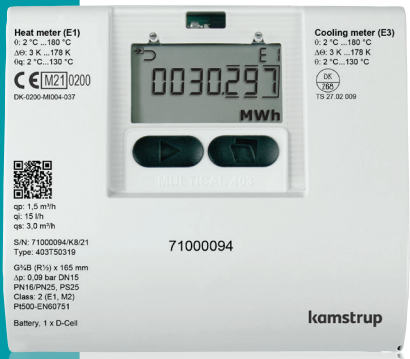
kamstrup

MULTICAL® 403



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MULTICAL® 403

> 60 °C

At a media temperature higher than 60 °C, the flow sensor should be shielded from unintended contact.

230 VAC

When connecting to a 230 V supply, there is a risk of electric shock.

16/25 bar

When working on the flow sensor in the installation, there is a risk of outflow of (hot) water under pressure.

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In general

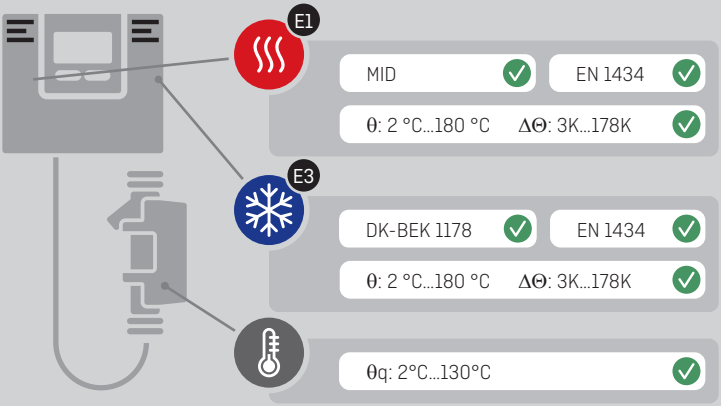
http://static.kamstrup.dk/hardlink/userguides/gb_mc403.htm

https://www.kamstrup.com/en-en/heat-solutions/meters-devices/meters/multical-403/documents

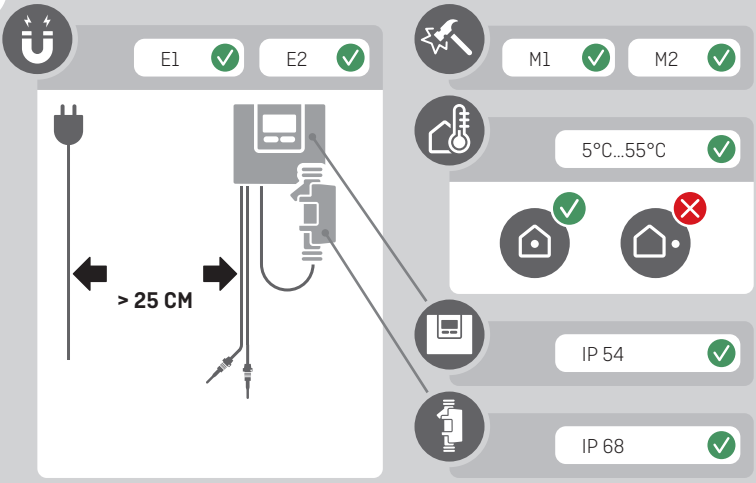
https://www.kamstrup.com/

Information

1/2

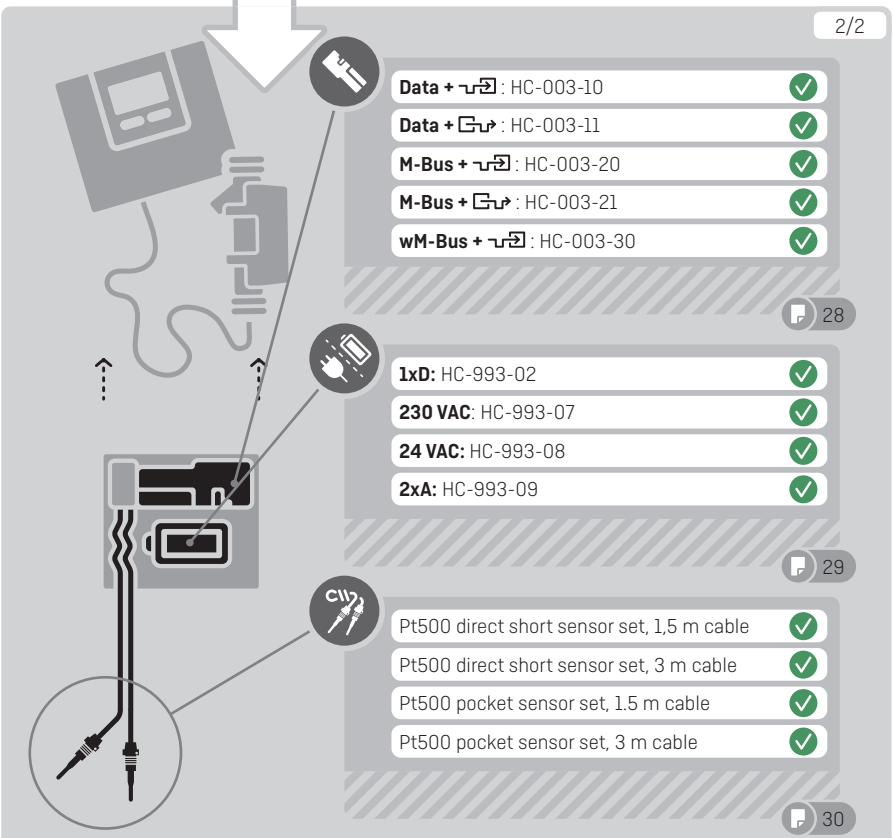


The meter's approvals and temperature area for heat and cooling measurements (E1 and E3), respectively. This data can likewise be found on the meter's front.



The meter's environmental and mechanical classes. The meter must be mounted indoors in the temperature area of 5 °C...55 °C. The meter's signal cables should be drawn with a minimum distance of 25 cm to other installations. The meter has the mechanical classes 1 and 2.

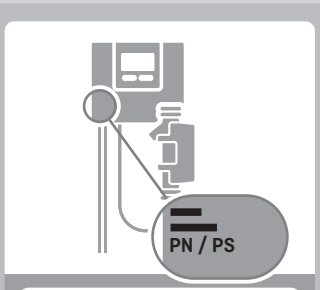
Information



The meter installation technician may replace the meter's temperature sensor set, communication module and power supply module. The overview shows some of the communication modules, power supply modules and the temperature sensor connection of the meter type. See the full overview on page 29.

