

Data Sheet

MULTICAL® 603 and MULTICAL® 803

- Fully programmable data logger with minute loggers
- 2-second integration interval
- 2/4 communication modules
- 7- or 8-digit display resolution
- User-friendly interface with 3 push buttons
- IP65 protection class
- Auto Detect of Kamstrup's ULTRAFLOW®
- Mixed fluid compatible



MID 2014/32/EU

CE **M25** 0200

EN 1434

DK-BEK 1178 – 06/11/2014



EN 1434



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Description

MULTICAL® 603 is a robust and versatile calculator, suitable as a heat meter, cooling meter, or combined heat/cooling meter.

MULTICAL® 603 can, in addition to heat and cooling measurement, be used for leak monitoring, permanent operation monitoring (PDO), power, flow, and temperature limiter with valve control, as well as energy measurement in both open and closed systems.

MULTICAL® 603 has 2 flow sensor inputs, which can be used for both electronic and mechanical flow sensors. The pulse value can be programmed from 0.001 to 300 pulses/liter, and the calculator can be programmed for all nominal flow sensor sizes from 0.6 to 15,000 m³/h. The calculator can be supplied with both galvanically coupled and separated flow sensor inputs.

The summarized heat energy and/or cooling energy can be displayed in kWh, MWh, GJ, or Gcal, all with seven or eight significant digits and unit of measurement. The display is specially designed to achieve long life and high contrast over a wide temperature range. MULTICAL® 603 can also be supplied in a version with a backlit display (type 603-F).

MULTICAL® 603 is powered by an internal D-cell lithium battery with up to 16 years of life or a 2xA lithium pack with up to 9 years of life. Alternatively, the meter can be powered either from 24 VAC/VDC or 230 VAC.

Auto Detect UF allows for the replacement of ULTRAFLOW® X4 on MULTICAL® 603 without the need for reconfiguration (changing the CCC code). MULTICAL® 603 can automatically adjust the pulse count and qp to match the connected ULTRAFLOW® X4.

MULTICAL® 803 is a robust and versatile calculator, suitable as a heat meter, cooling meter, or combined heat/cooling meter.

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

MULTICAL® 803 has 2 flow sensor inputs, which can be used for both electronic and mechanical flow sensors. The pulse value can be programmed from 0.001 to 300 pulses/liter, and the calculator can be programmed for all nominal flow sensor sizes from 0.6 to 15,000 m³/h. The calculator is supplied as standard with galvanically coupled flow sensor inputs, suitable for ULTRAFLOW® and, for example, Reed contacts. Additionally, a connection board with 2 galvanically isolated flow sensor inputs can be supplied.

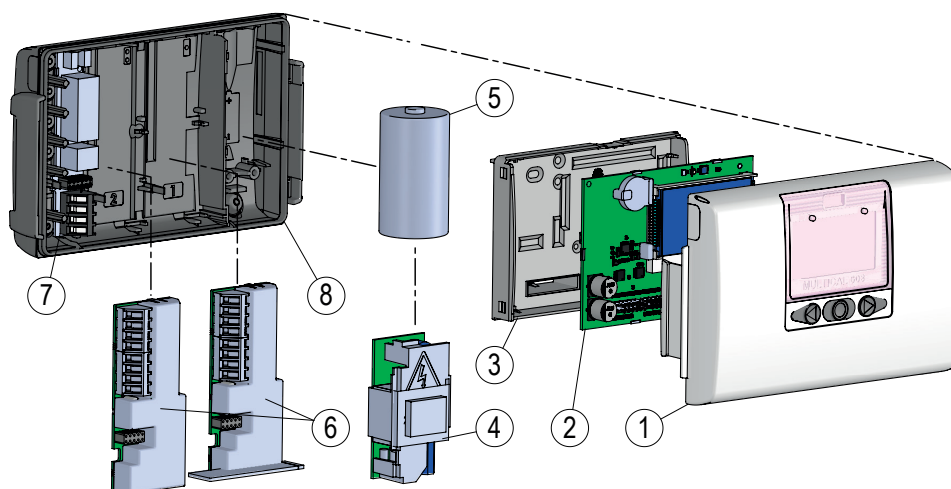
The summarized heat energy and/or cooling energy can be displayed in kWh, MWh, GJ, or Gcal, all with 7 or 8 significant digits and unit of measurement. The display is specially designed to achieve long life and high contrast over a wide temperature range, and MULTICAL® 803 has a backlit display as standard.

MULTICAL® 803 is powered either from 24 VAC/DC or 230 VAC. An internal battery backup ensures that the meter continues energy measurement for 6 years in the event of a power failure. There is also the option to connect battery backup to module slot M1, allowing, for example, M-Bus or wM-Bus to continue functioning during a power failure.

Auto Detect UF allows for the replacement of ULTRAFLOW® X4 on MULTICAL® 803 without the need for reconfiguration (changing the CCC code). MULTICAL® 803 can automatically adjust the pulse count and qp to match the connected ULTRAFLOW® X4.



