DANAK
PROD Reg. No. 7026

FORCE Certification

EU-Type Examination Certificate

Measuring Instrument Directive

Certificate number: DK-0200-MI004-038
Issued by FORCE Certification A/S, Denmark
EU-notified body number 0200

In accordance with the Danish Safety Technology Authority's statutory order no. 544 of May 28, 2018 which implements the Directive 2014/32/EU of the European Parliament and Council of February 26, 2014 on measuring instruments (MID).

Issued to: **DAF Energy**
Gazi Bulvarı No:36
Anadolu Yakası Org. San. Bölgesi Aydınlı
TUZLA – İSTANBUL
Turkey

Type of instrument:	Energy Meter, complete meter
Type designation:	SonicHeat Heatmeter 10
Valid until:	06-11-2025
Number of pages:	21, including appendix
Date of issue:	14-03-2019
Version No.:	6 This new version of DK-0200-MI004-038 is issued due to editorial changes. The previous certificate is withdrawn.

Approved by

Michael Møller Nielsen
Certification Manager

Processed by

Lars Poder
Examiner

The conformity markings may only be affixed to the above type approved equipment. The manufacturer's Declaration of Conformity may only be issued and the notified body identification number may only be affixed on the instrument when the production/product assessment module (D or F) of the directive is fully complied with and controlled by a written inspection agreement with a notified body.

FORCE Certification references: TASK no.: 119-24176.01 and ID no.: 0200-MID-05981

Appendix to

EU-Type Examination Certificate
Measuring Instrument Directive

Number: DK-0200-MI004-038
Issued by FORCE Certification A/S, Denmark
EU-notified body number 0200

Version	Issue date	Changes
DK-0200-MI004-038	11-10-2016	Original certificate
DK-0200-MI004-038 Ver. 1	02-03-2017	▪ Changed Heat meter to Energy meter ▪ New firmware added ▪ Energy verification updated with extra temperatures ▪ New photo added ▪ Various textual changes
DK-0200-MI004-038 Ver. 2	02-06-2017	▪ DN25 qp6.0 added ▪ DN32 qp6.0 added ▪ New hardware issue added ▪ Radio WalkBy Module added
DK-0200-MI004-038 Ver. 3	15-09-2017	▪ New pulse output module added ▪ Comment on passed durability tests added
DK-0200-MI004-038 Ver. 4	07-02-2018	▪ New hardware issue and part numbers added ▪ New firmware added ▪ Bifunctional meter setup added
DK-0200-MI004-038 Ver. 5	14-05-2018	▪ New firmware added ▪ New hardware issue added
DK-0200-MI004-038 Ver. 6	14-03-2019	▪ Specific hardware part numbers removed

Applied standards and documents:
EN 1434-4:2015 + A1:2018

The instruments/measuring systems shall correspond with the following specifications.

Type designation:
SonicHeat Heatmeter 10

Description:
DAF SonicHeat Heatmeter 10 is battery powered ultrasonic compact energy meter intended for measuring energy consumption in heating applications for billing purposes. The meter consists of a flow sensor, a pair of Pt1000 temperature sensors and a calculator with integrated circuits for temperature measurement, flow measurement and energy calculation. There is one main PCBA with a display, a push button, a µC and an optical communication facility.

The flow sensor consists of a meter body made of brass and is based on the ultrasonic principle with no moving parts. The flow velocity is derived from difference time and speed of sound measurements.

The calculator is part of the main PCBA and includes either wired M-Bus communication, or no communication. Various communication- and input-/output- modules can be connected to main PCBA. The electrical connection between the calculator and the flow sensor is typically a 0.5 m long cable. The Pt1000 temperature sensor cables are typically 1.5 m long.

Technical documentation:
Reference no.:

- 119-24176.01
- 118-22324.02
- 118-22324.01
- 117-22150.03
- 117-22150.02
- 117-22150.01
- 116-30232.02

Technical data

General

Instrument type according to:	EN 1434-4:2015 + A1:2018
Instrument types:	Heat and bifunctional meter Complete instrument or Hybrid instrument (A energy meter, which for the purpose of pattern approval and verification can be treated as a combined instrument. However, after verification, its sub-assemblies shall be treated as inseparable)
Sub-assembly for hybrid instrument:	Calculator, flow sensor and temperature sensor pair
Energy indication:	GJ – Gcal – MWh – kWh
Temperature range:	$\theta_{min} - \theta_{max}$ = 5 °C – 95 °C
Diff. temperature range:	$\Delta\theta_{min} - \Delta\theta_{max}$ = 3 K – 90 K
Temperature sensors:	Pt1000 direct short, 2 wire, 1.5 m cable length (The cables may be longer but shall be shorter than 10 m)
Cable length flow sensor/calculator:	0.5 m (The cable may be longer but shall be shorter than 10 m)
Flow sensor, orientation:	Any orientation, no inlet or outlet restrictions
Accuracy class:	2 and 3
Environmental class:	E1, M1, M2 and M3
Ambient temperature:	5 to 55 °C, non-condensing, closed location
Durability specification:	Min. 10 years, based on passed basic durability test, additional durability test and accelerated durability test
Protection class:	IP54
Power supply:	3.6 V Lithium battery (1 AA-cell)

