



T550 (UH50...)



Note: In the following text, the term meter refers to both the heat meter, the cooling meter and the flow meter, unless they are otherwise differentiated.

1. General

The meter left the factory in a faultless condition where safety is concerned. Adjustments, maintenance work, replacement of parts or repairs may only be carried out by specialist staff who are aware of the associated hazards. The manufacturer will provide additional technical support on request. Calibration relevant security seals on the meter must not be damaged or removed. Otherwise, the warranty and calibration validity of the meter will no longer apply.

- Keep the packaging so that you can transport the meter in its original packaging following expiry of the calibration validity.
- Lay all cables at a minimum distance of 500 mm to high voltage and high frequency cables.
- A relative humidity of < 93 % at 25 °C is permissible (without condensation).
- Avoid cavitation in the whole system due to overpressure i.e. at least 1 bar at qp and approx. 3 bar at qs (applies for approx. 80 °C).
- The 110 V / 230 V network parts correspond to protection rating II so that the line voltage does not need to be disconnected when changing the meter.

2. Safety Information



The meter may only be used in building service engineering systems and only for the applications described.



The local regulations (installation etc.) must be adhered to.



The operating conditions according to the type plate must be complied with during use. Non-compliance can result in hazardous situations and the expiry of all claims arising from liability for defects as well as liability based on any expressly granted guarantees.



Requirements for circulating water (CEN/TR 16911: 2016).



The meter is only suitable for circulating water in heating systems.



The meter is not suitable for drinking water.



Do not lift the meter by the electronic unit.



Be aware of sharp edges on the thread, flange and measuring tube.



Only personnel, trained in the installation and operation of meters in heating and cooling systems, may install and remove the meter.



Only install or remove the meter when the pipes are pressure-less.



After installing the meter, check the leak-tightness of the system.



Warranty and calibration validity will lapse if the calibration relevant security seals are broken.



Only clean the meter from outside with a soft, lightly wetted cloth. Do not use any spirit or cleaning solvent.



The 110 V / 230 V connections may only be made by an electrician.



The meter may only be powered up once the installation has been completed. There is otherwise a danger of electronic shock on the terminals.



A defective or obviously damaged appliance must be disconnected from the power supply immediately and replaced.



As far as disposal is concerned, the meter is a waste electronic appliance in the sense of European Directive 2012/19/EU (WEEE) and it must not be disposed of as domestic waste. The relevant national, legal regulations must be observed as the appliance must be disposed of via the channels provided for this purpose. The local and currently valid legislation must be observed.



The meter contains lithium batteries. Do not dispose of the meter and the batteries with domestic waste. Observe the local stipulations and laws on disposal.



You can return the lithium batteries to the manufacturer for appropriate disposal following use. When shipping please observe legal regulations, in particular, those governing the labelling and packaging of hazardous goods.



Do not open the batteries. Do not bring batteries into contact with water or expose to temperatures above 80 °C.



The meter does not have any lightning protection. Ensure lightning protection via the in-house installation.



Only fit one compartment for the power supply. Do not remove the red locking hatch.

3. Installation

To install the meter, proceed as follows:

- Determine the place of installation in line with the inscription on the meter.



Note: At a **heat meter** or combined heating/cooling meter the mounting place of the flow sensor cold side is equivalent to return. The mounting place of the flow sensor hot side is equivalent to flow.



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

- Observe the dimensions of the meter and check whether there is sufficient space available.
- Rinse the system thoroughly before installing the meter.
- Fit the meter vertically or horizontally between two slide valves so that the arrow on the housing and the flow direction match. Also observe the installation situations and the following examples of installation.

- Fit the temperature sensors in the same circuit as the meter. Observe the admixtures.
- Seal the temperature sensors and the fittings to protect against manipulation.
- Loosen the elastic band or the cable tie, provided for the transport, from the volume measurement unit. In operation, the temperature sensor and the control cable should not depend directly on the volume measurement unit.
- If you install the meter for cooling metering, follow the appropriate notes.

Installation Notes

Inlet or outlet sections are not necessary. If you install the meter in the common return of two circuits, determine a place of installation with a minimum distance of $10 \times DN$ from the T-piece. This distance ensures a good thorough mixing of the different water temperatures. You can install the temperature sensors in T-pieces, ball valves, directly immersed or in pockets depending on the version. The temperature sensor ends must reach to at least the middle of the pipe cross section.