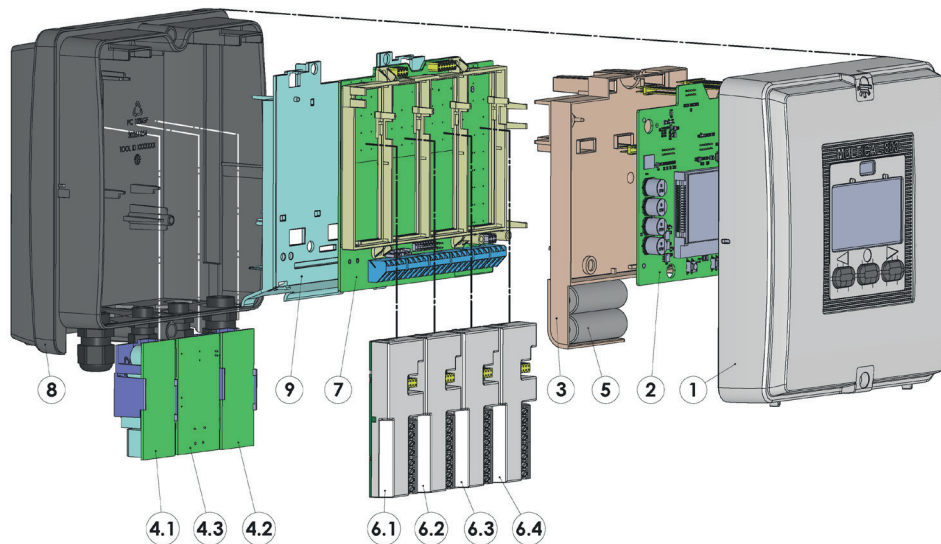
Mechanical design MULTICAL® 603



- | | | | |
|---|---|---|---|
| 1 | Calculator top with front buttons and laser engraving | 5 | ...or a battery can be mounted |
| 2 | PCB with microcontroller, display, etc. | 6 | 1 or 2 communication modules |
| 3 | Verification cover (may only be opened at an authorized laboratory) | 7 | Connection of temperature sensors and flow meters |
| 4 | Either a power supply module can be mounted... | 8 | Calculator bottom |



Mechanical design MULTICAL® 803



- | | | | |
|-----|---|-----|--|
| 1 | Top cover with front buttons 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 authorized laboratory) | 6.3 | Module slot M3 |
| 4.1 | Mandatory power supply | 6.4 | Module slot M4 |
| 4.2 | Optional power supply | 7 | Connection board |
| 4.3 | Optional power supply (isolated 24 VDC) | 8 | Bottom cover with cable glands |
| 5 | Backup battery | 9 | Power supply cover (may only be removed by authorized personnel) |



Mechanical data

	MULTICAL® 603	MULTICAL® 803
Weight	450 g	1150 g including backup battery
Ambient temperature	5...55 °C. Non-condensing, closed location (indoor installation)	
Protection class	IP65	
Media temperatures in ULTRAFLOW®	2...130 °C	
	For media temperatures below ambient temperature or above 90 °C, wall mounting of the calculator is recommended.	
Media in ULTRAFLOW®	Water (district heating water as described in CEN TR 16911 and AGFW FW510)*	
Storage temperature	-25...60 °C (drained meter)	
Connection cable	ø3.5...6 mm	M12: ø3...8 mm M16: ø4...10 mm
Supply cable	ø5...8 mm	ø4...10 mm

* MULTICAL® 603 and MULTICAL® 803 are not approved for use with drinking water.

Materials

	MULTICAL® 603	MULTICAL® 803
Calculator housing		
Top and bottom	Thermoplastic, PC 10% GF with TPE (thermoplastic elastomer)	
Verification cover	ABS	
Cables	Silicone cable with internal Teflon insulation	
Molded plastic parts		Thermoplastic, PC 10% GF
Gasket	TPE (thermoplastic elastomer)	Neoprene rubber
Push buttons	TPE (thermoplastic elastomer)	EPDM rubber



Approved meter data

	MULTICAL® 603	MULTICAL® 803
Approvals		
Heat meter	DK-0200-MI004-040	DK-0200-MI004-042
– Temperature range	θ : 2 °C...180 °C	
– Differential range	$\Delta\theta$: 3 K...178 K	
Cooling meter	TS 27.02 012	TS 27.02 013
– Temperature range	θ : 2 °C...180 °C	
– Differential range	$\Delta\theta$: 3 K...178 K	
Dual-function heat/cooling meter	Labeled with DK-0200-MI004-040 and TS 27.02 012 as well as year mark as MID	Labeled with DK-0200-MI004-042 and TS 27.02 013, as well as year mark as MID
– Temperature range	θ : 2 °C...180 °C	
– Differential range	$\Delta\theta$: 3 K...178 K	
	The specified minimum temperatures are only 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.	
Mixed fluid meter	EN 1434 without MID approval	
– Temperature range	θ : -40 °C...140 °C	
– Differential range	$\Delta\theta$: 3 K...180 K	
	The temperature range -40 °C ...140 °C indicates the technical operating range in which the calculator calculates energy. The temperature range for any installation depends on the design of the installation and the type of fluid and solution used.	
Standards and Norms	EN 1434:2007/AC:2007 EN 1434:2015+A1:2018 EN 1434:2022	EN 1434:2007/AC:2007 EN 1434:2015+A1:2018 FprEN 1434:2022 from 2022-04
EU directives	Measuring Instruments Directive (MID) Low Voltage Directive (LVD) Electromagnetic Compatibility Directive (EMC) Radio Equipment Directive (RED) Restriction of Hazardous Substances Directive (RoHS) Pressure Equipment Directive (PED)	
EN 1434 designation	Environmental Class A and C	
MID designation		
Mechanical environment	Class M1 and M2	
Electromagnetic environment	Class E1 and E2	
	5...55 °C. Non-condensing, enclosed location (indoor installation)	
Temperature Sensor Connection		
Type 603-A	Pt100 – EN 60751, 2-wire connection	
Type 603-B	Pt100 – EN 60751, 4-wire connection	
Type 603-C/E/F/M/S	Pt500 – EN 60751, 2-wire connection	
Type 603-D/G/H/U	Pt500 – EN 60751, 4-wire connection	
Type 803-A/M		Pt100 or Pt500 – EN 60751, 2- or 4-wire connection

