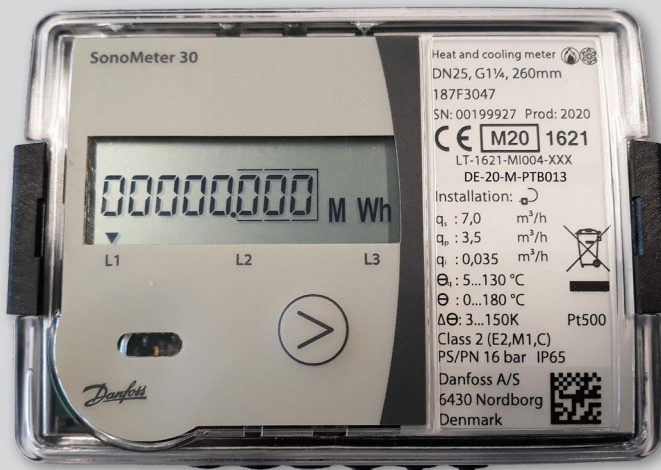


Installation guide

# SonoMeter 30

## Ultrasonic energy meter for heating and cooling applications





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## EU DECLARATION OF CONFORMITY

**Danfoss A/S**  
**Danfoss Energy Metering**

declares under our sole responsibility that the

Product(s):

**Energy Meters**

Type(s):

**SonoMeter 30**

covered by this declaration is in conformity with the following directive(s), standard(s) or other normative document(s), provided that the product is used in accordance with our instructions.

- MID Directive 2014/32/EU Measuring Instrument Directive

Module B + D  
o EN1434-4:2015

Notified Body: Lithuanian Energy Institute, 1621, performed type approval and issued certificate  
LT-1621-MI004-022

- EMC Directive 2014/30/EU Electromagnetic Compatibility<sup>1</sup>
  - o EN 61000-6-1:2007
  - o EN 61000-6-3:2007/A1:2011
  - o EN 55022:2010

- RoHS Directive 2011/65/EU Restriction of Hazardous substances
  - o EN 50581:2012

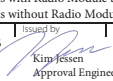
- RED Directive 2014/53/EU Radio Equipment Directive<sup>2</sup>
  - o EN 300 220-2 V3.1.1
  - o EN 301 489-1 V1.9.2:2011-09
  - o EN 301 489-3 V1.6.1:2013-06
  - o EN 62311:2008
  - o EN 61010-1:2010
  - o EN 60950-1:2006/A11:2009/A12:2011/AC:2011/A2:2013

- LVD Directive 2014/35/EU Low Voltage Directive<sup>1</sup>
  - o EN 62311:2008
  - o EN 61010-1:2010
  - o EN 60950-1:2006/A11:2009/A12:2011/AC:2011/A2:2013

- PED Directive 2017/68/EU

<sup>1</sup> For variants with Radio Module the declaration for EMC & LVD shall be ignored

<sup>2</sup> For variants without Radio Module the declaration for RED shall be ignored

Date	Issued by	Place of issue	Date	Approved by
2018.04.26	 Kim Jensen Approval Engineer, Danfoss Energy Metering	Nordborg, DK	2018.04.26	 Jeppe Møllekov Blaabjerg Energy Metering Category Manager

Danfoss only vouches for the correctness of the English version of this declaration. In the event of the declaration being translated into any other language, the translator concerned shall be liable for the correctness of the translation

