# Installation and User's Guide

# MULTICAL® 41

## Water Meter


Kamstrup

www.kamstrup.com

INSTALLATION

# MULTICAL® 41

English


Kamstrup

Kamstrup A/S
Industrivej 28, Stilling, DK-8660 Skanderborg
TEL: +45 89 93 10 00 · FAX: +45 89 93 10 01
info@kamstrup.com · www.kamstrup.com

# 1. General information

⚠ Please read these instructions before installing the heat meter. Kamstrup's guarantee obligations do not apply in case of incorrect installation.

Please note the following installation requirements:

Max. inlet pressure for meters with screw-joints is 16 bar.

## 1.1 MID designations

The meter is approved according to MID (OIML R49).

Rated operation conditions/measuring ranges:

Temperature of medium in flow sensor: 0.1°C...30°C

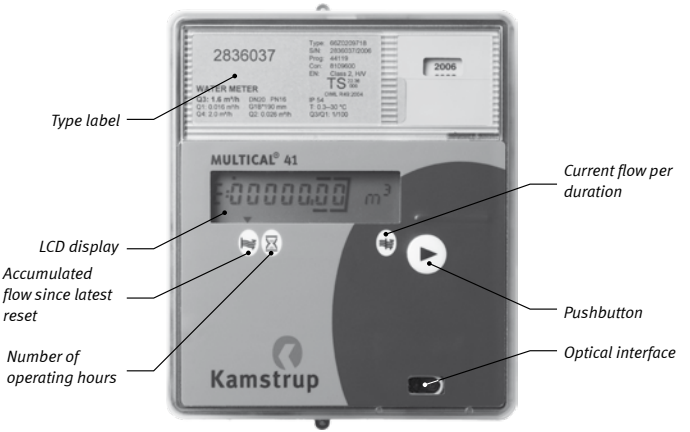
Mechanical environment: M1 (fixed installation with minimum vibration)

Electromagnetic environment: E1 (Domestic and light industrial). Signal cables from the meter must be separated by at least 25 cm distance to other installations.

Climatic environment: The installation shall be made in non-condensing environments and in closed location (indoor). The ambient temperature must be within 5...55°C.

Maintenance and repair: The water supplier is allowed to change communication module and battery. The flow part must never be separated from the calculator. All repairs require a following re-verification on an accredited laboratory.

Battery for replacement: Kamstrup type 66-00-200-100.




# 2. Information codes “E”

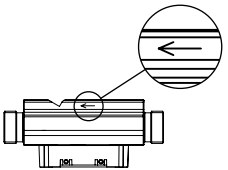
MULTICAL® 41 constantly monitors a number of important functions. If a serious error occurs in the metering system or in the installation, an “E” appears in the left side of the display and an information code can be read by activating the front key until an “E” appears in the right side of the display.

| Information code | Description |
|---|---|
| **000** | No irregularities |
| **016** | Air in the flow sensor |
| **128** | Battery replacement (12 years’ lifetime) |

# 3. Mounting

Before mounting the flow part (flow sensor), flush the system thoroughly and remove protection plugs/plastic membranes from the flow sensor.

The flow direction is indicated by an arrow on the side of the flow sensor.



To prevent cavitation the operating pressure at the flow sensor must be min. 1.5 bar at $Q_3$ and min. 2.5 bar at $Q_4$.

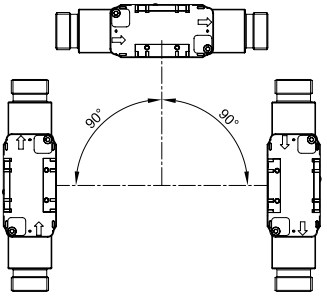
The flow sensor must not be exposed to pressures below ambient pressures (vacuum).

| **Flowrate** | **Operating conditions** | |
|---|---|---|
| $Q_1$ | Minimum flow rate | Lowest flow rate, at which it is required that the water meter operates within the maximum permissible error range. |
| $Q_2$ | Transitional flow rate | Flow rate, which occurs between the permanent flow rate $Q_3$ and the min. flow rate $Q_1$ where the tolerance changes. |
| $Q_3$ | Permanent flow rate | Highest flow rate within the operating range. |
| $Q_4$ | Overload flow rate | The highest flow rate, at which the flow sensor can operate for short periods within the tolerance range. |

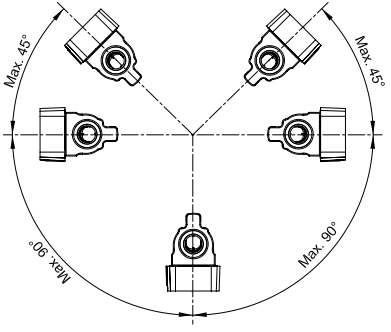
## 3.1 Straight inlet

MULTICAL® 41 requires neither straight inlet nor outlet to meet the Measuring Instruments Directive (MID) 2004/22/EC and OIML R 49. Only in case of heavy flow disturbances before the meter will a straight inlet section be necessary.