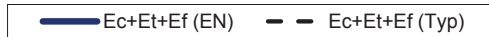


Accuracy

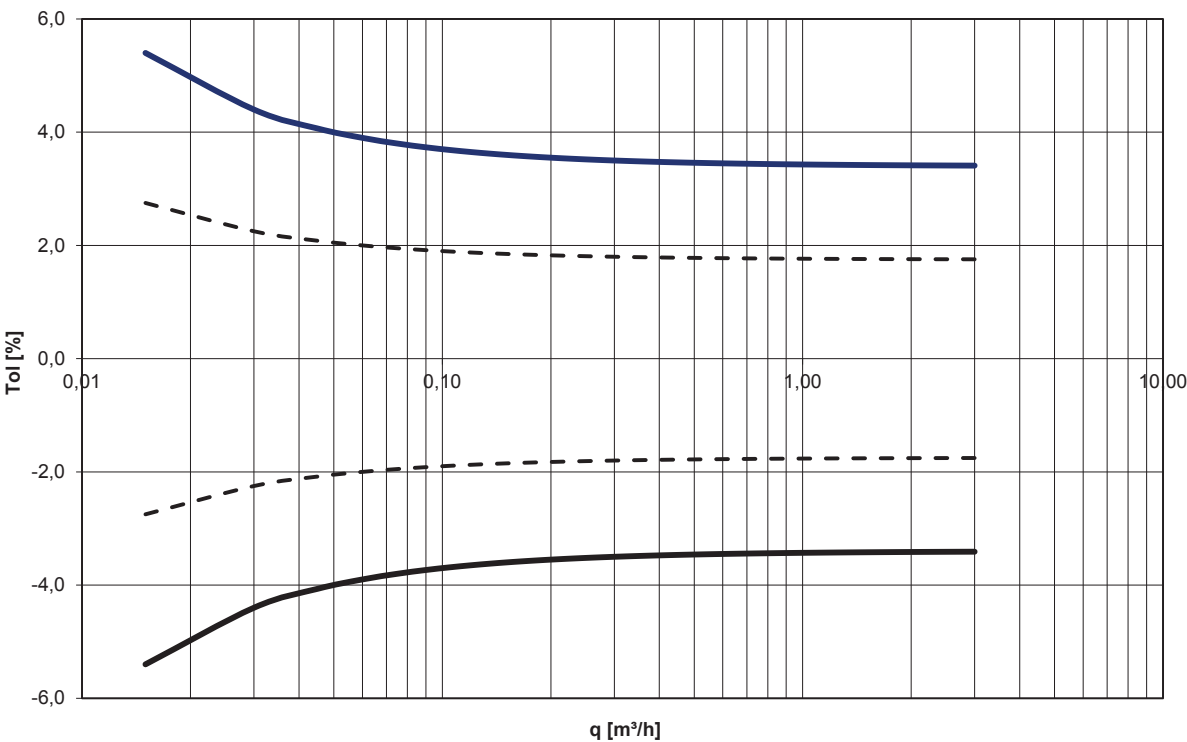
Heat meter components	MPE according to EN 1434-1	Typical accuracy
Calculator	$E_c = \pm [0.5 + \Delta\Theta \text{ min}/\Delta\Theta] \%$	$E_c = \pm [0.15 + 2/\Delta\Theta] \%$
ULTRAFLOW®	$E_f = \pm [2 + 0.02 q_p/q]$, but not exceeding $\pm 5 \%$	$E_f = \pm [1 + 0.01 q_p/q] \%$
Temperature sensor set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

MULTICAL® 603/MULTICAL® 803 and ULTRAFLOW® $q_p 1.5 \text{ m}^3/\text{h} @ \Delta\Theta 30\text{K}$

Overall typical accuracy for MULTICAL® 603 and MULTICAL® 803, sensor pair, and ULTRAFLOW® compared to EN 1434-1.



MULTICAL® 603 and MULTICAL® 803 $q_p 1.5 \text{ m}^3/\text{h} @ \Delta\Theta 30\text{K}$

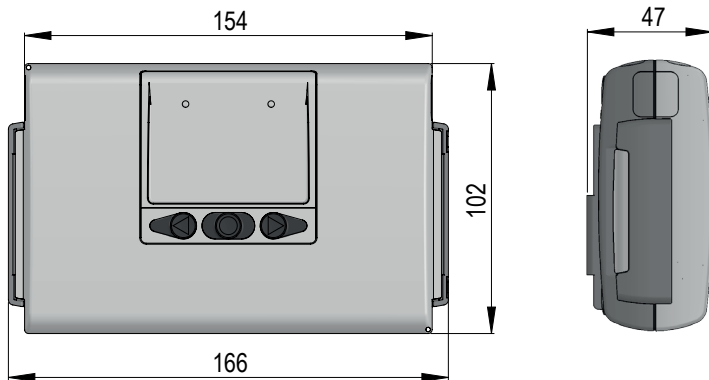




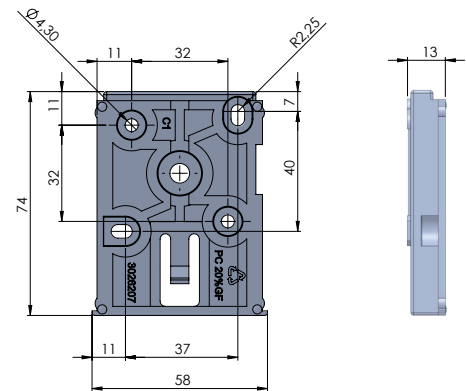
Dimensions MULTICAL® 603

All dimensions in [mm]