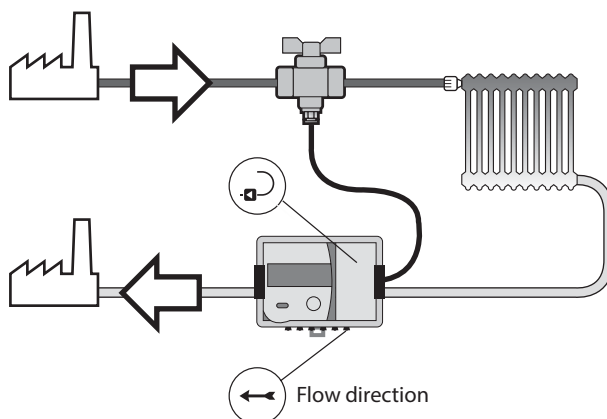
## 1. Installation

### 1.1. Preparation

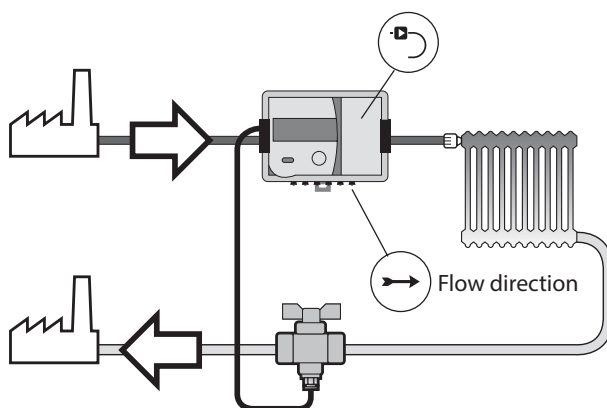
Only qualified personnel may install the equipment, following the requirements listed in this document. More detailed instruction can be found on [www.heating.danfoss.com](http://www.heating.danfoss.com).

**Note!** This product is approved for ambient temperature between 5-55°C, but to ensure optimal conditions for battery it is recommended to install Calculator at max. 45°C. Avoid installation stress from pipes and fittings. Flush the system.

### 1.2. Identification of installation: Return/Supply pipe installation and flow direction



Return pipe installation

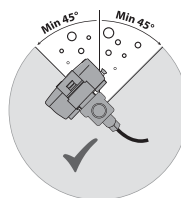
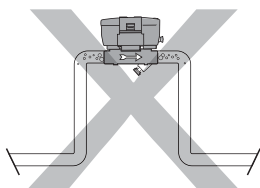


Supply pipe installation

## Installation guide

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### 1.3. Mounting of flow sensor

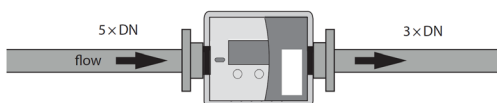


**Pipe position:** No limitations but avoid positions where air can be collected.

**Rotation in pipe axis:** Flow sensor should be angled in 45 to 315° to avoid air collection in flow sensor.

### Inlet/outlet conditions (only for DN 65-DN 100)

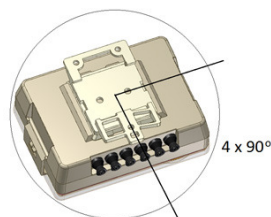
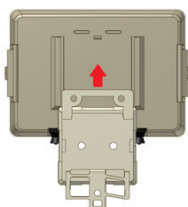
In order to maximize performance it is necessary to have straight inlet and outlet flow conditions before and after the flow sensor: 5 × DN on inlet and 3 × DN on outlet of flow sensor.



### 1.4. Mounting and sealing of calculator

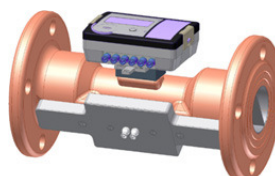
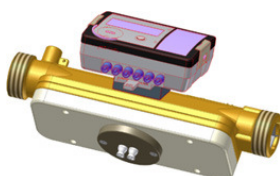
Heat meter calculator may be installed in heated premises, working ambient temperature shall be not more than 55 °C. It may not be exposed to direct sunlight.

The calculator is mounted on an auxiliary holder (it can be oriented in the required direction at an angle of each 90 °):



The possible ways of the mounting of the calculator (auxiliary holder):

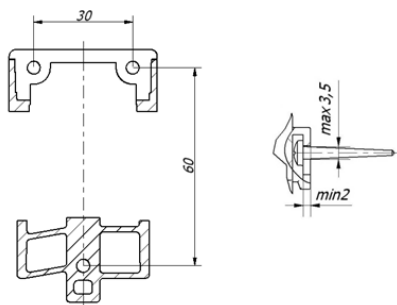
- Direct mounting on the housing of the flow sensor, by turning each 90° (only when the flow temperature does not exceed 90°C):