Mounting of flow sensor

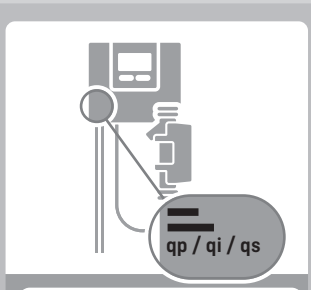
1/5



PN16, PS16

PN25, PS25

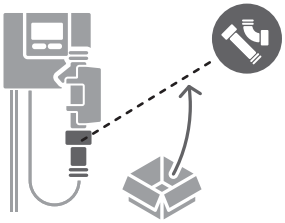
PN16/PN25, PS25



qp: XX m³/h

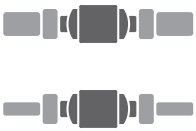
qi: XX l/h

qs: XX m³/h

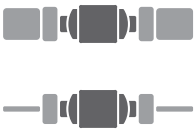


DN20

DN25 / DN15



DN32 / DN10

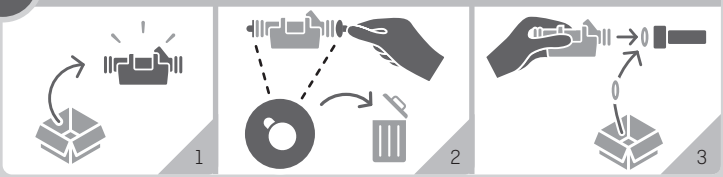


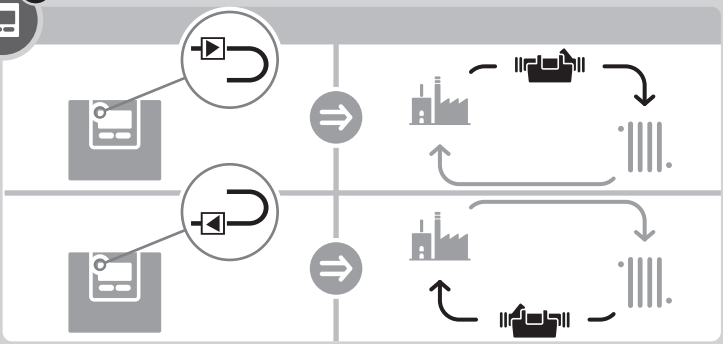
Pressure stage and flow data of the meter. The pressure stage of the provided accessories follows the markings on the meter. Up to and including DN80, PN16 and PN25 are connection compatible.

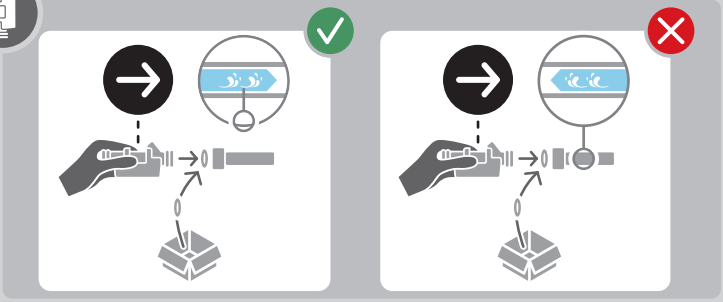
The DN measurements of the meter must fit the installation, but one dimension up or down in size is also acceptable.

Mounting of flow sensor

2/5

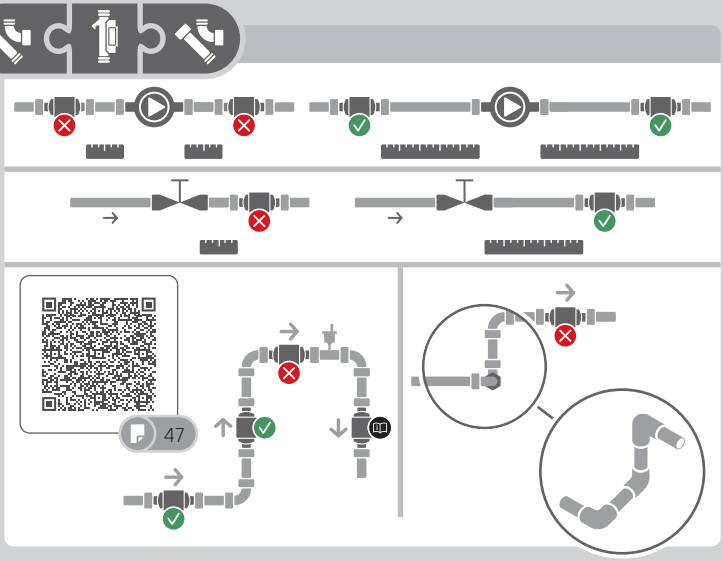






Preparations before mounting. Before mounting the flow sensor, protection wafers are removed; remember gasket when mounting

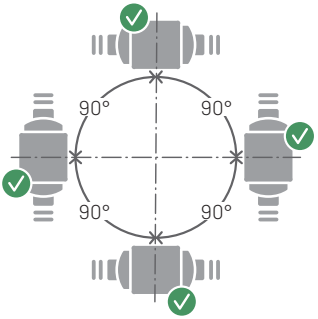
Check the meter display for correct placement of the flow sensor in either inlet or outlet, depending on the meter set-up. In the same way, the mounting of the flow sensor in the correct flow direction is ensured, which is indicated by an arrow on the flow sensor.



A Recommended position.
B Recommended position.
C Unacceptable position due to risk of air build-up.
D Acceptable position in closed systems.
E Ought not to be placed immediately after a valve, with the exception of block valves (ball valve type) which must be fully open when not used for blocking.
F Ought not to be placed immediately before or after a pump.
G Ought not to be placed immediately after a double bend in two planes.

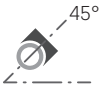
Mounting of flow sensor

4/5

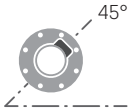


E3 qp 0.6...2.5 m³/h

E3 qp ≥ 3.5 m³/h



E3 qp ≥ 6.0 m³/h

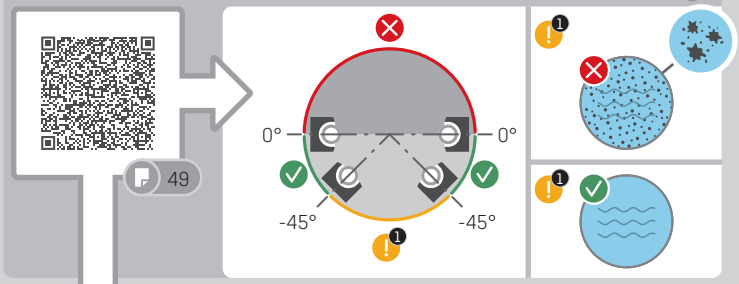


The flow sensor can be mounted horizontally, vertically or at an angle. In case of cooling installations, it is recommended to mount the flow sensor at an angle of 0° for q_p 0.6...2.5 m³/h and at an angle of 45° for the remaining sizes.

