BOSCH MU 100 BMS Interface Module Instruction Manual

Contents

BOSCH MU 100 BMS Interface Module

Product Information

- **Product Name:** MU 100
- **Model Number:** 44 55 66 77
- **Suitable for use in countries with language options:** de, en, cs, es, fr, it, nl, nl-BE, pl, sk
- **Product includes:** Modul, Beutel mit Zugentlastungen, Installationsanleitung
- **Technical Specifications:**
  - **Operating voltage:** 0 V – 10 V
  - **Protection class:** IP56
  - **Identification number:** 0010013327-002
  - **Permissible ambient temperature:** 0°C – 40°C

Product Usage Instructions

1. Ensure that only original replacement parts are used during installation and maintenance.
2. Warn users about the dangers of carbon monoxide (CO) and recommend the use of CO detectors.
3. Use the information provided in Table 2 to regulate the product's performance based on the required power output and flow temperature.

4. Follow the instructions in Table 11 to troubleshoot any issues with the product.
5. Refer to the product manual for further information on settings and commissioning.
6. Dispose of the product in an environmentally-friendly manner. Visit **www.weee.bosch-thermotechnology.com** for more information on disposal and environmental protection.

Explanation of symbols and safety instructions

Explanation of symbols

Warnings

In warnings, signal words at the beginning of a warning are used to indicate the type and seriousness of the ensuing risk if measures for minimizing danger are not taken.
The following signal words are defined and can be used in this document:

- **DANGER**
  DANGER indicates that severe or life-threatening personal injury will occur.
- **WARNING**
  WARNING indicates that severe to life-threatening personal injury may occur.
- **CAUTION**
  CAUTION indicates that minor to medium personal injury may occur.
- **NOTICE**
  NOTICE indicates that material damage may occur.

Important information

The info symbol indicates important information where there is no risk to people or property.

Additional symbols

Symbol	Meaning
▶	a step in an action sequence
	a reference to a related part in the document
•	a list entry
–	a list entry (second level)

General safety instructions

Notices for the target group

These installation instructions are intended for gas, plumbing, heating and electrical contractors. All instructions must be observed. Failure to comply with instructions may result in material damage and personal injury, including danger to life.

- Read the installation, service and commissioning instructions (heat source, heating controller, pumps, etc.) before installation.

- Observe the safety instructions and warnings.
- Follow national and regional regulations, technical regulations and guidelines.
- Record all work carried out.

  Determined use
- Use the product only to control heating systems.

Any other use is considered inappropriate. We take no responsibility for damage caused through incorrect use.

Installation, commissioning and maintenance
Installation, commissioning and maintenance must only be carried out by a competent person.

- Never install the product in wet rooms.
- Only use genuine spare parts.

Electrical work
Electrical work must only be carried out by a qualified electrician.

- Before starting electrical work:
  - Isolate all poles of the mains power supply and secure against reconnection.
  - Make sure the mains voltage is disconnected.
- The product requires different voltages.

  Do not connect the (ELV) side to the mains voltage or vice versa.
- Also observe the connection diagrams of other system components.

Handover to the user
When handing over, instruct the user how to operate the heating system and inform the user about its operating conditions.

- Explain how to operate the heating system and draw the user’s attention to any safety relevant action.
- In particular, point out the following:
  - Alterations and repairs must only be carried out by an approved contractor.
  - Safe and environmentally compatible operation requires inspection at least once a year and responsive cleaning and maintenance.
- Point out the possible consequences (personal injury, including danger to life or material damage) of non-existent or improper inspection, cleaning and maintenance.
- Point out the dangers of carbon monoxide (CO) and recommend the use of CO detectors.
- Leave the installation instructions and the operating instructions with the user for safekeeping.

Damage caused by frost
The system can freeze if it is switched off:

- Observe the notices regarding frost protection.
- Due to the additional functions, e.g. DHW heating or pump anti-seizure protection, the system should always be left on.
- Have faults rectified immediately.

