WMZ Plus

Beginning with firmware version 1.06

Calorimeter

Manual for the specialised craftsman

Installation
Operation
Functions and options
Troubleshooting

VBus.net

The Internet portal for easy and secure access to your system data – www.vbus.net

Thank you for buying this RESOL product.
Please read this manual carefully to get the best performance from this unit. Please keep this manual safe.

11211576

en

Manual

www.resol.com

Safety advice

Please pay attention to the following safety advice in order to avoid danger and damage to people and property.

Danger of electric shock:

- When carrying out works, the device must first of all be disconnected from the mains.
- It must be possible to disconnect the device from the mains at any time.
- Do not use the device if it is visibly damaged!

The device must not be used by children or persons with reduced physical, sensory or mental abilities or without any experience and knowledge. Make sure that children do not play with the device!

Only connect accessories authorised by the manufacturer to the device.

Make sure that the housing is properly closed before commissioning the device.

Set the code to the customer code before handing over the controller to the customer.

Target group

These instructions are exclusively addressed to authorised skilled personnel.

Only qualified electricians are allowed to carry out electrical works.

Initial commissioning must be effected by authorised skilled personnel.
Authorised skilled personnel are persons who have theoretical knowledge and experience with the installation, commissioning, operation, maintenance, etc. of electric/electronic devices and hydraulic systems and who have knowledge of relevant standards and directives.

Instructions

Attention must be paid to the valid local standards, regulations and directives!

Subject to technical change. Errors excepted.

Information about the product

Proper usage

The WMZ Plus is designed for measuring and indicating heat quantities in compliance with the technical data specified in this manual.

Any use beyond this is considered improper.

Proper usage also includes compliance with the specifications given in this manual.

The WMZ Plus is not suitable for billing purposes.

Improper use excludes all liability claims.

Note

Strong electromagnetic fields can impair the function of the device.

➔ Make sure the device as well as the system are not exposed to strong electromagnetic fields.

EU Declaration of conformity

The product complies with the relevant directives and is therefore labelled with the CE mark. The Declaration of Conformity is available upon request, please contact the manufacturer.

Scope of delivery

The scope of delivery of this product is indicated on the packaging label.

Storage and transport

Store the product at an ambient temperature of 0 … 40 °C and in dry interior rooms only.

Transport the product in its original packaging only.

Cleaning

Clean the product with a dry cloth. Do not use aggressive cleaning fluids.

Data security

We recommend regular backups of the data stored on the device via MicroSD card.

Decommissioning

1. Disconnect the device from the power supply.
2. Dismount the device.

Disposal

- Dispose of the packaging in an environmentally sound manner.
- At the end of its working life, the product must not be disposed of as urban waste. Old appliances must be disposed of by an authorised body in an environmentally sound manner. Upon request we will take back your old appliances bought from us and guarantee an environmentally sound disposal of the devices.

Description of symbols

Warnings are indicated with a warning symbol!

Signal words describe the danger that may occur, when it is not avoided.

WARNING **means that injury, possibly life-threatening injury, can occur.**

➔ It is indicated how to avoid the danger described.

ATTENTION **means that damage to the appliance can occur.**

➔ It is indicated how to avoid the danger described.

Note
Notes are indicated with an information symbol.

➔ Texts marked with an arrow indicate one single instruction step to be carried out.

1. Texts marked with numbers indicate several successive instruction steps to be carried out.

WMZ Plus Calorimeter

Universal calorimeter module for solar, heating and cooling systems. Graphic display for indication of flow and return temperature, heat quantity, flow rate and sensor faults (balance values are also stored in case of a power failure). Suited for systems with water or water-glycol mixtures (water, propylene glycol, ethylene glycol and Tyfocor® LS adjustable).

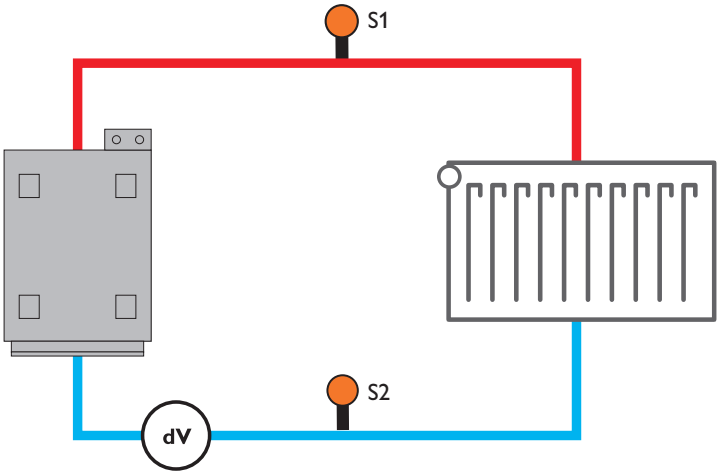
The WMZ Plus meters the heat quantity as well as the cold quantity. The total energy results from the sum of heat and cold energy.

Contents

1 Overview

- **Single or combined measurement of heat and cold energy**
- **Two independent calorimeters**
- **Commissioning menu for easy configuration**
- **Conversion into selectable alternative units (€, kg CO_2, m³ gas, etc.)**

Application example



Technical data

Inputs: 4 Pt1000 temperature sensors, 2 impulse inputs (adjustable), 2 4-20 mA inputs (convertible to 0-10 V), 2 analogue Grundfos Direct Sensors™ (VFS)
Outputs: 2 S0 outputs
Power supply: 100–240 V~ (50–60 Hz)
Standby: < 1 W
Settings:
• **Volumetric content of glycol:** 0 … 70 % (1-% steps)
• **Impulse rate of flow rate**: 0 … 99 l/Imp (1-l/Imp steps) for V40 flowmeter
Temperature measurement: with Pt1000 sensors and Grundfos Direct Sensors™ (VFS)
Measuring precision: ± 0.3 K
Measuring range: -40 … +120 °C (depending on the medium)
Data interface: VBus®, MicroSD card slot
VBus® current supply: 60 mA
Housing: plastic, PC-ABS and PMMA
Mounting: wall mounting, also suitable for mounting into patch panels
Indication / Display: graphic display, operating control LED (Lightwheel®)
Operation: 2 push buttons and 1 adjustment dial (Lightwheel®)
Ingress protection: IP 20 / EN 60529
Protection class: I
Ambient temperature: 0 … 40 °C
Fuse: T200 mA
Maximum altitude: 2000 m above MSL
Dimensions: 110 x 166 x 47 mm

2 Installation

2.1 Mounting

WARNING! **Electric shock!**

Upon opening the housing, live parts are exposed!