Mounting of flow sensor

5/5

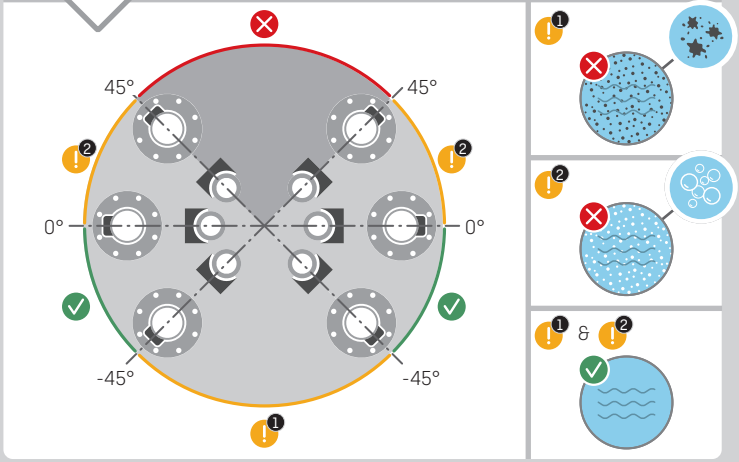
qp 0.6...2.5 m³/h



49

qp ≥ 3.5 m³/h

qp ≥ 6.0 m³/h



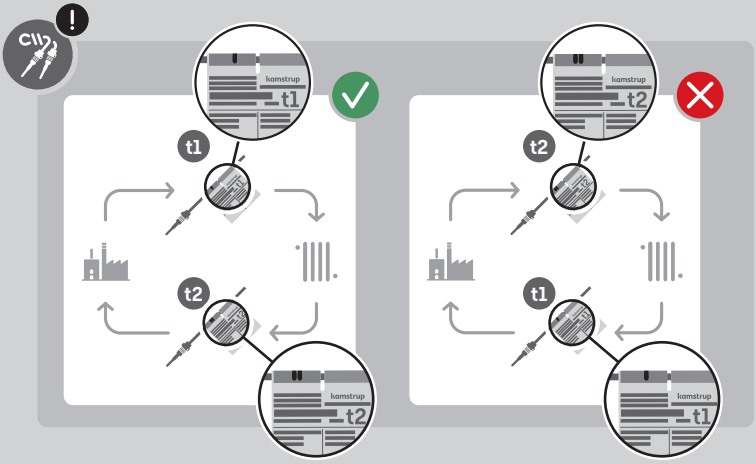
Directions marked with ! can be used if the prerequisites below are met:

❶ District heating water must be pure and not contain impurities. In a given case, impurities can cover the transducers of the flow sensors, which affects their abilities to register and send the ultrasound signal.

❷ District heating water must be free of air. Air bubbles affect the ultrasound signal significantly.

Mounting of temperature sensors

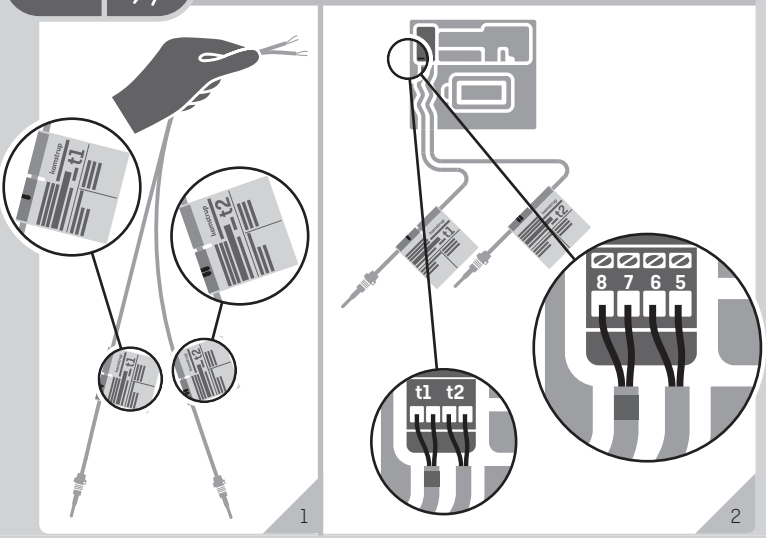
1/7

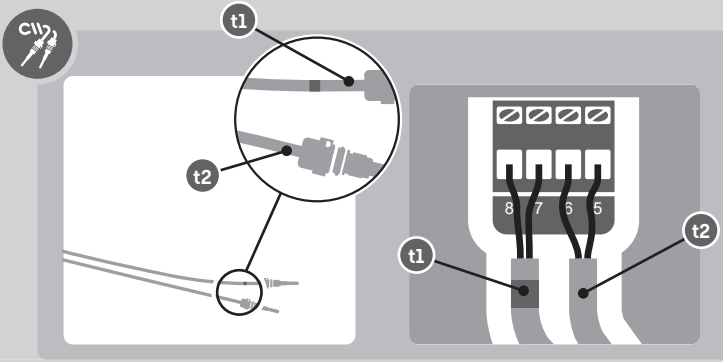


Mounting the temperature sensor. t1 must always be mounted in inlet, whereas t2 is always mounted in outlet. t1 and t2 appear from the temperature sensor label.

Mounting of temperature sensors

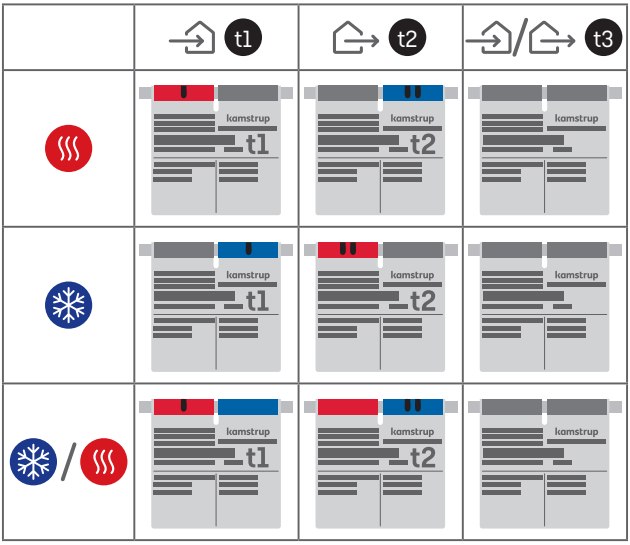
2/7





In addition to the marking on the label, t1 is marked with a laser engraved grey ring at both ends of the cable for quick indication.

(x1) t1 (x2) t2 (x0) t3



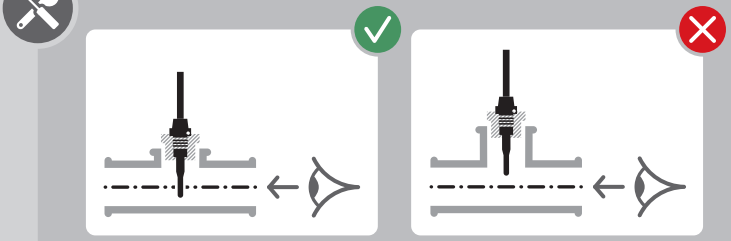
Depending on the type of the temperature sensor, there is, in addition to the marking of t1, t2 and t3, a colour and bar code for quick indication. t1 is always marked with a black line, whereas t2 is always marked with two black lines. t3 is never marked with lines but is always marked with grey. t3 can be mounted in inlet or outlet.

