maddalena
METERING EXPERTISE

Installation instructions

KUS ultrasonic flow sensor

1 General information

1.1 Use

The instrument described in this manual is a flow sensor designed for use with a calculator for determining the consumption of thermal energy in heating or cooling systems that use water.
The flow meter consists of a metal measuring part combined with a calculator. These two components are connected by a cable.

1.2 General notes

The flow meter left the factory in a faultless condition where safety is concerned. The manufacturer will provide additional technical support on request. Calibration relevant security seal on the flow meter must not be damaged or removed. Otherwise the guarantee and calibration validity of the flow meter will lapse.

- Keep the packaging so that you can transport the flow 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 flow 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.

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

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

The flow meter is not suitable for drinking water.

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

Do not lift the flow meter by the calculator.

Be aware of sharp points 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 flow meter.

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

As far as disposal is concerned, the flow 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 observes 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 flow meter does not have any lightning protection. Ensure lightning protection via the in-house installation.

3 Installation

Proceed as follows to install the flow meter:

- Observe the dimensions of the flow meter and check whether there is sufficient space available.
- Rinse the system thoroughly before installing the flow meter.
- Fit the flow 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 (see figure 2 and figure 3).
- Loosen the elastic band or the cable tie, provided for the transport, from the volume measurement unit. In operation, the control cable should not depend directly on the volume measurement unit.
- If you install the flow meter for cold metering, follow the appropriate instructions.

Recommendation: If you are installing more flow meters in one unit, make sure that all the flow meters operate under the same mounting conditions.

3.1 Installation notes

Note: When installing the flow meter the locally applicable installation regulation for flow meters must be observed.

Upstream and downstream straight pipes are not necessary. If you install the flow meter in the common return of two circuits, determine a place of installation with a minimum distance of 10 × DN from the T-piece. This distance ensures a good thorough mixing of the different water temperatures.

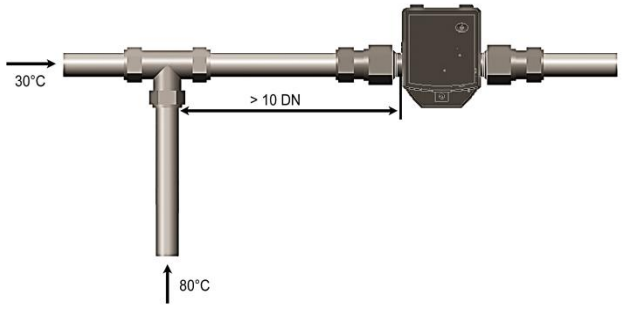

Fig. 1: Mixture of different return temperatures

3.2 Examples of installation

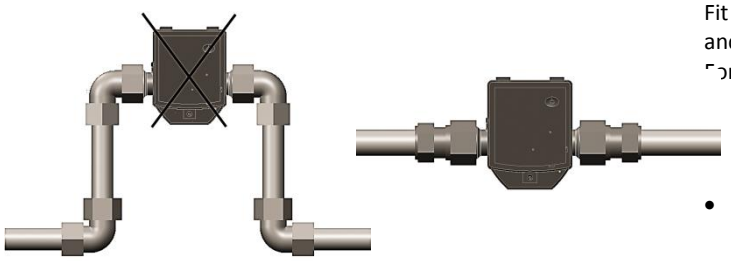

Fig. 2: Avoid accumulation of air

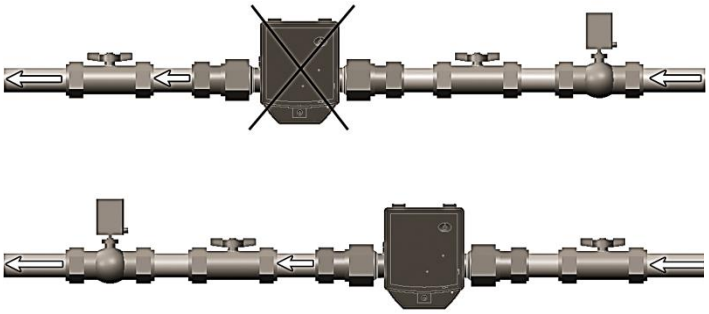

Fig. 3: Mount a valve or a regulator after the flow meter

Note: During installation it must be ensured that no water can enter the calculator.