Flow sensor sizes	**DN**	**15**	**20**	**25**	**25**	**32**
Nominal flow q_p	[m^3/h]	1.5	2.5	3.5	6.0	6.0
Maximum flow q_s	[m^3/h]	3.0	5.0	7.0	12.0	12.0
Minimum flow q_i	[m^3/h]	0.015	0.025	0.035	0.060	0.060
Pressure loss @ q_p	[mbar]	150	160	130	220	220
Connection	[Inch]	G¾ A	G1 A	G1¼ A	G1¼ A	G1½ A
Length	[mm]	110	130	160	260	260
Pressure stage	PN[bar]	16				

Firmware specification

The approved firmware is identified as:

Version No.	Code No.	Checksum for metrological part of the firmware
01.02.00	014C2600	9329 8405H
01.03.00	014C2620	BD03 F784H
01.05.00	014C2624	84D5 016BH
01.06.00	014C2624	36B6 3DADH

The firmware version is engraved on the front cover.

Hardware specification

The approved hardware is identified as:

- Main PCBA with integrated MBUS communication.
- Main PCBA without integrated MBUS communication.
- Main PCBA with integrated MBUS communication
  Display layout incl. symbols for Bi functional and Mains supply.
- Main PCBA without integrated MBUS communication
  Display layout incl. symbols for Bi functional and Mains supply.

Modules

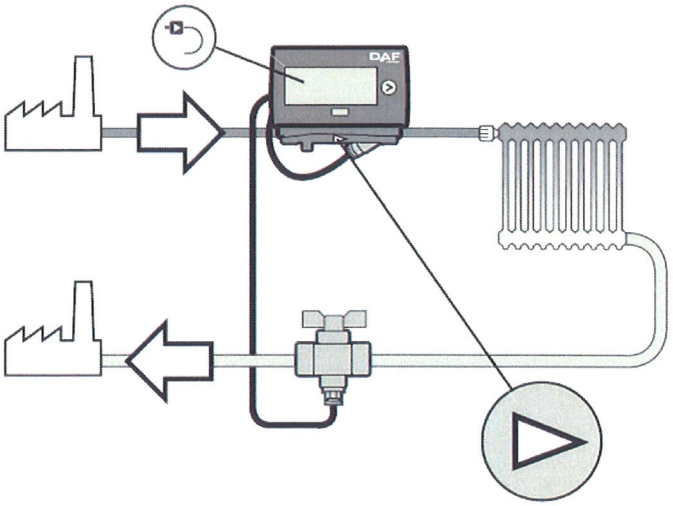
Several different Modules can be assembled from factory or can be mounted on site.
The Modules are not a legal part of the Energy meter.

Module types:

- 2 Pulse Input
- Wireless Radio/OMS with 2 Pulse Input
- Wireless Radio/OMS WalkBy with 2 Pulse Input
- 2 Pulse Output

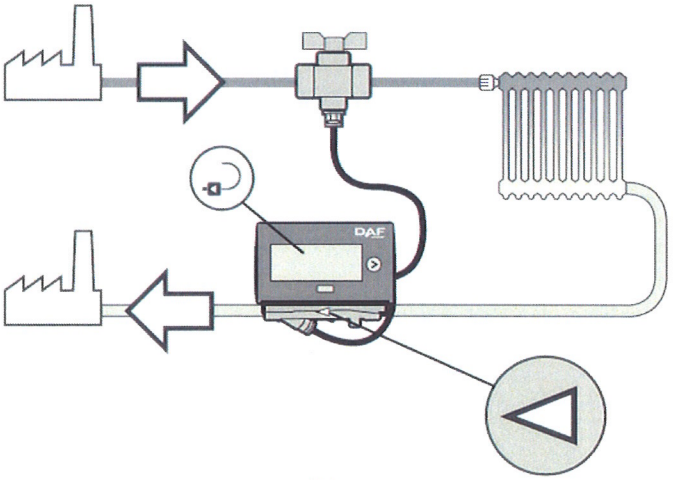
Application drawings

Supply pipe installation.



Supply

Return pipe installation.



Return

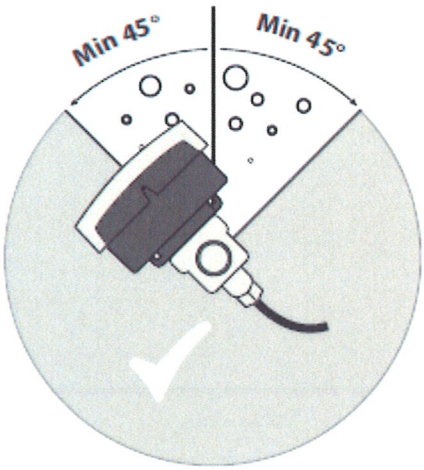
Verification

Test conditions

Make sure that no foreign objects are inside the Flow Sensor.