Product Information

- The module serves as an expansion module for EMS/EMS 2/EMS plus boiler and EMS 2/EMS plus heat pumps (in the following, generally called heat source).
- The module can adjust the flow temperature or the output of the heat source via an external control signal with 0–10 V (direct voltage).
- The module signals faults in the heat source as well as system faults, apart from service displays, faults in external controllers or maintenance for the installer.
  From here for the boiler:
- Te module can be used to activate a second solenoid valve.
- The module serves as the modulating speed control “Flow Control” of a boiler circulation pump (0-10 V or PWM) in combination with a low loss header or heat exchanger. The boiler circulation pump adapts the flow rate on the boiler side and prevents an increase in the return temperature of the boiler. The objective is to optimise the utilisation of calorific value and to save power. The choice of
  0- 10 V or pulse width modulation signal makes the function suitable for floor-standing heat sources and wall-mounted indoor units.
  3 control modes can be selected (Tab. 4.3, page 25):
  1. **Heat exchanger (Diff-T.Flow/Return boiler):** control with reference to temperature differential between heating flow and heating return (recommended for heat exchanger; flow temperature sensor T0 is optional)
  2. **Burner output:** output control proportional to the boiler output (if additional sensor is not possible)
  3. **Low loss header (Diff.-Flow-T.Boiler-header):** control with reference to temperature differential between heating flow and system flow T0 (recommended for low loss header)

Important notices on use

- The range of functions depends on the control unit installed. Detailed information on control units can be found in the technical guide and on the website of the manufacturer.
- The installation room must be appropriate for the IP rating stated in the technical data of the module.

Controls of the heat source

This control strategy is used when the heating system is controlled using a building management system with a 0–10 V controller output (Fig. 21 at the end of the document).

Input voltage	Flow temperature/ output setpoint (wall-mounted indoor unit)	Status of wall- mounted indoor unit
0 V – 0.5 V	0 %/0 °C	off
0.6 V	approx. 6 %/ approx. 15 °C	on if > min. output
5.0 V	approx. 50 %/ approx. 50 °C	on
10.0 V	approx. 100 %/ approx. 90 °C	on/maximum

Table 2 Control based on output/flow temperature

Output control
Linear relationship between the 0–10 V signal (U in volts) and the required performance (P in percent)

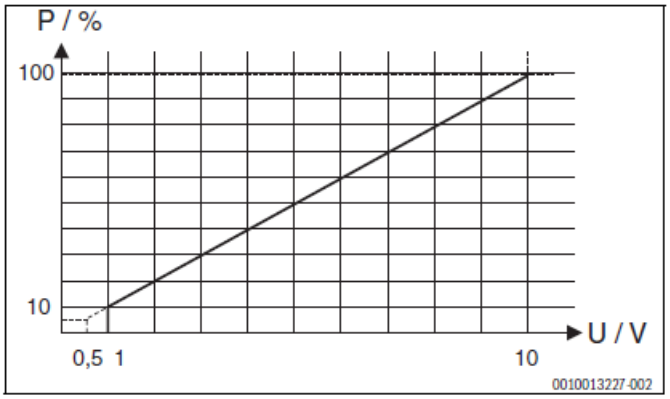


Fig. 1 Linear relationship between the 0–10 V signal (U in volts) and the required performance P (in percent with reference to the maximum system performance)
The connected heat source is enabled and disabled according to the required output.

Flow temperature control
Linear relationship between the 0–10 V signal (U in volts) and the required flow temperature 9 in °C with reference to the minimum flow temperature range to the maximum flow temperature range [default setting 20 to 90 °C]):

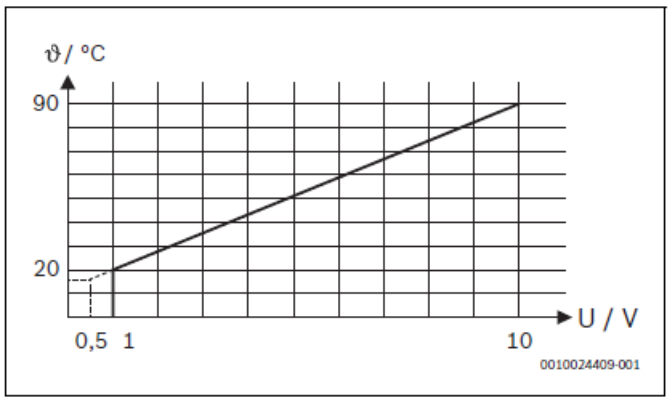


Fig. 2 Linear relationship between the 0–10 V signal (U in volts) and the required flow temperature 9 in °C)

The connected heat source is enabled and disabled according to the required flow temperature.

Supplied parts
Fig. 6 at end of document:

1. Module
2. Bag with strain relief
3. Installation Manual

Specification

This product conforms to European directives and supplementary national requirements in design and operation. Compliance is demonstrated by the CE marking.
You can request the conformity declaration of the product. If you require this, contact the address on the back cover of these instructions.

