

Data sheet

## MULTICAL® 803

### Heat and cooling meter for trade and industry

- Fully programmable data logger with minute loggers
- 2-second integration interval
- 4 communication modules
- 7- or 8-digit display resolution
- User-friendly interface with 3 push buttons
- Large backlit display
- IP65 density
- 6-year battery backup
- Auto Detect of Kamstrup's ULTRAFLOW®
- Auto Detect of Pt temperature sensor
- Mixed fluid compatible



MID 2014/32/EU



EN 1434

DK-BEK 1178 – 06/11/2014



EN 1434

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## Description

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MULTICAL® 803 is a robust and all-round calculator, suitable as heat meter, cooling meter or bifunctional heat/cooling meter together with 1 or 2 flow sensors and 1, 2, 3 or 4 temperature sensors. The meter is intended for energy measurement in almost all types of thermal installations where water is used as the energy-conveying medium.

MULTICAL® 803 can, in addition to heat and cooling measurement, be used for leakage monitoring, permanent performance monitoring, power, flow and temperature limiter with valve control as well as for energy measurement in both open and closed systems.

According to EN 1434 and MID, MULTICAL® 803 can be designated as a "calculator" with separate type approval and verification. The MULTICAL® 803 calculator top can be separated from the connection base by means of a 4 mm Allen wrench when the installation seals have been broken.

MULTICAL® 803 has 2 flow sensor inputs that can be used for both electronic and mechanical flow sensors. The pulse value can be configured from 0.001 to 300 pulses/liter, and the calculator can be configured for all nominal flow sensor sizes from 0.6 to 15,000 m<sup>3</sup>/h. By default, the calculator is supplied with galvanically coupled flow sensor inputs that fit ULTRAFLOW® and, for example, reed switches. In addition, a connection PCB with 2 galvanically isolated flow sensor inputs can also be supplied.

The accumulated heat energy and/or cooling energy can be displayed in kWh, MWh, GJ or Gcal, all in the form of 7 or 8

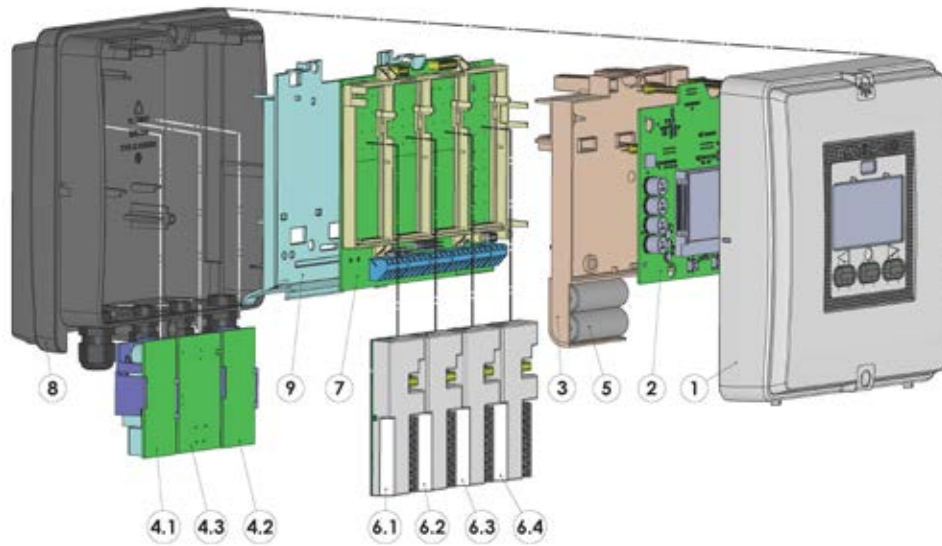
significant digits plus measuring unit. The display has been specially designed with a view to obtaining long lifetime and sharp contrast in a wide temperature range and, by default, MULTICAL® 803 has backlit display.

MULTICAL® 803 can be mains-supplied either by 24 VAC or 230 VAC. A built-in battery backup also ensures that the meter continues the energy measurement for 6 years in case of a voltage failure. Furthermore, it is possible to connect a battery backup to module slot M1 by which, for example, M-Bus or wM-Bus will continue to operate during a voltage failure.

In designing MULTICAL® 803, great importance has been attached to flexibility through programmable functions and plug-in modules in order to secure optimum use in a wide range of applications.

Auto Detect UF enables the exchange of ULTRAFLOW® X4 on MULTICAL® 803 without the need for reconfiguration (change of the CCC code). MULTICAL® 803 can automatically adjust the pulse value and qp to match the connected ULTRAFLOW® X4 X4. Auto Detect UF is active with CCC code 8xx and is initiated when the calculator top and base are assembled. In addition, MULTICAL® 803 has automatic conversion between Pt100 and Pt500 sensors via Auto Detect Pt. The meter even detects the type of the connected temperature sensor. However, all connected sensors must be of the same type.

