kamstrup

Installation and user guide

MULTICAL® 803 & ULTRAFLOW®

Kamstrup A/S · Industrivej 28, Stilling · DK-8660 Skanderborg · T: +45 89 93 10 00 · info@kamstrup.com · kamstrup.com

Information

Permissible operating conditions / measuring ranges

Heat meter with approval according to MID and EN1434:

Temperature range	θ: 2 °C...180 °C	$\Delta\Theta$: 3 K...178 K
ULTRAFLOW® (temperature of medium)	θq: 15 °C...130 °C	

Cooling meter with approval according to DK-BEK 1178 and EN1434:

Temperature range	θ: 2 °C...180 °C	$\Delta\Theta$: 3 K...178 K
ULTRAFLOW® (temperature of medium)	θq: 2 °C...130 °C	

MID designation

Mechanical environment

MULTICAL®:	Class M1 and M2
ULTRAFLOW®:	Class M1 (M2 for ULTRAFLOW® type 65-5-XX**H**X-XXX)

Electromagnetic environment

Class E1 (housing/light industry) and class E2 (industry).
The meter's control cables must be drawn at min. 25 cm distance from other installations.

Climatic environment

Condensing, closed location (installation indoors), ambient temperature 5...55 °C.

Maintenance and repair

The district heating supplier can replace temperature sensor pairs, flow sensor as well as supply and communication modules. Other repairs require subsequent reverification in an accredited laboratory.

Selection of temperature sensor pair

MULTICAL® 803-A:	Pt100/Pt500 - EN 60751, 4-wire connection

Battery for replacement

Kamstrup type HC-993-10

Communication modules

An overview of available modules is found in the paragraph "Communication modules".

Contents

1 In general

Please read this guide carefully before installing the energy meter.
In case of incorrect mounting, Kamstrup's guarantee obligations no longer apply.
By connecting to 230 V supply, there is a risk of electric shock.
When working on the flow sensor in the installation, there is a risk of outflow of (hot) water under pressure.
At a media temperature higher than 60 °C, the flow sensor should be shielded from unintended contact.

Please note that the following installation conditions must be obeyed:

- Pressure stage ULTRAFLOW®: PN16/PN25, see marking
- Pressure stage Kamstrup sensor pair, type DS: PN16/PN25
- Pressure stage Kamstrup pocket sensors, type PL: PN25

At media temperatures above 90 °C, we recommend flange sensors as well as wall-mounting of MULTICAL®.

At media temperatures below the ambient temperature, MULTICAL® must be wall-mounted, and the flow sensor/ULTRAFLOW® must be a condensation-proof version.

2 Mounting of temperature sensors

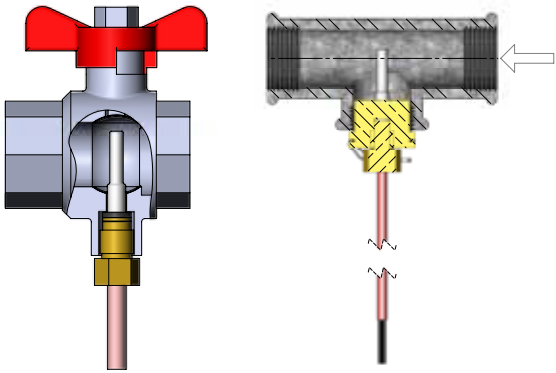
The temperature sensors used for measuring inlet and outlet temperatures respectively, constitute a matched sensor pair, which must never be separated. According to EN 1434/OIML R75, the cable length must not be changed. Should replacement be necessary, both sensors must be replaced.

The sensor marked with a red sign is to be installed in the inlet pipe. The other sensor, marked with a blue sign, is to be installed in the outlet pipe. For mounting in the calculator, see the paragraph "Electrical connection".

Note: The sensor cables must neither be exposed to jerking nor pulling. Please be aware of this when binding the cables, and be careful not to pull the binders unnecessarily tight as this may damage the cables. Please also note that temperature sensors must be mounted from below in cooling and heat/cooling installations.

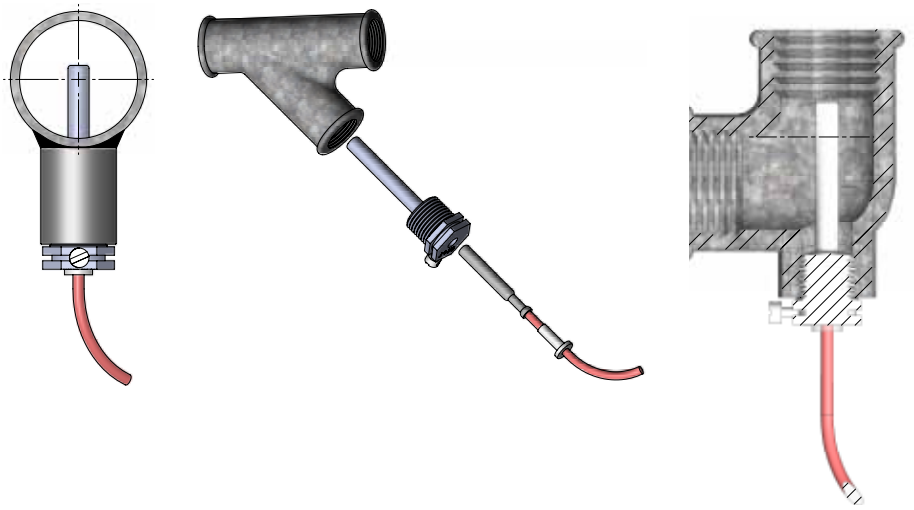
2.1 Short direct sensor (DS)