Specification	
Dimensions (W × H × D)	151 × 184 × 61 mm (for more dimensions à Fig. 7 at end of document)
Maximum conductor cross- section • 230 V terminal • Extra-low voltage terminal	 • 2.5 mm2 • 1.5 mm2
Rated voltages • BUS • Module mains voltage • User interface • Pump, solenoid valve, interference output	 • 15 V DC (reverse polarity protected) • 230 V AC, 50 Hz • 15 V DC (reverse polarity protected) • 230 V AC, 50 Hz
Fuse	230 V, 5 AT
BUS interface	EMS and EMS 2/EMS plus
Power consumption – Standby	< 3 W
Max. power output • per connection(PC0) • per connection(OE1)	 • 400 W (high-efficiency pumps permissible: < 30A for 10 ms) • 120 W (high-efficiency pumps permissible: < 30A for 10 ms)
Permitted ambient temperature	0 … 60 °C
IP rating	IP 44
Protection class	I
ID no.	Data plate (à Fig. 20 at the end of document)
Temperature of ball thrust test	75 °C
Degree of pollution	2

Table 3

°C	W	°C	W	°C	W
20	14772	**50**	4608	**80**	1704
25	12000	**55**	3856	**85**	1464
30	9786	**60**	3243	**90**	1262
35	8047	**65**	2744	**95**	1093
40	6653	**70**	2332	**100**	950
45	5523	**75**	1990	–	–

Table 4 Measurements of low loss header temperature sensor (T0), combined e.g. CW 400

°C	W	°C	W	°C	W
20	12486	**50**	3605	**80**	1256
25	10000	**55**	2989	**85**	1070
30	8060	**60**	2490	**90**	915
35	6536	**65**	2084	**100**	677
40	5331	**70**	1753	–	–
45	4372	**75**	1480	–	–

Table 5 Measurements of low loss header temperature sensor (T0), combined RC310

Additional accessories
For detailed information about suitable accessories, refer to the catalogue or Internet page of the manufacturer.

- Low loss header temperature sensor; connection to T0
- Primary pump; connection to PC0

Installation of additional accessories

- Install the additional accessories in accordance with legal regulations and the instructions supplied.

Cleaning

- Wipe the casing with a damp cloth when necessary. Never use aggressive or caustic cleaning agents.

Installation

DANGER

Danger to life from electric shock!
Touching live electrical parts can cause an electric shock.

- Danger to life from electric shock!
- Touching live electrical parts can cause an electric shock.

Preparation for the installation in the heat source

- Check by referring to the installation instructions of the heat source whether it is possible to install modules (e.g. MU 100) in the heat source.
- If the module can be installed in the heat source without a mounting rail, prepare the module (Fig. 8 and 9 at end of document).

Installation locations

- Install the module on a wall, (Fig. 10 and 11 at end of document), on a mounting rail (Fig. 12 at end of document), in an assembly or in the heat source.
- When the module is installed in a heat source, observe the heat source instructions.
- Remove the module from the mounting rail (Fig. 13 at end of document).

Installation of a temperature sensor on the low loss header or downstream of the heat exchanger
The low loss header temperature sensor T0 should as a priority be connected to MU 100. In the case of wall-mounted boilers with EMS 2/EMS plus, the sensor on the appliance can be connected to the MM 100 or also to the MC 400.

From software version OF02.05 onwards, one low loss header temperature sensor is sufficient in conjunction with MC 400.

Installation on the low-loss header
(Fig. 22 and 24 at the end of the document)
Position of flow temperature sensor (T0):

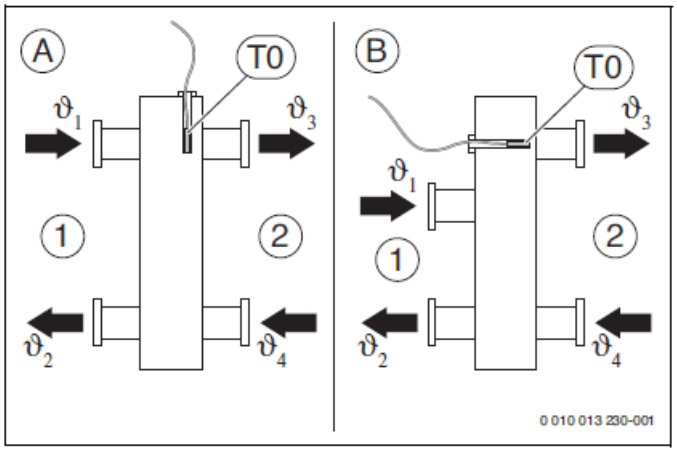


Fig. 3 Position of flow temperature sensor (T0)

