DANAK
PROD Reg. No. 7026

FORCE Certification

EU-Type Examination Certificate

Measuring Instrument Directive

Certificate number: DK-0200-MI004-047

Issued by FORCE Certification A/S, Denmark
EU-notified body number 0200

In accordance with Annex II Module B of the Directive 2014/32/EU of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to the making available on the market of measuring instruments (MID).

Issued to: **Kamstrup A/S**
Industrivej 28
DK-8660 Skanderborg
Denmark

Type of instrument:	Thermal energy meter/heat meter
Type designation:	MULTICAL® 603
Valid until:	2027-04-18
Number of pages:	16, including appendix
Date of issue:	2026-04-30
Version No.:	4 This new version of DK-0200-MI004-047 is issued due to the addition of two new communication modules and minor editorial changes. The previous certificate is withdrawn.

Approved by

Michael Møller Nielsen
Certification Manager

Processed by

Lars Poder
Examiner

FORCE Certification references: TASK No.: 125-26698.03 and ID. No.: 0200-MID-16745-5

Appendix to

EU-Type Examination Certificate
Measuring Instrument Directive

Number: DK-0200-MI004-047
Issued by FORCE Certification A/S, Denmark
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Revision	Issued	Changes
DK-0200-MI004-047	2024-02-20	Original certificate
DK-0200-MI004-047 ver 1	2024-11-28	New communication module HC-003-35 OMS-LPWAN, TDS, EU added, WELMEC 7.2:2023 version added, minor editorial changes
DK-0200-MI004-047 ver 2	2025-05-22	New software version F1 added and minor editorial changes
DK-0200-MI004-047 ver 3	2025-06-17	New software version G1 added and minor editorial changes
DK-0200-MI004-047 ver 4	2026-04-30	New modules added (module 36 + 55) and minor editorial changes

Applied standards and documents:
- EN 1434:2022
- WELMEC 7.2:2023 (from May 2024)
- OIML R 75:2002

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

Type designation:
MULTICAL® 603

Description:
The meter consists of a calculator, which constitute a thermal energy meter together with type approved temperature sensor pairs and type approved flow sensors.
The calculator unit has a display indicating registered thermal energy, and additionally, via pushbuttons, other values are available.
MULTICAL® 603 can be equipped with two internal communication modules (see the section on type number combination).

Technical documentation:
Reference No.:

- 125-26698.03
- 125-26698.02
- 125-26698.01
- 123-32862

Technical data

Instrument type according to	:	EN 1434:2022
	:	OIML R 75:2002
Instrument type	:	Combined instrument or Hybrid instrument
Parts:		
- Calculator or	:	DK-0200-MI004-047
- Calculator and temperature sensors or	:	DK-0200-MI004-047, -036 or -046
- Calculator and flow sensor or	:	DK-0200-MI004-047, -008, -033, 044 or -048
- Calculator, temp. sensor and flow sensor		DK-0200-MI004-047, 036 or -046 and -008, -033, -044 or -048
Energy indication	:	GJ, kWh or MWh (kWh in calibration mode)
Display registers	:	7 or 8 digits (programmable)
Integration/update intervals for energy, volume and temperature	:	Fixed 2 s, 8 s, 32 s or adaptive 2…64 s (programmable)
Temperature range θ_{min} … θ_{max}	:	2°C…180°C (or narrower range)
Temperature diff. range $\Delta\Theta_{min}$ … $\Delta\Theta_{max}$	:	3 K…178 K (or narrower range)
Temperature diff. cut-off	:	0.00…2.50 K configurable (default 0.00 K)
Flow sensor, range	:	From qp 0.6 m³/h to qp 15,000 m³/h
Flow sensor, position	:	Inlet or outlet pipe (programmable)
Environment class	:	E1 and E2, M1 and M2
Climatic class	:	5…55°C, non-condensing, closed location
	:	5…55°C, condensing, closed location
Protection class	:	IP 65
Durability, combined instrument	:	Defined by the flow sensor
Fast response meter	:	DS temp. sensor response time $\tau_{0.5} \leq 2.5$ s
(config L=4)	:	Temperature sampling interval ≤ 2 s
	:	Integration time ≤ 2.5 s
Mains supply	:	230 VAC, 48…62 Hz (Linear or SMPS) 24 VAC, 48…62 Hz (Linear) 24 VAC/VDC, 48…62 Hz (SMPS)
Battery	:	3.65 VDC, D-cell or 2xA-cell Lithium battery
Back-up battery	:	3.0 VDC, BR-cell Lithium battery

