

EU-Type Examination Certificate

Measuring Instrument Directive

Certificate number: DK-0200-MI004-009

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: **Kamstrup A/S**
Industrivej 28, Stilling
DK-8660 Skanderborg

Type of instrument: Thermal Energy Meter

Type designation: MULTICAL® 801 (type 67-F, 67-G, 67-K and 67-L)

Valid until: 24-08-2028

Number of pages: 11, including appendix

Date of issue: 24-08-2018

Version No.: 11
This new version of DK-0200-MI004-009 is issued due to validity extension.
All previous certificates are withdrawn.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.
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FORCE Certification references: TASK no.: 118-29672.01 and ID no.: 0200-MID-04771

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Appendix to

EU-Type Examination Certificate Measuring Instrument Directive

Number: DK-0200-MI004-009

Issued by FORCE Certification A/S, Denmark
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Revision	Issue date	Changes
DK-0200-MI004-009	26-11-2008	Original certificate
DK-0200-MI004-009	03-07-2009	-
DK-0200-MI004-009 rev 1-2010	08-10-2010	-
DK-0200-MI004-009 rev 1-2011	19-05-2011	-
DK-0200-MI004-009 rev 1-2012	21-02-2012	<ul style="list-style-type: none"> • New modules added • Changed LONWorks module • New meter types
DK-0200-MI004-009 rev 2-2012	18-12-2012	<ul style="list-style-type: none"> • New modules added • New text added to section "Description"
DK-0200-MI004-009 rev 1-2013	11-06-2013	<ul style="list-style-type: none"> • New software revision added • The two examples of labels switch places
DK-0200-MI004-009 rev 2-2013	30-09-2013	New module added to type number combination
DK-0200-MI004-009 rev 1-2014	24-09-2014	New module added to type number combination
DK-0200-MI004-009 rev 10	11-12-2015	<ul style="list-style-type: none"> • Revision history added • Overview of SW revision and checksum added • The terms inlet pipe and outlet pipe clarified • New examples of labels added • New photo added
DK-0200-MI004-009 ver 11	24-08-2018	<ul style="list-style-type: none"> • Validity extension • Various editorial changes

Applied standards and documents:

EN 1434:2015

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

Type designation:

MULTICAL® 801 (type 67-F, 67-G, 67-K and 67-L).

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Description:

The meter consists of a calculator, which constitute a heat 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 a pushbutton, other values can be shown.

MULTICAL® 801 can be extended by two internal modules.

Technical documentation:

Reference no.:

- 118-29672.01
- 114-33017.04.05.01
- 114-21535.0004.0018
- 113-21029.0004.0008
- 113-21029.0004.0003
- 112-23383.0004.0008
- 112-23383.0004.0002
- 80.976-061
- 80.976-096/09
- 80.976-187/10
- 80.976-219/11

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Technical data

Instrument type according to	: EN 1434:2015
Instrument type	: Combined instrument
Parts	: Calculator or Calculator and temperature sensors
Energy indication	: GJ, kWh or MWh (Wh in calibration mode)
Temperature range	: θ_{\min} - θ_{\max} : 2°C...180°C
Temperature diff. range	: $\Delta\theta_{\min}$ - $\Delta\theta_{\max}$: 3K...170 K
Flow sensor, range	: From qp 0.6 m ³ /h to qp 30,000 m ³ /h
Flow sensor, position	: Inlet or outlet pipe (programmable)
Environment class	: E1 and E2, M1
Climatic class	: 5...55°C, non-condensing, closed location
Durability specification	: 12 years
Protection class	: IP 67
Mains supply	: 230 VAC, 48...62 Hz 24 VAC, 48...62 Hz
Back-up battery	: 3.65 VDC, 2xA-cell Lithium battery
Temperature sensor cables (un-shielded)	: Max. 100 m sensors cables for 4-wire connections Or max. 10 m cables for Pt100 2-wire connections Or max. 20 m cables for Pt500 2-wire connections (Minimum cross-sectional area acc. to EN 1434-2, table 2)
Flow meter cables (un-shielded)	: Max. 100 m for flow sensors with 24 V pulse output Max. 20 m for flow meters with Reed-switch output Max. 10 m for ULTRAFLOW® Max. 10 m for flow sensors with electronic pulse output

Software identification

Version no.	Checksum for metrological part of the software
xxxx0201 / B1	15424
xxxx0301 / C1	31422
xxxx0401 / D1	12711

(xxxx is the meter type)