Note: During installation it must be ensured that no water can enter the electronic unit during operation.

Examples of installation

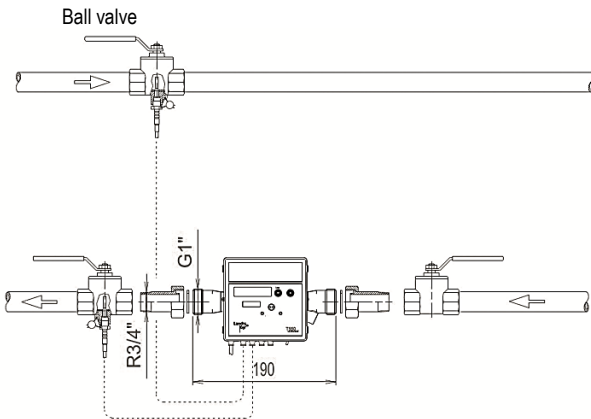


Fig. 1: Installation with a ball valve (recommended up to and including DN25)

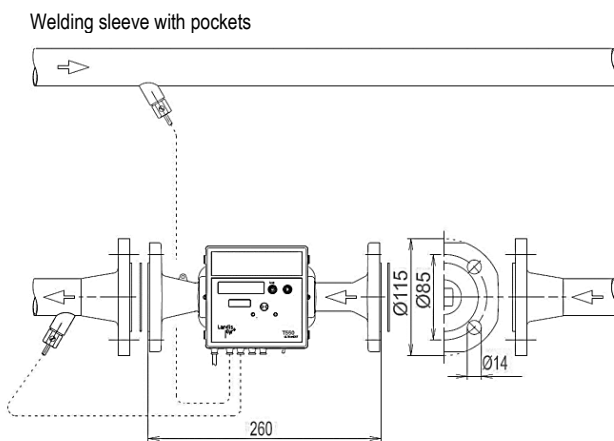


Fig. 2: Installation with pockets (recommended greater than or equal to DN25)

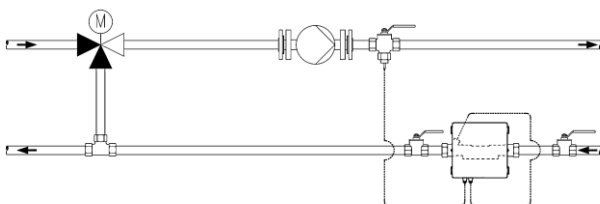


Fig. 3: Installation for circulation with admixing; placement of temperature sensors

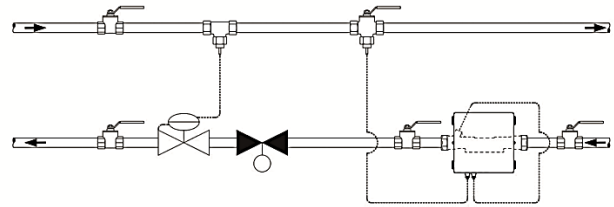


Fig. 4: Installation for circulation with throttling configuration for example (flow sensor in flow direction before control valve / differential pressure regulating valve)

Installation notes for sensor adapter set (temperature sensor directly immersed)

A mounting set is included for meters with 5.2×45 mm temperature sensors. With this you can fit the temperature sensor directly immersed into an insert or a ball valve for example.

1. Install with O-ring at the point of installation with the fit-up aid/pen provided.
2. Place both halves of the plastic bolting round the 3 notches of the temperature sensor.
3. Press the bolting together and screw the bolting hand tight into the point of installation until it comes to a stop (tightening torque 3 ... 5 Nm).

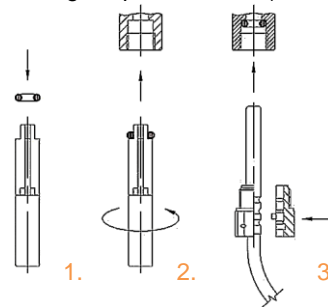


Fig. 5: Mounting adapter set

3.1 Installation for cooling metering

When installing as a cooling meter it is essential that the black cover on the measuring tube is pointed to the side or downwards in order to avoid problems with condensation forming. Fit the immersion sleeves so that the temperature sensor is positioned vertically downwards or horizontally. Fit the electronic unit separate to the volume measurement unit, e.g. on the wall. Make a loop downwards in order to prevent condensation running along the connected lines into the electronic unit.