1. all heat sources
2. all heating circuits

A low loss header model 1
B low loss header model 2

ϑ_1 overall flow temperature of all heat sources
overall return temperature of all heat sources
ϑ_2 overall flow temperature of all heating circuits
overall return temperature of all heating circuits
ϑ_3 flow temperature sensor on the low loss header
ϑ_4
T0 T0 must be positioned such that ϑ 3 is detected on the side of all heat sources [1] independently of the volumetric flow rate

This is the only way also to ensure stable operation of the control with small loads.
To ensure optimum control response, the flow should circulate around the temperature sensor. This can be achieved by a combination of tee, tap extension and sensor set.

Optimised sensor installation downstream of the heat exchanger
The temperature sensor (T0) must be mounted on the flow downstream of the heat exchanger on the secondary side (wet sensor) (→ Fig. 23 at end of document).
There are two ways to ensure optimised sensor installation downstream of the heat exchanger (Item [1] with angled screw connection and Item [2], 4):

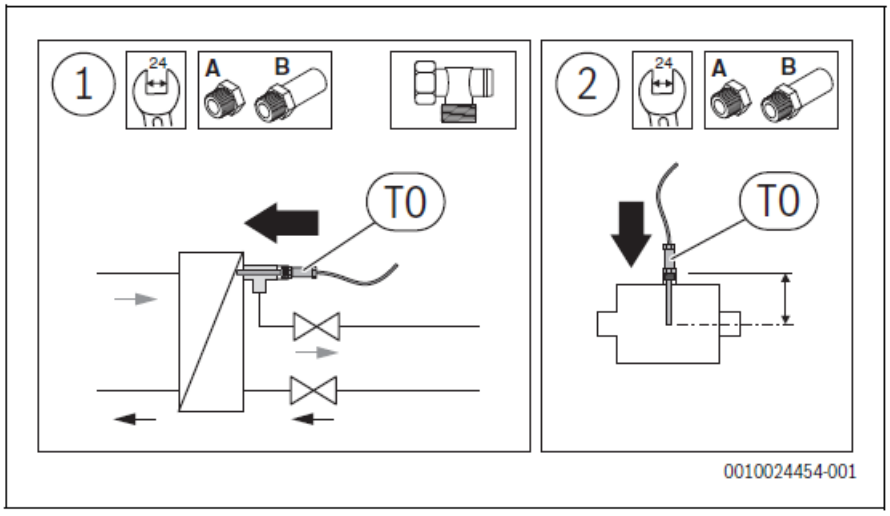


Fig. 4 Optimised sensor installation

The temperature sensor must be positioned so the measurement is taken centrally in the pipe.

- Use tap extensions to adjust the installation depth of the low loss header temperature sensor (→ Installation instructions of low loss header sensor set). If installed correctly, the sensor projects 1-2 cm into the heat exchanger.

Electric connection

- When observing the applicable regulations for the connection, at least electrical cables of type H05 VV-…. must be used.

  Establishing the BUS connection and temperature sensor (extra-low voltage side)
- If the conductor cross-sections vary, use a junction box to connect the BUS nodes.

  If the maximum total length of the BUS connections between all BUS nodes is exceeded or the BUS system has a ring structure, commissioning of the system is not possible.

Maximum total length of BUS connections:

- 100 m with 0.50mm2 conductor cross-section
- 300 m with 1.50 mm2 conductor cross-section
- To avoid inductive interference: Make sure all low-voltage cables are routed separately from supply voltage carrying cables (min. clearance 100 mm).
- In the case of external inductive effects (e.g. from PV systems) use shielded cable (e.g. LiYCY) and ground one end of the shield. |Connect the shield to the building's earthing system, e.g. to a free earth conductor terminal or water pipes, and not to the connecting terminal for earth leads in the module.

When extending the sensor leads, use the following conductor cross-sections:

- 0.75 to 1.50 mm2 conductor cross-section for up to 20 m
- 1.50mm2 conductor cross-section for 20 m to 100 m
- Route cables through the grommets provided and connect them as shown in the connection diagrams.

Connecting the power supply, pump, solenoid valve or fault display (mains voltage side)

The assignment of the electrical connection depends on which system is installed. The description at the end of the document in Fig. 14 to 17 is a possible suggestion for the electrical connection. Not all steps are shown in black. This makes it easier to see, which steps belong together.

