

Data sheet

MULTICAL® 403

The front runner in energy metering

- Fully programmable data logger with minute logger
- Configurable M-Bus modules with logger reading
- On-site configuration via front keys
- Highly flexible modular design
- Pulse inputs and pulse outputs
- Real-time clock backup
- 16 years' battery lifetime at a reading interval of as low as 10 seconds
- IP68 flow sensor
- 7- or 8-digit display resolution



MID 2014/32/EU

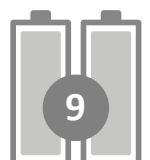
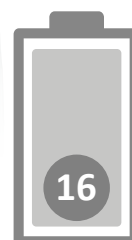


EN 1434

DK-BEK 1178 – 06/11/2014



EN 1434



Contents

| | |
|-----------------------|----|
| Application | 2 |
| Mechanical design | 3 |
| Mechanical data | 4 |
| Approved meter data | 5 |
| Accuracy | 6 |
| Pressure loss | 7 |
| Dimensioned sketches | 8 |
| Electrical data | 10 |
| Product variants | 12 |
| Meter configuration | 14 |
| Info codes in display | 15 |
| Accessories | 16 |

Application

MULTICAL® 403 is a static heat meter, cooling meter or combined heat/cooling meter based on the ultrasonic principle. The meter is intended for energy measurement in almost all types of thermal installations where water is used as the energy-conveying medium.

MULTICAL® 403 consists of a calculator, a flow sensor and two temperature sensors. MULTICAL® 403 has been developed for measurement of energy consumption in flats, single-family and multi-family houses, housing associations, blocks of flats and small industry. The meter is simple to install, and it has a temperature range of 2 ...180 °C and a meter programme with nominal flow from q_p 0.6 m³/h to 15 m³/h.

Due to its robust design and high quality, MULTICAL® 403 is practically maintenance-free, and its simple setup makes it easy to configure via the meter's front keys.

MULTICAL® 403 has been optimised compared to earlier generations. The total dynamic range has been increased to 1600:1 from saturation to start-up and the meter has an approved dynamic range of 250:1. It is thereby secured that every conceivable consumption is measured with the same well-known Kamstrup precision.

The meter can be powered by mains or battery supply as required. You can choose between a small battery without transport restrictions or a more powerful battery with 16 years' lifetime. No matter which solution you choose, the power consumption of MULTICAL® 403 is low.

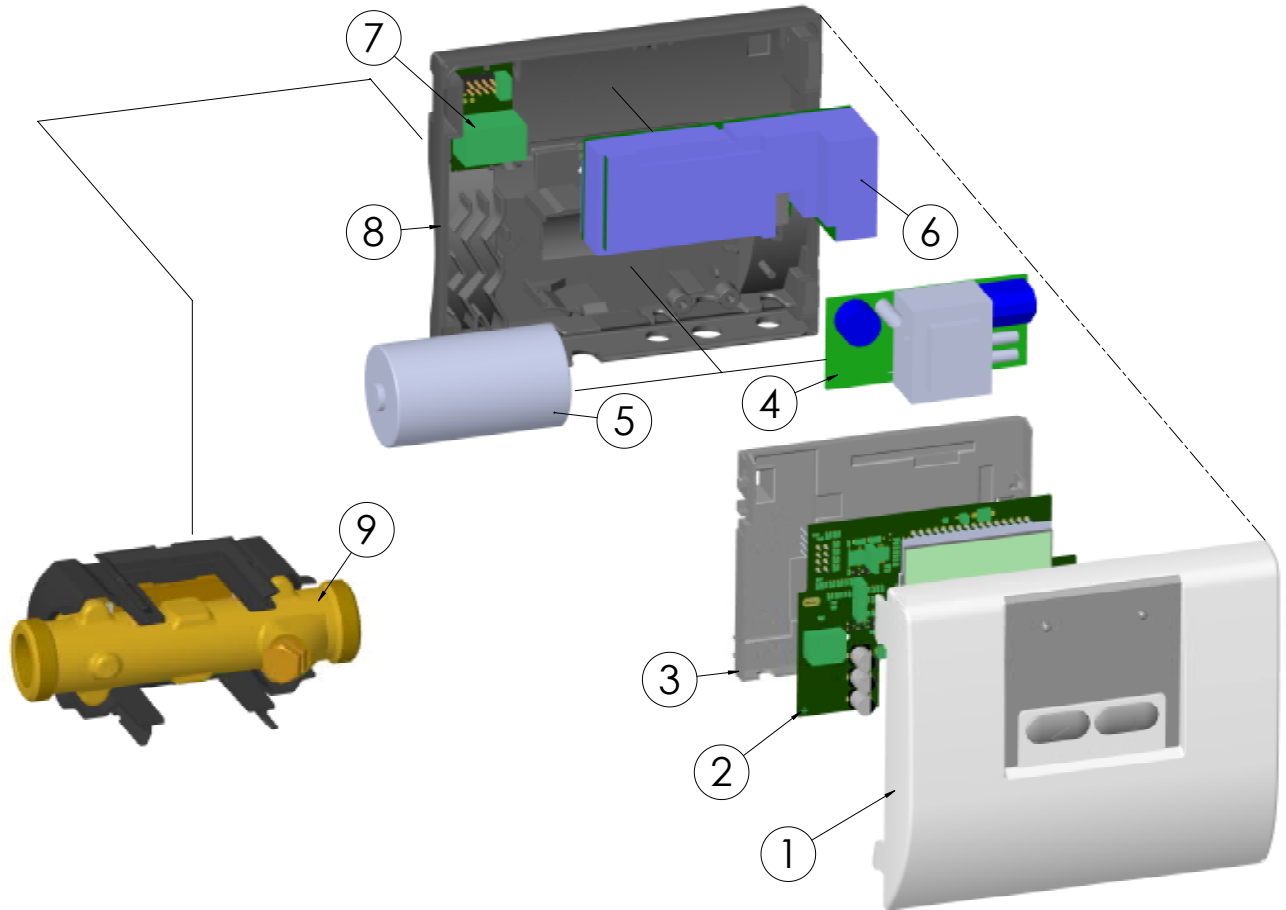
Volume is measured using bidirectional ultrasonic technique based on the transit time method, a proven long-term stable and accurate measuring principle.