Heat: t1 is marked with red colour and a black line; t2 is marked with blue colour and two black lines; t3 has no marking.

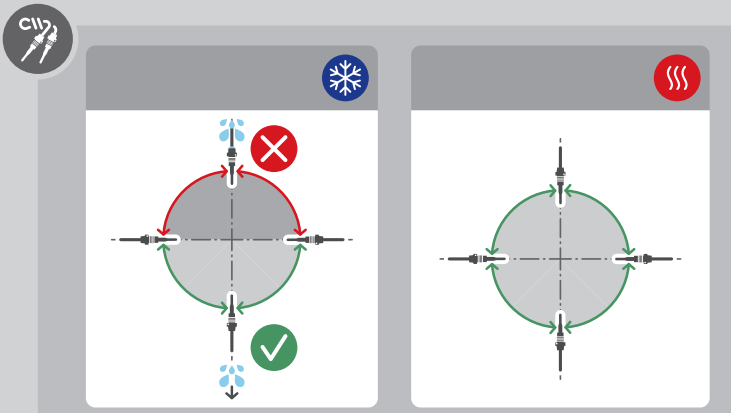
Cooling: t1 is marked with blue colour and a black line; t2 is marked with red colour and two black lines; t3 has no marking.

Heat/Cooling: t1 is marked with both red and blue colours and a black line; t2 is marked with both red and blue colours and two black lines; t3 has no marking.

4/7



Mounting/immersion depth of the temperature sensor. The sensor must as a minimum cross the centre of the pipe to ensure correct temperature measurement.



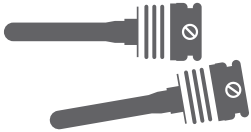
Be aware of the sensor's direction in the installation.

Cooling: To avoid that condensation forms on the sensor, the sensor should be mounted with the cable pointing downwards or to the side so that drops of water cannot get into the sensor.

Heat: All directions are acceptable.

5/7

PN16 PN25



PN16 PN25

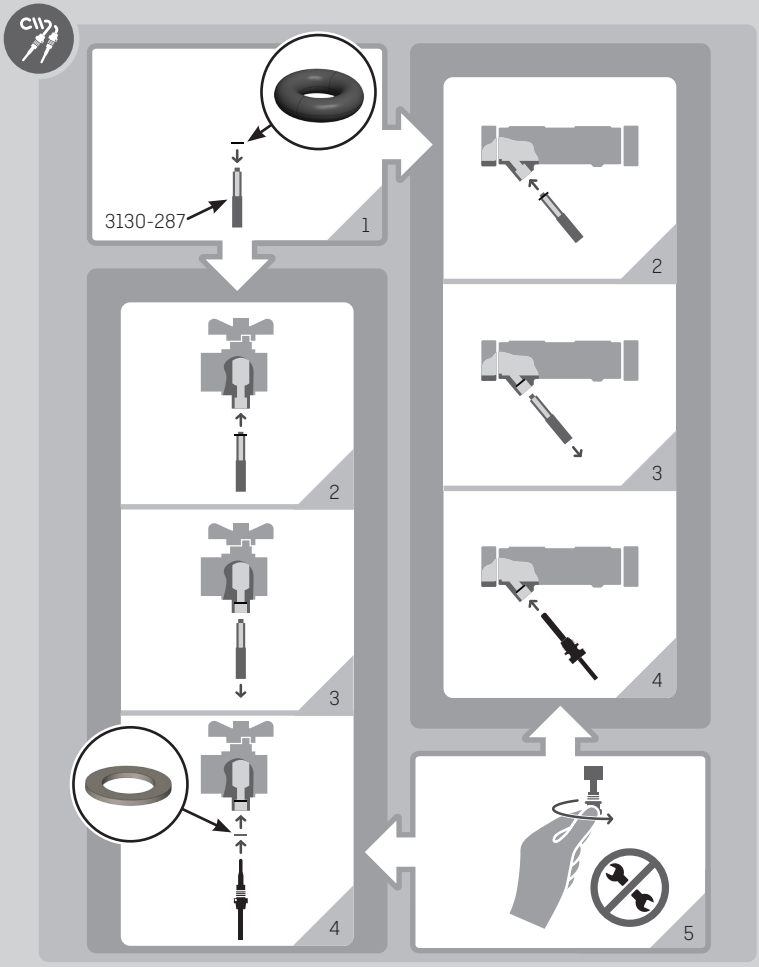
Approved pressure class of the temperature sensor. Temperature sensors and sensor pockets are approved for PN16 and PN25.

q_p	DN	G	DS 27.5	DS 38	PL Ø5.8
0.6-1.5	15	G¾B	X		
0.6-1.5	20	G1B	X		
3.5-6	25	G5/4B	X		
10	40	G2B		X	
15	50	-			X

Temperature sensor and flow sensor compatibility. The size of the flow sensor determines which temperature sensors you can use and how they are mounted.