Mount the Flow Sensor in an angle (45 to 315 deg.) to ensure no air is trapped in front of the Transducers.

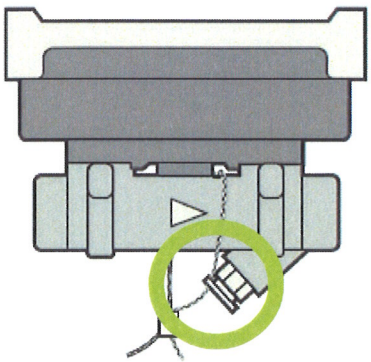
Make sure no air is trapped inside the Flow Sensor by flushing the system for several minutes with different flowrates (high and low alterations).

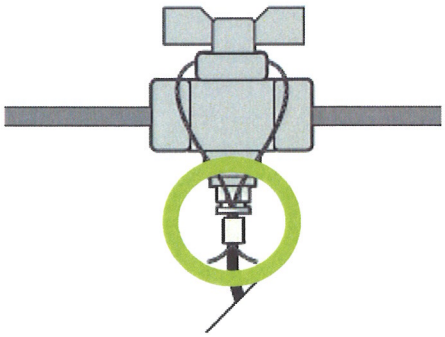


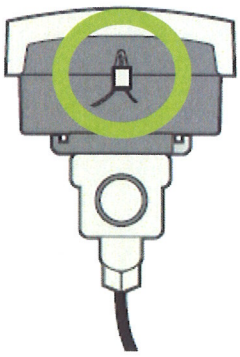
Application seals

The Energy meter has three or four application seals.

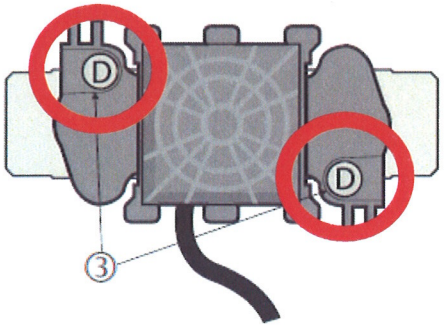
- One at the Temperature Sensor/Flow Sensor.
- One at the Temperature Sensor/Pipe.
- One or two at the Calculator enclosure.

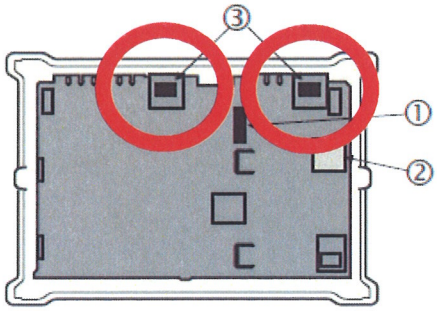






Factory seals
The factory seals (3) are not to be broken.





① Tamper monitor/ access level 1
② Test seal (verification mode)
③ Factory seal

The Energy meter Verification Mode can be accessed in two ways.

1. By breaking the Calculator application seal, opening the enclosure, breaking an adhesive seal and short-circuiting two internal test pads on PCBA.
   The measuring frequency is increased.
   CorrectionFactor can be changed.
   Accumulated Volume and Energy can be reset.
   Times out after 8 hours.

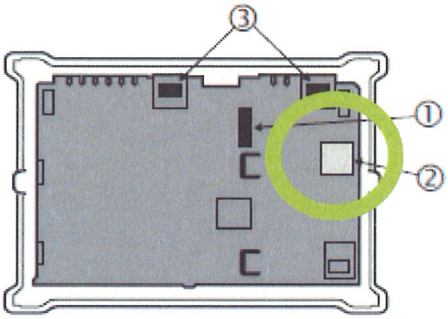
2. By optical communication (Dongle and smartphone App. Tool).
   For a limited number of times (typical 5) the Energy meter can be set to verification/high speed mode.
   The measuring frequency and display resolution is increased.
   Times out after 8 hours.
   This feature is only possible for specific countries (e.g. TR).

When the enclosure is opened, the Tamper monitor (1) will be activated, and "SEtUP" will be shown in display until the button is pressed.

Service symbol is shown to indicate operating condition.