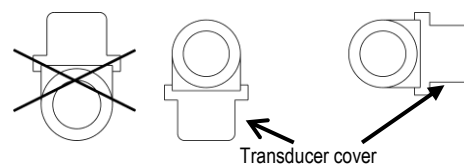


Fig. 6: Recommended installation position for cooling metering

3.2 Installation of qp 150

Note: Use flange bolts with a length of at least 100 mm to install the flanged body in the pipeline.

As an assembly aid 2 M8 threads are mounted on the flange. The threads allow the use of stainless-steel eye bolts, for example, for a lifting device.

The measurement insert in the flanged body should be positioned on the top. This allows a simple exchange of the measurement insert (see chapter 6).

3.3 Electronic unit

The ambient temperature of the electronic unit must not exceed 55°C . Avoid direct sunlight. For water temperatures between 10°C and 90°C you can fit the electronic unit on the volume measurement unit or on the wall.

Aligning electronic unit

Proceed as follows to align the electronic unit:

- Push the electronic unit upwards and remove it.
- Turn the electronic unit so that you can read the display comfortably.
- Push the electronic unit onto the adapter plate in this position until it engages.

Wall fitting (split fitting)

Fit the meter to the wall at water temperatures below 10 °C and above 90 °C.

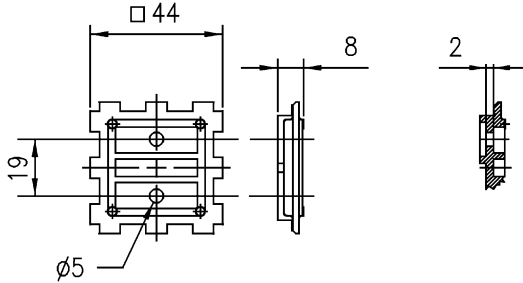


Fig. 7: Plan view and cross section of the adapter plate

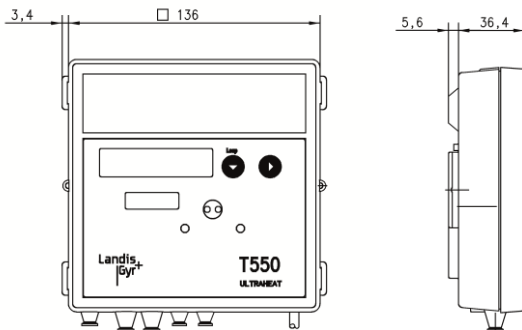


Fig. 8: Dimensions of the electronic unit

For wall mounting proceed as follows:

- Pull the electronic unit off the adapter plate.
- Unscrew the adapter plate from the volume measurement unit.
- Fit the adapter plate to the wall.
- Push the electronic unit onto the adapter plate.

For versions with a removable control cable, you can disconnect and reconnect this during installation.

- Only connect paired parts to one another when reconnecting (volume measurement unit, computer unit).
- Maintain the correct connection order.
- Do not lengthen the control cable.

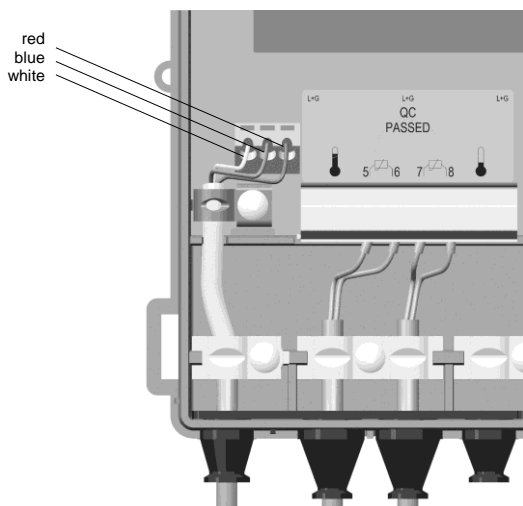


Fig. 9

3.4 Power supply

The meter can be supplied with power via a battery or via power supply modules as preferred. The power supply modules 110 V / 230 V are encapsulated and comply with safety class II. You can modify or upgrade the modules at any time.

