ENGINEERING
TOMORROW

Installation & User Guide

SonoMeter 30

Ultrasonic energy meter for heating and cooling applications

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EC / 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**

EC type-examination certificate no.: LT-1621-MI004-020 (LEI Lithuanian energy Institute)

is in conformity with the relevant Union harmonisation legislation acts, as far as these apply to the product:

MID Directive 2014/32/EU
EMC Directive 2014/30/EU
LVD Directive 2014/35/EU
RTTE Directive 1999/5/EC

The product complies with the following used harmonised standards and normative documents, rules and technical guidelines (level as indicated):

EN 1434:2007	EN 60529
WELMEC 7.2:2009	EN-61000-4-2
EN 61010-1:2010	EN-61000-4-3
EN 55022:2010	EN-61000-4-4
EN 300 220-2 v2.4.1:2012	EN-61000-4-6

The notified body LEI Lithuanian energy Institute, number 1621, surveils the quality system according module D / MID certificate no.: Module D: KS-1621MP-001.15

Date	Issued by		Date	Approved by	
1.6.2016	Signature		1.6.2016	Signature	
	Name	Siniša Bogar		Name	Bjarne Halkjær Sig
	Title	Product Manager		Title	Product Portfolio Director

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ID No: VJSHO102 Revision No: 01

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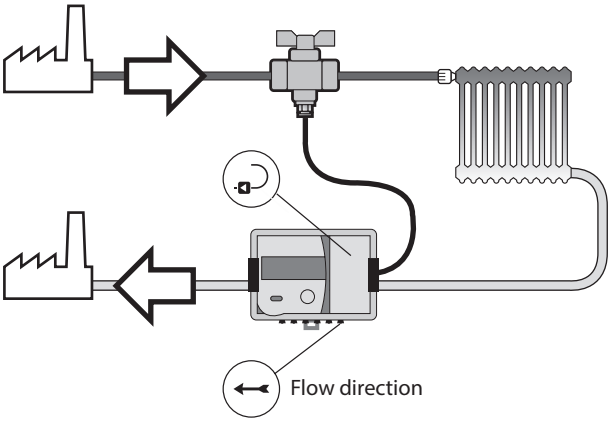
1. Installation

1.1. Preparation

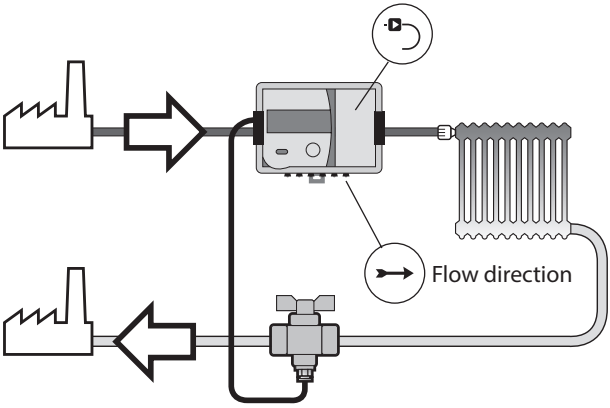
Only qualified personnel may install the equipment, following the requirements listed in this document. More detailed instruction can be found on www.heating.danfoss.com.

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

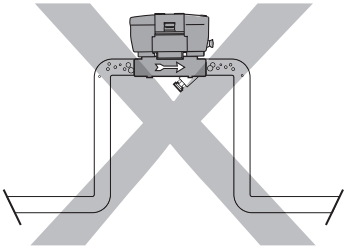


Return pipe installation

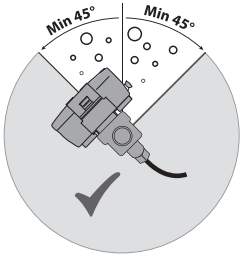


Supply pipe installation

1.3. Mounting of flow sensor



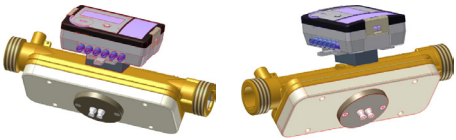
Pipe position: No limitations but avoid positions where air can be collected.