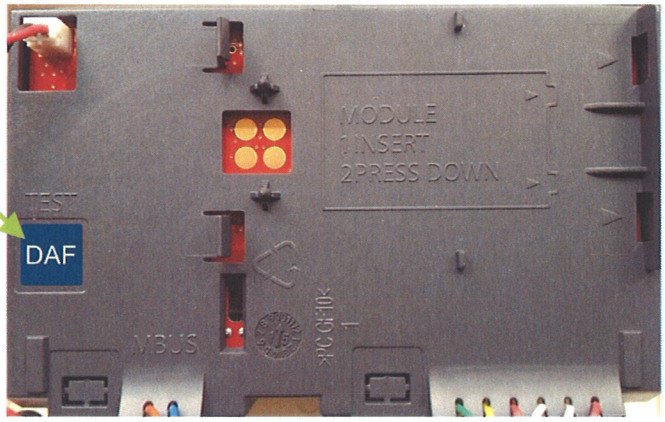
Verification seal (test seal)

To set the Energy meter in verification mode, the verification seal (2) must be broken.



① Tamper monitor/ access level 1
② Test seal (verification mode)
③ Factory seal

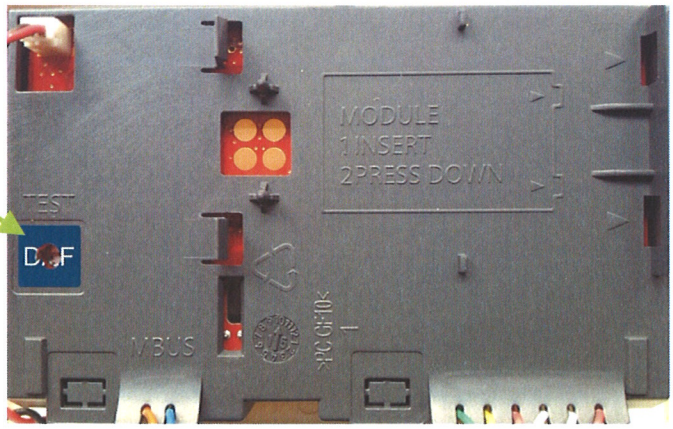
Testpad sealing



Contacts

To set the Energy meter in verification mode, the two contact pads must be short circuited for more than 1 second. Be careful not to scratch or damage the printed circuit board and contacts.

Test pads



When the test pads are short circuited, "tESt" will be shown in display until the button is pressed.

Service symbol  is shown to indicate operating condition.

In verification mode, Energy and Volume is shown with a higher resolution in the display.

A temporary overflow in the display will not affect the stored Volume or Energy.

The Energy meter will stay in Verification Mode for at least 8 hours.

Communication during the last hour will extend the time to 1 hour.

If the Energy meter has returned to Normal Mode, a new short circuit will start a new 8-hour interval in Verification Mode.

Normal/Verification mode display format
The resolution in the display depends on Normal Mode or Verification Mode.

	Normal		**Verification**	
	Decimals	Format	Decimals	Format
Volume	2	000000.00 m³	5	0000.00000 m³
Energy	0	00000000 kWh	4	0000.0000 kWh
Energy	3 *[1]	00000.000 GJ	6	0000.000000 GJ
Energy	3	00000.000 GCal	6	0000.000000 GCal

[1] For qp 6.0 m³/h variants, only 2 decimals.

Flow measurement

A number of topics have an influence on measuring time:

- Expected measuring accuracy for the test.
- Flow rate.
- Display resolution.
- Flow noise or flow fluctuations.
- Volume on scale and scale resolution/accuracy.
- Reference meter resolution/accuracy.

Verification and Re-verification of the flow-part must be performed at 50±5°C.
Test points are:

a) $q_i \leq q \leq 1.2\ q_i$;
b) $0.1\ q_p \leq q \leq 0.11\ q_p$;
c) $0.9\ q_p \leq q \leq 1.1\ q_p$.

Minimum test times and volumes.

	q_p = 1.50 m³/h			q_p = 2.50 m³/h		
Test point	a	b	c	a	b	c
Time [seconds]	1200	400	120	800	400	120
Volume [litre]	5.00	16.67	50.00	5.56	27.78	83.33

	q_p = 3.50 m³/h			q_p = 6.00 m³/h		
Test point	a	b	c	a	b	c
Time [seconds]	800	400	120	800	400	120
Volume [litre]	7.78	38.89	116.67	13.33	66.67	200.0

If the resolution and the repeatability in the measurements are acceptable, the volume and measuring time can be reduced, but never less than 120 seconds.

Energy measurement with simulated flow

The Energy meter can be verified using simulated flow and measured temperatures.
The Temperature Sensors must be placed in two temperature regulated baths with known constant temperature.

The Reference energy can be calculated using the shown Heat coefficients and the expression:

$Q_{Supply} = HC_{Supply} * Volume * \Delta\Theta$

or

$Q_{Return} = HC_{Return} * Volume * \Delta\Theta$

where:

- Heat coefficient depends on Flow sensor installation and temperature difference;
- Volume is the simulated accumulated value (read from display in each test);
- Temperature difference is the actual difference from temperature baths.

Flow simulation:

The simulated flow is kept at a constant flowrate of 0.75*qp during each test sequence.
The test sequence uses a constant time interval (120 seconds).