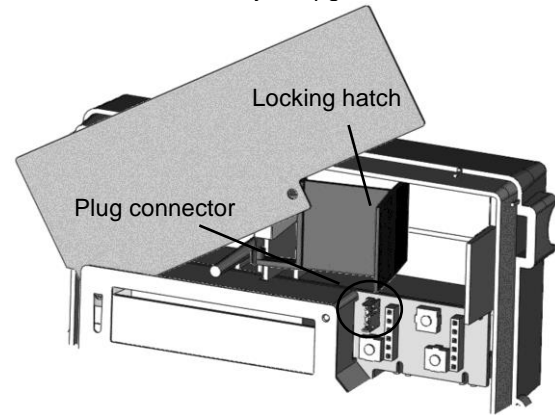


Fig. 10



Warning: Do not open the batteries. Do not bring batteries into contact with water or expose to temperatures above 80 °C. Dispose of used batteries at suitable collection points.

In the 110 V AC and 230 V AC versions a cable is fitted at the factory leading outwards which must be connected to the network voltage indicated. The 24 V ACDC version has connection terminals instead of a cable.

Installing the battery



Note: Only batteries approved by the manufacturer may be installed.

To install a battery proceed as follows:

- Press the four side lugs of the housing cover inwards and remove the cover.
- Turn the dial plate in an anti-clockwise direction until it comes to a noticeable stop.
- In order to free up the appropriate battery compartment, move the red locking hatch accordingly.



Note: Left compartment for 2× AA-cells or 1× C-cell, right compartment for 1× D-cell.



Note: The AA and C batteries are clicked into place in a holder.

- Insert the battery into the corresponding battery with the correct polarity in accordance with the markings.
- Turn the dial plate in clockwise direction into the starting position.

Installing power supply module



Note: The 110 V / 230 V connections may only be made by an electrician.

To install a power supply module, proceed as follows:

- Move the red locking hatch to the left.
- Move the right outside rubber sleeve upwards and outwards.
- Thread the connection cable of the line voltage of the module through the sleeve.
- Insert the module into the right upper corner of the electronic unit.
- Put the sleeve with the cable back into place from above.
- Connect the conductors in line with the inscription.
- Plug the connection cable for low voltages into the plug connector on the PCB.



Note: Only use cables with a diameter of 5.0 ... 6.0 mm for the 24 V ACDC version.



Note: The 110 V or 230 V power supply must be fused near the meter with a 6 A separator in accordance with the applicable safety standards. The separating device must be marked in accordance with applicable safety standards and be easily accessible for emergencies. Protect the power supply against manipulation.

Power supply module for meter exchange

Proceed as follows to exchange the meter following expiry of the validity of the calibration:

- Pull out the power supply module with cable and sleeve.
- Install the new meter.
- Put the module in.



Note: The network does not need to be disconnected while doing this due to safety class II.

Electronic unit interfaces

The meter is equipped with an optical interface in accordance with EN 62056-21:2002 as standard. You can additionally use for remote reading up to 2 of the following communication modules:

- Pulse module
- M-Bus module G4
- M-Bus module G4 MI with 2 pulse inputs
- Analog module
- GPRS module
- Radio module 868 MHz

These modules do not have an effect on the measurement. You can retrofit the modules at any time without damaging the security seal.

3.5 Communication modules



Note: Observe the necessary ESD protective measures while installing modules.

Up to 2 communication modules can be installed.