3.3 Installation for cooling metering

Note: It is recommended that the flow meter is installed on the hot side.

When installing as a cold 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 calculator separate to the volume measurement tube, e.g. on the wall. Make a loop downwards in order to prevent condensation running along the connected lines into the calculator.

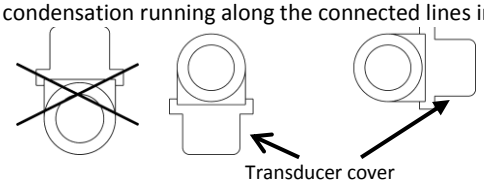

Fig. 4: Recommended installation position for cooling metering

4 Calculator

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

4.1 Aligning the calculator

Proceed as follows to align the calculator:

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

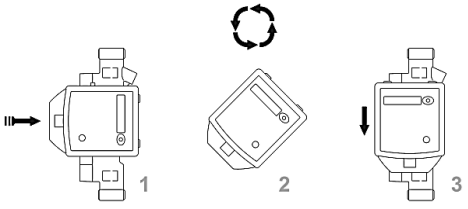

Fig. 5: Calculator installation position

4.2 Wall fitting (split fitting)

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

For wall mounting proceed as follows:

Pull the calculator off the adapter plate.

Unscrew the adapter plate from the volume measurement unit.

Fit the adapter plate to the wall.

- Push the calculator onto the adapter plate.

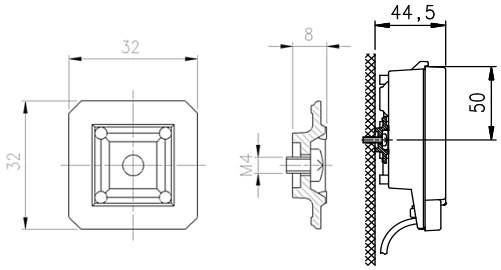

Fig. 6: Adapter plate and wall fitting

5 Power supply

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

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

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

6 Interfaces

The flow meter is equipped with an optical interface in accordance with EN 62056-21 as standard.

In addition, the flow meter is equipped with a pulse output and is delivered with a 2m two wire cable. The connecting cable can be lengthened with a cable 2 x 0.75 mm^2. A distributing box is recommended.

7 Activation of the calculator

For activation proceed as follows:

- Open the slide valves slowly.
- Check the system for leak-tightness and bleed air out carefully.

After more than 100 sec. the flow meter begins to work.

If the operating limit is exceeded and the flow rate is positive, volume pulses are generated according to the pulse parameter settings.

- Check the measured value flow or the volume of progress on the connected calculator for plausibility.
- Vent the system until the flow rate value on the calculator is stable. Check the output.

8 Functional details

The operating hours are counted from the first connection of the power supply.

Missing hours are summated if there is an error and the flow meter is thus unable to take a measurement.

Volume readings, maximum flow rates and missing hours are stored monthly for 36 months.

The device number and the firmware version number are issued by the manufacturer.

9 Technical data

Note: The information on the flow meter must be observed!