➔ **Always disconnect the device from power supply before opening the housing!**

Note

Strong electromagnetic fields can impair the function of the device.

➔ Make sure the device as well as the system are not exposed to strong electromagnetic fields.

The unit must only be located in dry interior rooms.

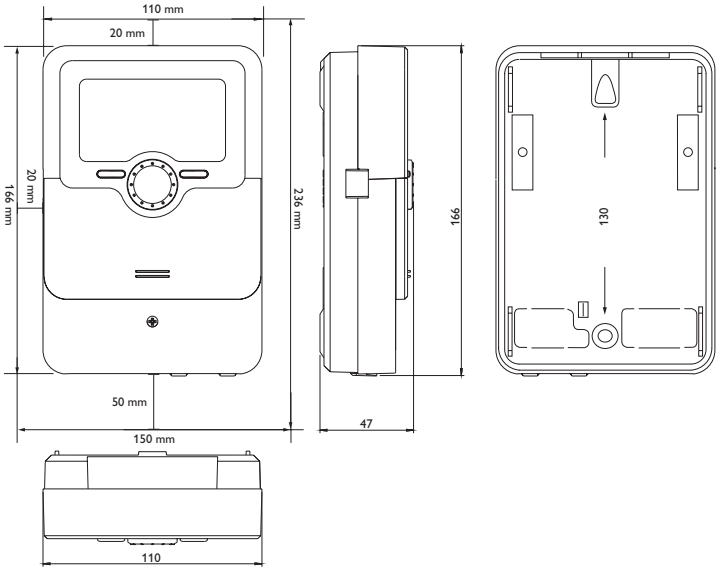
If the device is not equipped with a mains connection cable and a plug, the device must additionally be supplied from a double pole switch with contact gap of at least 3 mm.

Please pay attention to separate routing of sensor cables and mains cables.

In order to mount the device to the wall, carry out the following steps:

1. Unscrew the crosshead screw from the cover and remove it along with the cover from the housing.
2. Mark the upper fastening point on the wall. Drill and fasten the enclosed wall plug and screw leaving the head protruding.
3. Hang the housing from the upper fastening point and mark the lower fastening point (centres 130 mm).
4. Insert lower wall plug.
5. Fasten the housing to the wall with the lower fastening screws and tighten.
6. Carry out the electrical wiring in accordance with the terminal allocation (see page 7).
7. Put the cover on the housing.
8. Attach with the fastening screw.

Dimensions and minimum distances



2.2 Electrical connection

WARNING! **Electric shock!**

Upon opening the housing, live parts are exposed!

➔ **Always disconnect the device from power supply before opening the housing!**

ATTENTION! **Damage by overheating! Danger of fire!**

Improper connection of cables to the terminals can lead to damage caused by overheating!

➔ **For a safe and lasting electrical connection, take care for the proper connection of the cables to the terminals according to IEC 60947-1!**

ATTENTION! **ESD damage!**

Electrostatic discharge can lead to damage to electronic components!

➔ **Take care to discharge properly before touching the inside of the device! To do so, touch a grounded surface such as a radiator or tap!**

Note

Connecting the device to the power supply must always be the last step of the installation!

Note

It must be possible to disconnect the device from the mains at any time.

➔ Install the mains plug so that it is accessible at any time.

➔ If this is not possible, install a switch that can be accessed.

If the mains cable is damaged, it must be replaced by a special connection cable which is available from the manufacturer or its customer service.

Do not use the device if it is visibly damaged!

Depending on the product version, mains cables and sensor cables are already connected to the device. If that is not the case, please proceed as follows:

Attach flexible cables to the housing with the enclosed strain relief and the corresponding screws.

The stripped length of the cables must be at least 8 mm.

Connect the **temperature sensors** (S1 to S4) to the terminals S1 to S4 (either polarity).

S1 = Sensor 1 (flow HQM 1)

S2 = Sensor 2 (return HQM 1)

S3 = Sensor 3 (flow HQM 2)

S4 = Sensor 4 (return HQM 2)

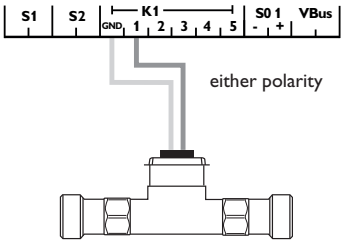
The cables carry low voltage and must not run together in a cable conduit with cables carrying a voltage higher than 50 V (please pay attention to the valid local regulations). The cable lentghs depend on the cross sectional area. Example: up to 100 m at 1.5 mm², up to 50 m at 0.75 mm². The cables can be extended with a two-wire cable.

K1 and **K2** are combined inputs for **flow rate sensors**.