Temperature sensor cables (un-shielded)	:	Max. 100 m sensors cables for 4-wire connections Or max. 20 m cables for Pt500 2-wire connections (Minimum cross-sectional area according to EN 1434-2, table 2)
Flow meter cables (un-shielded)	:	Max. 10 m for ULTRAFLOW® flow sensors Max. 10 m for flow sensors w/electronic pulse output Max. 10 m for mechanical flow sensors with Reed-switch Max. 30 m via the Cable extender box, 66-99-036

Software identification

Software revision	G1 (0701)	0 7 0 1
Kamstrup Internal Item No.	50981842	1 8 4 2
Software Identification		1 8 4 2 0 7 0 1

The Software identification and checksum can be shown on the display of the meter (display No. 10 and No. 11)

Software Identification	Date	CRC-32 sum	Description
18420401 (D1)	2024-01-11	E652F451	N: Initial release for production
18420501 (E1)	2025-03-11	C659CA6D	L: Release for internal tests
18420601 (F1)	2025-05-07	184CE58D	N: Second release for production
18420701 (G1)	2025-06-11	A6635C7D	N: Third release for production

N: Non-legally relevant software change
L: Legally relevant software change

Only for member states where software download is allowed

Software download according to WELMEC 7.2

The meter is approved for software download, both direct (via cable) and remote (via wireless). The software download function is separated between legally relevant (the software in the meter) and legally non-relevant software (the software in the communication module). The software separation is implemented via hardware separation, whereby the level of separation exceeds Extension S. The meter is a Type P instrument and Risk Class C applies.

The legally relevant software download function can be disabled for use in member states where software download for instruments in use is not allowed. In this case download of legally relevant software cannot be done without breaking the verification seal.

Type number combination MULTICAL® 603

	Static data		Dynamic data
	603-XXXX	-	XXXXXXXX
	Laser engraved		In display

Type 603 - □ - □ - □□ - □ - □□ - □ - □□ - □□

Calculator type							
Pt500 2-wire	t1-t2-t3	V1-V2		S			
Pt500 4-wire	t1-t2	V1-V2		U			
Meter type							
Heat meter		MID module B+D			2		
Heat/Cooling meter		MID module B+D & TS 27.02	θ_{HC} = OFF		3		
Heat/Cooling meter		MID module B+D & TS 27.02	θ_{HC} = ON		6		
Country code							
See country code specification.						XX	
Flow sensor connection type							
Delivered with one ULTRAFLOW®							1
Delivered with two identical ULTRAFLOW®							2
Prepared for one ULTRAFLOW®							7
Prepared for two identical ULTRAFLOW®							8
Prepared for flow sensors with fast and bounce-free electronic pulses							C
Prepared for flow sensors with slow and bounce-free electronic pulses							J
Prepared for flow sensors with slow pulses with bounce							L

Temperature sensor set				
Delivered without temperature sensor set				00
Pt500 temperature sensors				
Short direct sensor pair or 3 set	DS 27.5 mm	1.5 m	- 3.0 m	1x
Short direct sensor pair	DS 38.0 mm	1.5 m	- 3.0 m	2x
Pocket sensor pair or 3 set	PL ø5.8 mm	1.5 m	- 10 m	3x