Accumulated heat energy and/or cooling energy can be displayed in kWh, MWh or GJ, all in the form of seven or eight significant digits. The display has been specially designed with a view to obtaining longevity.

A wide range of parameters are configurable via the front keys of MULTICAL® 403: Flow sensor position in inlet or outlet, energy unit, primary M-Bus address, radio on/off, target dates, etc. Configuration can be carried out on site, thus contributing to a reduction of stocks and installation time.

MULTICAL® 403 is available with communication modules for Wireless M-Bus, M-Bus and RS232. The modules are available with either pulse inputs or pulse outputs. In addition to reading current values, the programmable data loggers of MULTICAL® 403 can be read via M-Bus.

Mechanical design



- 1 Top cover with front keys and laser engraving
- 2 PCB with micro-controller, flow-ASIC, display, etc.
- 3 PCB cover (may only be opened at an authorised laboratory)
- 4 Either a power supply module can be mounted
- 5 Or a battery can be mounted
- 6 Data module, e.g. M-Bus
- 7 Connection of temperature sensors
- 8 Bottom cover
- 9 Flow sensor (IP68)

Mechanical data

| | |
|-------------------------------|--|
| Weight | From 0.9 to 8.6 kgs depending on flow sensor size |
| Ambient temperature | 5...55 °C. Non-condensing, closed location (indoor installation) |
| Protection class | |
| – Calculator | IP54 |
| – Flow sensor | IP68 |
| Medium temperatures | |
| – Heat meters 403-V/W | 2...130 °C |
| – Cooling meters 403-C | 2...50 °C |
| – Heat/cooling meters 403-T | 2...130 °C |
| Medium in flow sensor | Water (district heating water as described in CEN TR 16911 and AGFW FW510) |
| Storage temperature | -25...60 °C (drained flow sensor) |
| Pressure stage (with thread) | PN16 with DS temperature sensor with fibre gasket PN25 with blind plug with O-ring gasket PN25 with DS temperature sensor with O-ring gasket |
| Pressure stage (with flanges) | PN16 and PN25 |
| Flow sensor cable | 1.5 m (cable non-demountable) |
| Connection cables | ø 3.5...6 mm |
| Supply cables | ø 5...8 mm |

At medium temperature below ambient temperature or above 90 °C, we recommend wall-mounting of calculator.

Materials

Wetted parts

| | |
|----------------|---|
| Case, coupling | Hot-pressed dezincification proof brass (CW 602N) |
| Case, flange | Stainless steel, material no. 1.4308 |
| Transducer | Stainless steel, material no. 1.4404 |
| O-rings | EPDM |
| Measuring tube | Thermoplastic, PES 30 % GF |
| Reflectors | Thermoplastic, PES 30 % GF and stainless steel, material no. 1.4306 |

Flow sensor case

| | |
|------------------|---------------------------|
| Top/wall bracket | Thermoplastic, PC 20 % GF |
|------------------|---------------------------|

Calculator case

| | |
|----------------|--|
| Top and base | Thermoplastic, PC 10 % GF with TPE (thermoplastic elastomer) |
| Internal cover | Thermoplastic, PC 10 % GF |

Cables

Silicone cable with inner Teflon insulation

Approved meter data

| | |
|-----------------------------------|---|
| Approvals | |
| - Heat meter | DK-0200-MI004-037 |
| - Temperature range | θ : 2 °C...180 °C |
| - Differential range | $\Delta\theta$: 3 K...178 K |
| - Cooling meter | TS 27.02 009 |
| - Temperature range | θ : 2 °C...180 °C |
| - Differential range | $\Delta\theta$: 3 K...178 K |
| - Bifunctional heat/cooling meter | Marked with DK-0200-MI004-037 and TS 27.02 009 as well as the yearly mark of MID |
| - Temperature range | θ : 2 °C...180 °C |
| - Differential range | $\Delta\theta$: 3 K...178 K |
| Standard | EN 1434:2015 |
| EU directives | Measuring Instruments Directive Low Voltage Directive Electromagnetic Compatibility Directive Radio Equipment Directive RoHS Directive Pressurised equipment Directive |
| EN 1434 designation | Environmental class A |
| MID designation | |
| - Mechanical environment | Class M1 and M2 |
| - Electromagnetic environment | Class E1 |
| Temperature sensor connection | |
| - Type 403-V | Pt100 – EN 60751, 2-wire connection |
| - Type 403-W/C/T | Pt500 – EN 60751, 2-wire connection |