The short, direct sensors up to DN25 can be mounted in special ball valves with built-in M 10 socket for the short direct sensor. They can also be mounted in installations with standard tee-pieces. Kamstrup A/S can supply R½ and R¾ brass nipples that fit the short direct sensors. The short direct sensor can also be mounted directly in selected flow sensors from Kamstrup A/S. Fasten the sensors' brass unions lightly (approx. 4 Nm) using a 12 mm face wrench, and seal the sensors with seal and locking wire.



2.2 Pocket sensor (PL)

The sensor pockets can be mounted in e.g. a welding sleeve or in a 45° lateral Y-piece. The tip of the sensor pocket must be placed in the middle of the flow. Push the temperature sensors as deep as possible into the pockets. If a short response time is required, "non-hardening" thermally conductive paste can be used. Push the plastic sleeve on the sensor cable into the sensor pocket and secure the cable by means of the enclosed M4 sealing screw. Fasten the screw with your fingers only. Seal the pockets using seal and locking wire.



2.3 Pocket sensor with connection head (PL)

See Installation and user guide no. 5512-2272.

3 Mounting of flow sensor

Prior to installation of the flow sensor, the system should be flushed and protection plugs/plastic diaphragms removed from the flow sensor.

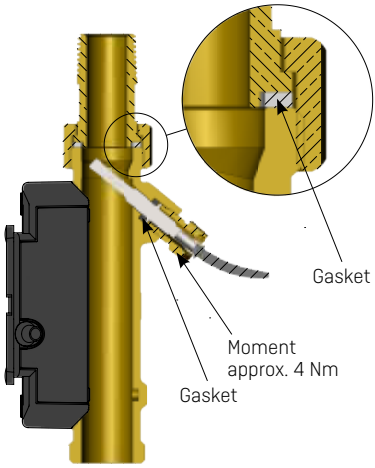
Correct position of the flow sensor appears either from the calculator's type label or from the display where indicates the position in inlet, whereas indicates the position in outlet. The flow direction is symbolised by an arrow on the flow sensor.

3.1 Mounting of couplings and short direct sensor in flow sensor

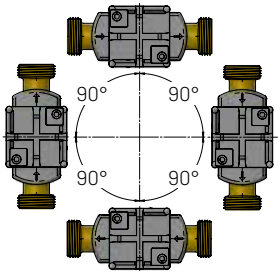
Flow sensor and any mounted blind plug can be used in connection with both PN16 and PN25. The flow sensor is available with either PN16 or PN25 marking as required. Any provided extensions and glands can be used for both PN16 and PN25.

In connection with flow sensors with the nominal dimensions G¾Bx110 mm and G1Bx110 mm, it must be checked if the thread run-out is sufficient.

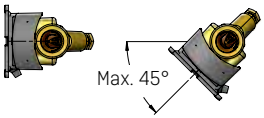
Couplings and gaskets are mounted as shown in the figure. Make sure to position the gasket correctly in the recess of the gland as shown in the details excerpt in the figure.



3.2 Mounting of ULTRAFLOW® ≤ DN125



The flow sensor can be mounted horizontally, vertically or at an angle.



The flow sensor should be mounted with the plastic casing placed on the side (at horizontal mounting).

The flow sensor (65-5-XX**H**X-XXX) may be turned up to 45° downwards in relation to the pipe axis as shown above, if required[1].

[1] Flow sensor types 65-5-XX**A**X-XXX, 65-5-XX**C**X-XXX and 65-5-XX**J**X-XXX may also be turned 45° upwards.

Note: In installations in which the media temperature is below the ambient temperature, ULTRAFLOW® in a condensation-proof version must be used. At the same time, ULTRAFLOW® must not be mounted with the plastic casing turned to below 0°. It is recommended to turn the plastic casing 45° upwards.

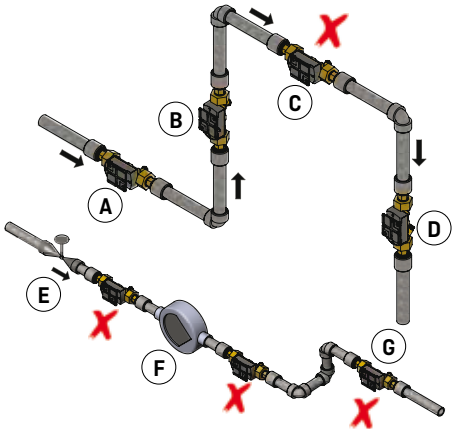
3.3 Mounting of ULTRAFLOW® 54 ≥ DN150

See Installation and user guide no. 5512-887.

