T350 (2WR6...)

32 14 101 002 a

Note: In the following text, the term meter refers to both the heating meter and the cooling 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 staffs 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 guarantee and calibration validity of the meter will lapse.

- 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).

2. Safety Information

The meters may only be used in building service engineering plants and only for the applications described.

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

Adhere to the operating conditions according to the dial plate during use. Non-adherence can cause hazards and the guarantee will lapse.

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

Adhere to the AGFW requirements regarding circulating water (FW510).

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 flow meter, check the leak-tightness of the system.

Guarantee 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.

As far as disposal is concerned, the meter is a waste electronic appliance in the sense of European Directive 2002/96/EC (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.

3. Installation

Proceed as follows to install the meter:

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

Note: At a **heating 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.
- Clean the appliance 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 sensor and the fittings to protect against manipulation.
- If you install the meter as a cooling meter, follow the appropriate notes.

Installation Guidelines

Inlet or outlet channels 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 x 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.

Example of installation

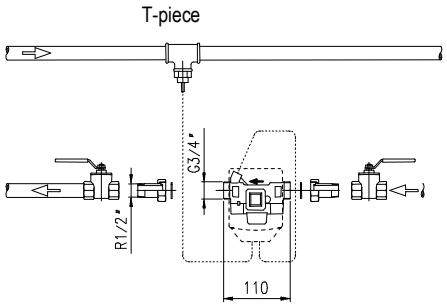

Fig.1: Example of integration with T-piece and meter with 110mm fitting

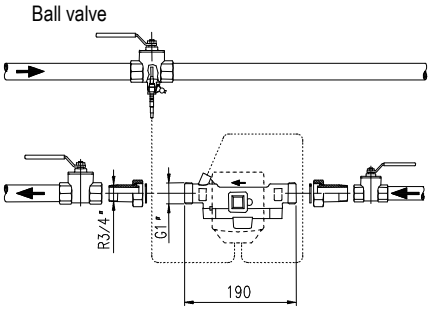

Fig.2: Example of integration with ball valve and meter with 190mm fitting

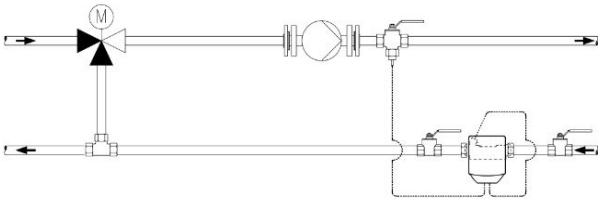

Fig. 3: Installation for circulation with admixing; placement of temperature sensors

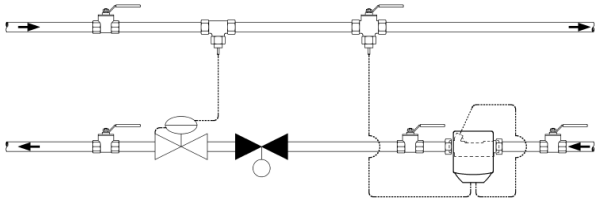

Fig. 4: Installation for circulation with throttling configuration for example (flow sensor in flow direction before control valve / differential pressure regulating valve)

Installation guidelines for sensor adapter set (sensor directly immersed)

A mounting set is included for meters with 5.2 x 45 mm temperature sensor. 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).

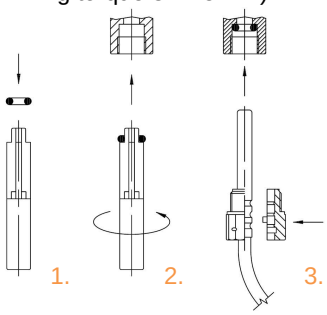

Fig.5: Mounting adapter set

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.

Note: Always install the volume measurement unit on the hot side.

Fit the electronic unit separately to the volume measurement unit, e.g. on the wall. Make a loop downwards in order to prevent the condensation running along the connected lines into the electronic unit.

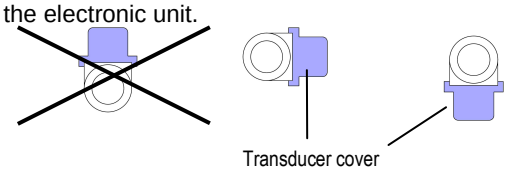

Fig.6: Recommended installation position for cooling metering

3.2 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.

Align electronic unit

Proceed as follows to align the electronic unit:

1. Pull the electronic unit away from the volume measurement unit.
2. Turn the electronic unit to the left or right through 90° or through 180° as required.
3. Push the electronic unit onto the adapter plate in this position until it clicks in.

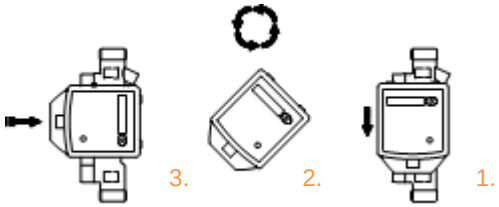

Fig.7: Computer unit installation position

Wall fitting (split fitting)

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

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

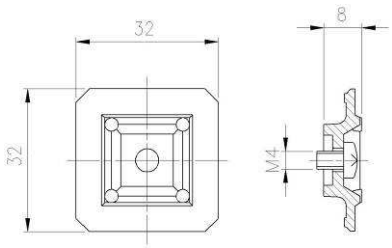

Fig.8: Securing plate and wall fitting

3.3 Power supply

The meter is equipped with a long life battery for 6 or 11 years of operation. You can take the operating time from the dial plate.