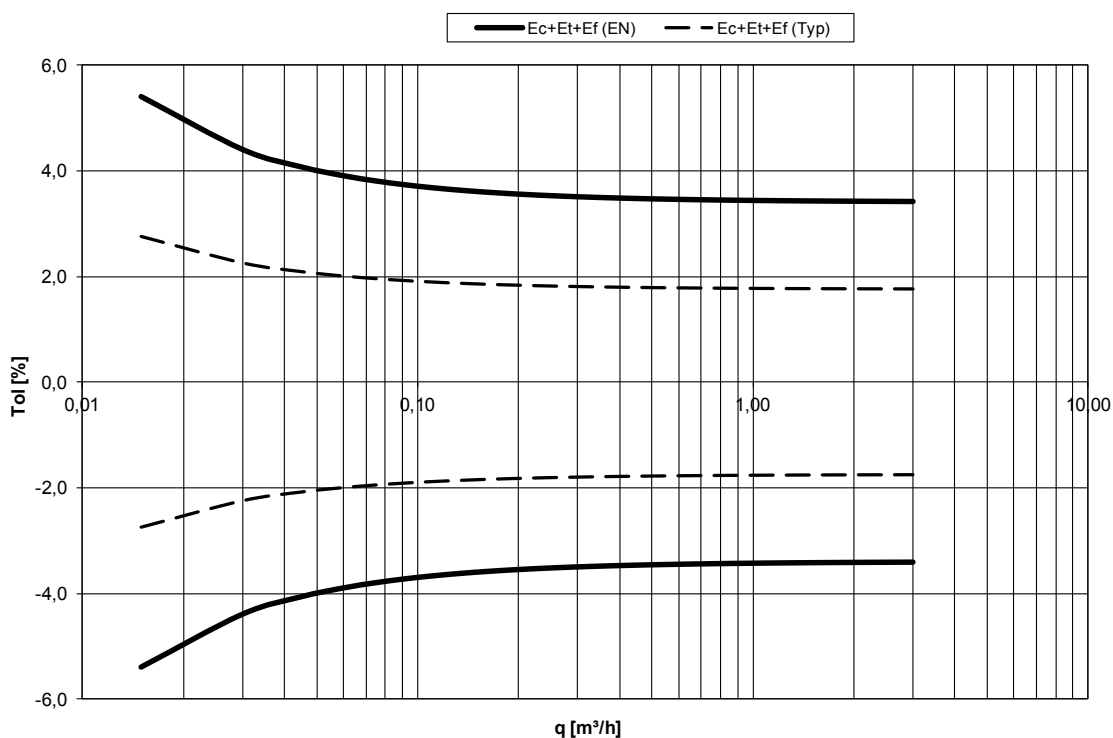
The stated minimum temperatures are related to the type approval. The meter has no cut-off for low temperature and thus measures down to 0.01 °C and 0.01 K.

Accuracy

| Heat meter components | MPE according to EN 1434-1 | MULTICAL® 403, typical accuracy |
|-----------------------|--|--|
| Calculator | $E_c = \pm [0.5 + \Delta\Theta \text{ min}/\Delta\Theta] \%$ | $E_c = \pm [0.15 + 2/\Delta\Theta] \%$ |
| Flow sensor | $E_f = \pm [2 + 0.02 q_p/q]$, but not exceeding $\pm 5 \%$ | $E_f = \pm [1 + 0.01 q_p/q] \%$ |
| Sensor pair | $E_t = \pm [0.5 + 3 \Delta\Theta \text{ min}/\Delta\Theta] \%$ | $E_t = \pm [0.4 + 4/\Delta\Theta] \%$ |

Total typical accuracy of MULTICAL® 403 compared to EN 1434-1.