Type number combination MULTICAL® 603 – continued

	Static data **603-XXXX** Laser engraved	-	*Dynamic data* **XXXXXXXX** In display						
Type 603 -	□	- □	- □□	- □	- □□	- □	- □□	- □□	
Supply									
Delivered without supply module						0			
Battery, 1 x D-cell						2			
Battery, 1 x D-cell battery IoT						5			
230 VAC High power SMPS						3			
24 VAC/VDC High power SMPS						4			
230 VAC power supply						7			
24 VAC power supply						8			
Battery, 2 x A-cell						9			
Communication modules (2 slots)									
No module							00	00	
Data Pulse, inputs (In-A, In-B)							10	10	
Data Pulse, outputs (Out-C, Out-D)							11	11	
Wired M-Bus, inputs (In-A, In-B)							20	20	
Wired M-Bus, outputs (Out-C, Out-D)							21	21	
Wired M-Bus, Thermal Disconnect							22	22	
Wireless M-Bus, inputs (In-A, In-B), 868 MHz							30	30	
Wireless M-Bus, outputs (Out-C, Out-D), 868 MHz							31	31	
LinkIQ/wM-Bus, Inputs, (In-A, In-B), EU							32	32	
LinkIQ/wM-Bus, Outputs, (Out-C, Out-D), EU							33	33	
OMS-LPWAN, TDS, EU							35	35	
OMS-LPWAN, inputs (In-A, In-B), EU							36	36	
Analog outputs 2 x 0/4...20 mA							40	40	
Analog inputs 2 x 4...20 mA / 0...10 V							41	41	
KNX communication							42	42	
PQT controller							43	43	
LoRaWAN (Elvaco), 868 MHz							53	53	
LoRaWAN, inputs (In-A, In-B), EU							55	55	
NB-IoT, inputs (In-A, In-B)							56	56	
NB-IoT (Elvaco)							58	58	
LON TP/FT-10, inputs (In-A, In-B)							60	60	
BACnet MS/TP, inputs (In-A, In-B)							66	66	
Modbus RTU, inputs (In-A, In-B)							67	67	
2G/4G Network, inputs (In-A, In-B)							80	80	
BACnet IP, inputs (in-A, In-B)							81	81	
Modbus/KMP TCP/IP, inputs (In-A, In-B)							82	82	
READy Ethernet, inputs (In-A, In-B)							83	83	

Verification

Errors:	[Maximum permissible errors according to Directive 2014/32/EU of the European Parliament and Council of February 26, 2014 on measurement instruments (MID), Annex VI, Thermal energy meters (MI-004)]
Procedure:	(Test points and verification requirements according to EN 1434-5)

Complete meter to: [3.] (6.7)
Calculator according to (6.4)
Calculator with temperature sensors according to (6.5)

Alternative test points

	Inlet	Outlet		Inlet	Outlet		Inlet	Outlet
	a) 44.3 °C	41 °C	or	a) 43 °C	40 °C	or	a) 43 °C	40 °C
	b) 80 °C	65 °C		b) 50 °C	40 °C		b) 50 °C	40 °C
	c) 160 °C	20 °C		c) 130 °C	40 °C		c) 160 °C	40 °C
	Inlet	Outlet		Inlet	Outlet		Inlet	Outlet
or	a) 53 °C	50 °C	or	a) 43 °C	40 °C	or	a) 43 °C	40 °C
	b) 70 °C	50 °C		b) 50 °C	40 °C		b) 110 °C	40 °C
	c) 130 °C	20 °C		c) 130 °C	40 °C		c) 160 °C	40 °C

Tolerances on simulated temperatures: ± 1 °C. Tolerances on temperature differences shall follow EN 1434-5

After verification, the meter can be reprogrammed with a view to:

- Installation of flow sensor in inlet or outlet pipe, according to the sign in the display
- Measuring unit of energy indication (kWh, MWh or GJ)
- Decimal point in energy* and volume* indication

*) *Register resolution requirements according to EN 1434 must be observed*

Auto Detect function

The calculator is available with an Auto Detect function, which automatically sets the pulse value, when connected to ULTRAFLOW® x4 flow sensors (e.g. DK-0200-MI004-008 and -033). The detected pulse value (e.g. in the range of 300 pulses/litre to 0.15 pulse/litre) as well as the flow sensors nominal size (e.g. in the range of qp 0.6 to 1000 m^3/h) is available in the meters display.