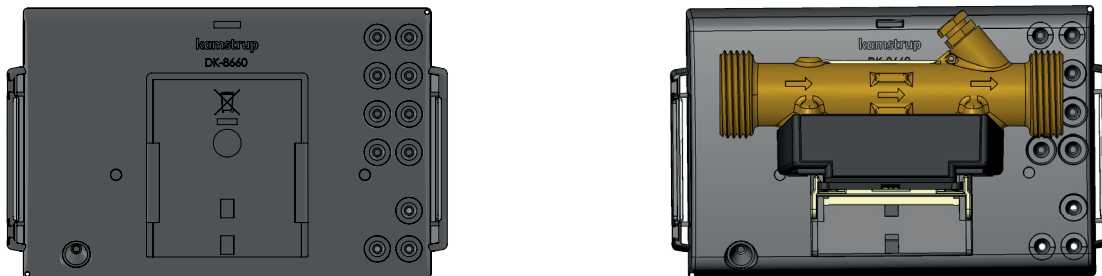
Mechanical dimensions for MULTICAL® 603 calculator



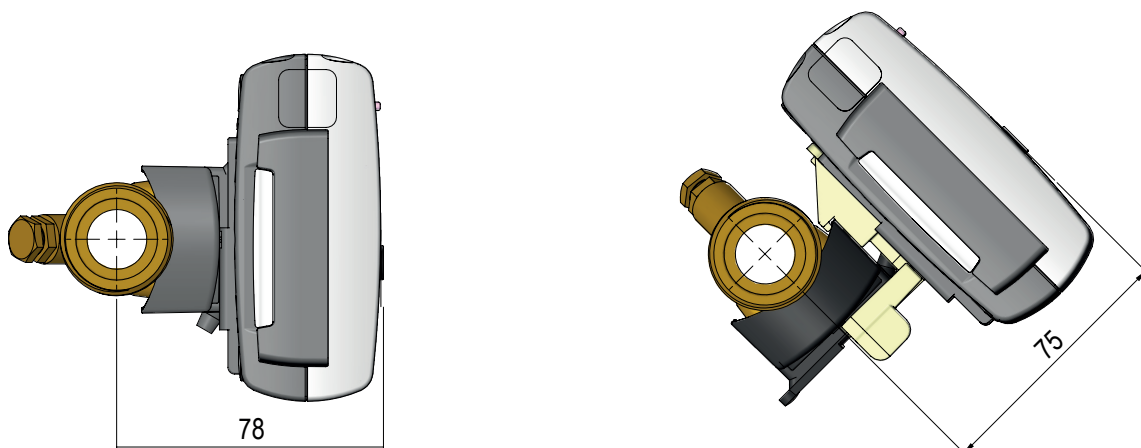
Bracket for wall mounting



Calculator base separate and mounted on ULTRAFLOW®



MULTICAL® 603 mounted on ULTRAFLOW® with G $\frac{3}{4}$ threaded connection

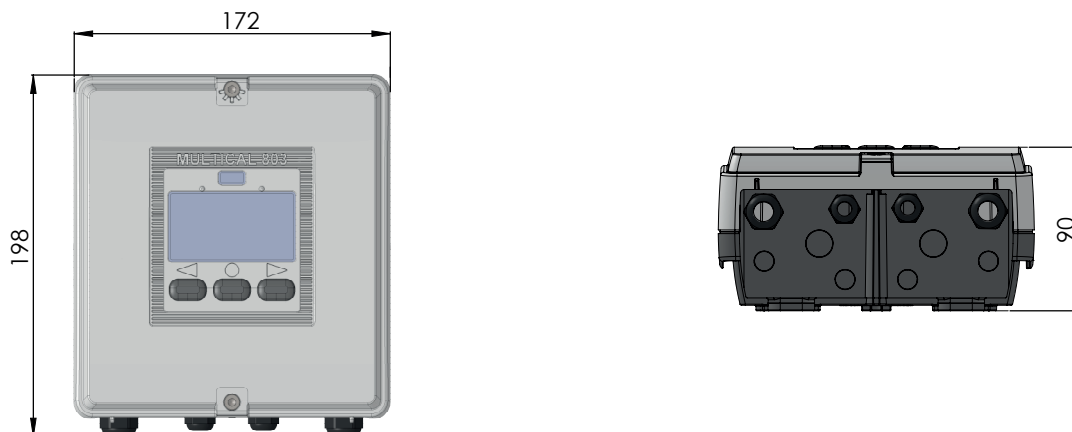




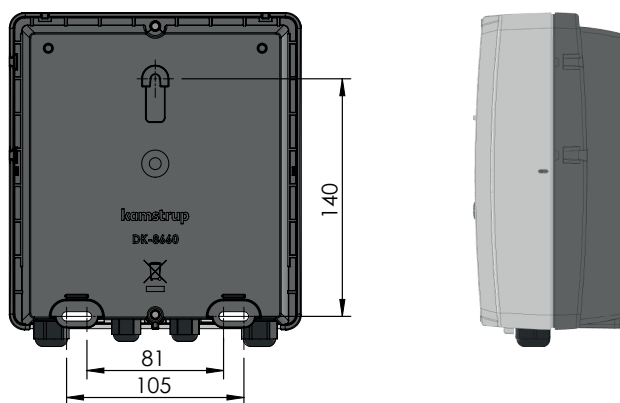
Dimensions MULTICAL® 803

All dimensions in [mm]