EN1434-5 §6.7 defines the outlet temperature to be 50°C ±5°C.
To be able to test Energy meters for both Supply and Return installation, this demand is interpreted as "the temperature for the Flow Sensor must be 50°C ±5°C".

Temperature:

$45°C \leq \Theta FlowSensor \leq 55°C$

a) $3.0K \leq \Delta\Theta \leq 3.6K$

b) $10K \leq \Delta\Theta \leq 20K$

c) $85K \leq \Delta\Theta \leq 90K$

In order to comply with the product specifications, $\Theta max = 95°C$, $\Theta min = 5°C$ and $\Delta\Theta max = 90K$.

When changing bath or temperature in a bath, wait at least 1 minute for the measurements to stabilize (response time in the Temperature Sensor and filter constants).

Table with Heat coefficient overview for selected ΔΘ & Θ.

Supply Heat coefficient overview				
Test point	a	b	c*[2]	c*[3]
Temperature Supply [°C]	50.0	50.0	50.0	92.5
Temperature Return [°C]	46.7	35.0	5.0	5.0
Temperature Difference [K]	3.3	15.0	45.0	87.5
HC Supply [MJ/m³/K]	4.12858	4.12802	4.13267	4.03413
HC Supply [kWh/m³/K]	1.14683	1.14667	1.14796	1.12059
HC Supply [GCal/m³/K]	0.00098609	0.00098596	0.00098707	0.00096353

Return Heat coefficient overview				
Test point	a	b	c*[4]	c*[5]
Temperature Supply [°C]	53.3	65.0	95.0	92.5
Temperature Return [°C]	50.0	50.0	50.0	5.0
Temperature Difference [K]	3.3	15.0	45.0	87.5
HC Return [MJ/m³/K]	4.12932	4.13136	4.14087	4.18637
HC Return [kWh/m³/K]	1.14703	1.14760	1.15024	1.16288
HC Return [GCal/m³/K]	0.00098627	0.00098676	0.00098903	0.00099990

Example

Tables with nominal values for volume, temperatures, heat coefficients and energy (Supply).

Energy Supply overview								
	qp = 1.50 m³/h				qp = 2.50 m³/h			
Test point	a	b	c*	c*	a	b	c*	c*
Temperature Supply [°C]	50.0	50.0	50.0	92.5	50.0	50.0	50.0	92.5
Temperature Return [°C]	46.7	35.0	5.0	5.0	46.7	35.0	5.0	5.0
Temperature Difference [K]	3.3	15.0	45.0	87.5	3.3	15.0	45.0	87.5
HC Supply [MJ/m³/K]	4.1286	4.1280	4.1327	4.0341	4.1286	4.1280	4.1327	4.0341
qp [m³/h]	1.500	1.500	1.500	1.500	2.500	2.500	2.500	2.500
Flow [%]	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0
Flow [m³/h]	1.125	1.125	1.125	1.125	1.875	1.875	1.875	1.875
Time [seconds]	120	120	120	120	120	120	120	120
Volume [m³]	0.03750	0.03750	0.03750	0.03750	0.06250	0.06250	0.06250	0.06250
Energy [MJ]	0.51091	2.32201	6.97388	13.23697	0.85152	3.87002	11.62314	22.06162
Energy [kWh]	0.14192	0.64500	1.93719	3.67694	0.23653	1.07501	3.22865	6.12823
Energy [GCal]	1.220E-4	5.546E-4	1.666E-3	3.162E-3	2.034E-4	9.243E-4	2.776E-3	5.269E-3
Allowed Energy error [%] (Incl. Temperature Sensors)	±4.64	±1.80	±1.27	±1.14	±4.64	±1.80	±1.27	±1.14

[2] Example with 50°C as Flow Sensor temperature
[3] Example with 92.5°C as Flow Sensor temperature
[4] Example with 50°C as Flow Sensor temperature
[5] Example with 5°C as Flow Sensor temperature

Tables with nominal values for volume, temperatures, heat coefficients and energy (Supply) (continued).

Energy Supply overview								
	qp = 3.50 m³/h				qp = 6.00 m³/h			
Test point	a	b	c*	c*	a	b	c*	c*
Temperature Supply [°C]	50.0	50.0	50.0	92.5	50.0	50.0	50.0	92.5
Temperature Return [°C]	46.7	35.0	5.0	5.0	46.7	35.0	5.0	5.0
Temperature Difference [K]	3.3	15.0	45.0	87.5	3.3	15.0	45.0	87.5
HC Supply [MJ/m³/K]	4.1286	4.1280	4.1327	4.0341	4.1286	4.1280	4.1327	4.0341
qp [m³/h]	3.500	3.500	3.500	3.500	6.000	6.000	6.000	6.000
Flow [%]	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0
Flow [m³/h]	2.625	2.625	2.625	2.625	4.500	4.500	4.500	4.500
Time [seconds]	120	120	120	120	120	120	120	120
Volume [m³]	0.08750	0.08750	0.08750	0.08750	0.15000	0.15000	0.15000	0.15000
Energy [MJ]	1.19213	5.41803	16.27239	30.88627	2.04365	9.28806	27.89553	52.94789
Energy [kWh]	0.33115	1.50501	4.52011	8.57952	0.56768	2.58002	7.74876	14.70775
Energy [GCal]	2.847E-4	1.294E-3	3.887E-3	7.377E-3	4.881E-4	2.218E-3	6.663E-3	1.265E-2
Allowed Energy error [%] (Incl. Temperature Sensors)	±4.64	±1.80	±1.27	±1.14	±4.64	±1.80	±1.27	±1.14