MULTICAL® 403 q_p 1.5 m³/h @ $\Delta\Theta$ 30K

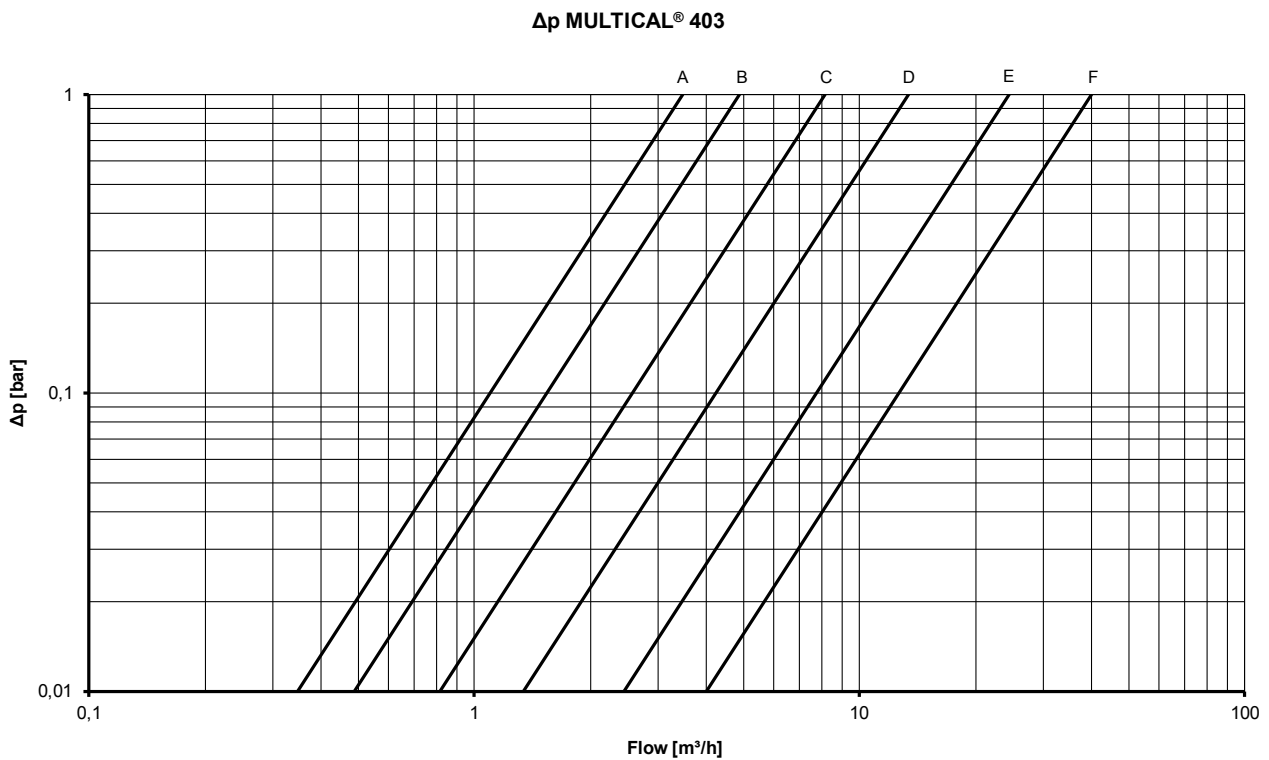


Pressure loss

Pressure loss in a flow sensor is stated as max pressure loss at q_p .
According to EN 1434, maximum pressure must not exceed 0.25 bar.

| Graph | Nom. flow q_p [m ³ /h] | Max flow q_s [m ³ /h] | Min. flow q_i^* [l/h] | Min. flow cut-off [l/h] | Saturation flow [m ³ /h] | Nom. diameter [mm] | $\Delta p@q_p$ [bar] | k_v | $q@0.25\text{ bar}$ [m ³ /h] |
|-------|---|--|-------------------------------|-------------------------------|---|-----------------------|-------------------------|-------|--|
| A | 0.6 | 1.2 | 6 | 3 | 1.5 | DN15/DN20 | 0.03 | 3.46 | 1.7 |
| B | 1.5 | 3.0 | 15 | 3 | 4.6 | DN15/DN20 | 0.09 | 4.89 | 2.4 |
| C | 2.5 | 5.0 | 25 | 5 | 7.6 | DN20 | 0.09 | 8.15 | 4.1 |
| D | 3.5 | 7.0 | 35 | 7 | 9.2 | DN25 | 0.07 | 13.42 | 6.8 |
| E | 6 | 12 | 60 | 12 | 18 | DN25 | 0.06 | 24.5 | 12.3 |
| F | 10 | 20 | 100 | 20 | 30 | DN40 | 0.06 | 40.83 | 20.4 |
| F | 15 | 30 | 150 | 30 | 46 | DN50 | 0.14 | 40.09 | 20.1 |

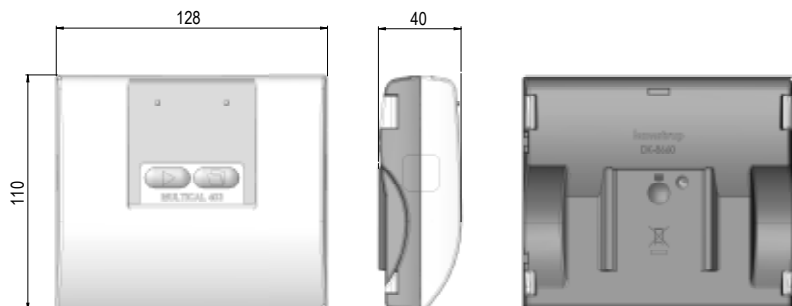
* Dynamic range $q_p:q_i = 100:1$



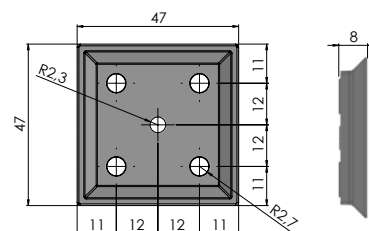
Dimensioned sketches

All measurements in [mm]