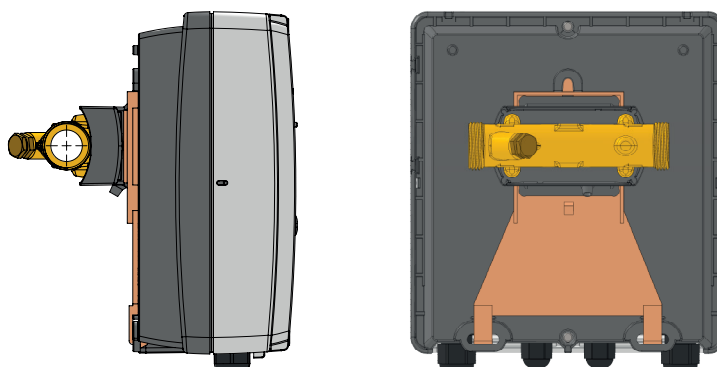
Mechanical dimensions for calculator



Calculator base



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





Electrical data

	MULTICAL® 603		MULTICAL® 803
Calculator data			
Display	LCD – 7 or 8 digits with 8.2 mm digit height		LCD – 7 or 8 digits with 10 mm digit height
Resolutions	9999.999 – 99999.99 – 999999.9 – 9999999 99999.999 – 999999.99 – 9999999.9 – 99999999		
Energy units	MWh – kWh – GJ – Gcal		
Data logger (EEPROM)			
Logger content	Programmable - all registers can be selected		
Logging interval	Programmable - from 1 minute to 1 year		
Logger depth	Programmable - standard: 20 years, 36 months, 460 days, 72 hours		
Info logger (EEPROM)	250 info codes (50 most recent displayed)		280 info codes (50 most recent displayed)
Clock/calendar	Clock, calendar, leap year compensation, cut-off date		
Daylight saving time	Programmable Function can be disabled to use "technical standard time"		
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 and modules		
Power in temperature sensors	< 10 µ W RMS		
Supply voltage	3.6 VDC ± 0.1 VDC		
Battery			
Type lithium	3.65 VDC 1 x D-cell	3.65 VDC 2 x A-cell	
Lifetime			
Mounted on wall	16 years @ t _{BAT} < 30 °C	9 years @ t _{BAT} < 30 °C	
Mounted on flow sensor	14 years @ t _{BAT} < 40 °C	7 years @ t _{BAT} < 40 °C	
	Battery lifetime depends on meter and module configuration		
Mains supply	230 VAC +15/-30 %, 50/60 Hz 24 VAC ±50%, 50/60 Hz or 24 VDC +75/-25% [24 VDC only High Power SMPS]		230 VAC +15/-30 %, 50/60 Hz 24 VAC ±50%, 50/60 Hz or 24 VDC +75/-25%
Insulation voltage	3.75 kV		
Power consumption	< 1 W		< 1 W til type 803-0000000-A and b < 7 W til type 803-0000000-C and d
Backup supply	Built-in supercap eliminates downtime during short power outages (only for power module type 7 and 8)		
Backup battery			3.65 VDC, 2 x A-cell



Electrical data

Temperature Measurement	t1 Inlet	t2 Outlet	t3 Control	t4 Extra	ΔΘ (t1-t2) Heat measure- ment	ΔΘ (t2-t1) Cooling measure- ment	t5 Preset for A1 and A2
Measurement Range 603-A, 2-wire, Pt100 603-B, 4-wire, Pt100 603-C/E/F/S, 2-wire, Pt500 603-D/G/H/U, 4-wire, Pt500 603-M, 2-wire, Pt500 803-A, 2/4-wire, Pt100/Pt500 803-M, 2/4-wire, Pt100/Pt500	0.00...185.00 °C (t1 and t2: approved for 2.00...180.00 °C) 0.00...185.00 °C (t1 and t2: approved for 2.00...180.00 °C) 0.00...185.00 °C (t1 and t2: approved for 2.00...180.00 °C) 0.00...185.00 °C (t1 and t2: approved for 2.00...180.00 °C) -42.00...143.00 °C (marked -40 °C...140 °C on the calculator) 0.00...185.00 °C (t1 and t2: approved for 2.00...180.00 °C) -42.00...143.00 °C (marked -40 °C...140 °C on the calculator)						
Offset adjustment	± 0.99 K common zero-point adjustment for t1, t2, t3, and t4 Note: The offset adjustment is only active on measured temperatures. For example, if t3 is set to a preset value, the offset adjustment will not affect the preset value.						
Maximum cable lengths MULTICAL® 603: max ø6 mm cable MULTICAL® 803: max ø8 mm cable	Pt100, 2-wire	Pt100, 4-wire		Pt500, 2-wire		Pt500, 4-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	4 x 0.25 mm ² : 100 m		2 x 0.25 mm ² : 10 m		4 x 0.25 mm ² : 100 m	
Flow measurement V1/V2	ULTRAFLOW® V1: 9-10-11 V2: 9-69-11	Reed contacts V1: 10-11 V2: 69-11		FET contacts V1: 10-11 V2: 69-11		24 V active pulses V1: 10B-11B V2: 69B-79B	
CCC code	1xx-2xx-4xx-5xx-8xx	0xx		9xx		2xx og 9xx	
EN 1434 pulse class	IC	IB		IB		[IA]	
Pulse input	680 kΩ pull-up to 3.6 V	680 kΩ pull-up to 3.6 V		680 kΩ 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	
Maximum cable length	10 m	10 m		10 m		100 m	
Maximum cable length with cable Extender Box, Type 66-99-036	30 m	30 m		30 m		-	
Pulse inputs In-A/In-B	Electronic contact			Reed contact			
Pulse input	680 kΩ pull-up to 3.6 V			680 kΩ 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			
Maximum cable length	25 m			25 m			
Requirements for external contact	Leakage current when open < 1 µA						
Pulse outputs Out-C/Out-D	HC-003-11 HC-003-21/-31	(before 2017-05) (before 2018-04)		HC-003-11 HC-003-21/-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 voltage	U _{CE} ≈ 1 V ved 10 mA			R _{ON} ≤ 40 Ω			
Electrical isolation	2 kV			2 kV			
Maximum cable length	25 m			25 m			