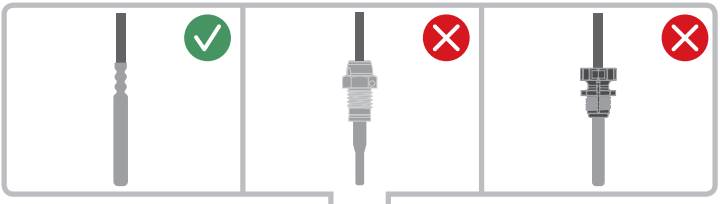
Mounting of temperature sensors

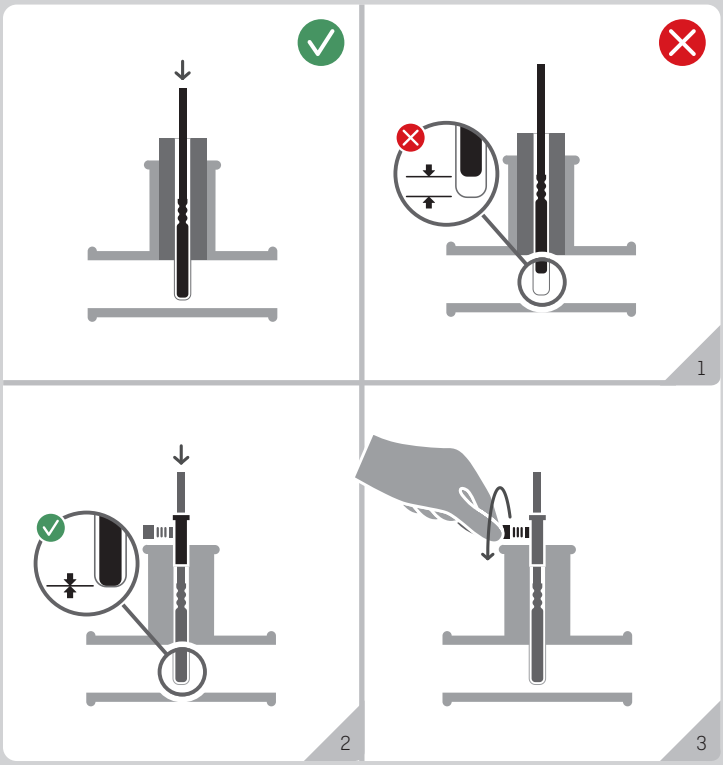
6/7



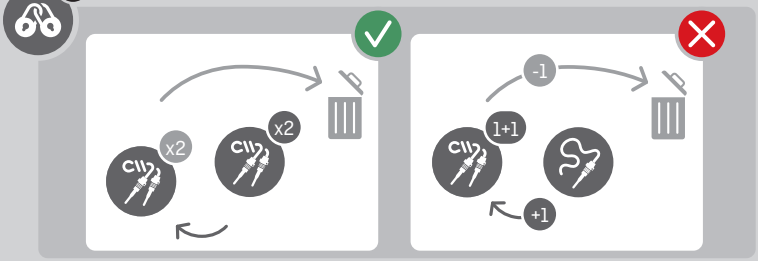
Mounting of ø5.0/ø5.2 with composite union nut. When mounting a sensor in a ball valve that does not follow EN1434-2:2022, an O-ring is inserted using the mounting tool (3130-287) as well as the provided spacer ring before the sensor is installed in the valve. When mounting a sensor in a flow sensor, nipples and ball valves that follow EN1434-2:2022, an O-ring is inserted using the mounting tool (3130-287) before the sensor is mounted.

The tightening of the sensor is done by hand.

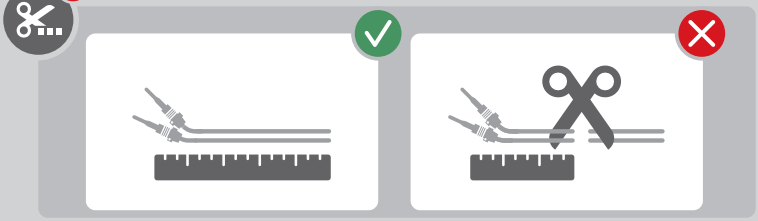




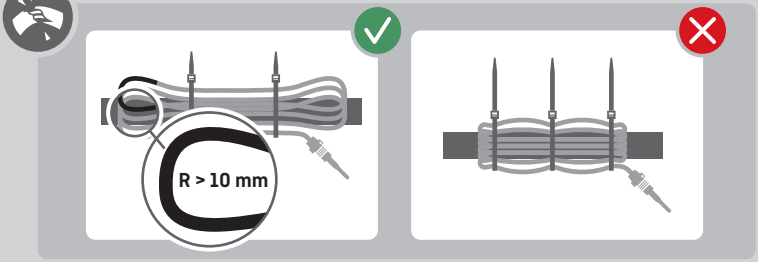
Correct mounting of pocket sensors in sensor pockets. When mounting pocket sensors, the sensor must be pushed all the way to the bottom of the pocket to avoid air at the bottom of the pocket. The collar of the cable is pushed down to the pocket opening, and the relief screw is tightened by hand.



Replacing two temperature sensors. When replacing temperature sensors, both sensors must be replaced by a new paired set. It is not allowed to replace only one temperature sensor.



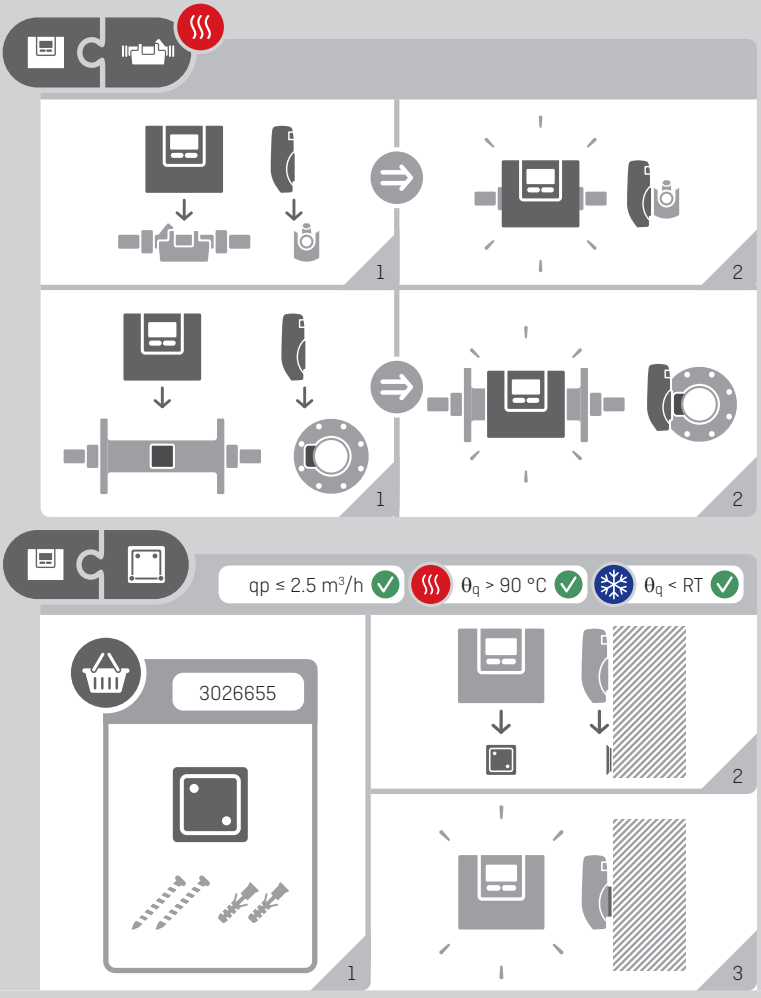
Shortening of temperature sensor cables. It is not allowed to shorten the cables of the temperature sensor.



Cable insulation of the temperature sensor. If the temperature sensor cables are bent in connection with the mounting, a bending radius of at least 10 mm must be ensured.

Mounting of calculator

1/3



The calculator can with advantage be mounted on the flow sensor in installations in which the medium temperature is higher than the ambient temperature but lower than 90 °C. Alternatively, the calculator can be mounted to a wall. For meters of $q_p \leq 2.5$ m³/h, the wall bracket (3026655.A) is used. For meters of $q_p > 2.5$ m³/h, the bracket is unscrewed from the flow sensor and used as a wall bracket.