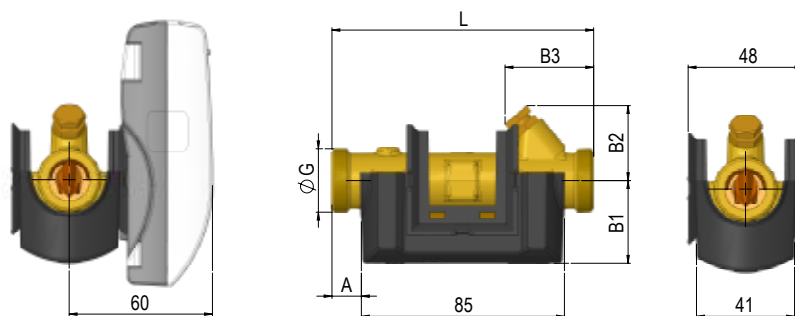
Mechanical measurements for calculator



Bracket for wall mounting



Flow sensor with G^{3/4} and G1 thread connection



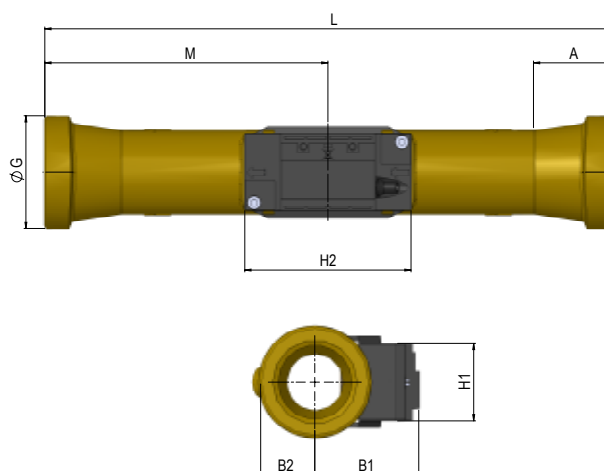
| Nominal flow q_p [m ³ /h] | Thread G | L | A | B1 | B2 | B3 | Approx. weight [kg] * |
|---|--------------------|-----|----|----|----|----|--------------------------|
| 0.6 + 1.5 | G ^{3/4} B | 110 | 12 | 35 | 32 | 38 | 0.9 |
| 1.5 | G ^{3/4} B | 165 | 12 | 35 | 32 | 65 | 1.0 |
| 1.5 | G1B | 130 | 22 | 38 | 32 | 48 | 1.0 |
| 2.5 | G1B | 130 | 22 | 38 | 38 | 48 | 1.0 |
| 0.6 + 1.5 | G1B | 190 | 22 | 38 | 38 | 78 | 1.1 |
| 2.5 | G1B | 190 | 22 | 38 | 38 | 78 | 1.2 |

* Weight of calculator, flow sensor, 3 m sensor pair excl. packing

Dimensioned sketches

All measurements in [mm]

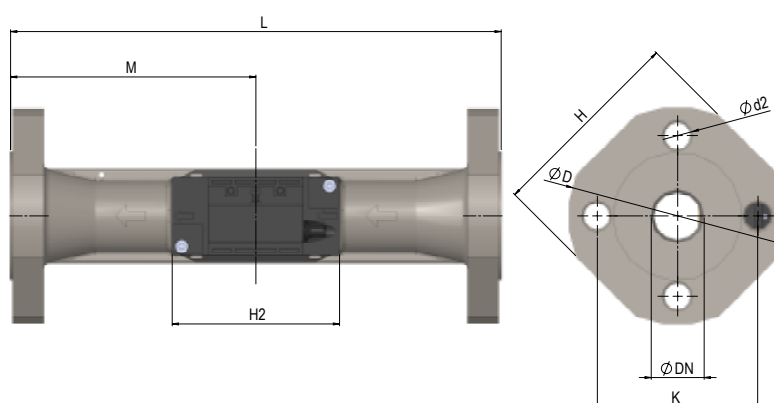
Flow sensor with G5/4 and G2 threaded connection



| Nominal flow q_p [m ³ /h] | Thread G | L | M | H2 | A | B1 | B2 | H1 | Approx. weight [kg] * |
|---|-------------|-----|-----|----|------|----|----|----|--------------------------|
| 3.5 | G5/4B | 260 | 130 | 88 | 16 | 51 | 20 | 41 | 2.0 |
| 6 | G5/4B | 260 | 130 | 88 | 16 | 53 | 20 | 41 | 2.1 |
| 10 | G2B | 300 | 150 | 88 | 40.2 | 55 | 29 | 41 | 3.0 |

* Weight of calculator, flow sensor, 3 m sensor pair excl. packing

Flow sensor with DN25, DN40 and DN50 flange connection



| Nominal flow q_p [m ³ /h] | Nom. diameter DN | L | M | H2 | D | H | K | Bolts | | | Approx. weight [kg] * |
|---|---------------------|-----|-----|----|-----|-----|-----|-------|--------|----|--------------------------|
| | | | | | | | | Qty | Thread | d2 | |
| 6 | DN25 | 260 | 130 | 88 | 115 | 106 | 85 | 4 | M12 | 14 | 4.6 |
| 10 | DN40 | 300 | 150 | 88 | 150 | 140 | 110 | 4 | M16 | 18 | 7.5 |
| 15 | DN50 | 270 | 155 | 88 | 165 | 145 | 125 | 4 | M16 | 18 | 8.6 |

* Weight of calculator, flow sensor, 3 m sensor pair excl. packing

Electrical data

Calculator data

| | |
|---------------------------------------|---|
| Display | LCD – 7 or 8 digits, digit height 8.2 mm |
| Resolutions | 9999.999 – 99999.99 – 999999.9 – 9999999 99999.999 – 999999.99 – 9999999.9 – 99999999 |
| Energy units | MWh – kWh – GJ |
| Data logger (EEPROM) | Programmable |
| – Log content | All registers can be selected |
| – Logging interval | From 1 minute to 1 year |
| – Logging depth | Default: 20 years, 36 months, 460 days, 1400 hours |
| Info logger (EEPROM) | 50 info codes (50 latest are shown on the display) |
| Clock/calender (with backup battery) | Clock, calendar, leap year compensation, target date |
| Daylight saving time/wintertime (DST) | Programmable The function can be disabled so that "technical normal time" is used |
| Clock accuracy | Without external adjustment: Less than 15 min./year With external adjustment every 48 hours: Less than 7 s from legal time |
| Data communication | KMP protocol with CRC16 used for optical communication as well as for modules |
| Power in temperature sensors | < 10 μ W RMS |
| Power supply | 3.6 VDC \pm 0.1 VDC |