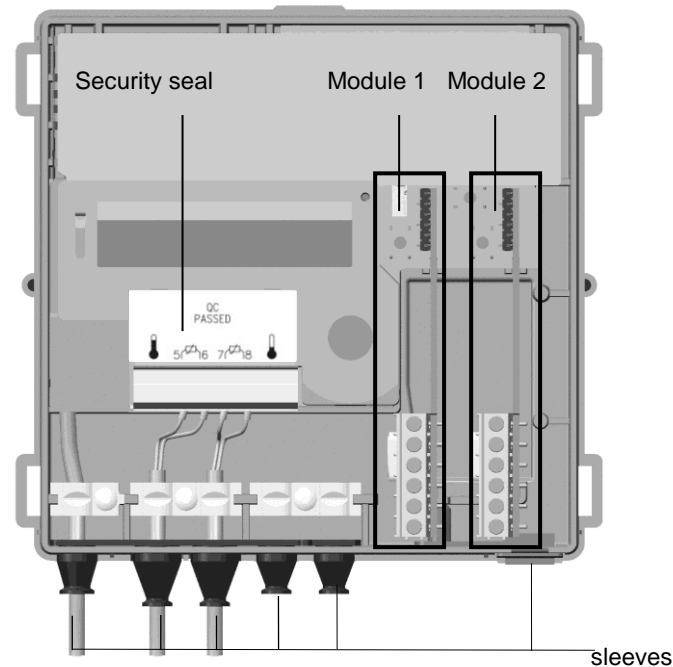


Fig. 11

Installing the communication module

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

To install a communication module, proceed as follows:

- Put the communication module into the correct position.

- Place the communication module carefully in both the guide slots and push it in.
- To connect an external cable, open the sleeve matching the cross section of the connection cable.



Note: Open the cable sleeves in such a way that they enclose the cable tightly.

- Guide the cable through the sleeve from outside.
- Strip the cable and connect it.



Note: Do not connect the shielding braid on the meter side.



Note: Take note of the permitted combinations and the correct slot for the communication modules.



Note: You will find the technical details and data on communication modules in their documentation.



Note: You will find the permitted combinations in the T550 (UH50...) technical description.



Note: The meter recognizes the inserted modules independently 30 seconds at most after installation and is ready for communications or pulse output.



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Terminals

2-pole or 4-pole terminals are used for connection of the external cables to the modules.

- Strip-back length 5 mm
- Connection capacity
 - rigid or flexible, 0,2 ... 2,5 mm²
 - flexible with wire end ferrule, 0,25 ... 1,5 mm²
 - conductor sizes 26 ... 14 AWG
- Multiple conductor connector (2 conductors with the same cross-section)
 - rigid or flexible, 0,2 ... 0,75 mm²
 - flexible with wire end ferrule without plastic sleeve, 0,25 ... 0,34 mm²
 - flexible with TWIN wire end ferrule with plastic sleeve, 0,5 ... 0,75 mm²
- Recommended screwdriver:
 - 0,6 × 3,5 mm
- Tightening torque: 0,4 Nm

3.6 Non-detachable temperature sensors



Note: Wires must not be separated, shortened or extended in factory-set, non-detachable temperature sensors.

- Insert the temperature sensors into the pockets, ball-valves or T-pieces.
- Seal the temperature sensors to protect against manipulation.

3.7 Detachable temperature sensors

Note: If detachable temperature sensors are used, they must have their own calibration or certification of conformity.

Note: The maximum cable length of the temperature sensors is 10 m. Extension is not permitted.

- Press the 4 side lugs of the housing cover inwards and remove the cover.
- Guide the wire of the temperature sensor from the outside through the 2nd sleeve from the left and the return sensor through the 3rd sleeve from the left.
- Strip both wires as in the figure 12.

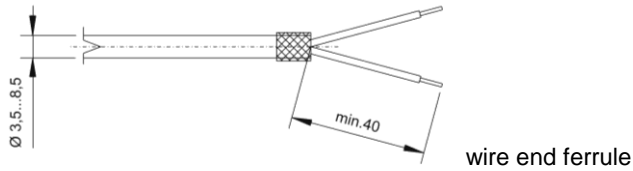


Fig. 12

- Connect the cores in line with the inscription printed on the meter.
The 2-wire connection occurs on terminal 5/6 and 7/8. This also applies to 4-wire connection).

Note: Do not connect the shielding braid on the meter side.

- Insert the temperature sensors into the pockets, ball-valves or T-pieces.
- Seal the temperature sensors to protect against manipulation.

When the LCD display shows **F8**, you can reset this error message via the parameterization menu, as described in chapter 0 "Call up parameter operation".

- Put the housing cover in position gently and press it gently until all the lugs click into place audibly.