3.4 Flow sensor position

Kamstrup flow sensors require neither straight inlet nor straight outlet to meet the Measuring Instruments Directive (MID) 2014/32/EU, OIML R75:2002 and EN 1434:2015. A straight inlet section will only be necessary in case of heavy flow disturbances before the meter. It is recommended to follow the guidelines of CEN CR 13582.

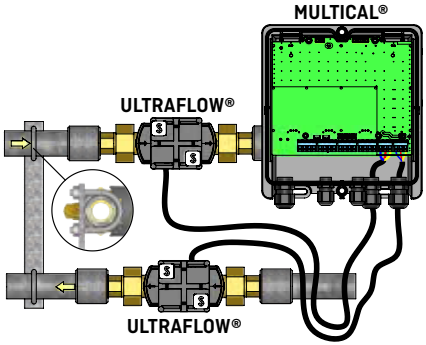
A Recommended position.
B Recommended position.
C Unacceptable position due to risk of air build-up.
D Acceptable position in closed systems.
E Ought not to be placed immediately after a valve, with the exception of block valves (ball valve type) which must be fully open when not used for blocking.
F Ought not to be placed immediately before or after a pump.
G Ought not to be placed immediately after a double bend in two planes.



In order to avoid cavitation, the back pressure at the flow sensor (the pressure at the flow sensor outlet) must be minimum 1.5 bar at q_p (nominal flow) and minimum 2.5 bar at q_s (maximum flow). This applies to temperatures up to approx. 80 °C. The flow sensor must not be exposed to pressure lower than the ambient pressure (vacuum).

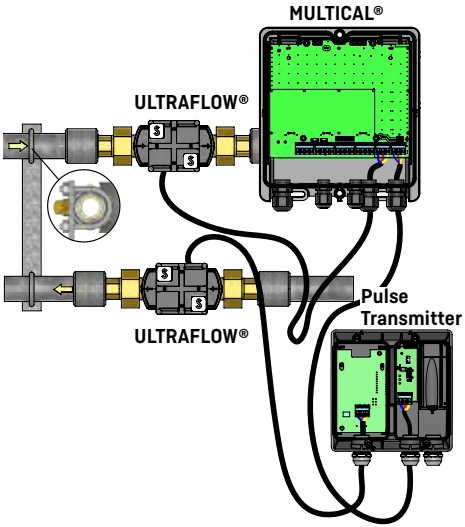
3.5 Installations with two ULTRAFLOW® sensors

MULTICAL® can be used in various applications with two ULTRAFLOW® sensors, including leak surveillance and open systems. As a main rule, when two ULTRAFLOW® sensors are installed with one MULTICAL®, a close electric coupling between the two pipes ought to be carried out on which the two flow sensors are mounted. If the two pipes are installed in a heat exchanger, close to the flow sensors, however, the heat exchanger will provide the necessary electric coupling.



- Inlet and outlet pipes are closely electrically coupled.
- The parts of the pipe installation that are electrically connected to the flow sensors must both be subjected to soldering.

In installations where the electric coupling is not possible or welding[1] can occur in the pipe system, the cable from one ULTRAFLOW® must be led through a Pulse Transmitter to obtain galvanic separation before the cable is connected to MULTICAL®.



[1] Electric welding must always be carried out with the grounding connection closest to the welding point. Damage to meters due to welding is not comprised by the factory guarantee.

4 Mounting the calculator

The MULTICAL® calculator can be mounted either directly on the wall (wall-mounting) or on ULTRAFLOW® by use of bracket 3026-857 (compact mounting).

4.1 Wall-mounting

It is recommended to wall mount MULTICAL® 803 directly on an even wall. Wall-mounting requires the use of three screws with corresponding rawlplugs. MULTICAL® 803 is mounted on the wall by first mounting the upper screw in the wall and screw this almost all the way in. Then, hang the calculator on this screw. With the calculator mounted on the upper screw, the positions of the lower two screw eyes are marked on the wall after which screws for these can be mounted.