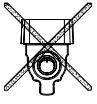
## 3.2 Installation angle




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

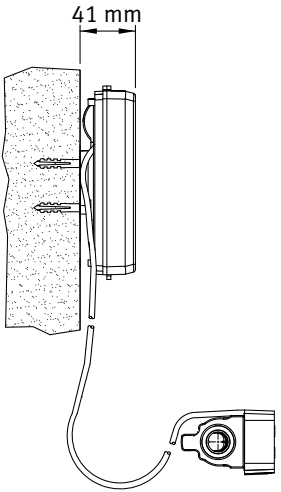



The flow sensor can be turned upwards to max. 45° and downwards to max. 90° in relation to the pipe axis.

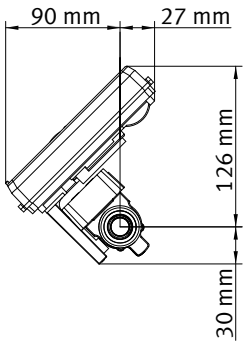


Do not mount the flow sensor with the plastic box upwards.

## 3.3 Mounting the calculator




Wall mounting of MULTICAL® 41.




MULTICAL® 41 mounted on ULTRAFLOW®, by means of angle fitting 3026-252.

# 4. Power supply

MULTICAL® 41 can be power supplied by a built-in lithium battery, a 24 VAC internal mains module or an internal 230 VAC mains module.

The two wires from the battery or mains module are to be mounted in terminals 60 and 61 of the calculator.

⚠ The polarity must be correct; connect the red wire to terminal no. 60 (+) and the black wire to terminal no. 61 (-).

## 4.1 Battery supply

Connect MULTICAL® 41 to a lithium battery, D-cell. The battery is marked with installation year, e.g. 2008, and production date.

Obtain optimal battery life by keeping the battery temperature below 30ºC.

The voltage of a lithium battery is almost constant throughout the entire lifetime of the battery (approx. 3.65 V). Therefore, it is not possible to determine the remaining capacity by measuring the voltage.

The battery cannot be and must neither be charged nor hortcircuited. Used batteries must be handed in for approved destruction e.g. at Kamstrup A/S.

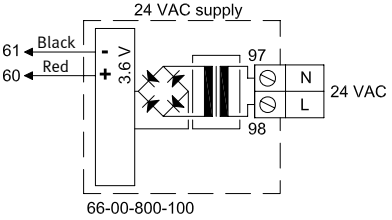
## 4.2 Mains modules

The modules are in protection class II and are connected via a two-wire cable (without earth) through the cable bush of the calculator placed at the top left corner of the connection unit.

Use connection cable with an outside diameter of 5–10 mm and secure correct dismantling as well as correct mounting of the cable relief.

Max. permitted fuse: 6 A

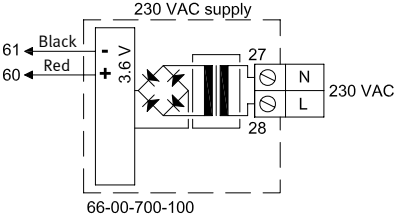
National installation regulations must be obeyed.




## 24 VAC

Use a transformer, e.g. type 66-99-403 for a 24 VAC supply module.

**NB!** This module cannot be supplied from 24 VDC.



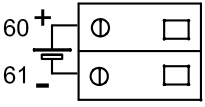

## 230 VAC

This module is used for direct mains connection.

# 5. Operational check

Carry out an operational check when the water meter is completely mounted. Activate the push-button on MULTICAL® 41 and check that reliable display values for water flow etc. appears.

# 6. Electrical connection




| | Terminal no. | Connection |
|---|---|---|
| + | 60 | Supply (red) |
| - | 61 | Supply (black) |

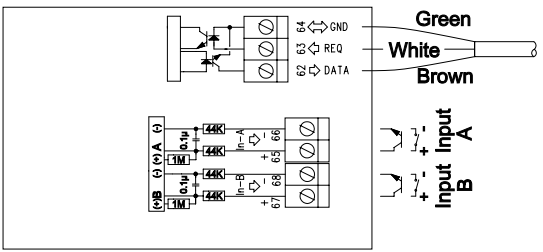
# 7. Plug-in modules

MULTICAL® 41 can be retrofitted with a number of extra functions by means of plug-in modules. Below is a brief description of the individual modules.

## 7.1 Data/pulse inputs

The data terminals are e.g. used to connect a PC or a MULTITERM hand-held terminal via an external reading plug, which is connected as shown below.

| | | |
|---|---|---|
| 65 - 66 | Input A | f < 0.5 Hz |
| 67 - 68 | Input B | f < 0.5 Hz |
| 62 | Brown | |
| 63 | White | |
| 64 | Green | |




The signal is passive and and galvanically separated through optocouplers. Conversion to RS232 level requires connection of data cable 66-99-106 with above connections.