Product variants MULTICAL® 603

MULTICAL® 603 type number

MULTICAL® 603 type number					Static data Written on the front of the meter 603-X X XX –			Dynamic data Displayed on the screen X XX X XX XX					
Type 603-					□	□	□□	–	□	□□	□	□□	□□
Calculator type													
Pt100 2-wire	t1-t2	V1	M-Bus	A									
Pt100 4-wire	t1-t2	V1	M-Bus	B									
Pt500 2-wire	t1-t2	V1	M-Bus	C									
Pt500 4-wire	t1-t2	V1	M-Bus	D									
Pt500 2-wire	t1-t2-t3	V1-V2		E									
Pt500 2-wire	t1-t2-t3	V1-V2	Backlit display	F									
Pt500 4-wire	t1-t2	V1 [24 V active pulses]	M-Bus	G									
Pt500 4-wire	t1-t2	V1-V2		H									
Pt500 2-wire	t1-t2-t3	V1-V2	(only Mixed fluid)	M									
Pt500 2-wire	t1-t2-t3	V1-V2	Two-way communication	S									
Pt500 4-wire	t1-t2	V1-V2	Two-way communication	U									
Meter type													
Heat meter		MID-module B		1									
Heat meter		MID-module B+D		2									
Heat/cooling meter		MID-module B+D & TS 27.02 * θ _{HC} = OFF		3									
Heat meter		National approval		4									
Cooling meter		TS 27.02+BEK1178		5									
Heat/cooling meter		MID-module B+D & TS 27.02 * θ _{HC} = ON		6									
Volume meter, warm				7									
Volume meter, cold				8									
Energy meter				9									
Country code													
Determined by Kamstrup upon order placement							XX						

* In some countries, only MID marking may appear on bi-functional meters type 3 and 6, due to national legislation.



Product variants MULTICAL® 603

MULTICAL® 603 type number

Static data
Written on the
front of the
meter
603-X XX X -

Dynamic data
Displayed on
the screen
X XX X XX XX

Type 603- □ □ □□ - □ □□ □ □□ □□

Flow sensor connection type

Supplied with one ULTRAFLow®	1
Supplied 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
Supplied with one flow sensor (only Mixed fluid)	G

Temperature sensor set

Supplied without temperature sensors	00
2-wire Pt500 temperature sensors	
Short direct temperature sensors, 2 pcs.	DS 27.5 mm L 1.5 m - 3.0 m 5x
Short direct temperature sensors, 2 pcs.	DS 38.0 mm L 1.5 m - 3.0 m 2x
Pocket temperature sensors, 2 pcs.	PL ø5.8 mm L 1.5 m - 10 m 8x
2-wire Pt100 temperature sensors	
Short direct temperature sensors, 2 pcs.	DS 27.5 mm L 2.0 m J6
4-wire Pt500/Pt100 temperature sensors	
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

Power supply

No supply	0
Battery, 1 x D-cell	2
230 VAC High Power SMPS	3
24 VAC/VDC High Power SMPS	4
Battery, 1 x D-cell IoT	5
230 VAC power supply	7
24 VAC power supply	8
Battery, 2 x A-cell	9

Communication module (2 module slots)

	M1	M2
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
linkIQ/wM-Bus, inputs (In-A, In-B), EU	32	
linkIQ/wM-Bus, outputs (Out-C, Out-D), EU	33	
wM-Bus, inputs (In-A, In-B), 912.5/915/918.5 MHz	34	
OMS LPWAN, TDS, EU (can only be used with calculator type S & U)	35	
Analog outputs 2 x 0/4...20 mA	40	40
Analog inputs 2 x 4...20 mA/0...10 V	41	41
PQT Controller	43	43
Low Power Radio, inputs (In-A, In-B), 434 MHz	50	
Low Power Radio GDPR, inputs (In-A, In-B), 434 MHz	51	
LoRaWan (Elvaco), 868 MHz	53	
NB-IoT, inputs (In-A, In-B)	56	
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	80	
BACnet IP, inputs (In-A, In-B)	81	81
Modbus/KMP TCP/IP, inputs (In-A, In-B)	82	82
READY TCP/IP, inputs (In-A, In-B)	83	83
High Power Radio Router, inputs (In-A, In-B), 444 MHz	84	
High Power Radio Router GDPR, inputs (In-A, In-B), 444 MHz	85	

Contact Kamstrup A/S for further information on product variants.