Battery

| Replacement interval | 3.65 VDC, D-cell lithium | 3.65 VDC, 2 x A-cells lithium |
|------------------------|------------------------------|----------------------------------|
| Wall-mounted | 16 years @ $t_{BAT} < 30$ °C | 9 years @ $t_{BAT} < 30$ °C |
| Mounted on flow sensor | 14 years @ $t_{BAT} < 40$ °C | 8 years @ $t_{BAT} < 40$ °C |

Note: Depends on the meter and module configuration

| | |
|--------------------------------------|--|
| Backup battery (for real-time clock) | 3.0 VDC, BR-cell lithium |
| Mains supply | 230 VAC +15/-30 %, 50/60 Hz 24 VAC \pm 50 %, 50/60 Hz |
| Insulation voltage | 3.75 kV |
| Power consumption | < 1 W |
| Backup supply | Integral SuperCap eliminates interruptions due to short-term power failures (only supply modules type 7 and 8) |

Electrical data

| Temperature measurement | t1 Inlet temperature | t2 Outlet temperature | $\Delta\Theta$ (t1-t2) Heat measurement | $\Delta\Theta$ (t2-t1) Cooling measurement | t5 Preset for A1 and A2 |
|---|----------------------------|-----------------------------|---|--|----------------------------|
| Measuring range 2-wire, Pt100 [403-V] 2-wire, Pt500 [403-W/C/T] | 0.01...185.00 °C | | | | |
| Offset adjustment | ± 0.99 K | | | | |

| Max cable lengths (max \varnothing 6 mm cable) | Pt100, 2-wire | Pt500, 2-wire |
|---|---|--|
| | 2 x 0.25 mm ² : 2.5 m 2 x 0.50 mm ² : 5 m 2 x 1.00 mm ² : 10 m | 2 x 0.25 mm ² : 10 m 2 x 0.50 mm ² : 20 m |

| Pulse inputs In-A/In-B | Elektronical contact | Reed contact |
|-----------------------------------|--|----------------------------------|
| Pulse input | 680 k Ω pull-up for 3.6 V | 680 k Ω pull-up for 3.6 V |
| Pulse ON | < 0.4 V for > 30 ms | < 0.4 V for > 500 ms |
| Pulse OFF | > 2.5 V for > 30 ms | > 2.5 V for > 500 ms |
| Pulse frequency | < 3 Hz | < 1 Hz |
| Electrical isolation | No | No |
| Max cable length | 25 m | 25 m |
| Requirements for external contact | Leakage current at function open < 1 μ A | |

| Pulse outputs Out-C/Out-D | HC-003-11 HC-003-21 and -31 (before 2017-05) (before 2018-04) | HC-003-11 HC-003-21 and -31 (after 2017-05) (after 2018-04) |
|---------------------------|--|--|
| Pulse output type | Open collector (OB) | Opto FET |
| External voltage | 5...30 VDC | 1...48 VDC/VAC |
| Current | < 10 mA | < 50 mA |
| Residual stress | $U_{CE} \approx 1$ V t 10 mA | $R_{ON} \leq 40 \Omega$ |
| Electrical isolation | 2 kV | 2 kV |
| Max cable length | 25 m | 25 m |

Product variants

| | | | | Static data Written on the meter's front 403-X XX X XX | | | | Dynamic data Shown on display XX X XX | | | | |
|---|------------|----------------|------------------|--|--------------------------|--------------------------|--------------------------|---|---|--------------------------|--------------------------|--------------------------|
| MULTICAL® 403 | | | | Type 403- | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | - | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Sensor connection | | | | | | | | | | | | |
| Pt100 heat meter | | | | | V | | | | | | | |
| Pt500 heat meter | | | | | W | | | | | | | |
| Pt500 cooling meter | | | | | C | | | | | | | |
| Pt500 cooling meter and heat/cooling meter | | | | | T | | | | | | | |
| Flow sensor q _p [m ³ /h] | Connection | Length [mm] | Dynamic range | | | | | | | | | |
| 0.6 | G½B (R½) | 110 | 100:1 | | | | | | | | | 10 |
| 0.6 | G1B (R¾) | 190 | 100:1 | | | | | | | | | 30 |
| 1.5 | G½B (R½) | 110 | 100:1 | | | | | | | | | 40 |
| 1.5 | G¾B (R¾) | 165 | 100:1 | | | | | | | | | 50 |
| 1.5 | G1B (R¾) | 110 | 100:1 | | | | | | | | | 60 |
| 1.5 | G1B (R¾) | 130 | 100:1 | | | | | | | | | 70 |
| 1.5 | G1B (R¾) | 165 | 100:1 | (130 mm with extension) | | | | | | | | 80 |
| 1.5 | G1B (R¾) | 190 | 100:1 | | | | | | | | | 90 |
| 2.5 | G1B (R¾) | 130 | 100:1 | | | | | | | | | A0 |
| 2.5 | G1B (R¾) | 190 | 100:1 | | | | | | | | | B0 |
| 3.5 | G5/4B (R1) | 260 | 100:1 | | | | | | | | | D0 |
| 6.0 | G5/4B (R1) | 260 | 100:1 | | | | | | | | | F0 |
| 6.0 | DN25 | 260 | 100:1 | | | | | | | | | G0 |
| 10 | G2B (R1½) | 300 | 100:1 | | | | | | | | | H0 |
| 10 | DN40 | 300 | 100:1 | | | | | | | | | J0 |
| 15 | DN50 | 270 | 100:1 | | | | | | | | | K0 |
| Meter type | | | | | | | | | | | | |
| Heat meter (MID module B) | | | | | | | | | | | | 1 |
| Heat meter (MID modules B+D) | | | | | | | | | | | | 2 |
| Heat/cooling meter (MID modules B+D & TS+DK268) | | | | | | | | | | | | 3 |
| Heat meter (national approvals) | | | | | | | | | | | | 4 |
| Cooling meter (TS+DK268) | | | | | | | | | | | | 5 |
| Heat/cooling meter | | | | | | | | | | | | 6 |
| Volume meter, hot | | | | | | | | | | | | 7 |
| Volume meter, cold | | | | | | | | | | | | 8 |
| Country code | | | | | | | | | | | | |
| Determined by Kamstrup upon receipt of order | | | | | | | | | | | | XX |