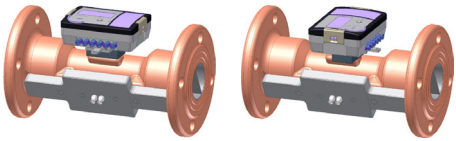
Rotation in pipe axis: Flow sensor should be angled in 45 to 315° to avoid air collection in flow sensor.

1.4. Mounting and sealing of calculator

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

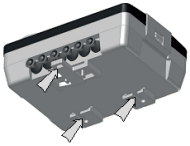


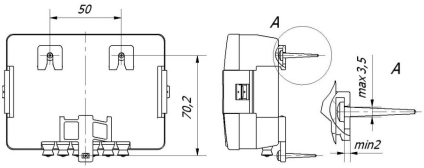
a) On the flow sensor with a thread connection



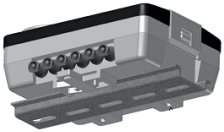
b) On the flow sensor with flange connection

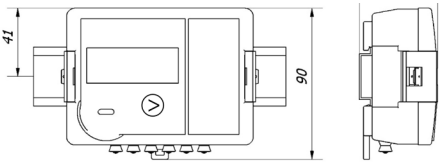
On the wall:



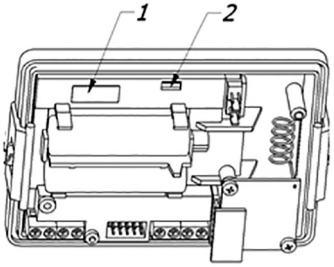


Panel mounting on standard DIN-rail:



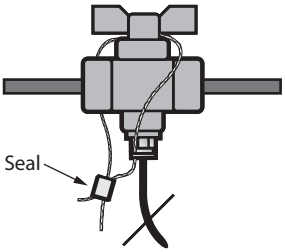


Calculator seals

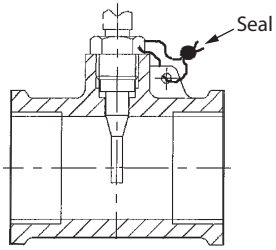


1: Manufacturer adhesive seal-sticker on the access to the adjustment activation jumper -verification seal.
2: Manufacturer adhesive seal-sticker on the fixer of the cover protecting electronic module -manufacturer security seal.
3: Mounting seal after installation.

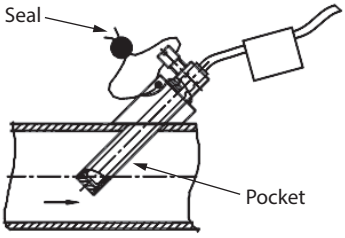
1.5. Mounting and sealing of temperature sensors



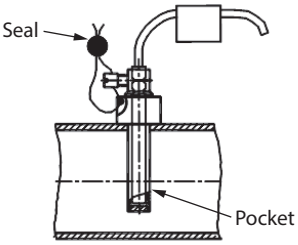
Installation recommendations for ball valve mounting and sealing



Installation recommendations for direct short temperature sensors



a) angled 45°

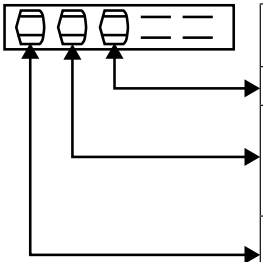


b) perpendicular

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

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:



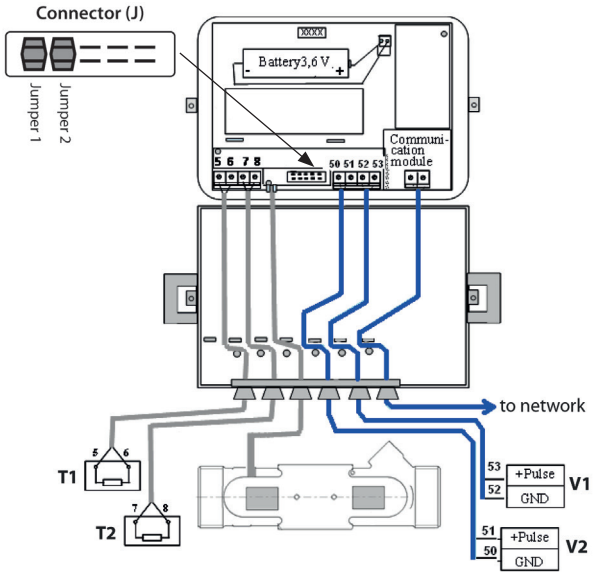
Jumper is not set (contacts are opened)	Jumper is set (contacts are connected)
NORMAL MODE	VERIFICATION (TEST) MODE
The first pulse output V1 is active (terminals 52,53). Energy as default.	The first pulse intput V1 is active (terminals 52,53) (Jumper must be removed when operating in TEST mode)
The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

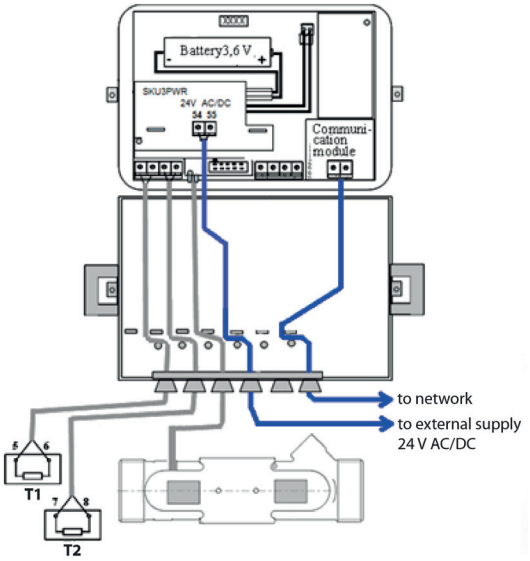
Jumper settings:
1: Additional pulse input V2 is on.
2: Additional pulse input V1 is on.



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

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 (+)
91	RS-485 Modbus RTU module (-)
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

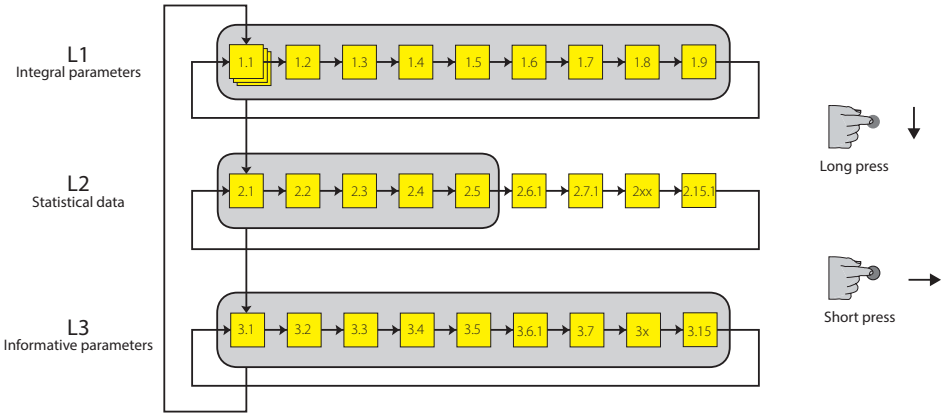
1. Bleed the system until the flow rate display is steady.
2. Make sure no error codes are displayed.
3. Check the display for a plausible indication of flow rate and temperatures.

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



4.2. Display symbols

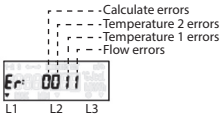
Explanation of special symbols:

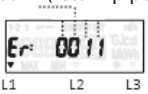
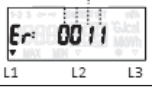
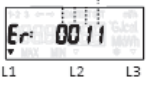
→	flow is flowing forward (right direction)
←	flow is flowing backwards (wrong direction)
no arrow	no flow

Explanation of other symbols are described in detailed instruction on www.heating.danfoss.com.

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
- 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

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