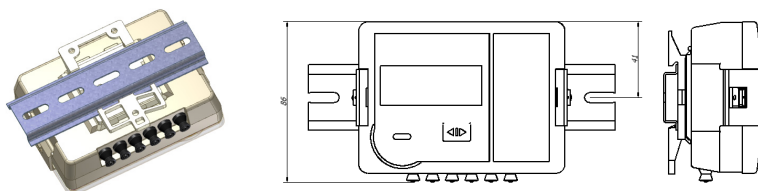
## Installation guide

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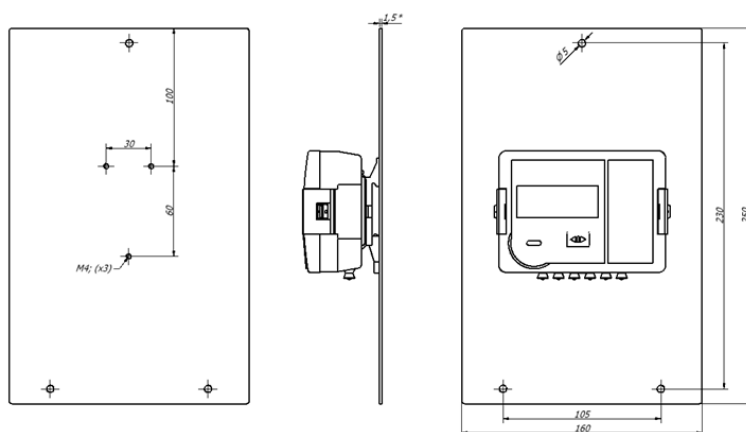
- On the wall:



- Panel mounting on standard DIN-rail:

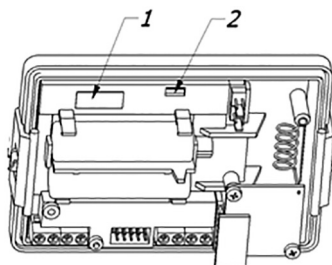


- Adapter plate according to figure 8 of EN1434-2:2007 for wall mounting of calculator can be used (if the aperture in the wall is too large for the calculator):



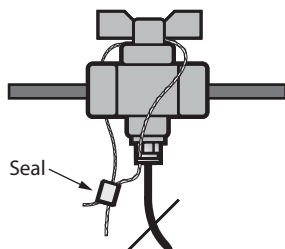
**Important:** It is forbidden to attach the calculator directly to a wall if there is a risk that on walls can be condensed humidity or temperature of a surface of a wall can fall lower than 5°C. In this case, it is recommended to attach the calculator so that between it and wall surfaces there was an air gap not less than 5 cm.

### Calculator seals

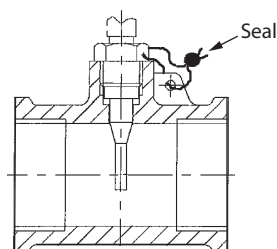


- 1: Manufacturer adhesive seal-sticker on the access to the adjustment activation jumper -verification seal.
- 2: Manufacturer adhesive seal-sticker on the fixer of the cover protecting electronic module -manufacturer security seal.
- 3: Mounting seal after installation.

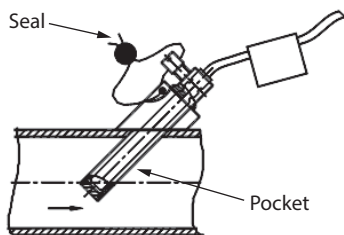
### 1.5. Mounting and sealing of temperature sensors



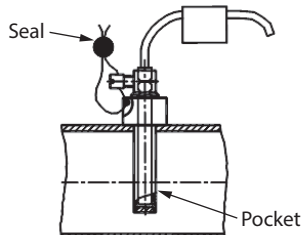
Installation recommendations for ball valve mounting and sealing



Installation recommendations for direct short temperature sensors



a) angled 45°



b) perpendicular


Installation recommendations for pocket temperature sensors with permanently connected signal leads.