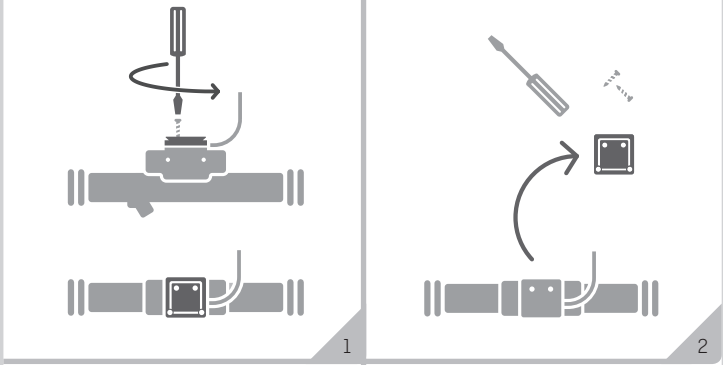
Mounting of calculator

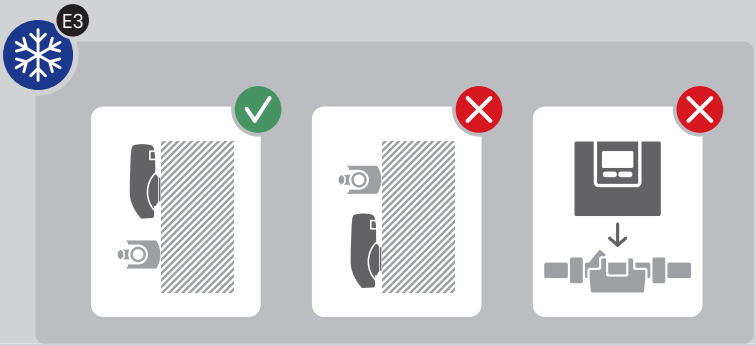
2/3

qp > 2.5 m³/h

θq > 90 °C

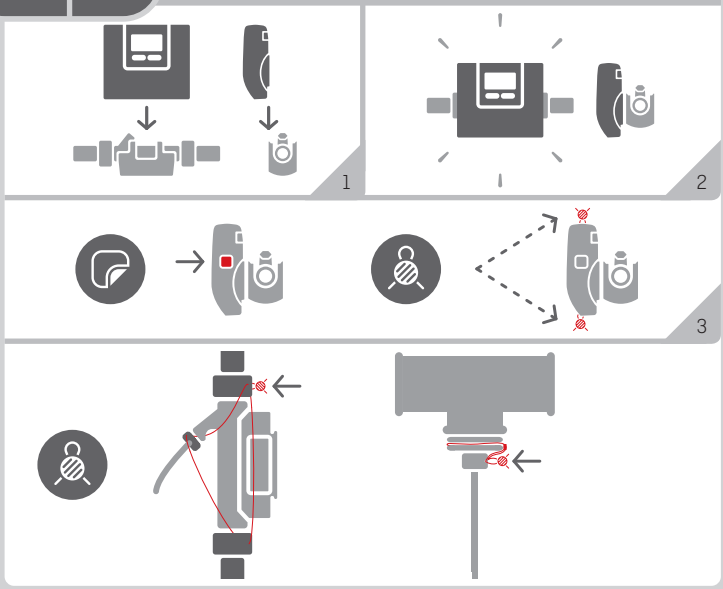
θq < RT





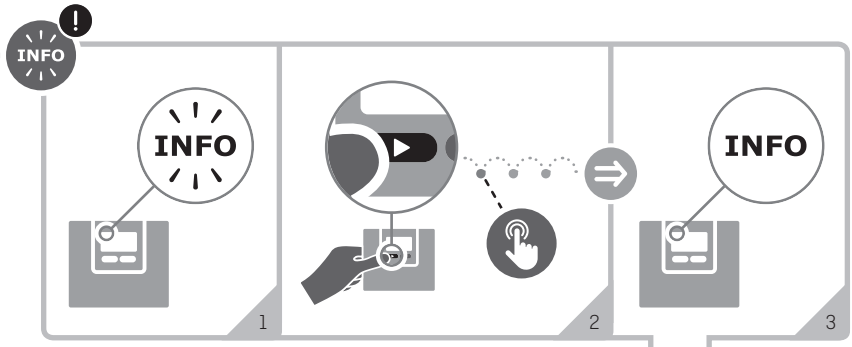
At cooling installations, the calculator must be placed on the wall above the flow sensor to avoid condensation problems.

3/3

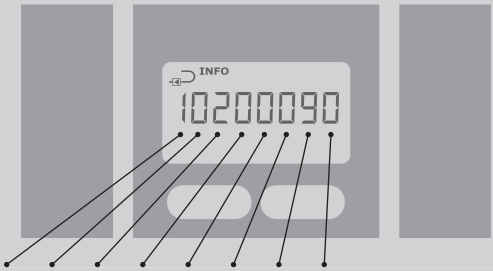


Mounting of installation sealings. To protect against fraud on the meter installation, installations sealings shall be mounted. The installation sealing can e.g. be done by means of wire and seal, sealing label or a combination of these.

Information codes “INFO”



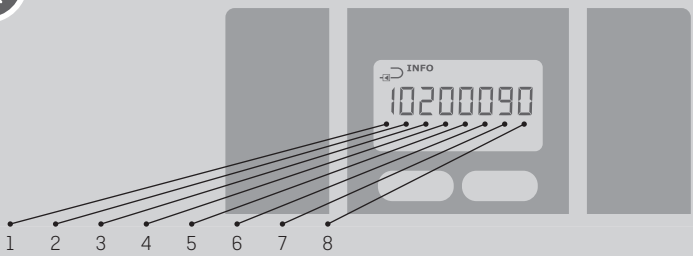
1/2

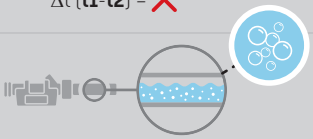


In case of errors in the meter, the info code can be read in the meter display. The different info codes are shown in the table below. For further details, see the technical description.

Info	t1	t2	0	V1	0	In-A	In-B	
1								
2								
9								
	1							**t1** > 185 °C
		1						**t2** > 185 °C

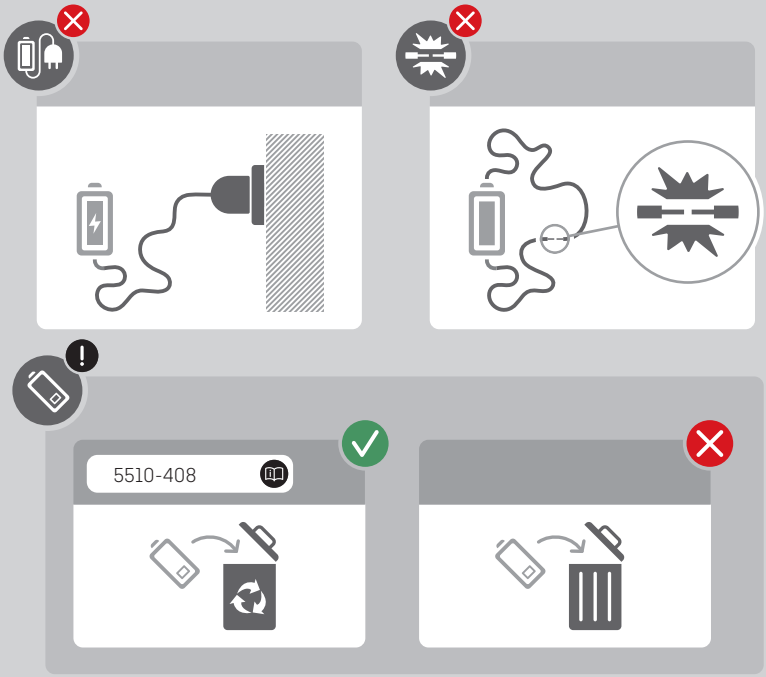
2/2



Info	t1	t2	0	V1	0	In-A	In-B	
	2							**t1** < 0 °C 
		2						**t2** < 0 °C 
	9	9						Δt [**t1**-**t2**] = ✕
				3				**V1**: 
				4				**V1**: 
				6				**V1** > qs
						8		**A**: 
						9		**A**: 
							8	**B**: 
							9	**B**: 