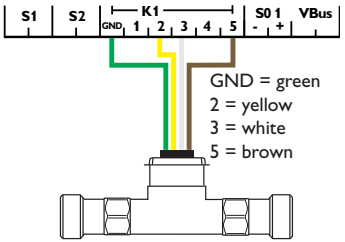
The following table shows the terminal allocations for the different sensor types at the combined inputs (K1 – WMZ 1 / K2 – WMZ 2):

Terminal / Sensor	GND Sensor ground	1 Flow rate signal (frequency)	2 Temperature	3 Flow rate	4 4-20 mA/0-10 V	5 Power supply 5 V
V40	✓	✓				
VFS	✓		✓	✓		✓
SIKA	✓	✓				✓
FlowRotor	✓	✓				✓
U/I	✓				✓	
US Echo II	✓	✓				✓

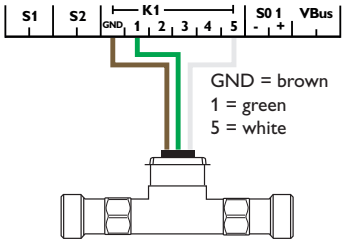
Connection examples



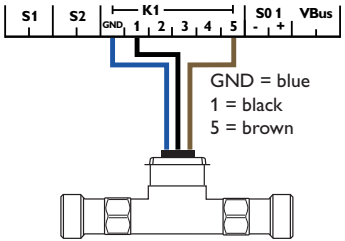
V40



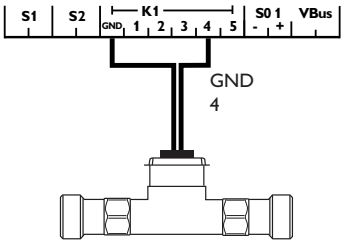
VFS



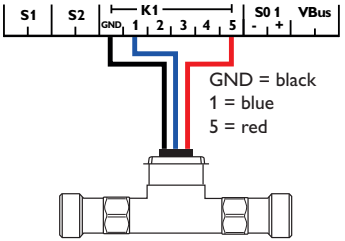
SIKA



FlowRotor



U/I



US Echo II

Note
If Grundfos Direct Sensors™ are used, connect GND of the combined inputs (K1 / K2) to PE.

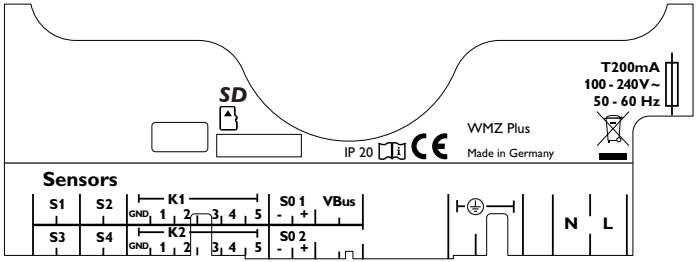
Note
Install the flow rate sensor into the return.

Connect the **V40** flowmeter to the terminals 1 and GND of the corresponding combined input (either polarity).

The **S0 outputs** are used for issuing the energy quantity:

S0-1: HQM 1

S0-2: HQM 2



The device is supplied with power via a mains cable. The power supply of the device must be 100–240 V~ (50–60 Hz).

The **mains connection** is at the terminals:

Neutral conductor	N
Conductor	L
Protective earth conductor	⏚

Note
For more details about the commissioning procedure see page 13.

2.3 Data communication / bus

The device is equipped with a **VBus®** for data transfer and energy supply to external modules. The connection is to be carried out at the terminals marked **VBus** (any polarity).

One or more VBus® modules can be connected via this data bus.

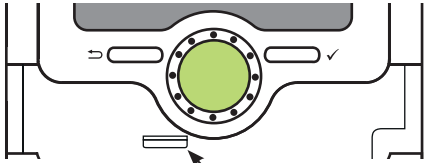
Note
If several VBus® accessories are used with a cascade, a VBus®-Repeater may be required. For more information about cascade operation, see page 18.

2.4 MicroSD card slot

The device is equipped with a MicroSD card slot.

With a MicroSD card, the following functions can be carried out:

- Store measurement and balance values onto the MicroSD card. After the transfer to a computer, the values can be opened and visualised, e.g. in a spreadsheet.
- Store adjustments and parameterisations on the MicroSD card and, if necessary, retrieve them from there.
- Download firmware updates from the Internet and install them on the device via MicroSD card.



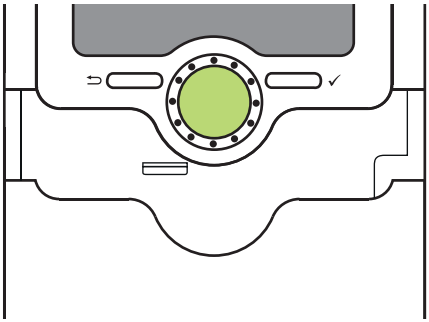
MicroSD card slot

A MicroSD card is not included, but can be purchased from the manufacturer.

Note
For more information about using a MicroSD card, see page 19.

3 Operation and function

3.1 Buttons and adjustment dial



The device is operated via 2 buttons and 1 adjustment dial (Lightwheel®) below the display:

Left button (⮌) - escape button for changing into the previous menu
Right button(✓) - confirming / selecting
Lightwheel® - scrolling upwards / scrolling downwards, increasing adjustment values / reducing adjustment values

3.2 Control lamp

The device is equipped with a multicolour LED in the centre of the Lightwheel®, indicating the following states:

Colour	Permanently shown	Flashing
Green	Everything OK	
Red		Sensor line break, sensor short circuit
Yellow		Parameterisation active, update in progress, MicroSD card writing error

3.3 Parameterisation mode

After the installer code is entered (see page 20), the device changes to the parameterisation mode.

Note
In parameterisation mode, the metering process will stop and the message **Metering stopped – Parameterisation active** will be indicated.
The LED in the Lightwheel® will glow yellow.

1. In order to carry out adjustments in the menu, press the right button (✓).

The device changes to the main menu in which adjustments on the installer level can be made.

2. In order to save the adjustments made, select the menu item **Save** in the main menu.

The device will leave the installer level and restart.

3.4 Selecting menu points and adjusting values

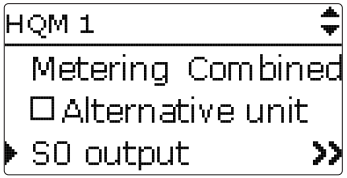
During normal operation of the device, the display indicates the main menu.