4.2 Compact mounting

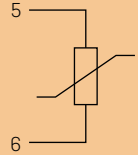
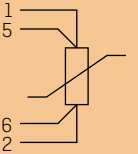
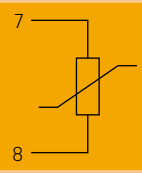
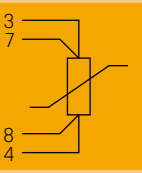
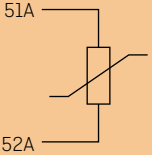
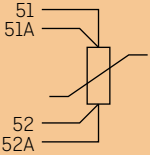
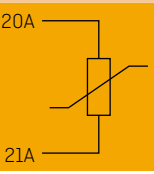
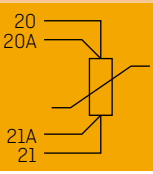
In some cases, compact mounting of the MULTICAL® 803 calculator may be an advantage. The MULTICAL® 803 calculator is large and only suitable for compact mounting in places where the installation can be secured against mechanical influences such as impacts. By compact mounting, the calculator is mounted on ULTRAFLOW® using mounting bracket 3026-857 If there is a risk of condensation (e.g. in cooling applications), the calculator ought to always be wall-mounted. Furthermore, ULTRAFLOW® in cooling applications must be the condensation-proof version.

Note: In case of compact mounting, it may be necessary to use the enclosed angle fitting with some types of ULTRAFLOW® to obtain a required combination of viewing angle for the calculator's display and installation angle for ULTRAFLOW®.

5 Electrical connection

5.1 Connection of temperature sensors

Temperature sensors are connected to MULTICAL® 803 via the screw terminals on the connection PCB. It is possible to use both 4-wire and 2-wire sensor types. When using 2-wire sensors, it is important to mount the supplied jumper on the pins marked with 2-W, located directly above the screw terminals on the connection PCB. If the supplied jumper is lost, it is possible to terminate the extra connection terminals by short-circuiting them in pairs as illustrated in red in the table below.

Sensor	2-wire		4-wire	
	Terminal number	Illustration	Terminal number	Illustration
t1	1 5 6 2		1 5 6 2	
t2	3 7 8 4		3 7 8 4	
t3	51 51A 52A 52		51 51A 52A 52	
t4	20 20A 21A 21		20 20A 21A 21	

5.2 Connection of ULTRAFLOW®

ULTRAFLOW® is connected to MULTICAL® 803 via the connection PCB using the terminal numbers to the right.

ULTRAFLOW®	Wire	Terminal number
V1	Signal [ ] + [●] - [●]	10 9 11
V2	Signal [ ] + [●] - [●]	69 9 11

5.3 Connection of other flow sensors

Other passive flow sensors with either reed switch or transistor output can be connected to MULTICAL® via the terminal numbers to the right. Be aware of correct mounting of + and - of flow sensors with transistor outputs.

Flow sensor	Wire	Terminal number
V1	+ -	10 11
V2	+ -	69 11

MULTICAL® 803 can be connected to other flow sensors with 24 V active pulse outputs by using connection PCB 6699-045 that is available as accessory for MULTICAL® 803. See the terminal numbers to the right. Be aware of correct mounting of + and -.

Flow sensor	Wire	Terminal number
V1	Signal - + 24 VDC [1]	10B 11B 97A
V2	Signal - + 24 VDC [1]	69B 11B 97A

[1] Requires that MULTICAL® 803 has supply type C or D.

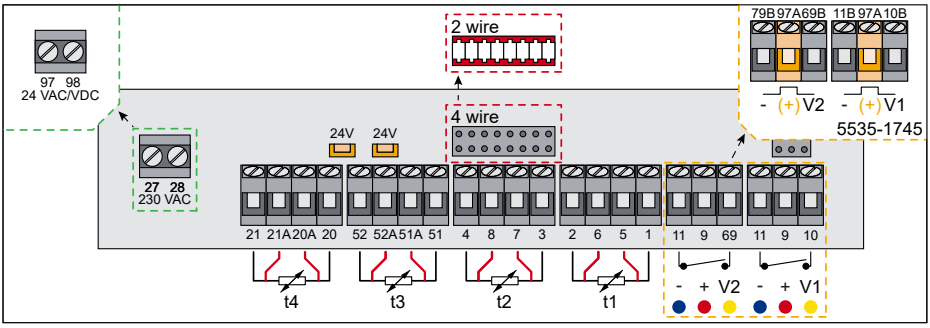


Figure 1 Conncetion of PCB MULTICAL® 803

6 Connection of power supply

6.1 Mains supply

MULTICAL® 803 is available with supply modules for either 24 VAC/VDC or 230 VAC.

MULTICAL® 803 can be supplied from either 24 VAC/VDC or 230 VAC with cable through the large cable connection to the left in the connection base. Use connecting cable with an outer diameter of 4-10 mm and ensure correct cable stripping as well as correct mounting of cable relief. If connecting to 230 VAC, it is important to make sure that the whole installation complies with current regulations. Kamstrup A/S can provide a supply cable to connect the mains supply, in the size 2 x 0.75 mm^2. The supply cable to the meter must never be protected by a larger fuse than permitted for any given cable size.

In case of doubt, it is recommended to take advice from an authorised electrician and get an individual assessment of the execution of the installation in question. In addition, note that work on fixed installations and any intervention in the fuse box must be carried out by an authorized electrician only.

For installation in Denmark: See "Installation of mains connected equipment for registration of consumption" from the Danish National Safety Board.