Voltage supply

1/3

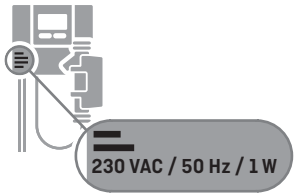


The meter's battery must neither be charged nor short-circuited.
Batteries are disposed of by handing them in for approved destruction of lithium batteries, e.g. to Kamstrup A/S.

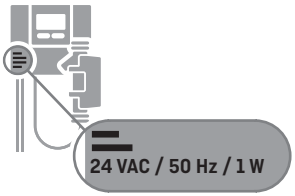
Voltage supply

2/3

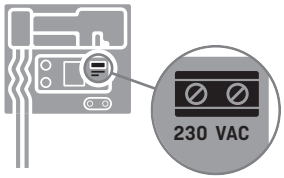
230 VAC / 50 Hz / 1 W



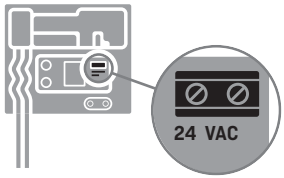
24 VAC / 50 Hz / 1 W



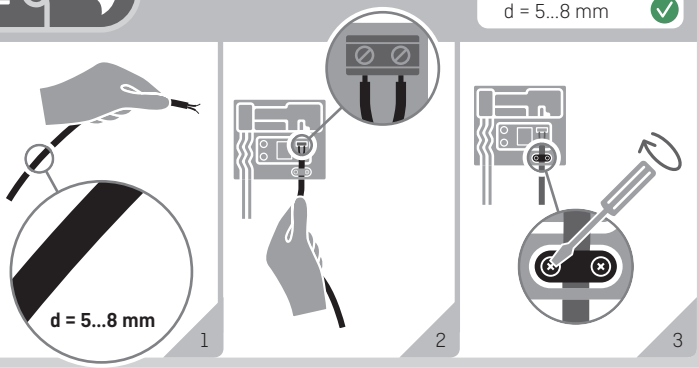
230 VAC



24 VAC



d = 5...8 mm



Fixed supply. On the meter front, it can be seen if the meter is prepared for 230 VAC or 24 VAC/VDC. This is also shown at the connection terminals.

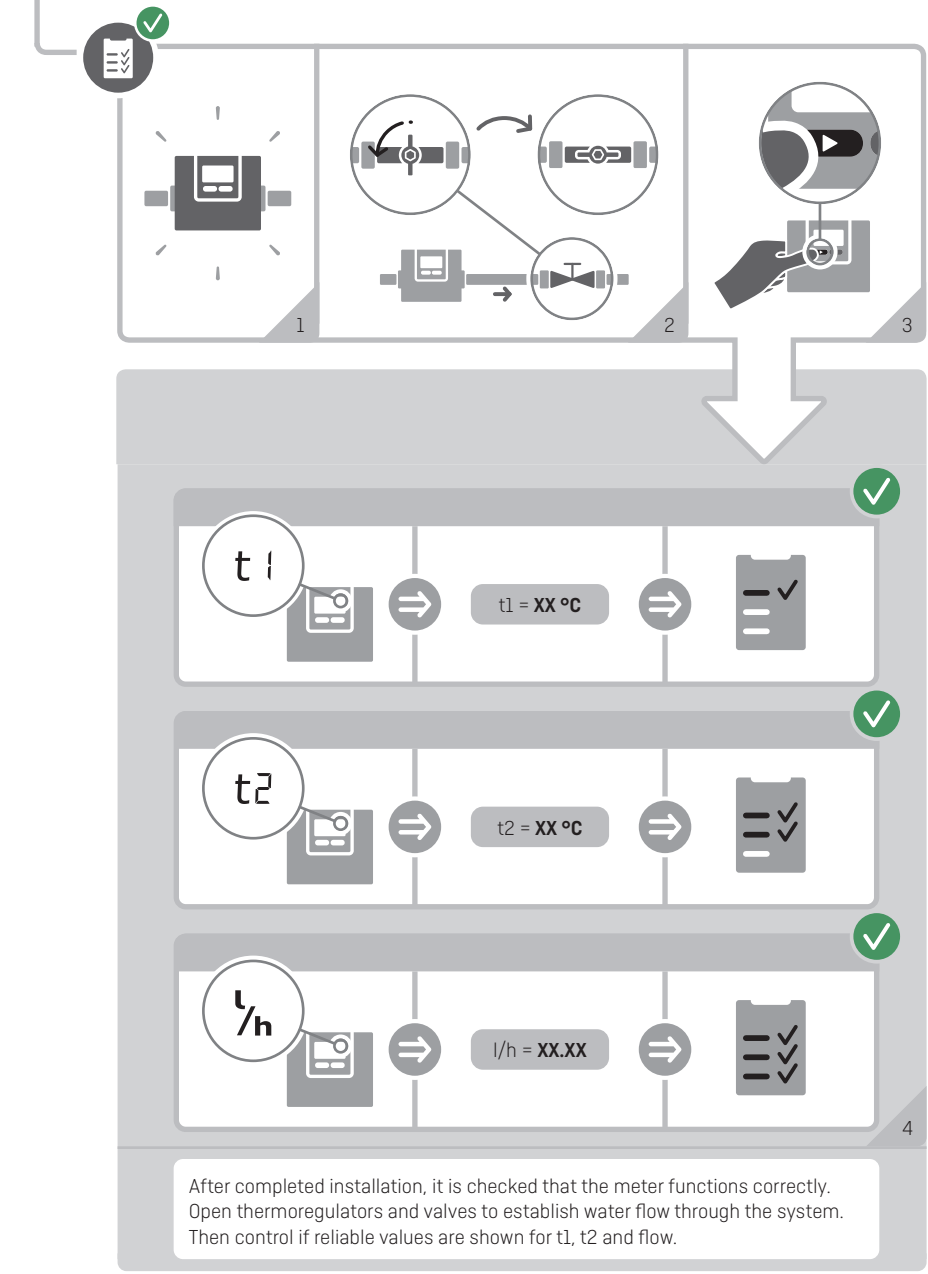
Cables with an outer diameter of 5...8 mm must be used. The cable is relieved in the meter through the provided relief bracket around the outer cap.