Meter configuration MULTICAL® 603

	A	B	CCC	DDD	EE	FF	GG	L	M	N	PP	RR	T	VVV
Flow sensor position														
Supply	3													
Return	4													
Measurement unit														
GJ	2													
kWh	3													
MWh	4													
Gcal	5													
Auto Detect CCC codes (UF x4)														
Normal resolution (7 digits)			807											
High resolution (8 digits)			818											
Static CCC codes														
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											
Display														
Heat meter (standard)				210										
Heat/cooling meter (standard)				310										
Cooling meter (standard)				510										
Tariffs														
No tariff active					00									
Power tariff					11									
Flow tariff					12									
t1-t2 tariff					13									
Supply tariff					14									
Return tariff					15									
Time-controlled tariff					19									
Heat/cooling volume tariff					20									
PQ tariff					21									
Pulse inputs In-A/In-B														
10 m³/h, 10 l/imp, counter 1 (standard)						24	24							
Integration mode														
Adaptive mode (2-64 s)	Display on							1						
Normal mode (32 s)	Display on							2						
Fast mode (8 s)	Display on							3						
Fast mode (2 s)	Display on							4						
Adaptive mode (2-64 s)	Display off							5						
Normal mode (32 s)	Display off							6						
Fast mode (8 s)	Display off							7						
Leakage limits (V1/V2)														
OFF										0				
1,0 % af q_p + 20 % af q										1				
1,0 % af q_p + 10 % af q										2				
0,5 % af q_p + 20 % af q										3				
0,5 % af q_p + 10 % af q										4				
Cold water leakage limits (In-A/In-B)														
OFF											0			
½ hour without pulses											1			
1 hour without pulses											2			
2 hours without pulses											3			



Meter configuration MULTICAL® 603

		A	B	CCC	DDD	EE	FF	GG	L	M	N	PP	RR	T	VVVV
Pulse outputs Out-C/Out-D															
Out-C: V1/4	5 ms											73			
Out-C: V1/1, 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 managed by data commands												99			
Data logger profile															
Standard data logger profile													30		
Encryption level															
Individual key														3	
Customer label															
Serial number															0000



Product variants MULTICAL® 803

MULTICAL® 803 type number

		Static data Written on the front of the meter 803-X-X-XX-	Dynamic data meter Displayed on the screen X-XX-X-	Dynamic data module Displayed on the screen XX-XX-XX-XX			
Type 803-		□ - □ - □□	□ - □□	□ - □□	□□	□□	□□ - □□
Calculator type							
Pt100/500 2/4-wire, t1t2-t3-t4. V1-V2, backlit display	A						
Pt100/500 2/4-wire, t1-t2-t3-t4. V1-V2, backlit display (only Mixed fluid)	M						
Meter type							
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, warm		7					
Volume meter, cold		8					
Energy meter		9					
Mixed fluid		G					
Country code							
Determined by Kamstrup upon order placement		XX					
Flow sensor connection type							
Supplied with one ULTRAFLOW®			1				
Supplied 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				
Supplied with one flow sensor (only Mixed fluid)			G				
Temperature sensor set							
Supplied without temperature sensors			00				
2-wire Pt500 temperature sensors							
Short direct temperature sensors, 2 pcs.	DS 27.5 mm	L 1.5 m - 3.0 m	1x				
Short direct 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	3x				
2-wire Pt100 temperature sensors							
Short direct temperature sensors, 2 pcs.	DS 27.5 mm or DS 38.0 mm	L 2.0 m	Jx				
4-wire Pt500/Pt100 temperature sensors							
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 90 mm - 180 mm	bx				
Power supply modules							
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 power supply	C				
2 x 24 VAC/VDC	supply of 4 communication modules (M1+M2+M3+M4)	1 x 24 VDC auxiliary power supply	d				

* In some countries, only MID marking may appear on bi-functional meters type 3 and 6, due to national legislation.



Product variants MULTICAL® 803

MULTICAL® 803 type number

	Static data Written on the front of the meter 803-X-X-XX-	Dynamic data meter Displayed on the screen X-XX-X-	Dynamic data module Displayed on the screen 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			
linkIQ/wM-Bus, outputs (Out-C, Out-D), EU			33			
wM-Bus, inputs (In-A, In-B), 912.5/915/918.5 MHz			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			
Low Power Radio GDPR, inputs (In-A, In-B), 434 MHz			51			
LoRaWan (Elvaco), 868 MHz			53			
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			
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			
High Power Radio Router GDPR, inputs (In-A, In-B), 444 MHz			85			

Contact Kamstrup A/S for further information on product variants.