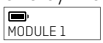
Replacement and extension of the mains supply

PLEASE MAKE SURE TO DISCONNECT THE MAINS SUPPLY FROM THE CONNECTION PCB BEFORE INITIATING THE REPLACEMENT OR EXTENSION OF THE SUPPLY!

The mains supply in MULTICAL® 803 consists of up to three supply modules of protection class II, which are connected to the underside of the connection PCB in the meter via a two-wire cable with connector at one end and screw terminals at the other. It is possible to connect 2 x 3.6 V supply modules to calculator and module slots as well as a 24 VDC supply module to the supply of analog outputs or passive third-party flow sensors. Read more in the technical description of MULTICAL® 803, document no. 5512-2360.

Note: Replacement and extension of the mains supply should always be carried out at a workshop.

6.2 Backup battery

MULTICAL® 803 comes with backup of calculator, temperature sensors and flow sensors so that the basic meter function is maintained in the event of an interruption of the mains supply. It is, however, possible to extend the backup functionality to include the communication module in module slot 1. This is done by moving the connection of the backup battery to the connector under the label with the text 

placed in the calculator top.

Note: Not all communication modules are suitable for backup operation. For example, communication modules with pulse outputs and LON communications cannot be used with the appropriate battery life. Read more about appropriate modules in the technical description of MULTICAL® 803, document no. 5512 -2360.

Optimal battery lifetime is obtained by keeping the battery temperature below 30 °C, e.g. by wall mounting. The voltage of a lithium battery is almost constant throughout the lifetime of the battery (approx. 3.65 VDC). Therefore, it is not possible to determine the remaining capacity of the battery by measuring the voltage. The battery cannot and must not be charged and must not be short-circuited. Used batteries must be handed in for approved destruction, e.g. at Kamstrup A/S. Further details appear from the document on handling and disposal of lithium batteries (5510-408).

7 Testing of function

Carry out an operational check when the energy meter has been fully mounted. Open thermoregulators and valves to enable water flow through the heating system. Activate the front key of MULTICAL® to change display reading, and check that the displayed values for temperatures and water flow are credible values.

8 Info code

MULTICAL® constantly monitors a number of important functions. If a serious error occurs in the measuring system or installation, a flashing "INFO" appears in the display. The "INFO" field keeps flashing as long as the error is present, no matter which reading you choose. The "INFO" field automatically switches off when the error has been corrected. For indicating current errors in MULTICAL®, it is possible to scroll to the information code in the display. This is the display in which "INFO" does not flash, but is shown permanently. The information code display is available both in the USER loop and TECH loop. The info code consists of 8 digits, and each functionality has its own digit dedicated to the indication of relevant information. For example, all information concerning temperature sensor t1 is shown in the display as the second digit from the left.

Display digit									
1	2	3	4	5	6	7	8		
Info	**t1**	**t2**	**t3/ t4**	**V1**	**V2**	**In-A**	**In-B**	**Description**	**Response time of active INFO**
1								Supply voltage interrupted	-
2								The meter is supplied by the backup battery	< 3 minutes
9								External alarm (e.g. via KMP)	< 1 second
	1							t1 above measuring range or switched off	< 3 minutes
		1						t2 above measuring range or switched off	< 3 minutes
			1					t3/t4 above measuring range or switched off	< 3 minutes
	2							t1 below measuring range or short-circuited	< 3 minutes
		2						t2 below measuring range or short-circuited	< 3 minutes
			2					t3/t4 below measuring range or short-circuited	< 3 minutes
	9	9						t1-t2 Invalid temperature difference	< 3 minutes
				1				V1 Communication error	< 1 day
					1			V2 Communication error	< 1 day
				2				V1 Wrong pulse figure	< 1 day
					2			V2 Wrong pulse figure	< 1 day
				3				V1 Air	< 1 day
					3			V2 Air	< 1 day
				4				V1 Wrong flow direction	< 1 day
					4			V2 Wrong flow direction	< 1 day
				6				V1 Increased flow (flow1 > q_S, for more than 1 hour)	< 1 hour
					6			V2 Increased flow (flow2 > q_S, for more than 1 hour)	< 1 hour
				7				V1/V2 Burst, water loss (flow1 > flow2)	< 120 seconds
					7			V1/V2 Burst, water penetration (flow1 < flow2)	< 120 seconds
				8				V1/V2 Leakage, water loss (M1 > M2)	< 1 day
					8			V1/V2 Leakage, water penetration (M1 < M2)	< 1 day
						7		In-A2 Leakage in the system	< 1 day
						8		In-A1 Leakage in the system	< 1 day
						9		In-A1/A2 External alarm	< 5 seconds
							7	In-B2 Leakage in the system	< 1 day
							8	In-B1 Leakage in the system	< 1 day
							9	In-B1/B2 External alarm	< 5 seconds

9 Communication modules

MULTICAL® 803 can be extended by a wide range of extra functions by means of communication modules. Below, pulse inputs/outputs and module types are briefly described.