Note: The flow sensor is approved for the dynamic areas q_p:q_i 250:1 and 100:1, but is, by default, delivered as q_p:q_i 100:1.

Product variants

| MULTICAL® 403 | Static data Written on the meter's front 403-X XX X XX – | | | | Dynamic data Shown on display XX X XX | | |
|--|--|--|--------------|--|---|--|----|
| | Type 403- | | | | | | |
| Temperature sensor set | | | | | | | |
| Supplied without temperature sensors | | | | | | | 00 |
| 2-wire Pt500 temperature sensors | | | | | | | |
| Direct short temperature sensors, 2 pcs. | DS 27.5 mm | | 1.5 m - 3 m | | | | 1x |
| Direct short temperature sensors, 2 pcs. | DS 38 mm | | 1.5 m - 3 m | | | | 2x |
| Pocket temperature sensors, 2 pcs. | PL ø5.8 mm | | 1.5 m - 10 m | | | | 3x |
| 2-wire Pt100 temperature sensors | | | | | | | |
| Direct short temperature sensors, 2 pcs. | DS 27.5 mm or DS 38 mm | | 2 m | | | | Jx |
| Supply | | | | | | | |
| No supply | | | | | | | 0 |
| Battery, 1 x D-cell | | | | | | | 2 |
| 230 VAC supply | | | | | | | 7 |
| 24 VAC supply | | | | | | | 8 |
| Battery, 2 x A-cells | | | | | | | 9 |
| Modules | | | | | | | |
| No module | | | | | | | 00 |
| Data Pulse, inputs (In-A, In-B) | | | | | | | 10 |
| Data Pulse, outputs (Out-C, Out-D) | | | | | | | 11 |
| Wired M-Bus, inputs (In-A, In-B) | | | | | | | 20 |
| Wired M-Bus, outputs (Out-C, Out-D) | | | | | | | 21 |
| Wired M-Bus, Thermal Disconnect * | | | | | | | 22 |
| Wireless M-Bus, inputs (In-A, In-B), 868 MHz | | | | | | | 30 |
| Wireless M-Bus, outputs (Out-C, Out-D), 868 MHz | | | | | | | 31 |
| Analog outputs 2 x 0/4...20 mA * | | | | | | | 40 |
| PQT Controller * | | | | | | | 43 |
| Low Power Radio, inputs (In-A, In-B), 434 MHz | | | | | | | 50 |
| Low Power Radio GDPR, inputs (In-A, In-B), 434 MHz | | | | | | | 51 |
| BACnet MS/TP, inputs (In-A, In-B) * | | | | | | | 66 |
| Modbus RTU, inputs (In-A, In-B) * | | | | | | | 67 |

* The meter must be mains-supplied.

Contact Kamstrup for further information about product variants.

Meter configuration

| | A | B | CCC | DDD | EE | FF | GG | L | N | PP | RR | T | VVV |
|---|---|---|--------|-----|----|----|----|---|---|----|----|---|------|
| Flow sensor position | | | | | | | | | | | | | |
| Inlet | | 3 | | | | | | | | | | | |
| Outlet | | 4 | | | | | | | | | | | |
| Measuring unit | | | | | | | | | | | | | |
| GJ | | 2 | | | | | | | | | | | |
| kWh | | 3 | | | | | | | | | | | |
| MWh | | 4 | | | | | | | | | | | |
| Flow sensor coding | | | | | | | | | | | | | |
| 7-digit CCC-codes | | | 4xx | | | | | | | | | | |
| 8-digit CCC-codes | | | 5xx | | | | | | | | | | |
| Display | | | | | | | | | | | | | |
| Heat meter | | | | 210 | | | | | | | | | |
| Heat/cooling meter | | | | 310 | | | | | | | | | |
| Cooling meter | | | | 510 | | | | | | | | | |
| Tariffs | | | | | | | | | | | | | |
| No active tariff | | | | | 00 | | | | | | | | |
| Power tariff | | | | | 11 | | | | | | | | |
| Flow tariff | | | | | 12 | | | | | | | | |
| t1-t2 tariff | | | | | 13 | | | | | | | | |
| Inlet tariff | | | | | 14 | | | | | | | | |
| Outlet tariff | | | | | 15 | | | | | | | | |
| Time-controlled tariff | | | | | 19 | | | | | | | | |
| Heat/cooling volume tariff | | | | | 20 | | | | | | | | |
| PQ tariff | | | | | 21 | | | | | | | | |
| Pulse inputs A and B | | | | | | | | | | | | | |
| 10 l/imp, pre-counter 1 (<10 m ³ /h) | | | | | | 24 | 24 | | | | | | |
| Integration mode | | | | | | | | | | | | | |
| Adaptive mode [4-64 s] | | | | | | | | | 1 | | | | |
| Normal mode [32 s] | | | | | | | | | 2 | | | | |
| Fast mode [4 s] | | | | | | | | | 3 | | | | |
| Cold water leak detection (input A) | | | | | | | | | | | | | |
| OFF | | | | | | | | | | | | 0 | |
| 30 min. without pulses | | | | | | | | | | | | 1 | |
| 1 hour without pulses | | | | | | | | | | | | 2 | |
| 2 hours without pulses | | | | | | | | | | | | 3 | |
| Pulse outputs Out-C/Out-D | | | | | | | | | | | | | |
| Out-C: V1/4 | | | 5.0 ms | | | | | | | | | | 73 |
| Out-C: V1/1 | | | 3.9 ms | | | | | | | | | | 82 |
| Out-C: V1/4 | | | 22 ms | | | | | | | | | | 83 |
| E1 and V1 or E3 and V1 | | | 10 ms | | | | | | | | | | 95 |
| E1 and V1 or E3 and V1 | | | 32 ms | | | | | | | | | | 96 |
| Controlled output based on data commands | | | | | | | | | | | | | 99 |
| Data logger profile | | | | | | | | | | | | | |
| Standard data logger profile | | | | | | | | | | | | | 10 |
| Encryption level | | | | | | | | | | | | | |
| Individual key | | | | | | | | | | | | | 3 |
| Customer label | | | | | | | | | | | | | |
| Serial number | | | | | | | | | | | | | 0000 |