Tables with nominal values for volume, temperatures, heat coefficients and energy (Return).

Energy Return overview								
	qp = 1.50 m³/h				qp = 2.50 m³/h			
Test point	a	b	c*	c*	a	b	c*	c*
Temperature Supply [°C]	53.3	65.0	95.0	92.5	53.3	65.0	95.0	92.5
Temperature Return [°C]	50.0	50.0	50.0	5.0	50.0	50.0	50.0	5.0
Temperature Difference [K]	3.3	15.0	45.0	87.5	3.3	15.0	45.0	87.5
HC Return [MJ/m³/K]	4.1293	4.1314	4.1409	4.1864	4.1293	4.1314	4.1409	4.1864
qp [m³/h]	1.500	1.500	1.500	1.500	2.500	2.500	2.500	2.500
Flow [%]	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0
Flow [m³/h]	1.125	1.125	1.125	1.125	1.875	1.875	1.875	1.875
Time [seconds]	120	120	120	120	120	120	120	120
Volume [m³]	0.03750	0.03750	0.03750	0.03750	0.06250	0.06250	0.06250	0.06250
Energy [MJ]	0.51100	2.32389	6.98772	13.73654	0.85167	3.87315	11.64619	22.89423
Energy [kWh]	0.14195	0.64553	1.94103	3.81570	0.23658	1.07588	3.23505	6.35951
Energy [GCal]	1.221E-4	5.551E-4	1.669E-3	3.281E-3	2.034E-4	9.251E-4	2.782E-3	5.468E-3
Allowed Energy error [%] (Incl. Temperature Sensors)	±4.64	±1.80	±1.27	±1.14	±4.64	±1.80	±1.27	±1.14

Energy Return overview								
	qp = 3.50 m³/h				qp = 6.00 m³/h			
Test point	a	b	c*	c*	a	b	c*	c*
Temperature Supply [°C]	53.3	65.0	95.0	92.5	53.3	65.0	95.0	92.5
Temperature Return [°C]	50.0	50.0	50.0	5.0	50.0	50.0	50.0	5.0
Temperature Difference [K]	3.3	15.0	45.0	87.5	3.3	15.0	45.0	87.5
HC Return [MJ/m³/K]	4.1293	4.1314	4.1409	4.1864	4.1293	4.1314	4.1409	4.1864
qp [m³/h]	3.500	3.500	3.500	3.500	6.000	6.000	6.000	6.000
Flow [%]	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0
Flow [m³/h]	2.625	2.625	2.625	2.625	4.500	4.500	4.500	4.500
Time [seconds]	120	120	120	120	120	120	120	120
Volume [m³]	0.08750	0.08750	0.08750	0.08750	0.15000	0.15000	0.15000	0.15000
Energy [MJ]	1.19234	5.42241	16.30467	32.05192	2.04401	9.29556	27.95086	54.94615
Energy [kWh]	0.33121	1.50623	4.52908	8.90331	0.56778	2.58210	7.76413	15.26282
Energy [GCal]	2.848E-4	1.295E-3	3.894E-3	7.655E-3	4.882E-4	2.220E-3	6.676E-3	1.312E-2
Allowed Energy error [%] (Incl. Temperature Sensors)	±4.64	±1.80	±1.27	±1.14	±4.64	±1.80	±1.27	±1.14

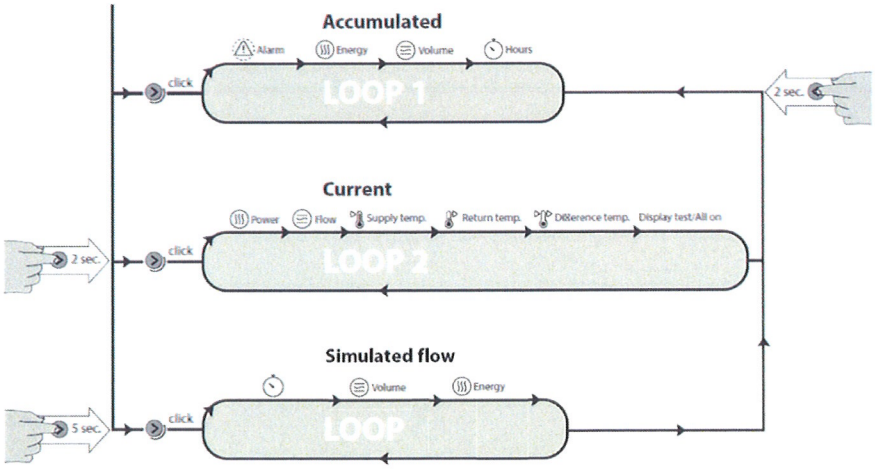
Selecting simulated flow

The Energy meter must be in Verification mode, see page 9.
Energy and Volume is shown with normal units, but with more decimals (no frame on decimals).
After 8 hours the Energy meter automatically returns to Normal mode.