General information	
Measuring accuracy	Class 2 (EN 1434)
Environment class	A (EN 1434) for indoor installation
Mechanical class	M1 (according to Directive 2014/32/EU)
Electromagnetic class	E1 (according to Directive 2014/32/EU)
Ambient humidity	<93% rel. humidity at 25 °C, without condensation
Max. height	2000 m above sea level
Storage temperature	-20 °C … +60 °C
Calculator	
Ambient temperature	+5 °C… +55 °C
Housing protection rating	IP65 according to EN 60529
Power supply	Battery, service life 10 years
Optical interface	Standard, EN 62056-21
Communication	Pulse output
Separability	Always
Pulse output	
Type	Open drain
Dielectric strength	500 V_{eff} against ground, galvanic isolation
Pulse options	Depending on the size (refer to the data sheet)
Pulse length	Maddalena standard 25 ms
Pulse sequence	In packages every 0.5 s (not regular)
Cable length	2 m
Voltage	Maximum 30 V
Current	Maximum 30 mA
Voltage drop	< 0.3 V at 10 mA
Polarity	Bipolar
Volume measurement unit	
Protection class	IP65 according to EN 60529
Mounting place	Hot side/cold side (standard: cold side)
Installation position	Any
Straight pipes	Not required
Measuring range	1:100 or 1:50
Recommended temperature range	+5 °C … +130 °C National type approvals may vary.
Temperature range for heat application	+10 °C … +130 °C
Temperature range for cooling application	+5 °C… +50 °C
Maximum overload	2.8 x qp
Nominal pressure	PN 25 (PS 25)

10 Manufacturer

Landis+Gyr GmbH
Humboldtstrasse 64
90459 Nuremberg
Germany

11 Contacts

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EC Declaration of Conformity

No. CE 2WR7 013 / 06.17

Landis+Gyr

Product description: Ultrasonic flow rate meter ULTRAHEAT®T150 (2WR7...)

Manufacturer: Landis+Gyr GmbH, Humboldtstraße 64, 90459 Nuremberg, Germany

Landis+Gyr GmbH takes sole responsibility for the issue of this declaration of conformity. It declares herewith that the above named product meets the requirements of the following directives and laws:

2014/30/EU	(EMC)	OJ L 96	29/03/2014
2014/32/EU	(MID)	OJ L 96	29/03/2014
2014/35/EU	(LVD)	OJ L 96	29/03/2014
2011/65/EU	(RoHS)	OJ L 174	01/07/2011
2014/68/EU	(PED)	OJ L 189	27/06/2014

These respective harmonised standards and normative documents were taken as a basis:

Standard	Last revised	Directive	Reference	Standard	Last revised	Directive	Reference
EN 61000-6-3	2011	EMC	OJ C 053 25/02/2014	EN 13480-5	A1:2014	PED	OJ C 293 12/08/2016
2014/32/EU	2014	EMC/MID	OJ L 96 29/03/2014	EN 10213	2016	PED	OJ C 293 12/08/2016
EN 1434-4	2007	EMC/MID	OJ C 218 24/07/2012	EN 12516-2	2015	PED	OJ C 293 12/08/2016
EN 1434-5	2007	MID	OJ C 218 24/07/2012	EN 12266-1	2012	PED	OJ C 293 12/08/2016
EN 61010-1	2011	LVD	OJ C 149 16/05/2014	EN 13480-2	2014	PED	OJ C 293 12/08/2016
EN 1434-4	2015	EMC/MID		AD2000		PED	
EN 1434-5	2015	MID		For DN150: PS (max. pressure): 25 bar; max. temperature 3/150 °C; DN: 150; class II; test medium: water (class 2 liquid) / test pressure: 37 bar; conformity assessment method: module A1; appointed authority: 0036; EC design analysis certificate no.: E-IS-DDB-MUC-13-12-104567-001a-001			
EN 50581	2012	RoHs	OJ C 363 23/11/2012	Environmental class for MID and EMC E1 or A			

The notified authority (PTB, 0102) has tested the technical design and certified that it meets the requirements applicable for the device and has issued the following certificate: DE-06-MI004-PTB004

The notified authority (PTB, 0102) has evaluated the quality assurance system and recognises it in: DE-M-AQ-PTB006

Nuremberg, 27/07/2017

Brunner, VP CoC HEAT ..... Signature
Name, Position

Dr. Rother, Head R&D ..... Signature
Name, Position

This declaration certifies conformity with the stated directives and standards, it does not however constitute a commitment to any specific properties!
The safety instructions included in the product documentation must be followed!