Note: Before replacing or mounting modules, the supply to the meter must be switched off. The same applies for mounting of an antenna.

9.1 Module overview

MULTICAL® 803 communication modules:

Type no.	Description
HC-003-10	Data Pulse, inputs (In-A, In-B)
HC-003-11	Data Pulse, outputs (Out-C, Out-D)
HC-003-20	Wired M-Bus, inputs (In-A, In-B)
HC-003-21	Wired M-Bus, outputs (Out-C, Out-D)
HC-003-22	Wired M-Bus, Thermal Disconnect
HC-003-30	Wireless M-Bus, inputs (In-A, In-B), 868 MHz
HC-003-31	Wireless M-Bus, outputs (Out-C, Out-D), 868 MHz
HC-003-40	Analog outputs 2 x 0/4...20 mA
HC-003-41	Analog inputs 2 x 4...20 mA / 0...10 V
HC-003-43	PQT Controller
HC-003-60	LON TP/FT-10, inputs (In-A, In-B)
HC-003-66	BACnet MS/TP, inputs (In-A, In-B)
HC-003-67	Modbus RTU, inputs (In-A, In-B)
HC-003-80	2G/4G Network
HC-003-82	Modbus/KMP TCP/IP, inputs (In-A, In-B)

9.2 Pulse inputs

Pulse inputs A and B are used for connection of extra meters with either reed switch output or passive electronic pulse output.

Min. pulse duration is 30 ms and max pulse frequency is 3 Hz.

65 + 66 -	Pulse input A
67 + 68 -	Pulse input B

If a module with pulse inputs is mounted in MULTICAL®, the meter is automatically configured for pulse inputs. Note that the pulse figure (litres/pulse) must match the extra water meters and the configurations of inputs A and B. After delivery, the configurations of pulse inputs A and B can be changed by means of the PC program METERTOOL HCW.

9.3 Pulse outputs

Pulse outputs for energy and volume are made with Opto Fet, the pulse outputs are available on a number of communication modules.

Max voltage and current of the outputs are 45 VDC and 50 mA, respectively.

16 + 17 -	Pulse output C
18 + 19 -	Pulse output D

When a module with pulse outputs is mounted in MULTICAL®, the meter is automatically configured for pulse outputs. The pulse duration is ordered at 32 ms or 100 ms. After delivery, the pulse duration can be changed by means of the PC program METERTOOL HCW.

The resolutions of the pulse outputs always follow the least significant digit displayed for energy and volume, respectively.

9.4 Data + pulse inputs, type HC-003-10

The data terminals are used for connection of e.g. a PC. The signal is passive and galvanically separated by means of optocouplers. Conversion to RS232 level requires connection of data cable 66-99-106 (D-SUB 9F) or 66-99-098 (USB type A) with the following connections:

62	Brown	(DAT)
63	White	(REQ)
64	Green	(GND)

9.5 Data + pulse outputs, type HC-003-11

The data terminals are used for connection of e.g. a PC. The signal is passive and galvanically separated by means of optocouplers. Conversion to RS232 level requires connection of data cable 66-99-106 (D-SUB 9F) or 66-99-098 (USB type A) with the following connections:

62	Brown	(DAT)
63	White	(REQ)
64	Green	(GND)

9.6 M-Bus + pulse inputs, type HC-003-20

M-Bus module with primary, secondary and enhanced secondary addressing.

The module is connected to an M-Bus master via terminals 24 and 25 using a twisted pair. The polarity is without importance for the functionality.

The module is powered by the connected master.

9.7 M-Bus + pulse outputs, type HC-003-21

M-Bus module with primary, secondary and enhanced secondary addressing.

The module is connected to an M-Bus master via terminals 24 and 25 using a twisted pair. The polarity is without importance for the functionality.

The module is powered by the connected master.

9.8 M-Bus + Thermal Disconnect, type HC-003-22

M-Bus module with primary, secondary and enhanced secondary addressing. The module is connected to an M-Bus master via terminals 24 and 25 using a twisted pair. The polarity is without importance for the functionality.

The meter must be supplied by 24 VAC or 230 VAC.

The module requires an external 24 VAC power supply for operating the connected actuator.

9.9 Wireless M-Bus + pulse inputs, type HC-003-30*

The wireless M-Bus module has been designed to form part of Kamstrup's hand-held Wireless M-Bus Reader system, which operates within the unlicenced frequency band in the 868 MHz area. The radio module is available with either internal or external antenna. Note that both antenna types use the same connection.

9.10 Wireless M-Bus + pulse outputs, type HC-003-31*

The wireless M-Bus module has been designed to form part of Kamstrup's hand-held Wireless M-Bus Reader system, which operates within the unlicenced frequency band in the 868 MHz area. The radio module is available with either internal or external antenna. Note that both antenna types use the same connection.

9.11 Analog outputs, type HC-003-40

Analog module with 2 pcs. 0/4..20 mA current outputs. The current is measured directly via the 2 sets of output terminals 80-81 and 82-83.