## Mechanical design



- |     |   |     |   |
|-----|---|-----|---|
| 1   | Top cover with front keys and laser engraving                       | 6.1 | Module slot M1  |
| 2   | PCB with microcontroller, display, etc.                             | 6.2 | Module slot M2  |
| 3   | Verification cover (may only be opened at an authorised laboratory) | 6.3 | Module slot M3  |
| 4.1 | Mandatory power supply  | 6.4 | Module slot M4  |
| 4.2 | Optional power supply   | 7   | Connection PCB  |
| 4.3 | Optional power supply (isolated 24 VDC)                             | 8   | Base cover with cable glands                                    |
| 5   | Backup battery  | 9   | Power supply cover (only authorized personnel must remove this) |

## Mechanical data

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|                                |  |   |
|--------------------------------|--|---|
| Weight                         | 1150 g incl. backup battery  |   |
| Ambient temperature            | 5...55 °C. Non-condensing, closed location (indoor installation)           |   |
| Protection class               | IP65   |   |
| Medium temperatures ULTRAFLOW® | 2...130 °C   | At medium temperatures below the ambient temperature or above 90 °C in flow sensor, wall-mounting of the calculator is recommended. |
| Medium in ULTRAFLOW®           | Water (district heating water as described in CEN TR 16911 and AGFW FW510) |   |
| Storage temperature            | -25...60 °C (drained flow sensor)  |   |
| Connection cable               | M12: $\varnothing$ 3...8 mm<br>M16: $\varnothing$ 4...10 mm                |   |
| Supply cable                   | $\varnothing$ 4...10 mm  |   |
| <b>Materials</b>               |  |   |
| Cast composite parts           | Thermoplastic, PC 10 % GF  |   |
| Gasket                         | Neoprene rubber  |   |
| Push buttons                   | EPDM rubber  |   |

## Approved meter data

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### Approvals

|                                   |   |
|-----------------------------------|---|
| - Heat meter                      | DK-0200-MI004-042   |
| - Temperature range               | $\theta$ : 2 °C...180 °C  |
| - Differential area               | $\Delta\theta$ : 3 K...178 K  |
| - Cooling meter                   | TS 27.02 013  |
| - Temperature range               | $\theta$ : 2 °C...180 °C  |
| - Differential area               | $\Delta\theta$ : 3 K...178 K  |
| - Bifunctional heat/cooling meter | Marked with DK-0200-MI004-042 and TS 27.2 013 as well as yearly mark of MID |
| - Temperature range               | $\theta$ : 2 °C...180 °C  |
| - Differential range              | $\Delta\theta$ : 3 K...178 K  |
| - Mixed fluid meter               | EN 1434 without MID approval  |
| - Temperature range               | $\theta$ : -40 °C...140 °C  |
| - Differential range              | $\Delta\theta$ : 3 K...180 K  |

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.

The temperature area -40 °C ...140 °C indicates the technical functional area in which the calculator calculates energy.

The temperature area for any installation depends on the design of the installation and the type of fluid and solution used.

### Standards

EN 1434:2007/AC:2007  
EN 1434:2015+A1:2018  
FprEN 1434:2022 from 2022-04

### EU directives

Measuring Instrument Directive  
Low Voltage Directive  
Electromagnetic Compatibility Directive  
Radio Equipment Directive  
RoHS Directive  
Pressurised Equipment Directive

### EN 1434 designation

Environmental classes A and C

### MID designation

|                               |  |
|-------------------------------|--|
| - Mechanical environment      | Classes M1 and M2  |
| - Electromagnetic environment | Classes E1 and E2  |
|                               | 5...55 °C. Non-condensing, closed location (indoor installation) |

### Temperature sensor connection

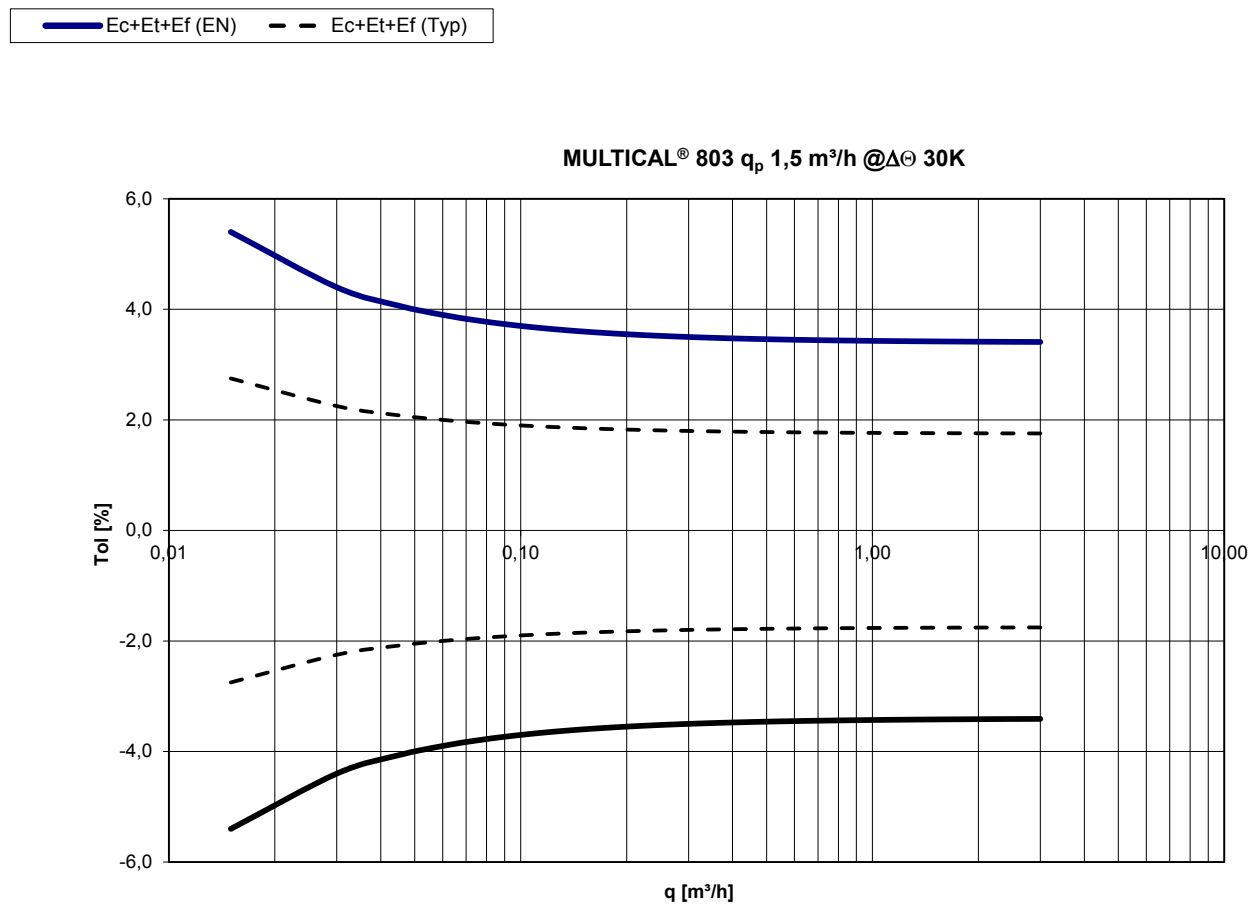
|              |   |
|--------------|---|
| - Type 803-A | Pt100 or Pt500 – EN 60 751, 2-wire or 4-wire connection |
|--------------|---|