Temperature offset

The temperature reading can be offset adjusted from -0.99…0.99 K, commonly for the inlet and outlet, in order to compensate for the sensor cable influence on the absolute temperature.
During change of temperature sensor pairs, it is recommended to adjust the meters offset temperature according to the newly mounted sensor pair. Alternatively adjust the offset to 0.00 K whereby the function is disabled (OFF).
Example: If the temperature sensor pair has an error at +0.20 K at zero, then the meters offset should be
-0.20 K in order to compensate.

Test mode

During the calculator test, the internal high-resolution registers are useful to reduce the test duration.

Flow sensor size	High resolution	
qp ≤ 1.5	0.001 kWh	0.01 litre
1.5 < qp ≤ 15	0.01 kWh	0.1 litre
15 < qp ≤ 150	0.1 kWh	1 litre
150 < qp ≤ 1500	1 kWh	0.01 m^3
1500 < qp ≤ 15000	0.01 MWh	0.1 m^3

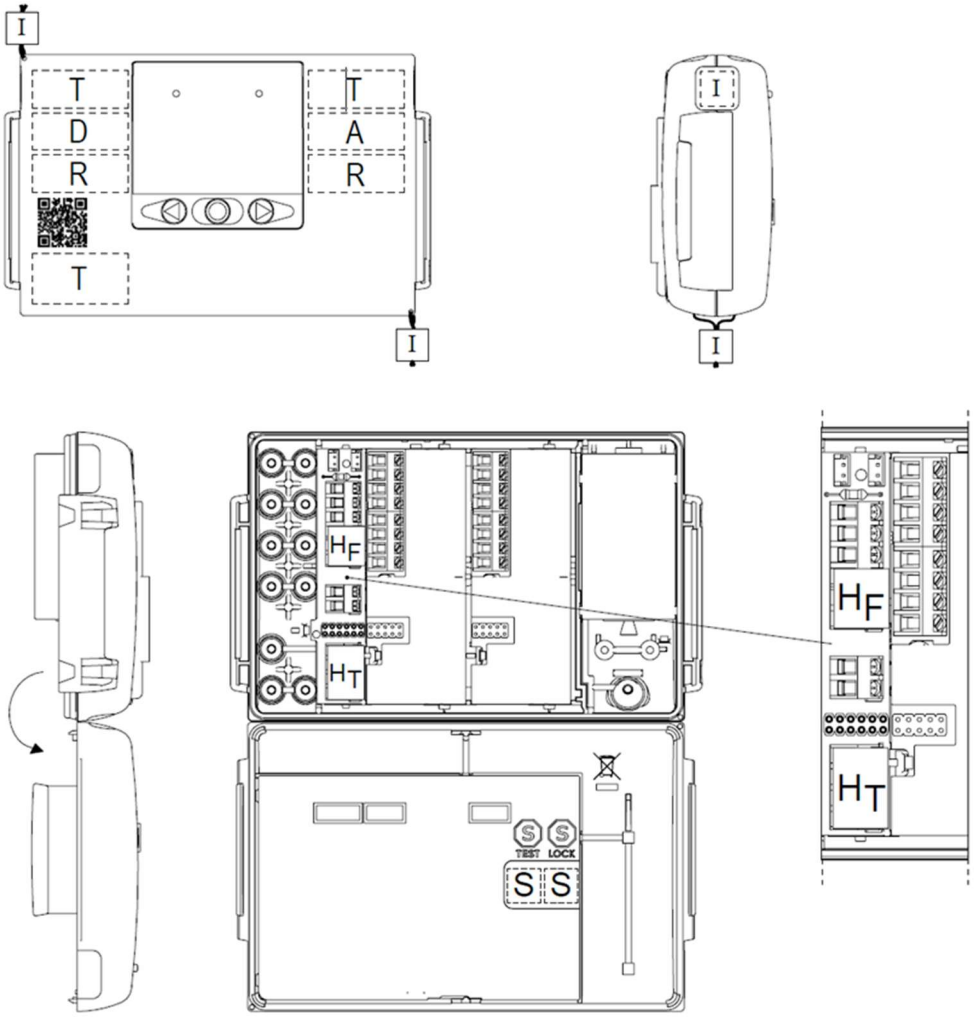
Configuration data logger

The meter includes several non-volatile data loggers, e.g. for configuration changes. The data logger read-out is done by means of an IEC 1107 optical head, placed above the display on the meter and connected to a standard PC or Tablet, using the PC-programme LogView, which is available from Kamstrup