If no button is pressed for 2 min, the display illumination switches off. After another 2 min, the device changes to the status display.

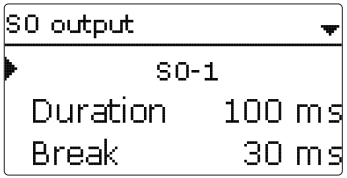
➔ In order to get from the status menu into the main menu, press the left button (⮌)!

➔ Press any key to reactivate the display illumination.

➔ In order to scroll through the menu items, turn the Lightwheel®.



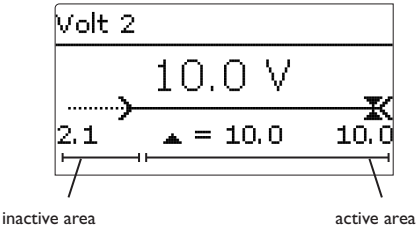
If the symbol » is shown behind a menu item, pressing the right button (✓) will open a new submenu.



Values and options can be changed in different ways:

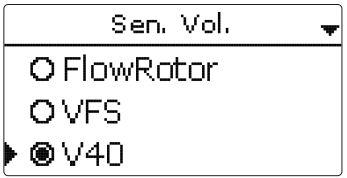
Numeric values can be adjusted by means of a slide bar. The minimum value is indicated to the left, the maximum value to the right. The large number above the slide bar indicates the current adjustment. By turning the Lightwheel®, the upper slide bar can be moved to the left or to the right.

Only after the adjustment has been confirmed by pressing the right button (✓) will the number below the slide bar indicate the new value. The new value will be saved if it is confirmed by pressing the right button (✓) again.

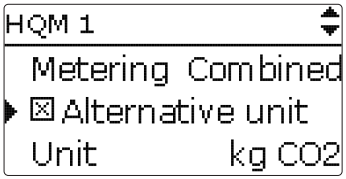


When 2 values are locked against each other, they will display a reduced adjustment range depending on the adjustment of the respective other value.

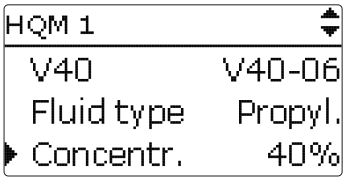
In this case, the active area of the slide bar is shortened, the inactive area is indicated as a dotted line. The indication of the minimum and maximum values will adapt to the reduction.



If only one item of several can be selected, they will be indicated with radio buttons. When one item has been selected, the radio button in front of it is filled.



If more than one item of several can be selected, they will be indicated with checkboxes. When an item has been selected, an **x** appears inside the checkbox.



If further menu items are available and the symbol ▲▼ is indicated on the upper right-hand side of the display, more menu items can be accessed by turning the Lightwheel®.

3.5 Menu structure

Main menu
- Status
- Balance values
- HQM 1
- HQM 2
- Basic settings
- SD card
- User code

Status
- HQM
- Service
- Messages
- Version

HQM 1
- Sen. flow rate
- …
- Fluid type
- Concentration
- Metering
- Alternative unit
- …

Basic settings
- Language
- Date
- Time
- Auto DST
- Vol. unit
- Reset

The menu items and adjustment values selectable are variable depending on adjustments already made. The figure only shows an exemplary excerpt of the complete menu in order to visualise the menu structure.

4 Flow rate sensors

The following flow rate sensor options are available:

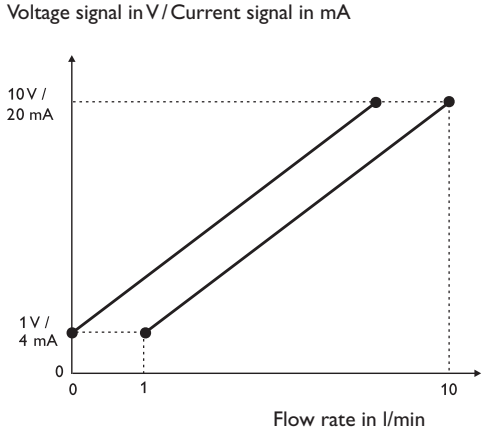
- US Echo II
- SIKA
- U/I (sensors issuing voltage or current signals)
- FlowRotor
- VFS
- V40

Depending on the flow rate sensor selected further adjustment channels appear. The following table gives an overview of the sensors and the corresponding adjustment values.

Flow rate sensor	Corresponding adjustment channels	Description	Adjustment range / selection	Factory setting
US Echo II	Vol./Imp.	US Echo II impulse rate	0.1 … 100.0 l/Imp	1.0 l/Imp
SIKA	Type	SIKA sensor type	VY1030M, VY1030K, VTY20	VTY20
U/I	U/I	Voltage or current signal	4-20 mA, 0-10 V	0-10 V
	Curve	Curve submenu		
	Unit	Flow rate unit	m³/h, l/min	l/min
	Volt 1	Voltage minimum flow rate (only if 0-10 V has been selected)	0.0 … 10.0 V	1.0 V
	Current 1	Current minimum flow rate (only if 4-20 mA has been selected)	0 … 20 mA	4 mA
	Fl.r.1	Minimum flow rate	0.0 … 500.0 l/min 0.0 … 30.0 m³/h	1.0 l/min 1.0 m³/h
	Volt 2	Voltage maximum flow rate (only if 0-10 V has been selected)	0.0 … 10.0 V	10.0 V
	Current 2	Current maximum flow rate (only if 4-20 mA has been selected)	0 … 20 mA	20 mA
	Fl.r.2	Maximum flow rate	0.0 … 500.0 l/min 0.0 … 30.0 m³/h	10.0 l/min 10.0 m³/h
FlowRotor	Type	FlowRotor sensor type	DN20, DN25, DN32	DN20
VFS	Type	VFS sensor type	2-40, 1-12	2-40
V40	Vol./Imp.	V40 impulse rate	0.1 … 100.0 l/Imp	1.0 l/Imp

The characteristic curve of the voltage and current signal as a function of the flow rate is defined by 2 set points. At a flow rate of **Fl.r.1** the voltage signal is **Volt 1** and the current signal **Current 1** respectively. At a flow rate of **Fl.r.2** the voltage signal is **Volt 2** and the current signal **Current 2** respectively. The device automatically calculates the characteristic curve resulting from these values.