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

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Type number composition

		MULTICAL® 801	Type 67-	□	□	□□	□	□	□	□	□□
Sensor connection											
Pt100	4-wire (T1-T2-T3)	No analog outputs		F							
Pt500	4-wire (T1-T2-T3)	No analog outputs		G							
Pt100	4-wire (T1-T2-T3)	4 analog outputs		K							
Pt500	4-wire (T1-T2-T3)	4 analog outputs		L							
Module 2 (VA and VB are <u>not</u> available for module position 2)											
No module											O
KNX module											K
SIOX module (Auto detect baud rate)											M
M-Bus (Alt. Reg.)											P
M-Bus module with MC-III data package											Q
M-Bus											V
RadioRouter											W
LonWorks, module											Y
GSM/GPRS module											Z
3G GSM/GPRS module (GSM8H)											U
Ethernet/IP module (IP201)											T
Module 1 (VA and VB are available for module position 1)											
No module											00
M-Bus + pulse inputs											20
RadioRouter + pulse inputs											21
Data logger + 4-20 mA inputs + pulse inputs											22
LonWorks, module + pulse inputs											24
M-Bus (Alt. Reg.) + pulse inputs											27
M-Bus module with MC-III data package + pulse inputs											29
Wireless M-Bus mode C1, 868 MHz + pulse inputs											30
Wireless M-Bus Mode T1 Std. reg. (Individual Key)											31
Wireless M-Bus Mode C2 Std. reg. (Individual Key) + pulse inputs											33
Wireless M-Bus Mode C1 Alt. reg. (Individual Key) + pulse inputs											35
Wireless M-Bus Mode T1 Std. reg. (Common Key)											37
Wireless M-Bus Mode C1 Fixed network (Individual Key) + pulse inputs											38
ZigBee 2.4 GHz internal antenna + pulse inputs											60
Metasys N2 (RS485) + pulse inputs											62
SIOX module (Auto detect baud rate)											64
BACnet MS/TP module											66
Modbus RTU + pulse inputs											67
KNX module											69
GSM/GPRS module											80
3G GSM/GPRS module (GSM8H)											81
Ethernet/IP module (IP201)											82
High Power Radio Router + pulse inputs											84
Supply											
230 VAC supply											7
24 VAC supply											8
Pt500 sensor pair (2-wire sensors)											
No sensor pair											O
Pocket sensor pair with 1.5 m cable											A
Pocket sensor pair with 3.0 m cable											B
Pocket sensor pair with 5 m cable											C
Pocket sensor pair with 10 m cable											D
Short direct sensor pair with 1.5 m cable											F
Short direct sensor pair with 3.0 m cable											G
Set of 3 pocket sensors with 1.5 m cable											L
Set of 3 direct sensors with 1.5 m cable											Q3
Flow sensor/pick-up unit											
Supplied w/1 pcs. ULTRAFLOW®											1
Supplied w/2 pcs. ULTRAFLOW®											2
Prepared for 1 pcs. ULTRAFLOW®											7
Prepared for 2 pcs. (identical) ULTRAFLOW®											8
Prepared for meters w/ Reed switch output (Both V1 and V2)											L
Prepared for foreign flowpart with passive/active pulses											N
Meter type											
Heat meter, (MID module B)											1
Heat meter, (MID module B+D)											2
Heat meter, (MID module B+D) E1 & E3 displayed											3
Delivery code (language on label etc.)											XX

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Verification

Errors: Maximum permissible errors according to Directive 2014/32/EU of the European Parliament and Council of February 26, 2014 on measuring instruments (MID), Annex VI (MI-004).

Procedure: Test points and verification requirements according to EN 1434-5:2015.

Calculator according to 5.4

Calculator with temperature sensors according to 5.5.

Test points

Inlet pipe	Outlet pipe		Inlet pipe	Outlet pipe		Inlet pipe	Outlet pipe
a) 43°C	40°C	or	a) 43°C	40°C	or	a) 53°C	50°C
b) 80°C	60°C		b) 50°C	40°C		b) 70°C	50°C
c) 160°C	20°C		c) 160°C	40°C		c) 175°C	20°C

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

Placing of flow sensor in inlet pipe or outlet pipe, according to type label
 Measuring unit of energy indication (kWh, MWh or GJ)*
 Decimal point in energy* and volume* indication*.

*) Register resolution requirements according to EN 1434-1:2015, point 6.3.7 must be observed.