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### 1.6. Setting up the jumpers (J)

The connector J is on the calculator plate between the temperature sensors and pulse input / output connection terminals (see 6.3). Joining or leaving open the connector contacts, you can choose the normal or verification (test) mode, activate the pulse inputs or outputs:

	Jumper is not set (contacts are opened)	Jumper is set (contacts are connected)
	NORMAL MODE	VERIFICATION (TEST) MODE
	The first pulse output V1 is active (terminals 52,53). Energy as default.	The first pulse input V1 is active (terminals 52,53) (Jumper must be removed when operating in TEST mode)
	The second pulse output V2 is active (terminals 50,51). Volume as default.	The second pulse input V2 is active (terminals 50,51) (Jumper must be removed when operating in TEST mode)

**Note:** On delivery the heat meter is configured with two outputs.

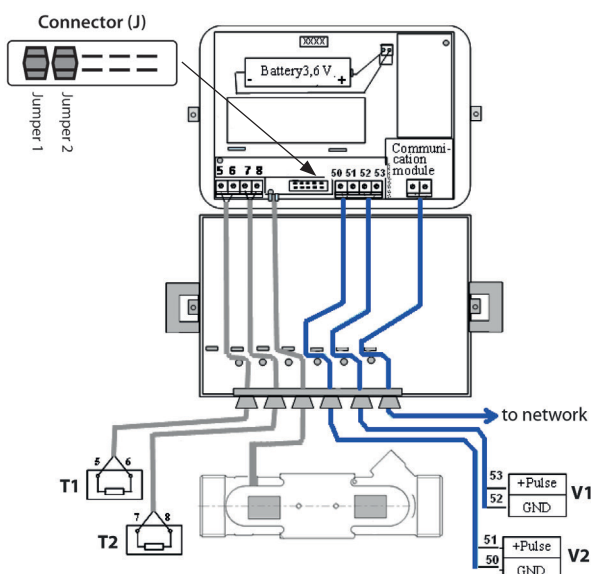
## 2. Electrical wiring

### Wiring diagram 1

Jumper settings:

- 1: Additional pulse input V2 is on.
- 2: Additional pulse input V1 is on.

T1: flow temperature sensor.  
T2: return temperature sensor.  
V1: additional pulse input/output 1.  
V2: additional pulse input/output 2.

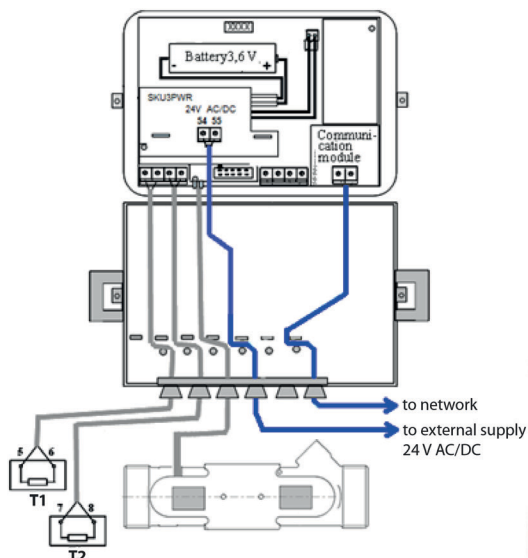


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### Wiring diagram 2

Connecting the meter to the mains power supply, 24 V AC/DC.  
230 V AC to 24 V AC transformer must be used for connection to 230 V AC!



### Calculator

Terminals	Description
5	T1 supply temperature sensor
6	T1 supply temperature sensor
7	T2 return temperature sensor
8	T2 return temperature sensor
50	V2 additional pulse input/output GND
51	V2 additional pulse input/output (Volume output in TEST mode)
52	V1 additional pulse input/output GND
53	V1 additional pulse input/output (Energy output in TEST mode)

### Communication modules

Terminals	Description
24, 25	M-bus module (bipolar)
60, 61	12-24 V DC power supply voltage for Modbus and LON (bipolar)
90	RS-485 Modbus RTU module (+) or BACnet (+)
91	RS-485 Modbus RTU module (+) or BACnet (+)
96	LON module (line A)
97	LON module (line B)

## External power supply module

Terminals	Description
54	Mains supply 24 V AC/DC (bipolar)
55	Mains supply 24 V AC/DC (bipolar)