Note
The flow rate sensor has to be installed in the return.



5 Commissioning

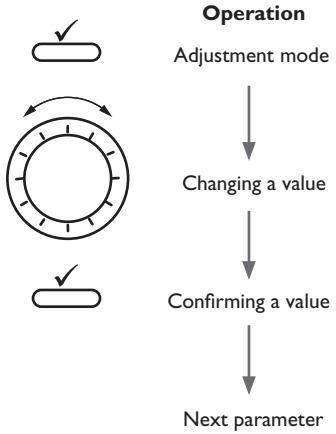
When the system is ready for operation, establish power supply of the device.

The device runs an initialisation phase in which the Lightwheel® glows red.

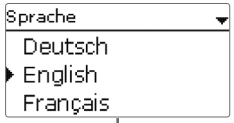
When the device is commissioned or when it is reset, it will run a commissioning menu after the initialisation phase. The commissioning menu leads the user through the most important adjustment channels.

Commissioning menu

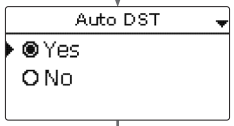
The commissioning menu consists of the channels described in the following. In order to make an adjustment, adjust the desired value with the Lightwheel® and confirm with the right button (✓). The next channel will appear in the display.



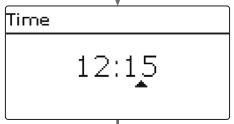
1. **Language:**
➔ Adjust the desired menu language.



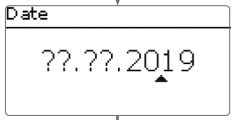
2. **Daylight savings time adjustment:**
➔ Activate or deactivate the automatic daylight savings time adjustment.



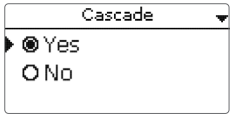
3. **Time:**
➔ Adjust the clock time. First of all adjust the hours, then the minutes.



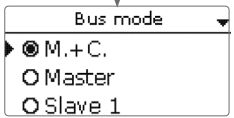
4. **Date:**
➔ Adjust the date. First of all adjust the year, then the month and then the day.



5. **Cascade:**
➔ If the device is to be used in a cascade, select **Yes**.



6. **Bus mode (if 5. = Yes):**
➔ Define whether the device is used as a master with a controller, as a master or as a slave.



7. Flow rate sensor:

➔ Adjust the desired flow rate sensor.

Depending on the flow rate sensor selected further adjustment channels appears, see page 12.

8. Medium:

1. Adjust the desired heat transfer fluid.

If **Tyfocor LS, Ethyl** or **Propyl.** has been selected, another channel for adjusting the antifreeze concentration appears.

2. Adjust the desired **concentration** of the heat transfer medium.

9. Metering:

➔ Adjust the desired energy metering.

10. Alternative unit:

1. Activate or deactivate the alternative unit.

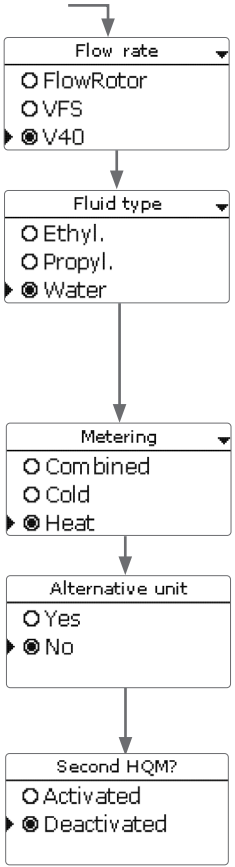
If the alternative unit is activated, further channels appear:

2. Adjust the desired **Unit**.
3. Adjust the desired **Factor**.

11. Second HQM?

➔ Activate a second heat quantity measurement, if required.

Note
If a second calorimeter is activated, the channels described above will be displayed for the second heat quantity measurement.



12. Completing the commissioning menu:

After the adjustments have been made, a security enquiry appears. If the security enquiry is confirmed, the adjustments will be saved.

➔ In order to confirm the security enquiry, press the right button (✓).

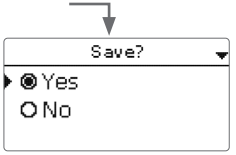
➔ In order to get back to the adjustment channels of the commissioning menu, press the left button (⮌).

After the security enquiry has been confirmed, the device is ready for operation.

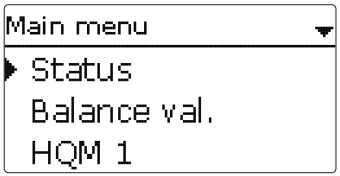
Note
The adjustments carried out during commissioning can be changed anytime in the corresponding adjustment channel. Additional functions and options can also be activated and adjusted.

Note
After commissioning, check whether the latest firmware version is installed on the device. The current firmware can be downloaded from www.resol.com/firmware.

➔ If a newer firmware version is available, update the device!



6 Main menu



In this menu, different menu areas can be selected.

The following menus are available:

- Status
- Balance values
- HQM 1
- HQM 2
- Basic settings
- SD card
- User code

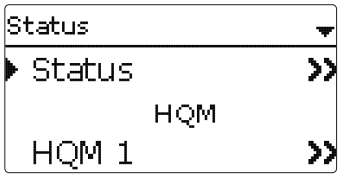
1. Select the menu area by turning the Lightwheel®.
2. In order to access the desired menu area, press the right button (✓).