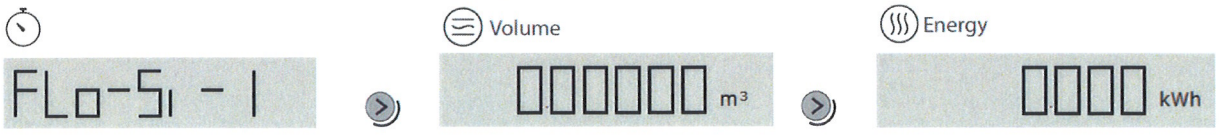
When in Verification mode, Flow simulation mode can be accessed with a long button press.
Flow simulation mode use special totalizers during the test sequence.
These Volume and Energy totalizers are set to zero when Flow simulation mode is activated (started).
After a defined time (e.g. 120 seconds) accumulation is stopped.
Simulation mode, Volume and Energy is shown in the display with a short button press.

Menu/Mode selection:

- A short button press (<2s) will change menu within a Loop.
- A button press (>2s and <5s) will change from menu Loop1 to Loop2 or back.
- A long button press (>5s) will change to a special energy test menu.
- A button press (>2s) will change back to normal menu (Loop1).



Flow simulation mode started and counting:



Flow simulation mode stopped:

For each test (a, b & c) the measured Energy value must be compared to calculated Reference Energy using simulated Volume and Temperature Difference.

Permissible Energy error (incl. Temperature Sensors): Class 2.

Parameters

A few settings (parameters) can be changed when the Energy meter is in verification mode. (Access Level is set to Re-verification).

To change any settings, an Optical dongle and the DAF Tool App. Tool for Smartphones is needed.

The communication protocol is EN13757 and CJ/T-188 compliant.

Changeable Parameters:

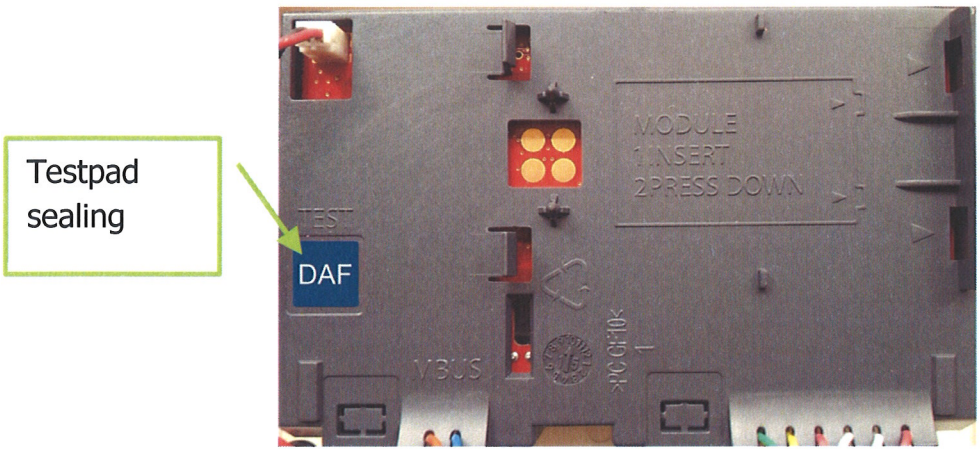
- Customer information
- AccumulatedEnergy unit
- AccumulatedEnergy decimals
- CorrectionFactor
- AccumulatedVolume
- AccumulatedEnergy
- VolumePulseInAmount_I
- VolumePulseInAmount_II
- AccumulatedVolumePulse_I
- AccumulatedVolumePulse_II

Physical Output

SonicHeat Heatmeter 10 has no physical pulse output for testing purposes.

Finishing

When the test is finished and the results are approved, an appropriate adhesive seal must be placed to cover/protect the test pads.



Close the Calculator securing that no wires are jammed by enclosure parts and rubber sealing.

Reset AccumulatedVolume, AccumulatedEnergy, AccumulatedVolumePulse_I and AccumulatedVolumePulse_II if needed.

The Energy meter will return to Normal Mode after 8 hours, or can be set to Normal Mode using the App. Tool.

If a Temperature Sensor is removed from Flow Sensor during verification, the correct one must be re-assembled to secure correct function.