Security measures

Sealing

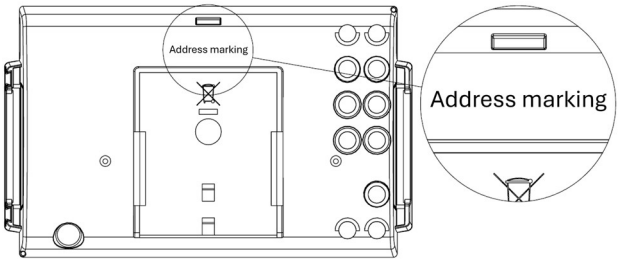
S	Security seals. Covering release for PCB box (label or integrated part of PCB box)
H_F	Additional seal for inseparable flow sensor of a hybrid instrument
H_T	Additional seal for inseparable temperature sensors of a hybrid instrument
D	Module D marking (engraving or separate label)
T	Type marking
I	Installation seals (sealing wire or void labels), if required
A	Alternative approval marking
R	Re-verification marking, if required, suggested position



Inscriptions

Marking for MULTICAL® 603

Manufacturer postal address (on the base/rear side)



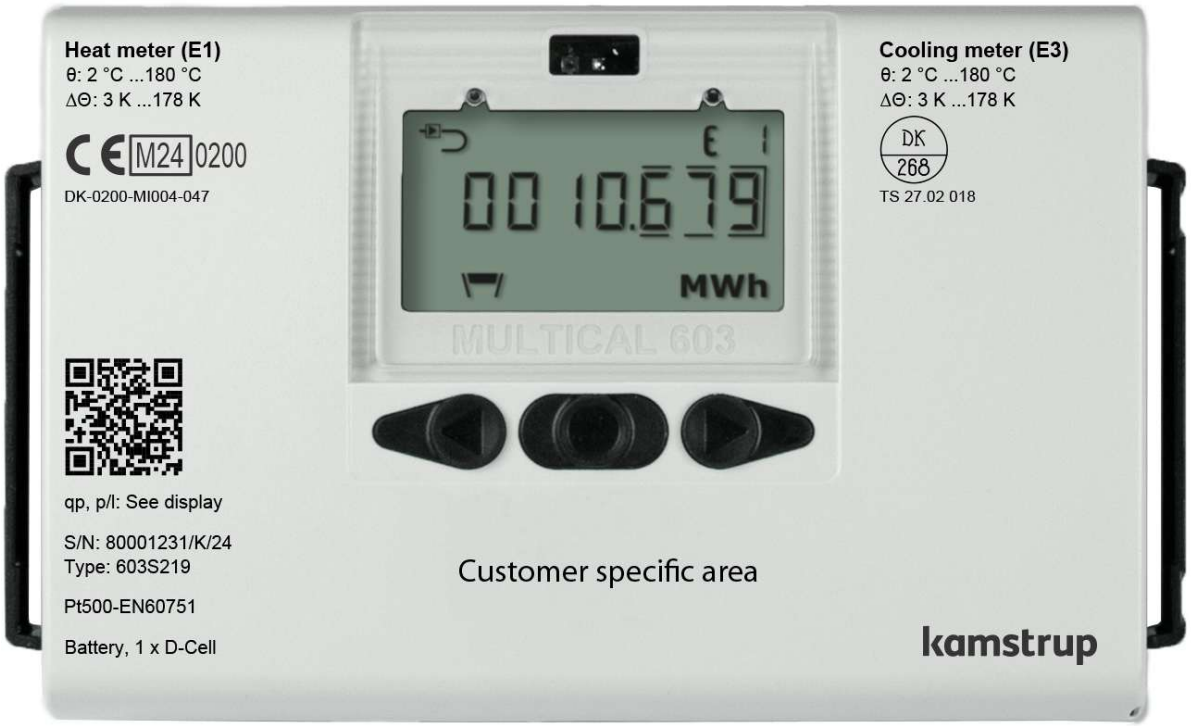
CE marking and the supplementary metrology marking
System designation (No. of the EU-type Examination Certificate)
Type, production year and serial number
Temperature limits (θ_{min} ... θ_{max})
Differential temperature limits ($\Delta\Theta_{min}$ ... $\Delta\Theta_{max}$)
Temperature sensor type (Pt500)