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.

An external feed 24 V AC/DC, galvanically separated, is available as a special version.

3.4 Electronic unit interfaces

The meter is equipped with an optical interface with M-Bus protocol as standard.

3.5 Communication

If the meter is equipped with one of the options "M-Bus", "Minibus" or "Pulse Output", it is supplied with a two-core connection cable. You can extend the connection cable with a 2 x 0.75 mm² cable. Observe the polarity for the pulse output when connecting (brown: +; white: -).

Note: When reading via M-Bus, the permissible average reading frequency must not be exceeded (1 × every 3 h at 2400 Bd, 1 × every 24 h at 300 Bd). A read-out with a higher frequency is not permitted and it could lead to incorrect functioning of the meter.

3.6 Temperature sensor

Note: Wires must not be separated, shortened or extended.

4. Parameterisation

Adjustable parameters

01.01. - -	S	Annual reference date (01.01. --)
01.08.12	D	Date (01.08.2012)
15.33.06	T	Time (15:33:06)
2 3 4 5 6 7 8	K	Property no. or M-BUS (secondary address)*
123	A	Primary address*
Ft	+	Reset missing time
Nb -----		Return to normal mode
*) If the meter is already connected to the M-Bus, set a change of voltage at the M-Bus for assimilation of a new M-Bus address.		

Call up parameter operation

Proceed as follows to call up the parameter operation:

- Hold the button for 10s

The LCD switches into the service loop.

- Press the button repeatedly until the LCD for code input - - - - - - C is displayed.
- Hold down the button to change to the input mode.
- Input the current meter date.

The LCD switches into the parameterisation loop. The pull-down menu switches to the next menu point every 1.5 s.

Parameterisation

For parameterisation proceed as follows:

1. Press the button as soon as the desired function is displayed in order to select the function.
2. Hold down the button to set the value.
3. Press the button for a short time to select the set value which is blinking.

The next point to the right flashes. Repeat step 2 and 3 for all points.

- The LCD shows a star symbol briefly to confirm.

If inputs are incorrect, parameterisation can be repeated.

Completing parameterisation

Proceed as follows to leave the parameterisation operation:

- Press the button when the display Nb ----- is displayed.

The meter leaves the parameterisation operation automatically after 10 mins of inactivity.

5. Getting Started

For activation proceed as follows:

- Open the slide valves gently.
- Check the plat 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 sensors to protect against manipulation.
- Fit the user locks to the fittings and the sensors.
- Read the meter status for energy, volume, operation and missing time and note the values.

Recommendation: Reset the maxima and the missing time.

Installing the user locks

Two so-called "self-lock" seals are provided for the meter with which the flow sensor and the measuring unit fitting can be sealed.

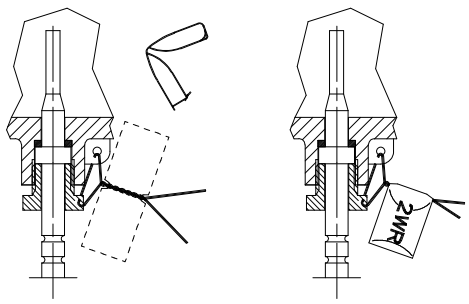
Fig.9: Example of flow sensor

Error messages for incorrect installation:

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°.

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

Heating 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

6. Functional Details

If the respective operation thresholds are exceeded and flow and temperature difference are positive, the meter summates the energy and the volume.
If the operation thresholds have dropped, a "u" is displayed in front. The current temperatures are presented together as whole numbers in °C in a display line.
All segments of the display are switched on for control purposes during the segment test.
The meter status for energy, volume and missing time is stored in a log for the previous year on an annual basis on the annual reference date.
The flow, power and temperature differences are recorded with the appropriate +/- sign.
The operating hours are counted from the first connection of the power supply. Missing hours are summated if there is a fault and the meter is thus unable to take a measurement. The date is incremented on a daily basis.
You can set the 8 digit property number (secondary address for M-Bus operation) in the parameterising mode. The highest value point is suppressed in the display. The appliance number is issued by the manufacturer.
The number for the firmware version is issued by the manufacturer.

7. Error Messages

The meter continuously runs a self-diagnosis and can thus recognise and display various installation or meter errors:

Error code	Error	Notes for service
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 measurable	Air in the measurement unit/pipe, bleed air from pipe (delivery condition)
F1	Interruption in the hot side temperature sensor	Meter exchange by specialists
F2	Interruption in the cold side temperature sensor	Meter exchange by specialists
F3	Electronics for temperature evaluation defective	Meter exchange by specialists
F4	Problem with the power supply; Battery flat	Meter exchange by specialists
F5	Short-circuit hot side temperature sensor	Meter exchange by specialists
F6	Short-circuit cold side temperature sensor	Meter exchange by specialists
F7	Error in internal memory holding	Meter exchange by specialists
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	Error in the electronics	Meter exchange by specialists

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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