## Accuracy

| Heat meter components | MPE according to EN 1434-1                                     | Typical accuracy                       |
|-----------------------|--|--|
| MULTICAL® 803         | $E_c = \pm [0.5 + \Delta\Theta \text{ min}/\Delta\Theta] \%$   | $E_c = \pm [0.15 + 2/\Delta\Theta] \%$ |
| ULTRAFLOW®            | $E_f = \pm [2 + 0.02 q_p/q]$ , but not above $\pm 5 \%$        | $E_f = \pm [1 + 0.01 q_p/q] \%$        |
| Sensor pair           | $E_t = \pm [0.5 + 3 \Delta\Theta \text{ min}/\Delta\Theta] \%$ | $E_t = \pm [0.4 + 4/\Delta\Theta] \%$  |

### MULTICAL® 803 and ULTRAFLOW® $q_p 1.5 \text{ m}^3/\text{h} @ \Delta\Theta 30\text{K}$

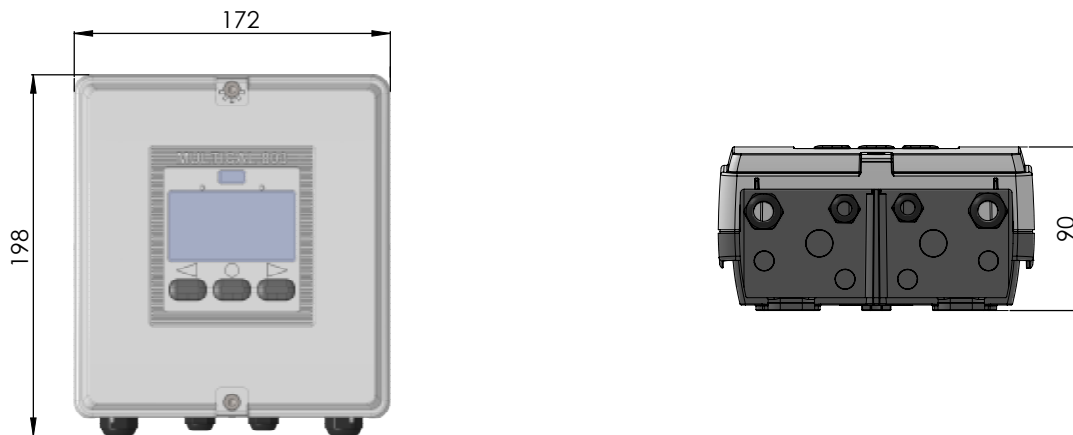
Total typical accuracy of MULTICAL® 803, sensor pair and ULTRAFLOW® compared to EN 1434-1.



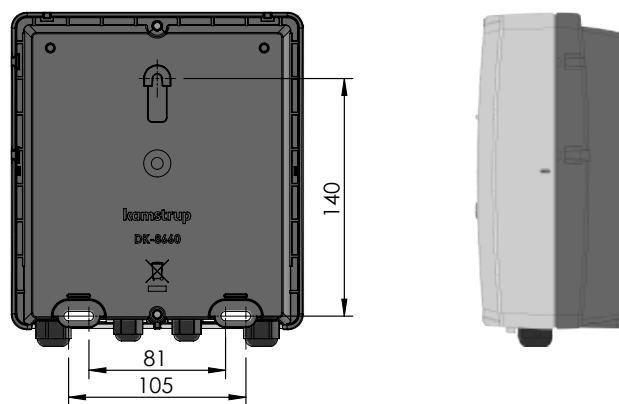
## Dimensioned sketches

All measurements in [mm].