Mount the Temperature Sensor in the Flow Sensor according to the symbol in the display.

Supply.
Temperature Sensor with **red** label marking in Flow Sensor.

Return.
Temperature Sensor with **blue** label marking in Flow Sensor.

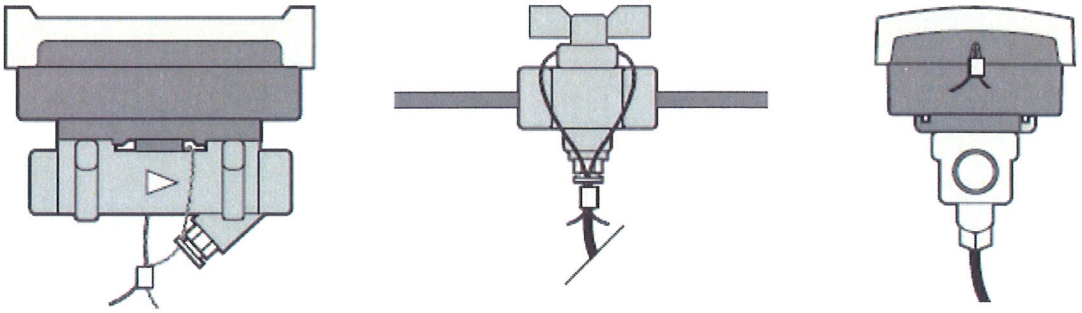
See annex

Mount application wire sealing on Calculator and Temperature Sensors if needed.

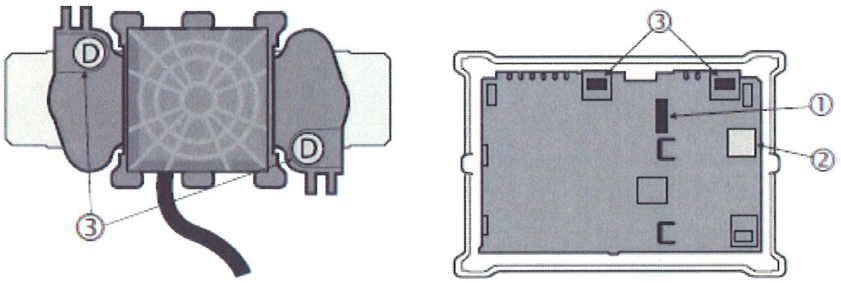
Security measures

Meter sealing

Application sealing



Factory and verification sealing



① Tamper monitor/ access level 1
② Test seal (verification mode)
③ Factory seal

Marking and inscriptions

Front cover (laser engraved)
Type identification, serial number and code number
Manufacturer's logo and year of manufacturing
CE marking and supplementary metrology marking
EC-Type Examination Certificate number
Firmware version
Electromagnetic / mechanical environment classes and IP class
Accuracy class
Limits of flow rate (qi, qp and qs)
Limits of temperature (θ_{min} - θ_{max}) and differential temperature ($\Delta\theta_{min}$ - $\Delta\theta_{max}$)
Temperature sensor type
Pressure stage
Connection and length

Back cover (label)
Manufacturer's address

Flow sensor body
Arrow indicating direction of flow

Additional information in the display
Unit of measurement
Supply or Return pipe installation

Examples

Inscriptions on SonicHeat Heatmeter 10 front cover

Label on back cover

DAF Enerji A.S.
Anadolu Org. San.
Tuzla-Istanbul-Turkey

DAF ENERGY

Informative Annex

Integrated functions not subject to the Measuring Instruments Directive:

Integrated Cooling function

The SonicHeat Heatmeter 10 and SonicCool Coolingmeter 10 are type tested respectively as Heating and Cooling energy meter according to EN 1434-4:2015 + A1:2018.

The integrated Cooling function can therefore be utilized under the operating conditions as described in this certificate.

Protection class:

- IP54 for Heating meter
- IP54/IP65 for Cooling meter

If a Temperature Sensor is removed from Flow Sensor during verification, the correct one must be re-assembled to secure correct function.

Mount the Temperature Sensor in the Flow Sensor according to the symbol in the display.

Supply.
Temperature Sensor with **blue** label marking in Flow Sensor.

Return.
Temperature Sensor with **red** label marking in Flow Sensor.

Bifunctional function

The SonicHeat Heatmeter 10 and SonicCool Coolingmeter 10 are type tested as Heating, Cooling and Bifunctional energy meter according to EN 1434-4:2015 + A1:2018.

The Bifunctional Heating or Cooling function can therefore be utilized under the operating conditions as described in this certificate.

If a Temperature Sensor is removed from Flow Sensor during verification, the correct one must be re-assembled to secure correct function.

Mount the Temperature Sensor in the Flow Sensor according to the symbol in the display.

Supply.
Temperature Sensor with **red** label marking in Flow Sensor.

Return.
Temperature Sensor with **blue** label marking in Flow Sensor.