Meter configuration MULTICAL® 803

	A	B	CCC	DDD	EE	FF	GG	L	M	N	PP	RR	T	VVV
Flow sensor position														
Supply	3													
Return	4													
Measurement unit														
GJ		2												
kWh		3												
MWh		4												
Gcal		5												
Auto Detect CCC codes (UF x4)														
Normal resolution (7 digits)			807											
Normal resolution (8 digits)			808											
High resolution (8 digits)			818											
Static CCC codes														
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											
Display														
Heat meter (standard)				210										
Heat/cooling meter (standard)				310										
Cooling meter (standard)				510										
Tariffs														
No tariff active					00									
Power tariff					11									
Flow tariff					12									
t1-t2 tariff					13									
Supply tariff					14									
Return tariff					15									
Time-controlled tariff					19									
Heat/cooling volume tariff					20									
PQ tariff					21									
Pulse inputs In-A/In-B														
10 m³/h, 10 l/imp, counter 1 (standard)						24	24							
Integration mode														
Fast mode (2 s)		Display on						4						
Fast mode (2 s)		Display & backlight on						9						
Leakage limits (V1/V2)														
OFF									0					
1.0% of qp + 20% of q									1					
1.0% of qp + 10% of q									2					
0.5% of qp + 20% of q									3					
0.5% of qp + 10% of q									4					
Cold water leakage limits (In-A/In-B)														
OFF										0				
½ hour without pulses										1				
1 hour without pulses										2				
2 hours without pulses										3				



Meter configuration MULTICAL® 803

		A	B	CCC	DDD	EE	FF	GG	L	M	N	PP	RR	T	VVVV
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 managed by data commands												99			
Data logger profile															
Standard data logger profile													30		
Encryption level															
Individual key														3	
Customer label															
Serial number															0000

Contact Kamstrup A/S for information on additional configuration options.



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								Meter powered by backup battery
9								External alarm (e.g., via KMP)
	1							t1 Over measurement range or disconnected
		1						t2 Over measurement range or disconnected
			1					t3/t4 Over measurement range or disconnected
	2							t1 Under measurement range or short-circuited
		2						t2 Under measurement range or short-circuited
			2					t3/t4 Under measurement 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	
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Note: Info codes are configurable. Therefore, not all parameters may be available in a given MULTICAL® 603 or 803.

An info logger saves the info code each time the info code changes. It is possible to read the last 250/280 changes in the info code and the date of the change.



Accessories

Item number	Description	MULTICAL® 603	MULTICAL® 803
HC-993-02	Battery module with 1xD-cell	x	
HC-993-03	230 VAC High Power supply module	x	
HC-993-04	24 VAC/VDC High Power supply module	x	
HC-993-05	Battery module with 1xD-cell IoT	x	
HC-993-07	230 VAC supply module	x	
HC-993-08	24 VAC supply module	x	
HC-993-09	Battery module with 2xA-cell	x	
HC-993-10	Backup battery, 2xA-cells		x
HC-993-11	230 VAC supply module		x
HC-993-12	24 VAC/VDC supply module		x
HC-993-13	230 VAC to 24 VDC auxiliary supply module		x
HC-993-14	24 VAC/VDC to 24 VDC auxiliary supply module		x
2105-002	Sealing cap for flow sensor G¾B (R½), blue	x	x
3026-207.A	Wall bracket with screws and plugs for MULTICAL® 603	x	
3026-517	Sealing cap for temperature sensors, blue	x	x
3026-518	Sealing cap for temperature sensors, red	x	x
3026-857	Bracket for ULTRAFLOW®		x
3026-858	Angle bracket ULTRAFLOW® (qp 0.6...2.5)	x	
3026-909	Holder for optical read-out head	x	
3026-963	Disassembly tool	x	
3026-1148	Sealing cap for flow sensor G¾B (R½), self-locking, blue	x	x
3130-262	Blind plug with O-ring	x	x
3130-269	Cable relief set	x	
5000-337	Module cable 2 m (2x0.25 m²)	x	x
5000-503	Connection cable 3.6 VDC (red/black cable with two white connectors)		x
5000-504	Connection cable 24 VDC for modules (red/black cable with one white connector)		x
5000-505	Connection cable 230 VAC / 24 VAC/VDC (white cables with black connectors)		x
6699-035	USB cable for module configuration	x	x
6699-036	Cable Extender Box	x	x
6699-042	Metal plate for optical read-out head, 20 pcs.	x	x
6699-045	Connection board PCB-24V pulses		x
6699-047	Power supply module label MULTICAL® 403/603, 10 pcs. [2006-681]	x	
6699-048	Power supply label MULTICAL® 803, 10 pcs. [2006-776]		x
6699-049	Connection board 230 VAC [Green]		x
6699-050	Connection board 24 VAC/VDC [Blue]		x
6699-099	Infrared optical read-out head with USB plug	x	x
6699-110	Panel mounting kit	x	
6699-403	230/24 VAC safety transformer 5 VA	x	x
6699-404	230/24 VAC safety transformer 10 VA	x	x
6699-405	230/12/24 VAC safety transformer 63 VA	x	x
6699-447.E	Internal antenna for Kamstrup radio, 434 MHz	x	x
6699-448	Mini Triangle antenna for Wireless M-Bus and 2G/4G Network Module	x	x
6699-482.E	Internal antenna for Wireless M-Bus, 868 MHz	x	x
6699-724	METER TOOL HCW	x	x
6699-725	LogView HCW	x	x



Accessories

Calibration units

Item number	Description	MULTICAL® 603	MULTICAL® 803
6699-361	2/4-wire Pt500, heat/cooling (used with METERTOOL HCW)		x
6699-362	2/4-wire Pt100, heat/cooling (used with METERTOOL HCW)		x
6699-363	2-wire Pt500, heat/cooling (used with METERTOOL HCW)	x	
6699-364	4-wire Pt500, heat/cooling (used with METERTOOL HCW)	x	
6699-365	2/4-wire Pt100, heat/cooling (used with METERTOOL HCW)	x	

Find further information about MULTICAL® 603, MULTICAL® 803, and their accessories in the technical description at [Kamstrup Product Centre](#).

MULTICAL® 603 og MULTICAL® 803

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