During normal operation of the device, the display indicates the main menu.

If no button is pressed for 2 min, the display illumination switches off. After another 2 min, the device changes to the status display.

➔ In order to get from the status menu into the main menu, press the left button (⮌)!

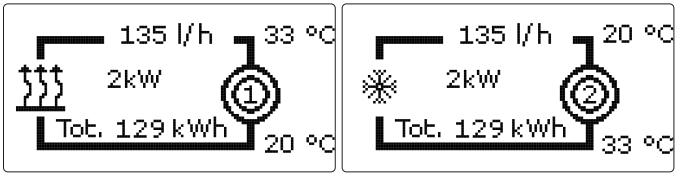
7 Status



The status menu is divided into the menu areas **Status**, **HQM** and **Service**.

7.1 Status

In the **Status**/**Status** menu, all current measured values are indicated in a clear graphic. Each HQM has its own display. In order to change between HQM 1 and HQM 2, turn the Lightwheel®.



The information given in the graphic can also be indicated as a text. For this purpose, select the desired HQM and press the right button (✓). In order to get back to the graphic, press the left button (⮌).

Symbol	Description
①	HQM 1
②	HQM 2
	Heat generator (if heat quantity is metered)
	Cold generator (if cold quantity is metered)

7.2 HQM

In the **Status**/**HQM** menu, the submenus **HQM 1** and **HQM 2** can be found in which all current measured values of the flow and return sensors, flow rate and power as well as heat quantity of the corresponding calorimeter are indicated.

7.3 Service

In the **Status**/**Service** menu, the **Messages** submenu can be found in which error and warning messages are indicated.

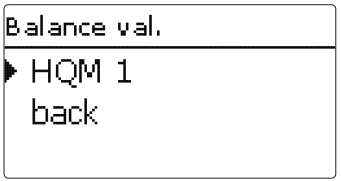
During normal operation, the message **Everything OK** is indicated.

In case of an error message, the display indicates the error type.

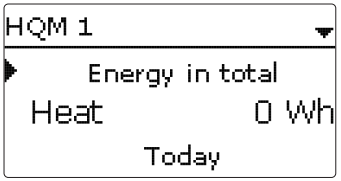
After the error has been removed, the error message will disappear.

Display	Description
HQM 1 !Fl. def.	HQM 1 Flow sensor defective (short-circuit or line break)
HQM 1 !Ret. def.	HQM 1 Return sensor defective (short-circuit or line break)
HQM 2 !Fl. def.	HQM 2 Flow sensor defective (short-circuit or line break)
HQM 2 !Ret. def.	HQM 2 Return sensor defective (short-circuit or line break)
!Date/Time	Clock module failed
!Data storage def.	Data storage defective
Card full	SD card full
Metering stopped	Parameterisation mode active

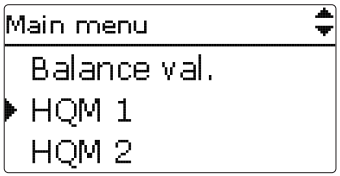
8 Balance values



In the **Balance values** menu, all balance values of the corresponding calorimeter are indicated. If, for example, **HQM 1** is selected, a submenu indicating all current values of the first calorimeter opens.



9 HQM



In the **HQM 1** and **HQM 2** menus, up to 2 internal heat quantity measurements can be activated and adjusted.

HQM 1 and HQM 2 respectively

Adjustment channel	Description	Adjustment range / selection	Factory setting
Sen. flow rate	Flow rate sensor selection	US Echo II, SIKA, U/I, FlowRotor, VFS, V40	-
Vol./Imp.	US Echo II impulse rate	0.1 … 100.0 l/Imp	1.0 l/Imp
Type	SIKA sensor type	VY1030M, VY1030K, VTY20	VTY20
U/I	Voltage or current signal	4-20 mA, 0-10 V	0-10 V
Curve	Curve submenu		
Unit	Flow rate unit	m³/h, l/min	l/min
Volt 1	Voltage minimum flow rate (only if 0-10 V has been selected)	0.0 … 10.0 V	1.0 V
Current 1	Current minimum flow rate (only if 4-20 mA has been selected)	0 … 20 mA	4 mA
Fl.r.1	Minimum flow rate	0.0 … 500.0 l/min 0.0 … 30.0 m³/h	1.0 l/min 1.0 m³/h
Volt 2	Voltage maximum flow rate (only if 0-10 V has been selected)	0.0 … 10.0 V	10.0 V
Current 2	Current maximum flow rate (only if 4-20 mA has been selected)	0 … 20 mA	20 mA
Fl.r.2	Maximum flow rate	0.0 … 500.0 l/min 0.0 … 30.0 m³/h	10.0 l/min 10.0 m³/h
Type	FlowRotor sensor type	DN20, DN25, DN32	DN20
Type	VFS sensor type	2-40, 1-12	2-40
Vol./Imp.	V40 impulse rate	0.1 … 100.0 l/Imp	1.0 l/Imp
Fluid type	Heat transfer fluid	Tyfocor LS, Ethyl., Propyl., Water	Water
Concentr.	Glycol concentration in the heat transfer fluid (only if fluid type = propylene glycol or ethylene glycol)	20 … 70 %	40 %
Metering	Selection of quantity to be metered	Combined, Heat, Cold	Heat
Alternative unit	Alternative unit option	Yes, No	No
Unit	Alternative display unit	Coal, Gas, Oil, CO_2, €	CO_2
Factor	Conversion factor	0.0000001 … 100.0000000	0.5000000
S0 output	Switch input selection	-	-
Duration	Impulse duration	30 … 120 ms	100 ms
Break	Impulse break	30 … 120 ms	30 ms
Imp/kWh	Impulse rate	1 … 1000	100
Reset	back to factory setting	Yes, No	No
Carryover	Carryover value (for the first-time configuration or after a HQM reset only)	0 … 999.999.999 kWh	-
Carryover Heat	Carryover value (only if Metering = Heat or Combined)	0 … 999.999.999 kWh	-
Carryover Cold	Carryover value (only if Metering = Cold or Combined)	0 … 999.999.999 kWh	-
Funct.	Activation / Deactivation	Activated, Deactivated	Activated

S1 is the flow sensor, S2 is the return sensor. If **VFS** has been selected as the flow rate sensor, the return temperature is measured automatically via the VFS sensor. In this case, the return sensor can be changed with the **Sen. return** parameter.