The meter must be supplied by 24 VAC or 230 VAC.

The module requires an external 24 VAC power supply for operating the analog outputs.

* ⚠ The wireless M-Bus module must be connected to an internal or external antenna. When mounting an external antenna, ensure that the antenna cable is not jammed or damaged when the calculator is assembled. Before replacing or mounting modules, the supply to the meter must be switched off. The same applies to mounting of an antenna.

9.12 Analog inputs, type HC-003-41

Analog module with 2 inputs configurable as either 4...20 mA or 0...10 V inputs. The inputs can be scaled according to the connected sensors. Connect the sensors to the module via the 2 sets of input terminals 60-58-57 and 60-59-57. The measured values can be read in the meter's P1 and P2 registers.

The meter must be supplied by 24 VAC or 230 VAC.

The module requires an external 24 VAC/VDC power supply for operating the module and the connected sensors.

9.13 PQT Controller, type HC-003-43

The PQT Controller module with output for controlling of three-point motor-operated valve. The module is used for regulating power, flow and temperature in the installation. The motor-operated valve is connected to the terminals 150, 151 and 152. The motor-operated valve's direction of rotation can be checked by short-circuiting the test points Up or Dn.

The meter must be supplied by 24 VAC or 230 VAC.

The module requires an external 24 VAC power supply for operating the connected motor-operated valve.

9.14 LON TP/FT-10 + pulse inputs, type HC-003-60

LON is often used in building automation systems and industrial applications.

The LON module is compatible with EN 14908/EU.

The module is delivered with bar codes with imprinted LON Node ID to use at the commissioning. To activate the LON service PIN, you must call the "CALL" function on the meter.

The module supports free topology on twisted-pair cables with speeds up to 78125 baud. The twisted-pair cables can be looped in the terminals 55 and 56.

The meter must be supplied by high-power supply of either 24 VAC or 230 VAC.

9.15 BACnet MS/TP + pulse inputs, type HC-003-66

BACnet is often used in building automation systems and industrial applications.

The BACnet module is compatible with ASHRAE 135. The module is BACnet-certified and registered on the BTL list.

The module communicates via RS485 with speeds up to 115200 baud. The twisted-pair shielded cables are connected to the terminals 137, 138 and 139.

The meter must be supplied by 24 VAC or 230 VAC.

9.16 Modbus RTU + pulse inputs, type HC-003-67

Modbus is often used in building automation systems and industrial applications. The module is a Modbus RTU slave device that is verified against the Modbus Implementation Guide V1.02.

The module communicates via RS485 with speeds up to 115200 baud. The shielded twisted pair cables are connected to the terminals 137, 138 and 139.

The meter must be supplied by 24 VAC or 230 VAC.

9.17 2G/4G network module + pulse inputs, type HC-003-80

The 2G/4G network module is a plug and play module that automatically starts to send data on the existing 2G and 4G mobile networks less than 30 seconds after installation of mains supply. In order to achieve the best possible connection to the mobile network, the module is delivered together with a dedicated external antenna.

32 current data registers are sent to the utility company every hour 24/7/365, and the module comes with an 8-year prepaid data subscription included. It is possible to extend the subscription by further 8 years.

The meter must be supplied by a High Power supply (24/230 VAC).

9.18 Modbus/KMP TCP/IP + pulse inputs, type HC-003-82

Ethernet TCP/IP module with 2 protocols, Modbus TCP or KMP (Kamstrup Meter Protocol).

Both automatic or fixed IP address assignment.

The Ethernet cable is connected to the module on the terminals 114, 115, 116 and 117 with specified wire colours.

The meter must be supplied by 24 VAC or 230 VAC.

10 Setup via front keys

A number of parameters in MULTICAL® 803 can be configured at the installation site. The configuration is carried out via the SETUP loop, which is available as long as MULTICAL® 803 remains in transport state, or until the configuration is ended by activating "End setup".

You can navigate from the USER loop to the SETUP loop by pressing the middle button (the primary key) for 5 seconds until the text 1-USER appears on the display. Then use the arrow keys to navigate to 3-SETUP and press the middle button once to open the SETUP loop in MULTICAL® 803. Use the arrow keys to switch to the parameter that you want to change. You can reach these keys by pressing the middle button. Then you can switch to the individual figures by pressing the arrow keys, e.g. minutes under time (3-004). The parameter is set by pressing the primary button shortly several times. Leave the menu item by keeping the primary key activated until "OK" is shown in the display. After 4 minutes without activation of the front keys, the meter returns to the energy reading in the USER loop.