4. Parameterization

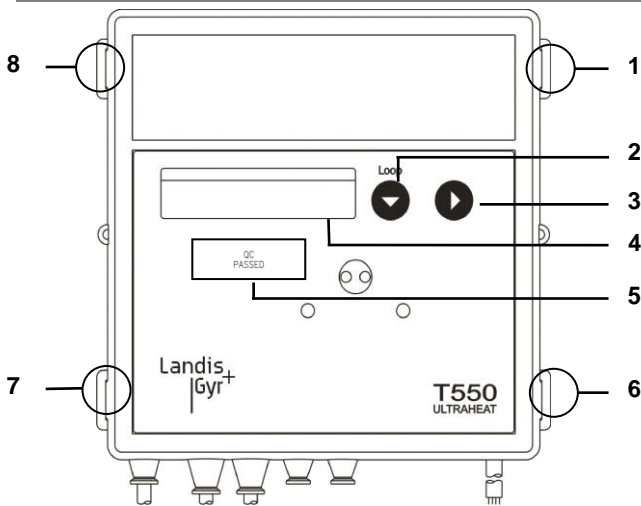


Fig. 13

Number	Description
1; 6; 7; 8	Cover lugs
2	Button 1
3	Button 2
4	LCD
5	Security seal

Note: Remove the housing cover temporarily in order to operate the service button.

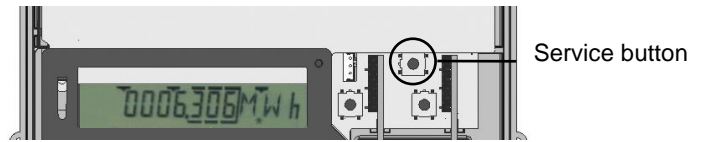


Fig. 14

4.1 Set date / time

For date and time, start meters directly with power supply unit or battery that has been newly installed on site in the settings menu.

D 230711	Date input
T 105959	Time input
Nb -----	Return to normal operation (manual)

Proceed as follows to set date and time:

- Press button 1 until the desired value is displayed.
- Press button 2. Change the values for date and time as described in chapter 4.6 "Parameterization".

4.2 Parameterization meter

Note: For battery-operation a D-cell is required for fast pulses.

Note: The parameters must be set appropriately with the service software for the desired fast pulses.

4.3 Adjustable parameters

The following parameters can be set on the meter:

F8 +	Reset error message F8 (only displayed if F8 appears)
Ma +	Reset maxima
Fcd +	Reset missing time and flow measurement time
S 3 105--	Enter yearly set day (DD, MM) *
S 3 1-- --	Enter monthly set day (DD) *
D 230711	Enter date (DD, MM, YY) *
T 105959	Enter time (hh, mm, ss) *
K 12345678	Enter 8-digit property number (corresponds to M-Bus secondary address)
AP1 0	Enter M-Bus primary address for module 1 (0..255) *
AP2 0	Enter M-Bus primary address for module 2 (0..255) *
Modul 1-1 CE Modul 1-1 C2	Select first module function for module 1 (CE or C2)
Modul 1-2 CV Modul 1-2 CT Modul 1-2 RI	Select second module function for module 1 (CV or CT or RI)
Modul 2-1 CE Modul 2-1 C2	Select first module function for module 2 (CE or C2)
Modul 2-2 CV Modul 2-2 CT Modul 2-2 RI	Select second module for module 2 (CV or CT or RI)
MP 60 min	Select maxima measurement period (7.5, 15, 30, 60 min / 3, 6, 12, 24 h)
Nb -----	Return to normal mode

* Ensure that sensible values are entered. The meter does not carry out a plausibility test. This means that incorrect values can also be entered (e. g. month > 12).

Note: The meter can be parameterized even if the modules have not yet been installed.

4.4 Call up parameter operation

Proceed as follows to call up the parameter operation:

- Hold the service button for 3 seconds until **PRUEF----** appears on the LCD.
- Press button 1 to switch the display until **PARA----** appears on the LCD.
- Press button 2 to select the menu.

Note: To reset error F8 or the maxima press button 2.

4.5 Selecting parameters

To select a parameter, proceed as follows:

- To switch the display press button 1.
- To activate the parameter to be changed press button 2.

4.6 Parameterization

For parameterization proceed as follows:

- To change the blinking value press button 2.
- To enter the set value press button 1.

The next digit to the right blinks. Repeat the steps above for all digits.

- The LCD displays a star symbol briefly to confirm.
- If inputs are incorrect, parameterization can be repeated.