Depending on the flow rate sensor selected further adjustment channels appear, see page 12.

In the adjustment channel **Fluid type** the heat transfer fluid must be selected. If either propylene glycol or ethylene glycol is selected, the adjustment channel **Concentration** is indicated in which the antifreeze ratio of the heat transfer fluid can be adjusted.

For temperatures below 0 °C a heat transfer fluid with antifreeze is to be used.

The **Metering** channel is used for selecting whether heat quantity, cold quantity or both are to be metered.

When the **Alternative unit** option is activated, the device will convert the energy quantities into the quantity of fossil fuels (coal, oil or gas) saved, or the CO_2 emission saved respectively. The alternative **Unit** can be selected. A **factor** must be adjusted for the calculation. The conversion factor depends on the arrangement in use and has to be determined individually.

In the **S0 output** menu, a digital impulse output can be adjusted for each calorimeter, in order to issue the energy metered in form of pulses. The impulse duration, break and rate can be adjusted.

In order to reset the settings of a calorimeter, select **Reset** and confirm the security enquiry with **Yes**.

With the menu item **Function**, a calorimeter already adjusted can be temporarily deactivated or re-activated respectively. In this case, all adjustments will remain stored. If a calorimeter is deactivated, energy metering does not take place by this one. Sensor faults are ignored for the deactivated HQM.

If a calorimeter is being configured for the first time or after the overall quantity has been reset, the parameter **Carryover** appears.

A former value which is to be added to the overall quantity, can be entered.

If **Combined** is selected in the **Metering** channel, Heat and Cold values can be entered one after the other. The overall quantity results from the sum of both values.

10 Single and cascade operation

The WMZ Plus can be used as a single device or in a cascade. Up to 8 WMZ Plus can meter 16 heat quantities in total. If several WMZ Plus are used, the master has to be adjusted first.

The following possibilities are available:

10.1 Single operation

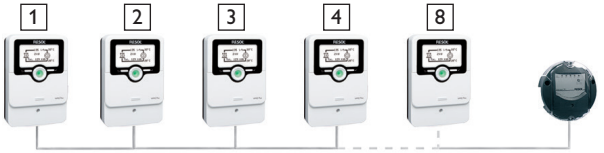
In single operation, one WMZ Plus can be connected to VBus® accessories.

Adjustment WMZ Plus:

Cascade = No; Bus mode = Single

10.2 Cascade without controller

In cascade operation, several WMZ Plus can be connected to each other via the VBus®.



Adjustment WMZ Plus 1:

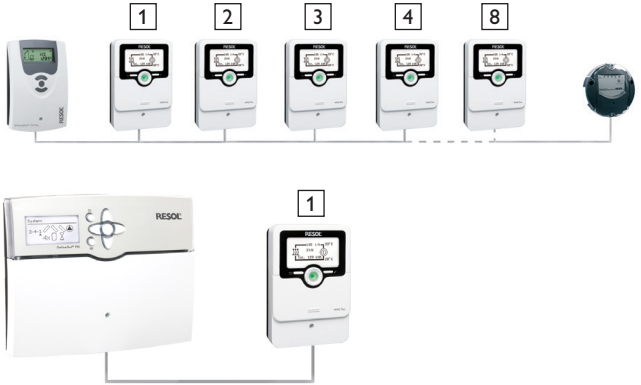
Cascade = Yes; Bus mode = Master

Adjustment WMZ Plus 2 to 8:

Cascade = Yes; Bus mode = Slave 1 … 7

10.3 Cascade with controller

In cascade mode, one or severeal WMZ Plus can be conneted to one controller via the VBus®.



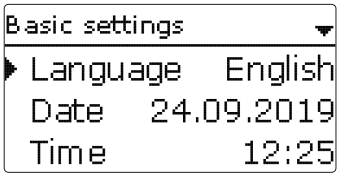
Adjustment WMZ Plus 1:

Cascade = Yes; Bus mode = M.+C.

Adjustment WMZ Plus 2 to 8:

Cascade = Yes; Bus mode = Slave 1 … 7

11 Basic settings

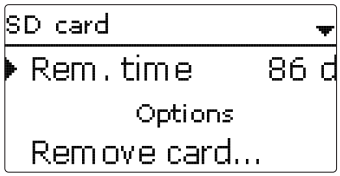


In the **Basic settings** menu, all basic parameters for the device can be adjusted. Normally, these settings have been made during commissioning. They can be subsequently changed in this menu.

Basic settings

Adjustment channel	Description	Adjustment range / selection	Factory setting
Language	Selection of the menu language	Deutsch, English, Français, Español, Italiano	Deutsch
Date	Adjustment of the date	01.01.2001 … 31.12.2099	01.01.2012
Time	Adjustment of the current time	00:00 … 23:59	-
Auto DST	Daylight savings time selection	Yes, No	Yes
Flow unit	Volume unit	l, m³	l
Bus mode	Bus mode single / cascade operation	M.+C., Master, Slave 1 … 7	-
Reset	back to factory setting	Yes, No	No

12 MicroSD card



SD card

Adjustment channel	Description	Adjustment range / selection	Factory setting
Rem. time	Remaining logging time	-	-
Remove card...	Safely remove card	-	-
Save adjustments	Save adjustments	-	-
Load adjustments	Load adjustments	-	-
Logging int.	Interval for data logging	00:01 … 20:00 (mm:ss)	60:00
Logging type	Logging type	Cyclic, Linear	Linear

The device is equipped with a MicroSD card slot for MicroSD memory cards.