Contact Kamstrup A/S for further information about meter configuration.

Info codes in display

| Display digit | | | | | | | | Description |
|---------------|----|----|---|----|---|------|------|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| Info | t1 | t2 | 0 | V1 | 0 | In-A | In-B | |
| 1 | | | | | | | | No voltage supply |
| 2 | | | | | | | | Low battery level |
| 9 | | | | | | | | External alarm (e.g. via KMP) |
| | 1 | | | | | | | t1 above measuring range or switched off |
| | | 1 | | | | | | t2 above measuring range or switched off |
| | 2 | | | | | | | t1 below measuring range or short-circuited |
| | | 2 | | | | | | t2 below measuring range or short-circuited |
| | 9 | 9 | | | | | | Invalid temperature difference (t1-t2) |
| | | | | 3 | | | | V1 air |
| | | | | 4 | | | | V1 wrong flow direction |
| | | | | 6 | | | | V1 > q _s for more than an hour |
| | | | | | | 8 | | Pulse input A Leakage in system |
| | | | | | | 9 | | Pulse input A External alarm |
| | | | | | | | 8 | Pulse input B Leakage in system |
| | | | | | | | 9 | Pulse input B External alarm |

Example:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|--|
| 1 | 0 | 2 | 0 | 0 | 0 | 9 | 0 | |
|---|---|---|---|---|---|---|---|--|

Note: Info codes are configurable. Therefore, it is not certain that all the above parameters are available in a given MULTICAL® 403.

An info logger saves the info code every time the info log is changed. It is possible to read the latest 50 changes of the info code and the date of the change.

Accessories

| Article number | Description |
|----------------|--|
| HC-993-09 | Battery module with two A-cells |
| HC-993-02 | Battery module with one D-cell |
| HC-993-07 | 230 VAC supply module |
| HC-993-08 | 24 VAC supply module |
| 2006-681 | Supply module label |
| 3026-517 | Sealing cap for temperature sensors, blue 2 pcs. |
| 3026-518 | Sealing cap for temperature sensors, red 2 pcs. |
| 3026-655 | Wall bracket |
| 3026-902 | Bracket for mounting MULTICAL® 403 on wall bracket for MULTICAL® 402 |
| 3026-961 | Disassemble tool base |
| 3026-962 | Disassemble tool bracket |
| 3130-262 | Blind plug with O-ring |
| 3130-269 | Cable clamp with screws |
| 5000-337 | Module cable, 2 m (2 x 0.25 mm ²) |
| 6699-035 | USB module configuration cable |
| 6699-042 | Metal plate for optical read-out head (20 pcs) |
| 6699-043 | Accessory bag with sealing buds |
| 6699-099 | Infrared optical reading head w/USB plug |
| 6699-102 | Infrared optical reading head w/D-sub plug |
| 6699-447.E | Internal antenna for Kamstrup radio, 434 MHz |
| 6699-448 | Mini Triangle antenna for Wireless M-Bus and 2G/4G Network Module |
| 6699-482.E | Internal antenna for Wireless M-Bus 868 MHz |
| 6699-724 | METERTOOL HCW |
| 6699-725 | LogView HCW |

Calibration units

| Article number | Description |
|----------------|--|
| 6699-367 | Verification unit for MULTICAL® 403, Pt100, heat/cooling (used with METERTOOL HCW) |
| 6699-366 | Verification unit for MULTICAL® 403, Pt500, heat/cooling (used with METERTOOL HCW) |

Find more information on ULTRAFLOW®, temperature sensors and ball valves on products.kamstrup.com.

Contact Kamstrup A/S for information about further accessories.

Kamstrup A/S

Industrivej 28, Stilling
 DK-8660 Skanderborg
 T: +45 89 93 10 00
 F: +45 89 93 10 01
info@kamstrup.com
kamstrup.com