4.7 Completing parameterization

To leave the parameterization operation proceeds as follows:

- Hold button 1 until the LCD shows **Nb-----**.
- Press button 2.

4.8 Cancelling Input

To close the parameterization proceeds as follows:

- Press the service button during parameterization (ESC function).

The LCD display shows the last valid value.

4.9 Service software

With the service software, tariffs, fast pulses and communication modules can be set in parameterization mode.

5. Getting started

For activation proceed as follows:

- Put the housing cover in position and press it gently until all the lugs click into place audibly.
- Open the slide valves slowly.
- Check the heating system for leak-tightness and bleed air out carefully.

The message "F0" disappears after 100 sec. at the most.

- Check the measured values for flow and temperatures for plausibility.
- Vent the heating system until the flow display is stable.
- Regulate the heating system with the flow display.
- Seal the electronic unit to protect against manipulation.
- Fit the user locks to the electronic unit.
- Read the meter status for energy, volume, operation and missing time and note the values.

Recommendation: Reset the maxima and the missing time.

6. Exchange of the measurement insert qp 150

The meter with the volume measurement unit qp 150 includes an exchangeable measurement insert.



Attention: Renew the gasket every time that the measurement insert is removed and installed. Use only a genuine gasket.

6.1 Removing the measurement insert



Warning: Only install or remove the measurement insert when the pipes are pressure-less.



Note: Please make sure that no adhesive labels are damaged.

Proceed as follows to remove the measurement insert:

- If necessary, pull the electronic unit away from the adapter plate.
- If necessary, remove the user locks.
- Loosen the screws "a" (see figure 15).
- Lift the measurement insert from the flanged body.

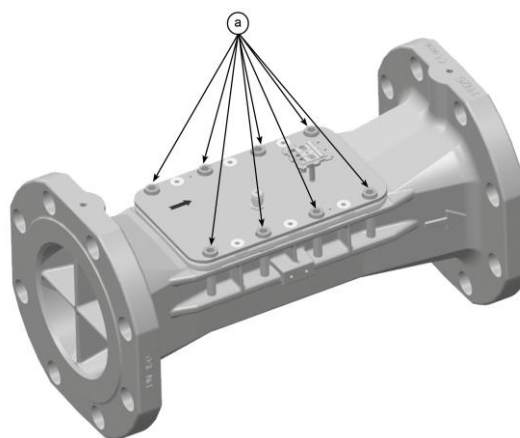


Fig. 15: Screws "a"

If the measurement insert cannot be removed, proceed as follows:

- Loosen the 2 screws "b" (see figure 16).
- Insert 2 screws M10 with a length of at least 30 mm into the 2 free threads of the screw's "b".
- Screw in the screws evenly until the measurement insert can be removed.

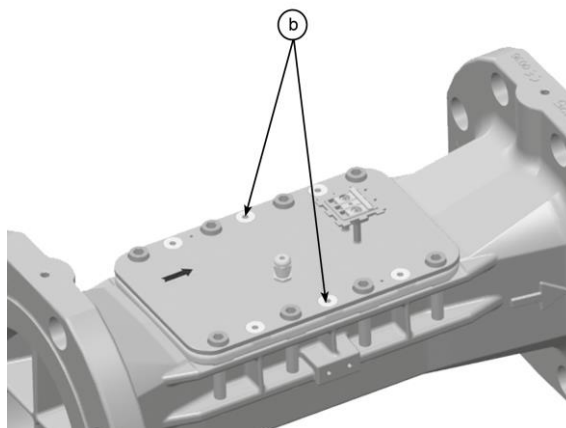


Fig. 16: Screws "b"

- Replace the measurement insert by another measurement insert.

If the measurement insert is not installed immediately, opening must be closed with the provided interim cover (available as accessory).