TEST INSTRUCTIONS FOR HEAT METER MULTICAL® 801

Test of MULTICAL integrator

The verification is based on the use of high-resolution energy of 0.1 Wh. Having counted a specific number of volume pulses (e.g. 10 litres) an integration is carried out, during which the energy is calculated.



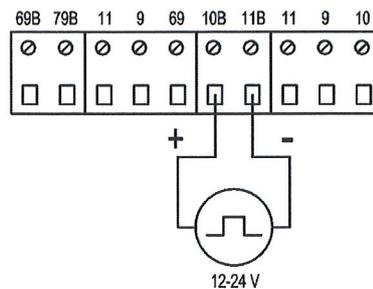
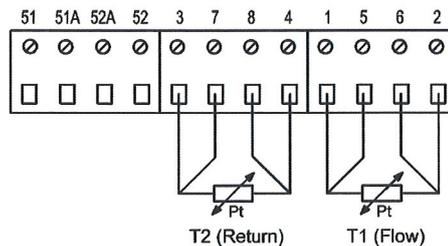
h l
345.4

The high-resolution energy display is provoked by pressing both front keys simultaneously whilst the supply voltage is switched on.

Pressing one of the front keys, the high-resolution energy display disappears.

Open the top cover of MULTICAL® 801

- Pt500 or Pt100 temperature sensors are simulated by means of reference resistors
- Flow (terminals 1-5-6-2) and return (terminals 3-7-8-4)
- Volume pulses (min. 10 integrations) are simulated via terminals 10B-11B ($f \leq 90$ Hz)



Test with PC-based equipment

MULTICAL® 801 can be checked by means of the following equipment, which is connected to a standard PC,

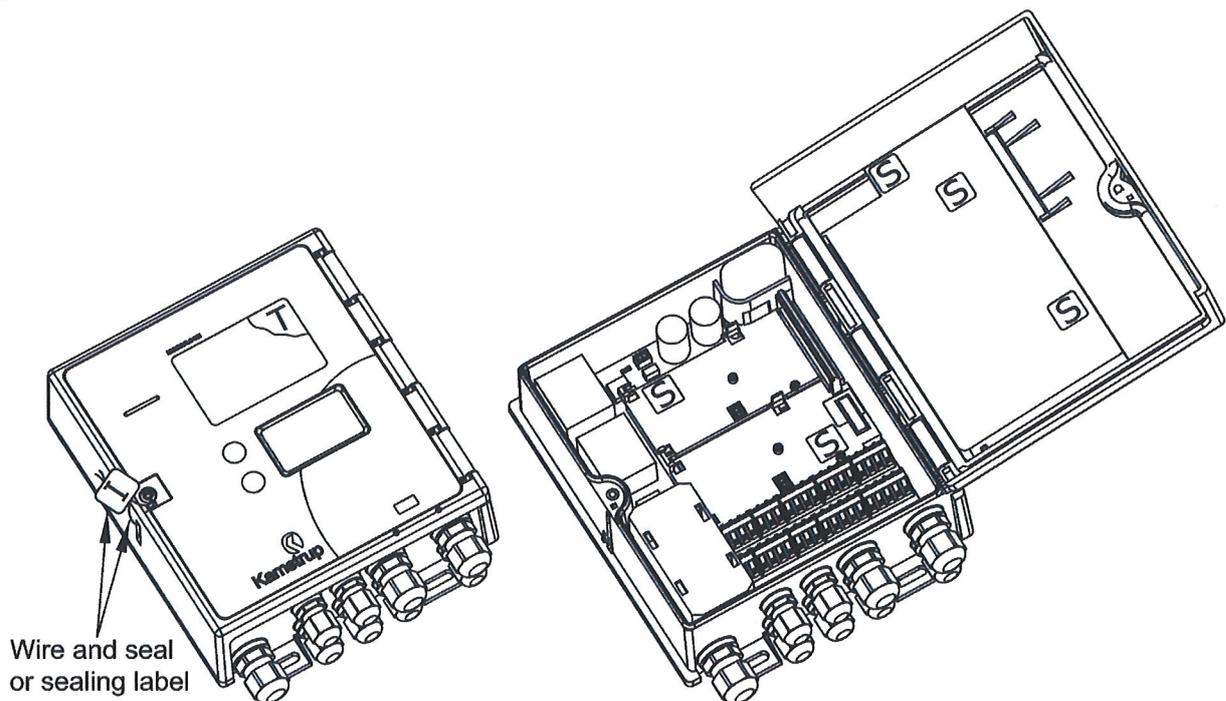
- VERIFICATION EQUIPMENT, type 6699-370 (Pt100, 4-wire) for type 67-F and 67-K
- VERIFICATION EQUIPMENT, type 6699-371 (Pt500, 4-wire) for type 67-G and 67-L
- METERTOOL HCW, type 6699-724

The equipment includes reference resistors with traceable calibration and starts auto integration by means of a serial data command.