SETUP loop		Index number in display
1.0	Customer number (Nº 1)	3-001
2.0	Customer number (Nº 2)	3-002
3.0	Date	3-003
4.0	Time [1]	3-004
5.0	Yearly target date 1 (MM.DD)	3-005
6.0	Monthly target date 1 (DD)	3-006
7.0	Flow sensor position: Inlet or outlet flow (A code)	3-007
8.0	Energy unit (B code)	3-008
9.0	Primary address module slot 1 (Nº 34)	3-009
10.0	Primary address module slot 2 (Nº 34)	3-010
11.0	Primary address module slot 3 (Nº 34)	3-011
12.0	Primary address module slot 4 (Nº 34)	3-012
13.0	Average time of min./max P and Q	3-013
14.0	θ_{hc} [2]	3-014
15.0	t offset	3-015
16.0	Radio "ON" or "OFF"	3-016
17.0	Input A1 (preset register)	3-017
18.0	Input B1 (preset register)	3-018
19.0	Meter number of Input A1	3-019
20.0	Meter number of Input B1	3-020
21.0	TL2	3-021
22.0	TL3	3-022
23.0	TL4	3-023
24.0	t5	3-024
25.0	EndSetup	3-025

[1] The clock can, under the installation seal, be adjusted by all modules.

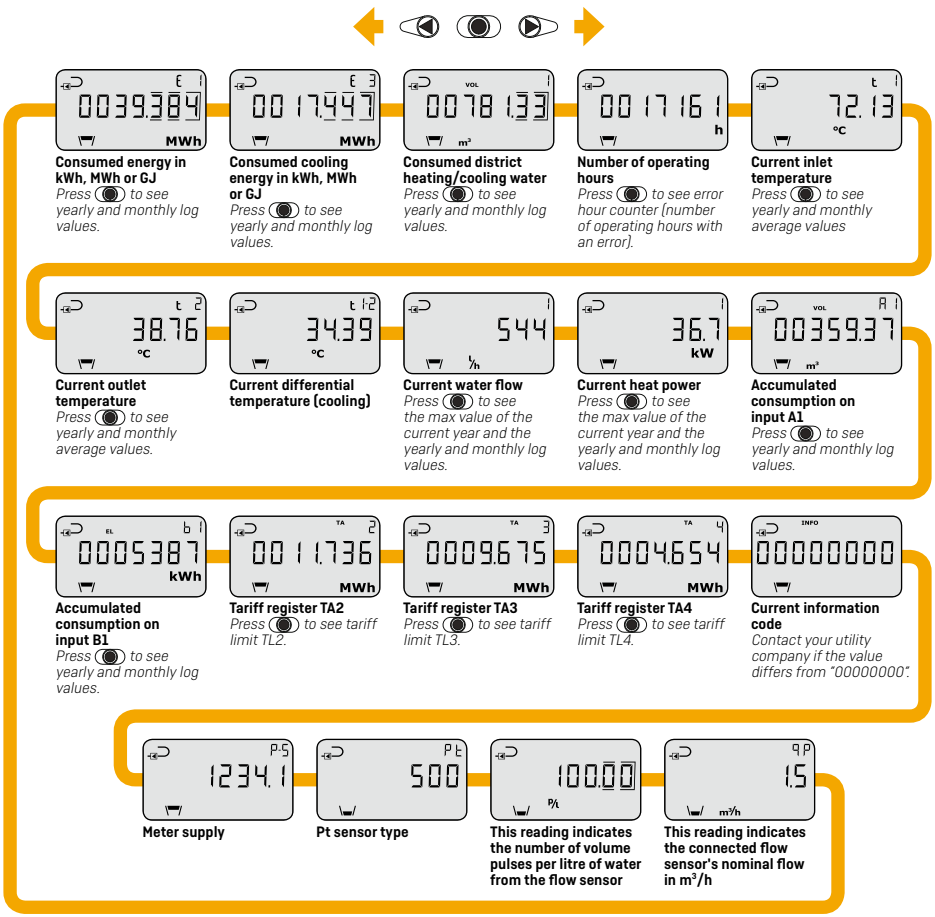
[2] θ_{hc} can only be changed in meter type 6. Upon attempts to access this menu in other meter types, the display shows the message "Off".

User guide

Energy measurement
MULTICAL® 803 functions as follows:
The flow sensor registers the quantity of water that circulates through the system in cubic metres (m^3).
The temperature sensors placed in inlet and outlet register the cooling, i.e. the difference between inlet and outlet temperatures.
MULTICAL® 803 calculates the energy consumption on the basis of volume of water and temperature difference.

Readings in the display
When one of the arrow keys (◀ or ▶) is activated, a new primary reading is displayed. The primary key ● is used for retrieving historical readings and average values and for returning to primary readings.
Four minutes after the latest activation of any front key, the reading automatically changes to consumed energy.

Display readings



The display readings are based on **DDD code 310 / 610**. At kamstrup.com, you find a selection of interactive user guides based on other DDD codes.

kamstrup

User Guide

MULTICAL® 803 & ULTRAFLOW®

Kamstrup A/S • 55122412_A1_GB_2019-03

Kamstrup A/S · Industrivej 28, Stilling · DK-8660 Skanderborg · T: +45 89 93 10 00 · info@kamstrup.com · kamstrup.com