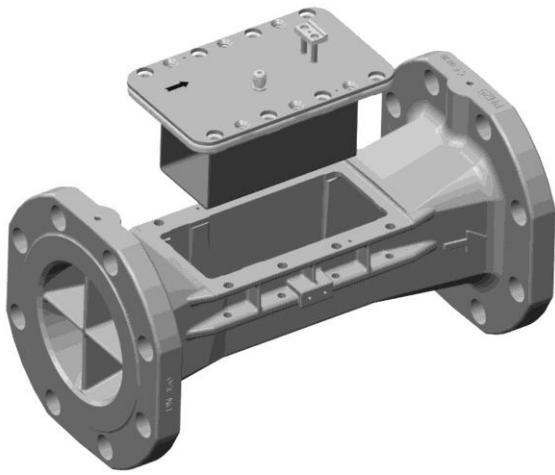


Fig. 17: Exchange of the measurement insert qp 150

6.2 Installing the measurement insert

To install the measurement, insert, proceed as follows:

- Check the sealing surface of the flanged body in the measurement insert for damage and cleanliness.
- Check the fit of the gasket "c" (see figure 18) on the interim cover. The gasket must be properly positioned in the groove and be free of any damage.

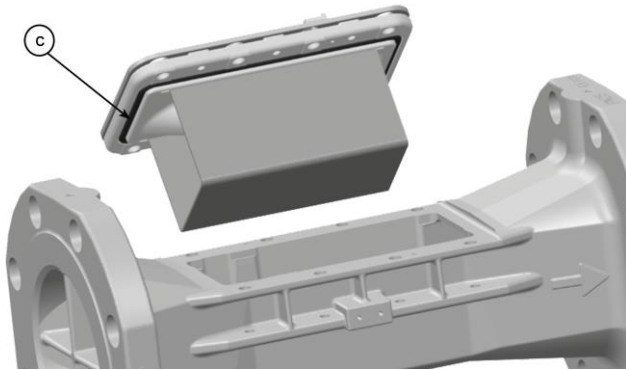


Fig. 18: Gasket "c" of the measurement insert

- Put the measurement insert into the opening. Please note the flow direction. The arrow on the measurement insert and the arrow on the flanged body have to match.
- Screw in the 8 screws "a" (see figure 15) with 35 Nm.
- If necessary, fit the user locks.



Warning: All screws "a" (see figure 15) and "b" (see figure 16) must be screwed.

Error messages for incorrect installation:

FL nEG

Error "incorrect flow direction (negative)"

Check that the flow direction arrows on the volume measurement unit match the flow direction of the system. If the directions do not match, turn the volume measurement unit through 180°.

DIFF nEG

Error "negative temperature difference"

Check whether the temperature sensors are installed correctly. If the sensors are not installed correctly, change the installation position of the temperature sensors.

Heat meter:

Temperature sensor in the flow-pipe with higher temperatures; temperature sensor in return-pipe with lower temperature

Cooling meter:

Temperature sensor in the flow-pipe with lower temperatures; temperature sensor in return-pipe with higher temperature



Note: When the appliance is idle, these messages may appear even if there has been no incorrect installation.

7. Display

The functional range of the LCD is described in detail in the attached operating instructions.

8. Error messages

The meter continuously runs a self-diagnosis and can thus recognize and display various installation or meter error messages.

Error code	Error	Service guidelines
FL nEG	Incorrect flow direction	Check flow or installation direction; correct if necessary
if necessary, in exchange with:		
DIFF nEG	Negative temperature difference	Check installation point of the temperature sensors; exchange if necessary
if necessary, in exchange with:		
F0	No flow can be measured	Air in the measurement unit/pipe; bleed air from line (delivery condition)
F1	Interruption in the hot side temperature sensor	Check hot side temperature sensors; replace if necessary
F2	Interruption in the cold side temperature sensor	Check cold side temperature sensors; replace if necessary
F3	Electronics for temperature evaluation defective	Exchange the meter
F4	Problem with the power supply; Battery flat;	Check connection; Change battery
F5	Short-circuit hot side temperature sensor	Check hot side temperature sensors; replace if necessary
F6	Short-circuit cold side temperature sensor	Check cold side temperature sensors; replace if necessary
F7	Fault in internal memory holding	Exchange the meter
F8	Errors F1, F2, F3, F5 or F6 for longer than 8 hours, recognition of attempts to manipulate. No further measurements are carried out.	Measure dependent on error code. Error message F8 must be reset by service department.
F9	Fault in the electronics	Exchange the meter



Note: Reset the message F8 in the parameterization mode manually or with the service software. All other error messages are deleted automatically once the error has been rectified.

9. Notes

The following applies for MID conforming appliances in Germany: For new installations in pipework less than or equal to DN 25, the installation of short sensors must only be made if they are directly immersed.

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