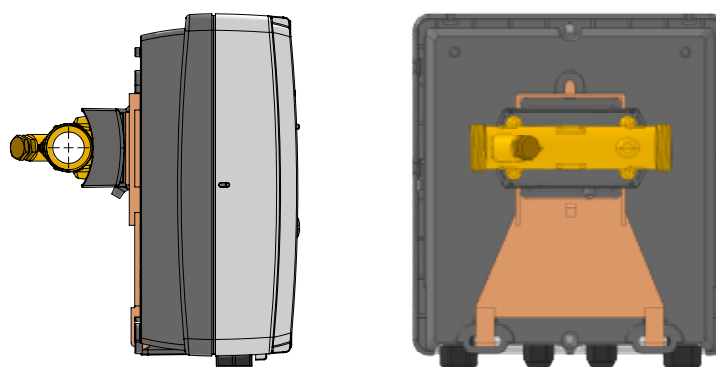
### Mechanical measurements of MULTICAL® 803 calculator



### Calculator base



### MULTICAL® 803 mounted on ULTRAFLOW® with G $\frac{3}{4}$ x 110 mm threaded connection





## Electrical data

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### Calculator data

|                                       |   |
|---------------------------------------|---|
| Display                               | LCD – 7 or 8 digits, 10 mm digit height   |
| Resolutions                           | 999.9999 - 9999.999 - 99999.99 - 999999.9 - 9999999<br>9999.9999 - 99999.999 - 999999.99 - 9999999.9 - 99999999               |
| Energy units                          | MWh – kWh – GJ – Gcal   |
| Data logger (EEPROM)                  | Programmable  |
| – Logging intervals                   | From 1 minute to 1 year   |
| – Logger contents                     | All registers can be selected   |
| – Logger profile                      | Standard: 20 years, 36 months, 460 days, 1400 hours   |
| Info logger (EEPROM)                  | 280 info codes (the latest 50 info codes are shown in the display)  |
| Clock/calender (with backup battery)  | Clock, calendar, leap year compensation, target date  |
| Daylight saving time/wintertime (DST) | Programmable<br>This function can be disabled so that "technical normal time" is used   |
| Clock accuracy                        | Without external adjustment: Less than 15 min./year<br>With external adjustment every 48 hours: Less than 7 s from legal time |
| Data communication                    | KMP protocol with CRC16 used for optical communication and for modules  |
| Power in temperature sensors          | < 10 $\mu$ W RMS  |
| Power supply                          | 3.6 VDC $\pm$ 0.1 VDC   |
| Backup battery                        | 3.6 VDC, 2 x A lithium  |
| Mains supply                          | 230 VAC +15/-30 %, 50/60 Hz<br>24 VAC $\pm$ 50 %, 50/60 Hz or 24 VDC +75/-25 %  |
| Insulation voltage                    | 3.75 kV   |
| Power consumption                     | < 1 W for type 803-0000000-A and b<br>< 7 W for type 803-0000000-C and d  |

## Electrical data

| Temperature measurement   | t1<br>Inlet   | t2<br>Outlet                            | t3<br>Control  | t4<br>Extra                                      | $\Delta\Theta$ (t1-t2)<br>Heat<br>measurement | $\Delta\Theta$ (t2-t1)<br>Cooling<br>measurement | t5<br>Preset for A1 and<br>A2 |
|---|---|---|--|--|---|--|-------------------------------|
| Measuring range<br>803-A, 2/4-wire, Pt100/Pt500<br>803-M, 2/4-wire, Pt100/Pt500 | 0.00...185.00 °C (t1 and t2: approved for 2.00...180.00 °C)<br>-42,00...143,00 °C [labeled -40 °C...140 °C on the meter]  |   |  |  |   |  |                               |
| Offset adjustment   | ± 0.99 K joint zero point adjustment for t1, t2, t3 and t4<br><b>Note:</b> The offset adjustment is only active on measured temperatures. For example, if t3 has been selected for a preset value, the offset adjustment will not influence the preset value. |   |  |  |   |  |                               |
| Max cable lengths<br>(max $\varnothing$ 6 mm cable)                             | Pt100, 2-wire   | Pt100, 4-wire                           | Pt500, 2-wire  | Pt500, 4-wire                                    |   |  |                               |
|   | 2 x 0.25 mm <sup>2</sup> : 2.5 m<br>2 x 0.50 mm <sup>2</sup> : 5 m<br>2 x 1.00 mm <sup>2</sup> : 10 m   | 4 x 0.25 mm <sup>2</sup> : 100 m        | 2 x 0.25 mm <sup>2</sup> : 10 m                            | 4 x 0.25 mm <sup>2</sup> : 100 m                 |   |  |                               |
| Flow measurement V1/V2  | ULTRAFLOW®<br>V1: 9-10-11<br>V2: 9-69-11  | Reed switches<br>V1: 10-11<br>V2: 69-11 | FET switches<br>V1: 10-11<br>V2: 69-11                     | 24 V active pulses<br>V1: 10B-11B<br>V2: 69B-79B |   |  |                               |
| CCC code  | 1xx-2xx-4xx-5xx-8xx   | 0xx                                     | 9xx  | 2xx and 9xx                                      |   |  |                               |
| EN 1434 pulse class   | IC  | IB                                      | IB   | (IA)   |   |  |                               |
| Pulse input   | 680 k $\Omega$ pull-up to 3.6 V   | 680 k $\Omega$ pull-up to 3.6 V         | 680 k $\Omega$ pull-up to 3.6 V                            | 12 mA at 24 V                                    |   |  |                               |
| Pulse ON  | < 0.4 V in > 1 ms   | < 0.4 V in > 300 ms                     | < 0.4 V in > 30 ms   | < 4 V in > 3 ms                                  |   |  |                               |
| Pulse OFF   | > 2.5 V in > 4 ms   | > 2.5 V in > 100 ms                     | > 2.5 V in > 70 ms   | > 12 V in > 4 ms                                 |   |  |                               |
| Pulse frequency   | < 128 Hz  | < 1 Hz                                  | < 8 Hz   | < 128 Hz   |   |  |                               |
| Integration frequency   | < 1 Hz  | < 1 Hz                                  | < 1 Hz   | < 1 Hz   |   |  |                               |
| Electrical isolation  | No  | No                                      | No   | 2 kV   |   |  |                               |
| Max cable length  | 10 m  | 10 m                                    | 10 m   | 100 m  |   |  |                               |
| Max cable length with Cable Extender Box, Type 66-99-036                        | 30 m  | 30 m                                    | 30 m   | -  |   |  |                               |
| Pulse inputs In-A/In-B  | Electronic switch   |   | Reed switch  |  |   |  |                               |
| Pulse input   | 680 k $\Omega$ pull-up to 3.6 V   |   | 680 k $\Omega$ pull-up to 3.6 V                            |  |   |  |                               |
| Pulse ON  | < 0.4 V in > 30 ms  |   | < 0.4 V in > 500 ms  |  |   |  |                               |
| Pulse OFF   | > 2.5 V in > 30 ms  |   | > 2.5 V in > 500 ms  |  |   |  |                               |
| Pulse frequency   | < 3 Hz  |   | < 1 Hz   |  |   |  |                               |
| Electrical isolation  | No  |   | No   |  |   |  |                               |
| Max cable length  | 25 m  |   | 25 m   |  |   |  |                               |
| Requirements to external contact  | Leakage current at function open < 1 $\mu$ A  |   |  |  |   |  |                               |
| Pulse outputs Out-C/Out-D   | HC-003-11 (before 2017-05)<br>HC-003-21/-31 (before 2018-04)  |   | HC-003-11 (after 2017-05)<br>HC-003-21/-31 (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 <sub>CE</sub> $\approx$ 1 V at 10 mA  |   | R <sub>ON</sub> $\leq$ 40 $\Omega$                         |  |   |  |                               |
| Electrical isolation  | 2 kV  |   | 2 kV   |  |   |  |                               |
| Max cable length  | 25 m  |   | 25 m   |  |   |  |                               |