## 3. Commissioning

### 3.1. Bleeding

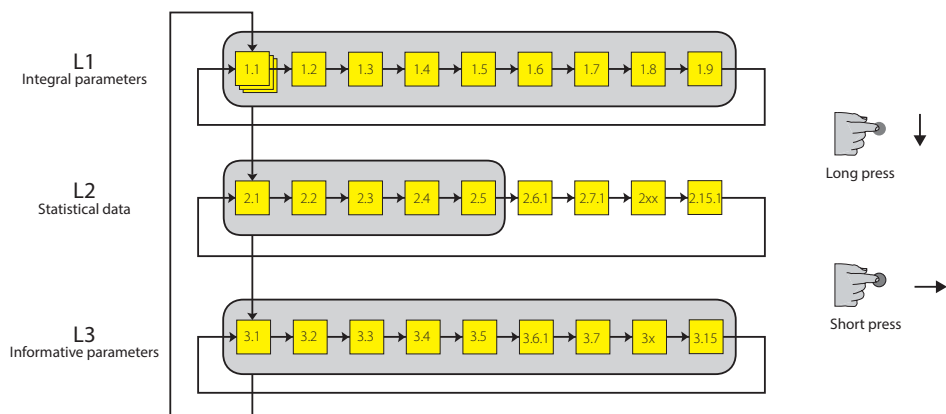
1. Bleed the system until the flow rate display is steady.
2. Make sure no error codes are displayed.
3. Check the display for a plausible indication of flow rate and temperatures.

### 3.2. IP class

Calculator	IP65
Flow sensor	IP65 for heat meter IP67 for heat and cooling meter

## 4. Display function overview

### 4.1. Menu structure



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### 4.2. Display symbols



#### Explanation of special symbols:

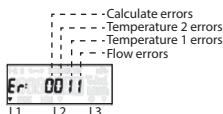
→	flow is flowing forward (right direction)
←	flow is flowing backwards (wrong direction)
no arrow	no flow

Explanation of other symbols are described in detailed instruction on [www.heating.danfoss.com](http://www.heating.danfoss.com).

### 4.3. Error codes

Error codes may consist of up to 4 symbols.

Each symbol may have values 0...8



Code	Description
Status of calculator 	0 - no error, normal operation 1 - warning – ending battery life 2 - temperature difference is greater than the permitted limits 4 - temperature difference is less than the permitted limits 8 - electronics failure
Status of temperature sensor 2 (return pipe) 	0 - no error, normal operation 4 - short circuit 8 - sensor failure (open circuit or short circuit)
Status of temperature sensor 1 (flow pipe) 	0 - no error, normal operation 4 - short circuit 8 - sensor failure (open circuit or short circuit)
Status of flow sensor 	0 - no error, normal operation 1 - no signal, flow sensor is empty 2 - flow flows in an reverse direction 4 - flow rate greater than 1.2-qs (are displayed q = 1,2qs) 8 - electronics failure

Active error codes are added and simultaneously displayed, if more than one error is detected:

- 3 - corresponds errors 2 + 1
- 5 - corresponds errors 4 + 1
- 7 - corresponds errors 4 + 2 + 1
- 9 - corresponds errors 8 + 1
- A - corresponds errors 8 + 2
- B - corresponds errors 8 + 2 + 1
- C - corresponds errors 8 + 4
- D - corresponds errors 8 + 4 + 1
- E - corresponds errors 8 + 4 + 2
- F - corresponds errors 8 + 4 + 2 + 1

## 5. Disposal



This symbol on the product indicates that it will not be treated as household waste. It must be handed over to the applicable take-back scheme for the recycling of electrical and electronic equipment. For more detailed information about the recycling of this product, please contact your local municipal office.

Item	Material	Disposal
Battery	AA-cell lithium/thionyl chloride 700 mg lithium	Approved deposit for lithium batteries
PCBA with display	Coppered epoxy laminate components soldered on, PC, TPE	Electronic waste
Cables	Copper with PUR or PVC jackets	Cable recovery
Flow sensor (incl. transducer and liner)	Brass, stainless steel, PPS	Metal recovery
Transducer	PZT, stainless steel, PEI	Approved deposit for PZT
Other plastic parts	PC, PPS, PEI, TPE	Plastic recovery

## 6. Local Importer name and address

For goods delivered to UK, importer name and address is:

Danfoss Ltd.  
Oxford Road  
UB9 4LH Denham  
UK