Voltage supply

3/3

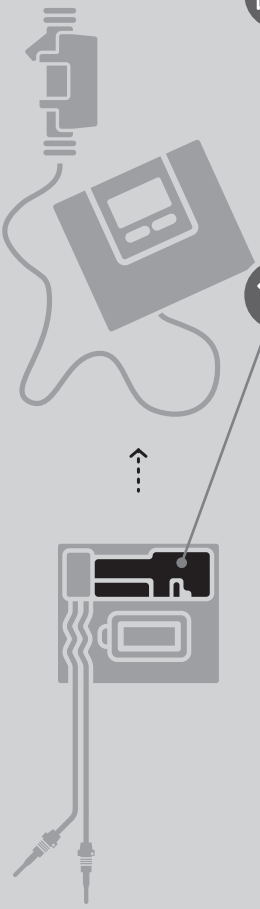
It must be ensured that the electrical connection of the meter complies with the rules in force. In case of doubt, it is recommended to consult an authorised electrician.

Testing of function



After completed installation, it is checked that the meter functions correctly. Open thermoregulators and valves to establish water flow through the system. Then control if reliable values are shown for t1, t2 and flow.

Accessories



https://www.kamstrup.com/en-en/heat-solutions/meters-devices/meters/multical-403

Data +	HC-003-10
Data +	HC-003-11
M-Bus +	HC-003-20
M-Bus +	HC-003-21
M-Bus +	HC-003-22
linkIQ/wM-Bus +	HC-003-32
linkIQ/wM-Bus +	HC-003-33
wM-Bus+	HC-003-34
Analog	HC-003-40
PQT+	HC-003-43
Radio +	HC-003-50
Radio GDPR +	HC-003-51
NB-IoT +	HC-003-56
BACnet +	HC-003-66
Modbus RTU +	HC-003-67
BACnet IP +	HC-003-81
Modbus +	HC-003-82

= In-A / In-B | **= Out-C / Out-D** | **= Out 1 / Out 2**

The meter can be mounted with different communication modules, depending on the requirements. The module can be replaced freely after the complete mounting of the meter.

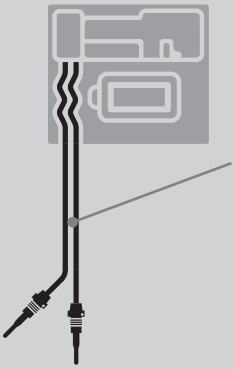
Accessories

https://www.kamstrup.com/en-en/heat-solutions/meters-devices/accessories

Battery, 1xD	HC-993-02	✓
230 VAC high power	HC-993-03	✓
24 VAC/VDC high power	HC-993-04	✓
Battery, 1xC IoT	HC-993-06	✓
230 VAC	HC-993-07	✓
24 VAC	HC-993-08	✓
Battery, 2xA	HC-993-09	✓

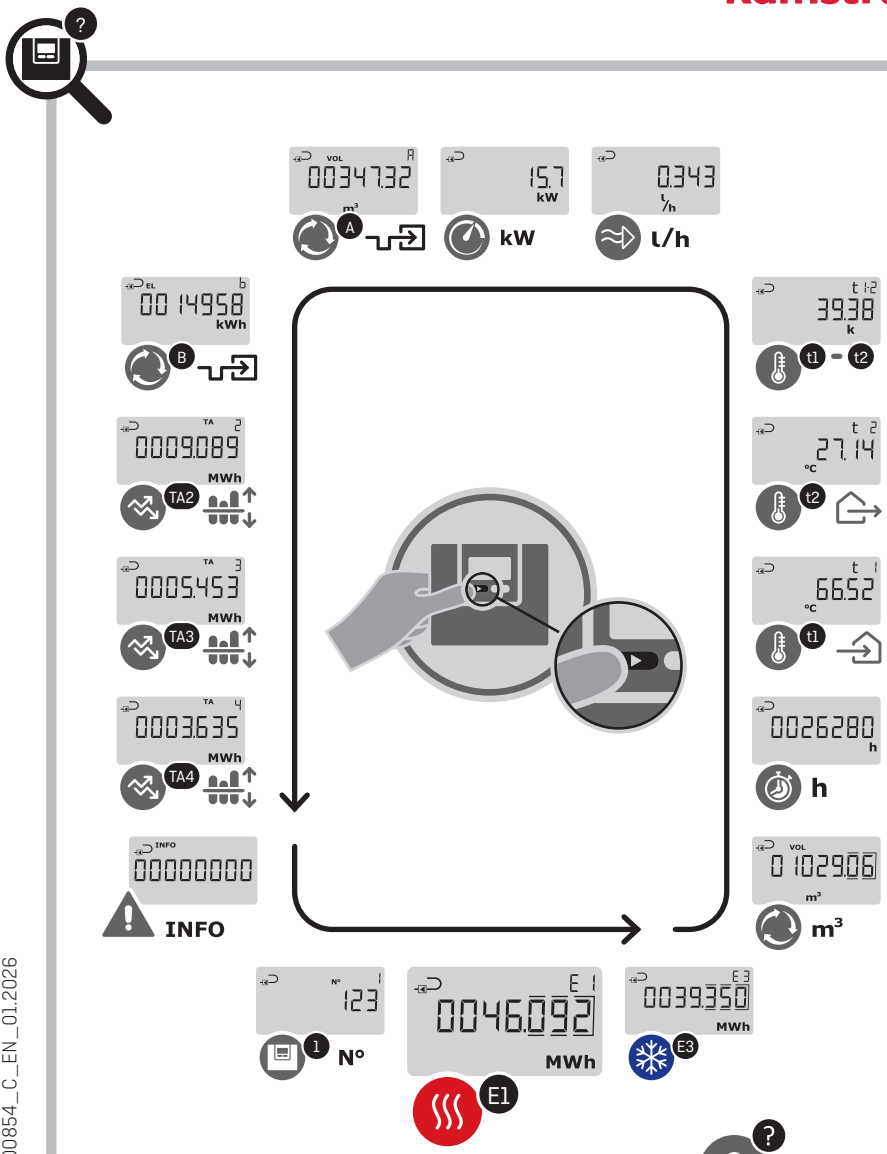
The meter can be mounted with different power supplies and batteries. These can be replaced freely after the complete mounting of the meter.

https://www.kamstrup.com/en-en/heat-solutions/meters-devices/temperature-sensors



- Pt500 direct short sensor set, 1.5 m cable
- Pt500 direct short sensor set, 3 m cable
- Pt500 pocket sensor set, 1.5 m cable
- Pt500 pocket sensor set, 3 m cable

kamstrup



DDD = 310/610

https://guides.kamstrup.com/userguides/gb_mc403.htm

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MULTICAL® 403

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