## Product variants

| MULTICAL® 803 type number  |  | Static data<br>Written on<br>the meter's front<br>803-X-X-XX- | Dynamic data<br>Meter<br>Shown on the<br>display<br>X-XX-X- | Dynamic data<br>Module<br>Shown on the display<br>XX-XX-XX-XX |
|--|--|---|---|---|
| Type 803-  |  | □ - □ - □□ -  | □ - □□ - □ -  | □□ - □□ - □□ - □□   |
| <b>Calculator type</b>   |  |   |   |   |
| Pt100/Pt500 2/4-wire, t1-t2-t3-t4. V1-V2, backlit display                    | A  |   |   |   |
| Pt100/Pt500 2/4-wire, t1-t2-t3-t4. V1-V2, backlit display (Mixed fluid only) | M  |   |   |   |
| <b>Meter type</b>  |  |   |   |   |
| Heat meter   | MID module B+D   | 2   |   |   |
| Heat/cooling meter   | MID module B+D & TS 27.02 * $\theta_{HC} = \text{OFF}$ | 3   |   |   |
| Heat meter   | National approval                                      | 4   |   |   |
| Cooling meter  | TS 27.02+BEK1178                                       | 5   |   |   |
| Heat/cooling meter   | MID module B+D & TS 27.02 * $\theta_{HC} = \text{ON}$  | 6   |   |   |
| Volume meter, hot  |  | 7   |   |   |
| Volume meter, cold   |  | 8   |   |   |
| Energy meter   |  | 9   |   |   |
| <b>Country code</b>  |  |   |   |   |
| Determined by Kamstrup upon placement of order                               |  | XX  |   |   |
| <b>Flow sensor connection type</b>   |  |   |   |   |
| 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 sensor with fast and bounce-free electronic pulses         |  |   | C   |   |
| Prepared for flow sensor with slow and bounce-free electronic pulses         |  |   | J   |   |
| Prepared for flow sensor with slow pulses with bounce                        |  |   | L   |   |
| Prepared for flow sensor with 24 V active pulses                             |  |   | P   |   |
| Delivered with one flow sensor (Mixed fluid only)                            |  |   | G   |   |
| <b>Temperature sensor set</b>  |  |   |   |   |
| Supplied without temperature sensors   |  |   | 00  |   |
| <b>2-wire Pt500 temperature sensors</b>                                      |  |   |   |   |
| Direct short temperature sensors, 2 pcs.                                     | DS 27.5 mm   | L 1.5 m - 3.0 m   | 5x  |   |
| Direct short temperature sensors, 2 pcs.                                     | DS 38.0 mm   | L 1.5 m - 3.0 m   | 2x  |   |
| Pocket temperature sensors, 2/3 pcs.   | PL ø5.8 mm   | L 1.5 m - 10 m  | 8x  |   |
| <b>2-wire Pt100 temperature sensors</b>                                      |  |   |   |   |
| Direct short temperature sensors, 2 pcs.                                     | DS 27.5 mm or DS 38.0 mm                               | L 2.0 m   | Jx  |   |
| <b>4-wire Pt500/Pt100 temperature sensors</b>                                |  |   |   |   |
| Pocket temperature sensors with connection head, 2 pcs.                      | PL ø6.0 mm   | L 105 mm - 230 mm   | Ax  |   |
| Pocket temperature sensors with connection head, 2 pcs.                      | PL ø5.8 mm   | L 65 mm - 180 mm  | Cx  |   |
| <b>Supply modules</b>  |  |   |   |   |
| 1 x 230 VAC  | supply of 2 communication modules (M1+M2)              |   | A   |   |
| 1 x 24 VAC/VDC   | supply of 2 communication modules (M1+M2)              |   | b   |   |
| 2 x 230 VAC  | supply of 4 communication modules (M1+M2+M3+M4)        | 1 x 24 VDC auxiliary supply                                   | C   |   |
| 2 x 24 VAC/VDC   | supply of 4 communication modules (M1+M2+M3+M4)        | 1 x 24 VDC auxiliary supply                                   | d   |   |