With a MicroSD card, the following functions can be carried out:

- Logging measurement and balance values. After the transfer to a computer, the values can be opened and visualised, e.g. in a spreadsheet.
- Store adjustments and parameterisations on the MicroSD card and, if necessary, retrieve them from there.
- Running firmware updates on the device.

Note
The MicroSD card used must be formatted in FAT32.

Firmware updates

The current software can be downloaded from www.resol.de/firmware. When a MicroSD card with a firmware update is inserted, the enquiry **Update?** is indicated on the display.

➔ In order to run an update, select **Yes** and confirm with the right button (✓).

The update will run automatically. The indication **Please wait** and a progress bar appear on the display. When the update has been completed, the device will automatically reboot and run a short initialisation phase.

Note
Only remove the card when the initialisation phase has been completed and the main menu is indicated on the device display!

➔ To skip the update, select **No**.

The devices starts normal operation.

Note

The device will only recognise a firmware update file if it is stored in a folder named **RESOL\WMZ** on the first level of the MicroSD card.

➔ Create a folder named **RESOL\WMZ** on the MicroSD card and extract the downloaded ZIP file into this folder.

Starting the logging

1. Insert the MicroSD card into the slot.
2. Adjust the desired logging type and interval.

Logging will start immediately.

Completing the logging process

1. Select the menu item **Remove card...**
2. After **Remove card** is displayed, remove the card from the slot.

When **Linear** is adjusted in the logging type adjustment channel, data logging will stop if the capacity limit is reached. The message **Card full** will be displayed.

If **Cyclic** is adjusted, the oldest data logged onto the SD card will be overwritten as soon as the capacity limit is reached.

Note

Because of the increasing size of the data packets, the remaining logging time does not decrease linearly. The data packet size can increase, e.g. with the increasing operating hours value.

Saving adjustments

➔ To store the adjustments on the MicroSD card, select the menu item **Save adjustments**.

While the adjustments are being stored, first **Please wait**, then **Done!** will be indicated on the display. The adjustments are stored as a .SET file on the MicroSD card.

Loading adjustments

1. To load adjustments from a MicroSD card, select the menu item **Load adjustments**.

The File selection window will appear.

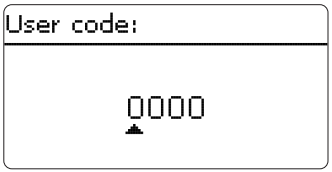
2. Select the desired .SET file.

While the adjustments are being loaded, first **Please wait**, then **Done!** will be indicated on the display.

Note

To safely remove the MicroSD card, always select the menu item **Remove card**… before removing the card.

13 User code



In the **User code** menu, a user code can be entered. Each number of the 4-digit code must be individually adjusted and confirmed. After the last digit has been confirmed, the menu automatically jumps to the superior menu level.

To access the menu areas of the installer level, the installer user code must be entered:

Installer: 0262

If the installer user code has been entered, the device changes to the parameterisation mode, see page 10.

Note

For safety reasons, the user code should generally be set to the customer code before the device is handed to the customer!

Customer: 0000

If a parameter of the installer level is to be changed without previously having entered the user code, the user code enquiry appears. Only if the installer user code has been entered, can the parameter be changed.

14 Troubleshooting

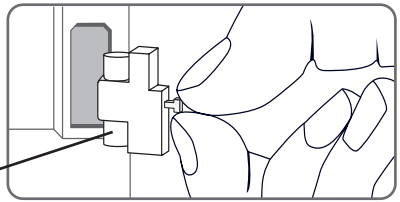
If a malfunction occurs, a message will appear on the display of the device.

WARNING! **Electric shock!**

Upon opening the housing, live parts are exposed!

➔ **Always disconnect the device from power supply before opening the housing!**

The device is protected by a fuse. The fuse holder (which also holds the spare fuse) becomes accessible when the cover is removed. To replace the fuse, pull the fuse holder from the base.



The Lightwheel® flashes red.

Sensor fault. An error code instead of a temperature is shown on the sensor display channel.

Short circuit or line break.
Disconnected temperature sensors can be checked with an ohmmeter. Please check if the resistance values correspond with the table.

°C	Ω Pt1000	°C	Ω Pt1000
-10	961	55	1213
-5	980	60	1232
0	1000	65	1252
5	1019	70	1271
10	1039	75	1290
15	1058	80	1309
20	1078	85	1328
25	1097	90	1347
30	1117	95	1366
35	1136	100	1385
40	1155	105	1404
45	1175	110	1423
50	1194	115	1442

The display is permanently off.

Press the right button (✓). Display illuminated?

- no
- yes → Device has been in standby, everything OK

Check the power supply of the device. Is it disconnected?

- no → The fuse of the device could be blown. The fuse holder (which holds the spare fuse) becomes accessible when the cover is removed. The fuse can then be replaced.
- yes → Check the supply line and reconnect it.

15 Index

Optionales Zubehör | Optional accessories | Accessoires optionnels | Accesorios opcionales | Accessori opzionali:
www.resol.de/4you

Distributed by:

RESOL – Elektronische Regelungen GmbH

Heiskampstraße 10
45527 Hattingen / Germany

Tel.: +49 (0) 23 24 / 96 48 - 0
Fax: +49 (0) 23 24 / 96 48 - 755

www.resol.com
info@resol.com

Important note

The texts and drawings in this manual are correct to the best of our knowledge. As faults can never be excluded, please note:

Your own calculations and plans, under consideration of the current standards and directions should only be basis for your projects. We do not offer a guarantee for the completeness of the drawings and texts of this manual - they only represent some examples. They can only be used at your own risk. No liability is assumed for incorrect, incomplete or false information and / or the resulting damages.

Note

The design and the specifications can be changed without notice.

The illustrations may differ from the original product.

Imprint