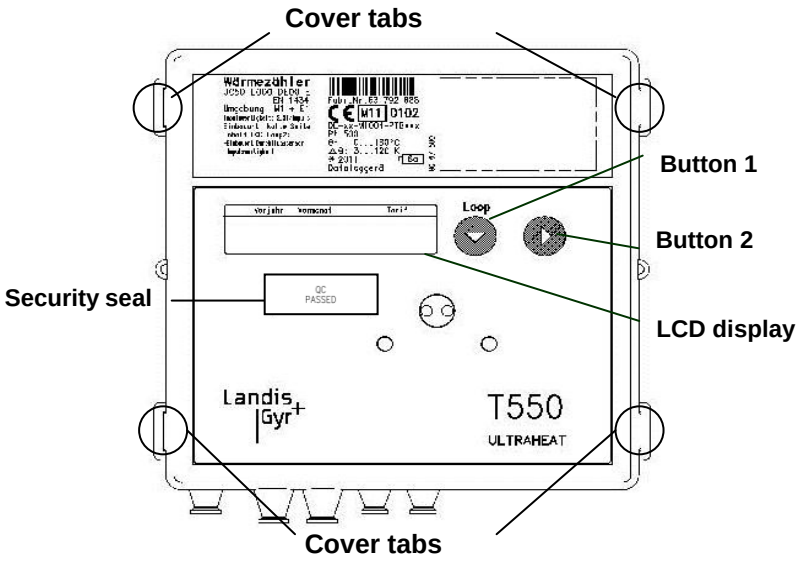
These modules have no effect on consumption metering and can therefore also be replaced at any time without violating the security seal.

For more information please read the appropriate instructions manuals (included to the meter/module).

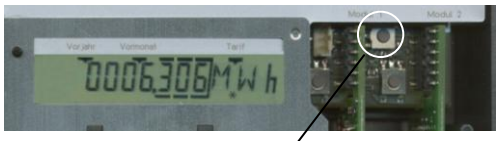
Permissible combinations of modules

The permissible combination of modules can be found in the UC50 configuration instruction.

Parameter setting



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



Setting the data / time

Units with a power supply unit or new battery connected on site 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 timet
Nb-------	Return to normal mode (manual)

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

Calling the parameter setting function

Press the service button for about 3 sec. The LCS shows the display PRUEF----.

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

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

Button 1 advances the display.

PRUEF----	Call test mode
PArA-----	Call parameter setting mode
Nb-------	Return to normal mode (manually)

Press button 1 repeatedly until „PArA“ is shown. Then press button 2.
The following parameter settings are possible:

Ma +	Reset the maxima
Fd +	Reset the error time and the flowrate measuring time
SD 01,01,--	Enter the yearly set day (DD, MM)
SD 01,--,--	Enter the monthly set day (DD) *)
D 10,05,06	Enter the date (DD, MM, YY) *)
T 10,59,59	Enter the time (hh, mm, ss) *)
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 min	Select the maxima measuring period: 7.5 – 15-30-60 min / 3-6-15-24 h
PI000,001 L/I	Pulse value
P05 cold	Mounting place of the flow sensor (here: cold side)
Nb-------	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.)

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

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

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

Parameterization of pulse value and mounting place of the flow sensor

ATTENTION:

Concerns only devices with this symbol: 

The pulse value must be set in the para menu before the first use. The right mounting place of the flow sensor is to check. As long as the pulse value hasn't yet been entered, the mounting place can be adapted.

Pulse value

Mounting place of the flow sensor (here: cold side)

Return to normal mode (manual)

Both entries will be adopted with the return in the normal operation and subsequently cannot be changed anymore!

LCD display will adopt automatically.

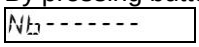
Performing parameter setting

Button 2 is used to change the blinking digit step by step or reset error or the maxima. 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 button 2 and can be applied with button 1. As the final acknowledgment of a display line, a star symbol is briefly displayed.

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

Completing parameter setting

The parameter setting mode is exited:

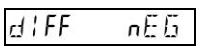
- By pressing button 2, when the display shows 

- Automatically after 15 hours

Start-up

Replace the housing cover and press it in gently until you hear all the tabs latch.
After that, check that the displays for flowrate and temperatures are plausible.
Seal the sensors. Attach user seals to the electronic unit and the sensors. Read and note down the meter reading for quantity of energy, volume, operating time and error time.
We recommend resetting the maxima and the error time (see parameter setting).

Error massages on incorrect mounting:



Temperature sensors were swapped round during mounting or connection

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

Display / priority rating

The view is limited to up to 7 entries. At puls parameterization, the display will adapt automatically. The display resolution can be selected from the following:

Puls [l/p]	Energy [MWh]	Energy [GJ]	Volume [m³]	Flow [m³/h]	Power [kW]
1	0000.001	0000.001	00000.01	0000.001	00000.1
2,5	0000.001	00000.01	00000.01	0000.001	00000.1
10	00000.01	00000.01	000000.1	0000.001	00000.1
25	00000.01	000000.1	000000.1	0000.001	00000.1
100	000000.1	000000.1	0000001	00000.01	000001
250	000000.1	0000001	0000001	00000.01	000001
1000	000000.1	0000001	0000001	00000.01	000001
2500	000000.1	0000001	0000001	00000.01	000001

Calculators up to 2.5 l/p can be parameterized to kWh.

Calculators with 1 l/p can be parameterized to MJ.

The pulse values are restricted by following connecting conditions:

Pulse [l/p]	Max. power [MW]	Max. flow [m³/h]
1	3,3	24
2,5	3,3	24
10	33	240
25	33	240
100	330	2400
250	330	2400
1000	330	2400
2500	330	2400

The full range of functions of LCD is described in detail in the “Operating Instructions” (enclosed).

Error messages

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

Error code	Error	Action
DIFF nEG	Negative temperature difference	Check / replace sensors place of installation
Possibly together with:		
F1	Interruption in the hot side sensor	Check / replace sensor
F2	Interruption in the cold side sensor	Check / replace sensor
F3	Temperature evaluation electronics defective	Replace calculator
F4	Battery empty; Problem with power supply	Replace battery; Check connection
F5	Short in the hot side sensor	Check / replace sensor
F6	Short in the cold side sensor	Check / replace sensor
F7	Fault in the internal memory	Replace calculator
F9	Error in the electronics	Replace calculator

Notes

- All regulations on the use of meters must be observed.
- 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 calculator 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 calculator detects the plugged modules automatically and is ready for communication or pulse output.
- Up-to-date versions of all instructions can be found at **www.landisgyr.com**

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