\* In some countries bi-functional meters type 3 and 6 are only allowed to be assigned with the MID marking, due to national law.

## Product variants

| MULTICAL® 803 type number                                  | Static data<br>Written on<br>the meter's front   | Dynamic data<br>Meter<br>Shown on the<br>display | Dynamic data<br>Module<br>Shown on the display |    |    |    |
|--|--|--|--|----|----|----|
|  | 803-X-X-XX-                                      | X-XX-X-  | XX-XX-XX-XX                                    |    |    |    |
| Type 803-  | □ - □ - □□ - □ - □□ - □ - □□ - □□ - □□ - □□ - □□ |  |  |    |    |    |
| Communication module (4 module slots)                      |  |  | M1   | M2 | M3 | M4 |
| No module  |  |  | 00   | 00 | 00 | 00 |
| Data Pulse, inputs (In-A, In-B)                            |  |  | 10   | 10 | 10 | 10 |
| Data Pulse, outputs (Out-C, Out-D)                         |  |  | 11   | 11 | 11 | 11 |
| Wired M-Bus, inputs (In-A, In-B)                           |  |  | 20   | 20 | 20 | 20 |
| Wired M-Bus, outputs (Out-C, Out-D)                        |  |  | 21   | 21 | 21 | 21 |
| Wired M-Bus, Thermal Disconnect                            |  |  | 22   | 22 | 22 | 22 |
| linkIQ/wM-Bus, inputs (In-A, In-B), EU                     |  |  | 32   | 32 |    |    |
| linkIQ/wM-Bus, outputs (Out-C, Out-D), EU                  |  |  | 33   | 33 |    |    |
| wM-Bus, inputs (In-A, In-B), 912,5/915/918,5 MHz           |  |  | 34   | 34 |    |    |
| Analog outputs 2 x 0/4...20 mA                             |  |  |  |    | 40 | 40 |
| Analog inputs 2 x 4...20 mA/0...10 V                       |  |  |  |    | 41 |    |
| PQT Controller   |  |  |  |    | 43 |    |
| Low Power Radio, inputs (In-A, In-B), 434 MHz              |  |  | 50   | 50 |    |    |
| Low Power Radio GDPR, inputs (In-A, In-B), 434 MHz         |  |  | 51   | 51 |    |    |
| NB-IoT, inputs (In-A, In-B)                                |  |  | 56   | 56 |    |    |
| LON TP/FT-10, inputs (In-A, In-B)                          |  |  | 60   | 60 | 60 | 60 |
| BACnet MS/TP, inputs (In-A, In-B)                          |  |  | 66   | 66 | 66 | 66 |
| Modbus RTU, inputs (In-A, In-B)                            |  |  | 67   | 67 | 67 | 67 |
| 2G/4G Network  |  |  | 80   | 80 |    |    |
| BACnet IP, inputs (In-A, In-B)                             |  |  | 81   | 81 | 81 | 81 |
| Modbus/KMP TCP/IP, inputs (In-A, In-B)                     |  |  | 82   | 82 | 82 | 82 |
| READy TCP/IP, inputs (In-A, In-B)                          |  |  | 83   | 83 | 83 | 83 |
| High Power Radio Router, inputs (In-A, In-B), 444 MHz      |  |  | 84   | 84 |    |    |
| High Power Radio Router GDPR, inputs (In-A, In-B), 444 MHz |  |  | 85   | 85 |    |    |

Please contact Kamstrup A/S for further information about product variants.