The test is automatically carried out monitored by the software.

MULTICAL® 801 Seals and markings

- S** Security seals
- T** Type label
- I** Installation seals

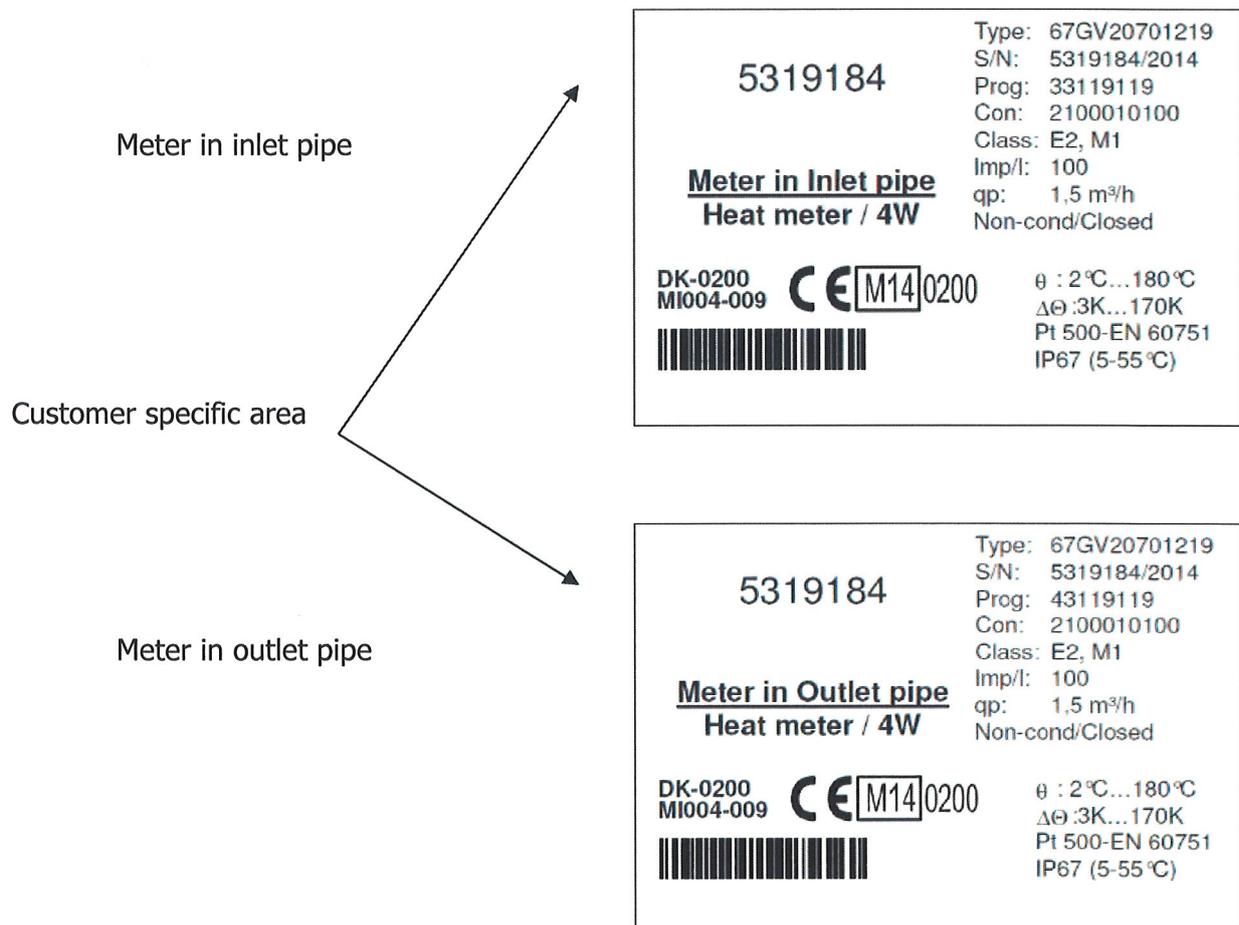


Labeling and inscriptions

Type label placed on the calculator with the following imprint:

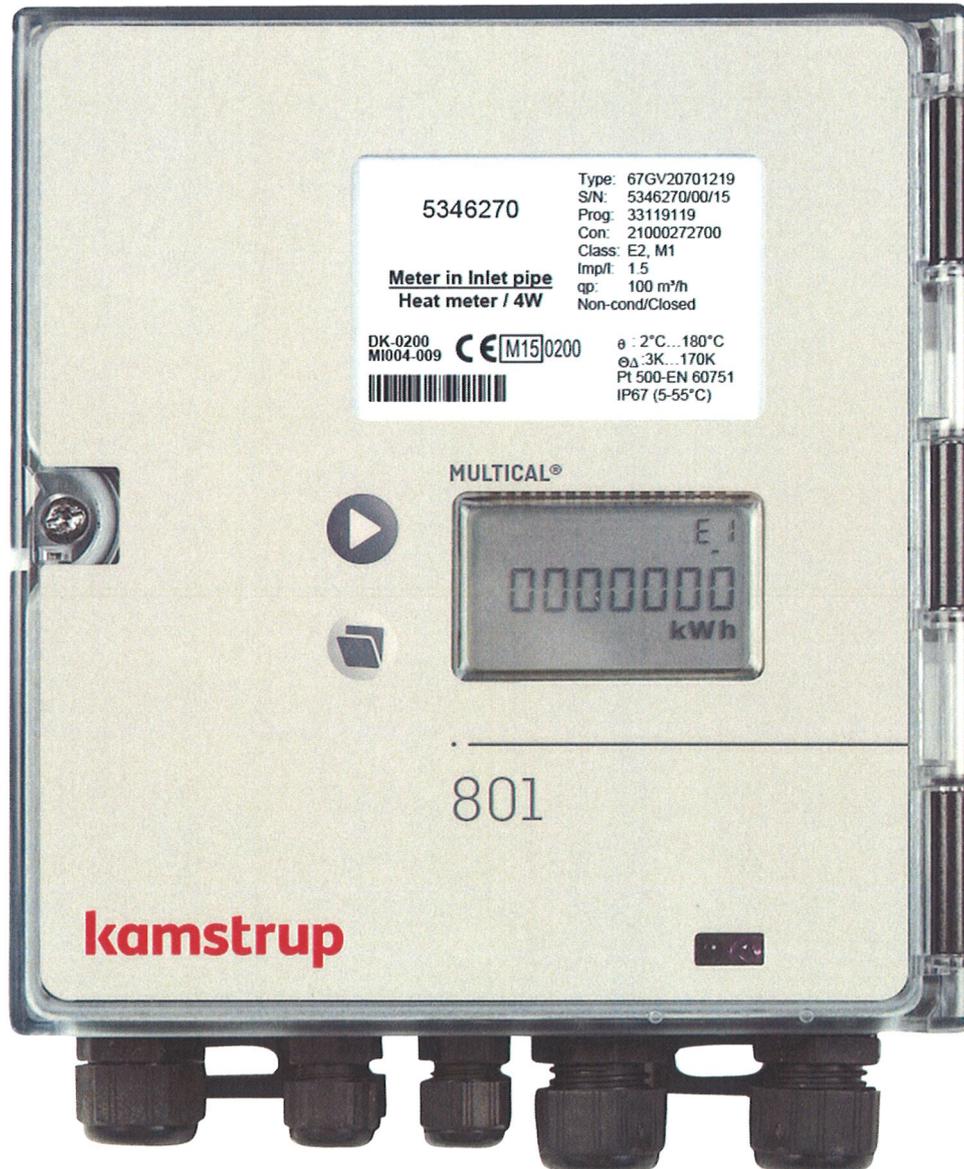
- System designation
- Manufacturer designation or logo
- Type, production year and serial number
- Mechanical and electromagnetic environment classes
- Climatic class
- Temperature limits (θ_{\min} - θ_{\max})
- Differential temperature limits $\Delta\theta_{\min}$ - $\Delta\theta_{\max}$
- Temperature sensor type (Pt500 or Pt100)
- Mounting the flow sensor in inlet or outlet pipe

Examples of type labels MULTICAL® 801



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Photo of MULTICAL® 801



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Informative Annex

Integrated functions not subject to the Measuring Instruments Directive:

Integrated Cooling function

MULTICAL[®] 801 is type tested as Heating and Cooling energy meter according to EN 1434-4:2015.

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