Pulse inputs to be used for e.g. connecting an extra water meter. Please note the max. pulse frequency and correct pulse coding (l/pulse), which are selected by means of the FF and GG configuration.

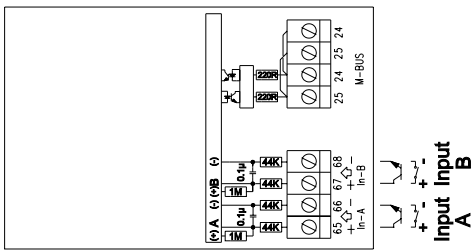
## 7.2 M-Bus/pulse inputs

The M-Bus module can be mounted in star, ring or bus topology.

The M-Bus module is available in two versions:

- supporting primary addressing
- supporting primary and secondary addressing

The M-Bus network is connected to the terminals 24 and 25. The polarity is unimportant. The M-Bus module is available with pulse inputs.



## 7.3 Radio/pulse inputs

The radio module is used for wireless reading of MULTICAL® 41.

When connecting the supply voltage the radio module retrieves the type and meter number of the meter and transfers data to the memory of the module.

The radio module is ready to communicate in less than 10 seconds.

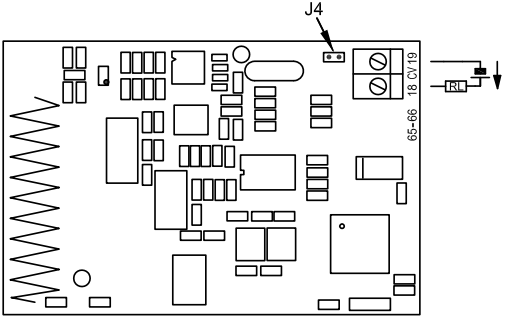
The radio module is read via the hand-held terminal, but is prepared to form part of a radio network.

For further information, see Technical Description 5512-013.

The radio module also offers the option of leak surveillance. Every hour the meter's volume is checked and compared to an alarm limit.

A pulse output is mounted on the module.

| | |
|---|---|
| Power: | 30 V |
| Load: | 10 mA |
| Pulse duration: | 0.1 seconds |
| Meter factor: | 10 litres/pulse |

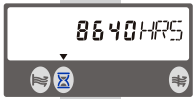



*Radio module*

## Primary register:

Water consumption ($m^3$)


Number of operating hours



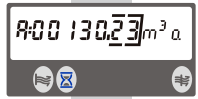

Aktual water flow


Peak-flow (max. flow)


Information codes

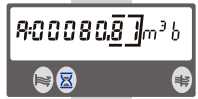
**NB!** If the figure is bigger than „000“, contact the water supplier.


## Secondary readings:



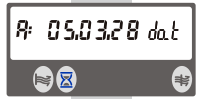

Totalized water consumption on input A

**NB!** The view only occurs if the system has several inputs

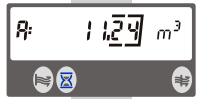



Totalized water consumption on input B

**NB!** The view only occurs if the system has several inputs

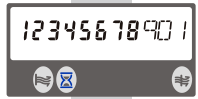



Latest target date

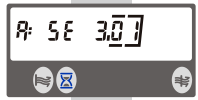



Volume count


The highest registered flow since the last target date




Customer number




Program number of calculator


Display segment test

**In order to change between primary and secondary display readings you press the button for min. 4 seconds. Subsequently an A is displayed.**

# MULTICAL® 41

USER GUIDE

## Volume measuring

**The water meter MULTICAL® 41** (0.1...30°C) functions as follows:

In the **primære register** (display) is shown:

- Volume in m³ (accumulated)
- Number of operating hours
- Aktual flow in l/h
- Peak flow in l/h
- Information codes

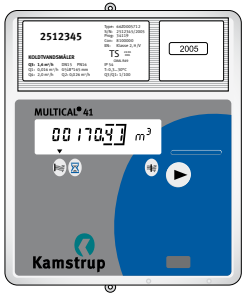
In the **secondary register** (display) is e.g. shown monthly data and others depending on the selected configuration.

## Readings in the display

When the front key ▶ is activated, a new reading will appear.

If the front key is activated for 4 seconds, the display changes between the primary and the secondary register.

150 sec. after the most recent activation of the front key MULTICAL® 41 automatically changes to displaying volume (m³).




Please contact the water supplier if you require further details.

**Please note!** ▼ The arrow indicates the type of reading. To the right on the display the measuring unit is displayed.

Kamstrup

www.kamstrup.com

5512307_E1_GB_03.2010