## Meter configuration

|  | A | B | CCC | DDD | EE | FF | GG | L | M | N | PP | RR | T | VVV   |
|--|---|---|-----|-----|----|----|----|---|---|---|----|----|---|-------|
| <b>Flow sensor position</b>                              |   |   |     |     |    |    |    |   |   |   |    |    |   |       |
| Inlet  |   | 3 |     |     |    |    |    |   |   |   |    |    |   |       |
| Outlet   |   | 4 |     |     |    |    |    |   |   |   |    |    |   |       |
| <b>Measuring unit</b>                                    |   |   |     |     |    |    |    |   |   |   |    |    |   |       |
| GJ   |   | 2 |     |     |    |    |    |   |   |   |    |    |   |       |
| kWh  |   | 3 |     |     |    |    |    |   |   |   |    |    |   |       |
| MWh  |   | 4 |     |     |    |    |    |   |   |   |    |    |   |       |
| Gcal   |   | 5 |     |     |    |    |    |   |   |   |    |    |   |       |
| <b>Auto Detect CCC codes (ULTRAFLOW® x4)</b>             |   |   |     |     |    |    |    |   |   |   |    |    |   |       |
| Normal resolution (7 digits)                             |   |   |     |     |    |    |    |   |   |   |    |    |   | 807   |
| Normal resolution (8 digits)                             |   |   |     |     |    |    |    |   |   |   |    |    |   | 808   |
| High resolution (8 digits)                               |   |   |     |     |    |    |    |   |   |   |    |    |   | 818   |
| <b>Static CCC codes</b>                                  |   |   |     |     |    |    |    |   |   |   |    |    |   |       |
| Reed contact (7 digits)                                  |   |   |     |     |    |    |    |   |   |   |    |    |   | 0xx   |
| Electronic, fast pulses (7 digits)                       |   |   |     |     |    |    |    |   |   |   |    |    |   | 1xx   |
| Electronic, fast pulses (8 digits)                       |   |   |     |     |    |    |    |   |   |   |    |    |   | 2xx   |
| Kamstrup, UF X4 (7 digits)                               |   |   |     |     |    |    |    |   |   |   |    |    |   | 4xx   |
| Kamstrup, UF X4 (8 digits)                               |   |   |     |     |    |    |    |   |   |   |    |    |   | 5xx   |
| Electronic, slow pulses (7 digits)                       |   |   |     |     |    |    |    |   |   |   |    |    |   | 9xx   |
| <b>Display</b>   |   |   |     |     |    |    |    |   |   |   |    |    |   |       |
| Heat meter (standard)                                    |   |   |     |     |    |    |    |   |   |   |    |    |   | 210   |
| Heat/cooling meter (standard)                            |   |   |     |     |    |    |    |   |   |   |    |    |   | 310   |
| Cooling meter (standard)                                 |   |   |     |     |    |    |    |   |   |   |    |    |   | 510   |
| <b>Tariffs</b>   |   |   |     |     |    |    |    |   |   |   |    |    |   |       |
| 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    |
| <b>Pulse inputs In-A/In-B</b>                            |   |   |     |     |    |    |    |   |   |   |    |    |   |       |
| 10 m <sup>3</sup> /h, 10 l/imp, pre-counter 1 (standard) |   |   |     |     |    |    |    |   |   |   |    |    |   | 24 24 |
| <b>Integration mode</b>                                  |   |   |     |     |    |    |    |   |   |   |    |    |   |       |
| Fast mode (2 s)  |   |   |     |     |    |    |    |   |   |   |    |    |   | 4     |
| Fast mode (2 s)  |   |   |     |     |    |    |    |   |   |   |    |    |   | 9     |
| <b>Leakage limits (V1/V2)</b>                            |   |   |     |     |    |    |    |   |   |   |    |    |   |       |
| OFF  |   |   |     |     |    |    |    |   |   |   |    |    |   | 0     |
| 1.0 % of q <sub>p</sub> + 20 % of q                      |   |   |     |     |    |    |    |   |   |   |    |    |   | 1     |
| 1.0 % of q <sub>p</sub> + 10 % of q                      |   |   |     |     |    |    |    |   |   |   |    |    |   | 2     |
| 0.5 % of q <sub>p</sub> + 20 % of q                      |   |   |     |     |    |    |    |   |   |   |    |    |   | 3     |
| 0.5 % of q <sub>p</sub> + 10 % of q                      |   |   |     |     |    |    |    |   |   |   |    |    |   | 4     |
| <b>Cold water leakage limits (In-A/In-B)</b>             |   |   |     |     |    |    |    |   |   |   |    |    |   |       |
| OFF  |   |   |     |     |    |    |    |   |   |   |    |    |   | 0     |
| 30 min. without pulses                                   |   |   |     |     |    |    |    |   |   |   |    |    |   | 1     |
| One hour without pulses                                  |   |   |     |     |    |    |    |   |   |   |    |    |   | 2     |
| Two hours without pulses                                 |   |   |     |     |    |    |    |   |   |   |    |    |   | 3     |

## Meter configuration

A - B - CCC - DDD - EE - FF - GG - L - M - N - PP - RR - T - VVV

### Pulse outputs Out-C/Out-D

|  |                |    |
|--|----------------|----|
| Out-C: V1/4                              | 5 ms           | 73 |
| Out-C: V1/4 Out-D: V2/1                  | 3.9 ms         | 80 |
| Out-C: V1/1                              | 3.9 ms         | 82 |
| Out-C: V1/4                              | 22 ms          | 83 |
| E1 and V1 or E3 and V1                   | 10 ms          | 94 |
| E1 and V1 or E3 and V1                   | 32 ms          | 95 |
| E1 and V1 or E3 and V1                   | 100 ms (0.1 s) | 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 |
|---------------|------|

Please contact Kamstrup A/S for further information about meter configuration.