Below information is available in the installation manual:
Mechanical and electromagnetic environment classes
Climatic class
Condensing/closed location

Other information about the product
-Software identification in the display
-Unit of measurement in the display
-Mounting the flow sensor in inlet or outlet pipe in the display
-Meter factor (pulse value) and qp in the display

Example of type marking for MULTICAL® 603

Marking:



Symbols, as an alternative to textual inscriptions, are acceptable, if explained in the installation manual.

Photo of MULTICAL® 603

Informative Annex

Integrated functions not subject to the Measuring Instruments Directive:

Integrated bi-functional Heat/Cooling function

The MULTICAL® 603 is type tested as Heating, Cooling and as bi-functional Heating/Cooling energy meter according to EN 1434-4:2015+A1:2018 and EN 1434-4:2022.

On this basis, the energy meter will be national type approved for Cooling according to the Danish law[1], System designation TS 27.02 018 pending approval.

The integrated bi-functional Heating/Cooling function can therefore be utilized under the operating conditions as described in this certificate.

The meter is type tested in the temperature differential range $\Delta\Theta_{min}$ - $\Delta\Theta_{max}$: 2 K…178 K and can be used as so.

Alternative energy units for use outside the EU

The calculator is also available with configuration as to register thermal energy in Gcal.

Re-verification

Re-verification of MULTICAL® 603 may be performed according to EN 1434-5 under the same conditions as stated in this certificate for verification of MULTICAL® 603, under consideration of national law.

Re-verification of the calculator as a heat meter or as a cooling meter is allowed, due to the extended type test.

Calibration of intelligent flow sensors through the calculator

The calculator facilitates password-protected adjustment of intelligent flow sensors via serial data, whereby the subassemblies calculator and flow sensor commonly is calibrated and adjusted as a compact meter in the laboratory, if the calculator and flow sensor have the same serial number.

Calibration unit for MULTICAL® 603 as a calculator sub-assembly
Technical description, Document No.: FILE100000489
Type No.: 6699-363 (Pt500 2-Wire), Type No.: 6699-364 (Pt500 4-Wire)
Temperature test points:
Heat: 44.3 °C – 41 °C = 3.3 K / 80 °C – 65 °C = 15 K / 160 °C – 20 °C = 140 K
Cooling: 15 °C – 18.3 °C = – 3.3 K / 6 °C – 20 °C = – 14 K

[1] BEK No. 1178 of 06/11/2014, Ordinance on metrological control of meters used for measuring consumption of cooling energy in district cooling systems and central cooling systems as amended by BEK. No. 549 of 01/06/2016.

Manufacturer, distributor or customer logo

There may be a manufacturer, distributor or customer logo located at the lower right part of the front, shown in the dotted red marking.