## Information codes in display

| Display digit |    |    |       |    |    |      |      | Description  |
|---------------|----|----|-------|----|----|------|------|--|
| 1             | 2  | 3  | 4     | 5  | 6  | 7    | 8    |  |
| Info          | t1 | t2 | t3/t4 | V1 | V2 | In-A | In-B |  |
| 1             |    |    |       |    |    |      |      | Supply voltage interrupted                           |
| 2             |    |    |       |    |    |      |      | The meter is supplied by the backup battery          |
| 9             |    |    |       |    |    |      |      | External alarm (e.g. via KMP)                        |
|               | 1  |    |       |    |    |      |      | t1 above measuring range or switched off             |
|               |    | 1  |       |    |    |      |      | t2 above measuring range or switched off             |
|               |    |    | 1     |    |    |      |      | t3/t4 above measuring range or switched off          |
|               | 2  |    |       |    |    |      |      | t1 below measuring range or short-circuited          |
|               |    | 2  |       |    |    |      |      | t2 below measuring range or short-circuited          |
|               |    |    | 2     |    |    |      |      | t3/t4 below measuring range or short-circuited       |
|               | 9  | 9  |       |    |    |      |      | t1-t2 Invalid temperature difference                 |
|               |    |    |       | 1  |    |      |      | V1 Communication error                               |
|               |    |    |       |    | 1  |      |      | V2 Communication error                               |
|               |    |    |       | 2  |    |      |      | V1 Wrong pulse figure                                |
|               |    |    |       |    | 2  |      |      | V2 Wrong pulse figure                                |
|               |    |    |       | 3  |    |      |      | V1 Air   |
|               |    |    |       |    | 3  |      |      | V2 Air   |
|               |    |    |       | 4  |    |      |      | V1 Wrong flow direction                              |
|               |    |    |       |    | 4  |      |      | V2 Wrong flow direction                              |
|               |    |    |       | 6  |    |      |      | V1 Increased flow (flow1 > qs, for more than 1 hour) |
|               |    |    |       |    | 6  |      |      | V2 Increased flow (flow2 > qs, for more than 1 hour) |
|               |    |    |       | 7  |    |      |      | V1/V2 Burst, water loss (flow1 > flow2)              |
|               |    |    |       |    | 7  |      |      | V1/V2 Burst, water penetration (flow1 < flow2)       |
|               |    |    |       | 8  |    |      |      | V1/V2 Leakage, water loss (M1 > M2)                  |
|               |    |    |       |    | 8  |      |      | V1/V2 Leakage, water penetration (M1 < M2)           |
|               |    |    |       |    |    | 7    |      | In-A2 Leakage in the system                          |
|               |    |    |       |    |    | 8    |      | In-A1 Leakage in the system                          |
|               |    |    |       |    |    | 9    |      | In-A1/A2 External alarm                              |
|               |    |    |       |    |    |      | 7    | In-B2 Leakage in the system                          |
|               |    |    |       |    |    |      | 8    | In-B1 Leakage in the system                          |
|               |    |    |       |    |    |      | 9    | In-B1/B2 External alarm                              |

### Example:

|   |   |   |   |   |   |   |   |  |
|---|---|---|---|---|---|---|---|--|
| 1 | 0 | 2 | 0 | 6 | 7 | 9 | 9 |  |
|---|---|---|---|---|---|---|---|--|

**Note:** Info codes are configurable. Therefore, it is not certain that all the parameters to the left are available in a given MULTICAL® 803.

An info logger saves the info code every time the info code is changed. It is possible to read the latest 280 changes of the information code as well as the dates of the changes.

## Accessories

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| Article number | Description  |
|----------------|--|
| HC-993-10      | Backup battery, 2xA-cells  |
| HC-993-11      | 230 VAC supply module  |
| HC-993-12      | 24 VAC/VDC supply module   |
| HC-993-13      | 230 VAC til 24 VDC auxiliary supply module                                     |
| HC-993-14      | 24 VAC/VDC til 24 VDC auxiliary supply module                                  |
| 3026-517       | Sealing cap for temperature sensors, blue 2 pcs.                               |
| 3026-518       | Sealing cap for temperature sensors, red 2 pcs.                                |
| 3026-857       | Bracket for ULTRAFLOW®   |
| 3130-262       | Blind plug with O-ring   |
| 5000-337       | Module cable, 2 m [2 x 0.25 mm <sup>2</sup> ]                                  |
| 5000-503       | Connection cable 3,6 VDC (red/black cable with two white connectors)           |
| 5000-504       | Connection cable 24 VDC for modules (red/black cable with one white connector) |
| 5000-505       | Connection cable 230 VAC / 24 VAC/VDC (white cables with black connectors)     |
| 6699-035       | USB module configuration cable   |
| 6699-036       | Cable Extender Box   |
| 6699-042       | Metal plate for optical read-out head (20 pcs)                                 |
| 6699-045       | Connection PCB 24V pulses  |
| 6699-048       | Supply label MULTICAL® 803, 10 pcs. (2006-776)                                 |
| 6699-049       | Connection PCB 230 VAC (green)   |
| 6699-050       | Connection PCB 24 VAC/VDC (blue)   |
| 6699-099       | Infrared optical read-out head w/USB plug                                      |
| 6699-403       | 230/24 VAC safety transformer 5 VA   |
| 6699-404       | 230/24 VAC safety transformer 10 VA  |
| 6699-405       | 230/12/24 VAC safety transformer 63 VA   |
| 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  |
|----------------|--|
| 6699-361       | 2/4-wire Pt500, heat/cooling (used with METERTOOL HCW) |
| 6699-362       | 2/4-wire Pt100, heat/cooling (used with METERTOOL HCW) |

For further information on MULTICAL® 803 and it's accessories, please refer to the technical description, which you can find on [Kamstrup Product Centre](#).

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