- Only use electric cables of the same quality.
- Make sure the power supply is connected to the correct phases.
  A power supply via an earthed safety plug is not permissible.
- Connect only components and assemblies to the outputs as described in these instructions. Do not connect any additional controls that operate other system components.
- Route cables through the grommets, connect them as shown in the connection diagrams and secure them with the strain relief devices included in the scope of delivery
- Fig. 14 to 17 at the end of this document).

The maximum power consumption of the connected components and assemblies must not exceed the power output stated in the specifications for the module.

- If the mains voltage is not supplied via the electronic system of the heat source EN 60335-1, install a standard all-pole isolator (in accordance with EN 60335-1) on site to interrupt the mains voltage.

Overview of the terminal assignment
This overview indicates which system parts can be connected.
Depending on what the module is used for (coding at the module and configuration via the control unit), connect the system parts as specified in the corresponding connection diagram.

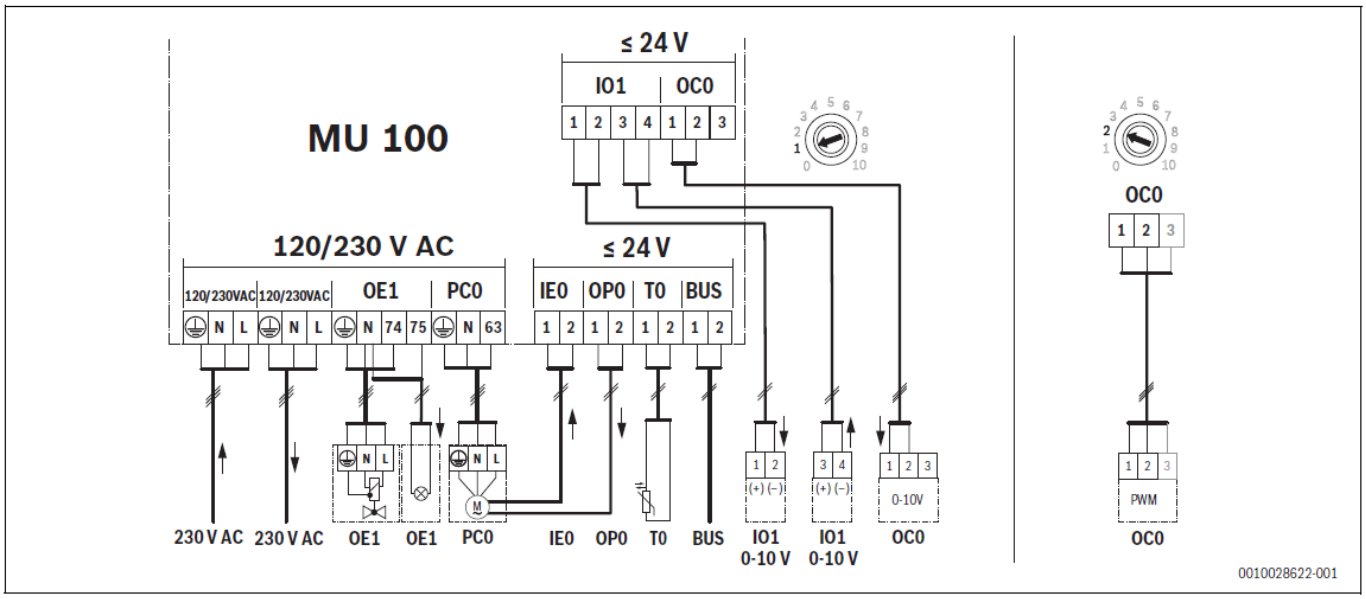
The pump plugs (Fig. 25 at the end of the document) are cut off, and the cables to PC0 and OC0 must be adapted.

Connection diagrams with system schematics
The hydraulic diagrams are only schematic in nature and are non-binding suggestions for a hydraulic layout. The safety equipment must be implemented in accordance with the applicable standards and local regulations. For further information and options, refer to the technical guides or tender specification.

The system components, which are marked with * in the system schematics at the end of the document, are possible as options depending on the control mode (Tab. 9).

System schematics at end of this document	Fig.
Connection to building management system (BMS) (setpoint value 0-10 V); wall-mounted ind oor unit; type of control is specified via rotary selector (3, 4) (à Tab. 6, page 22)	21
Floor-standing appliance; low loss header, pump outlet is specified via rotary selector (1, 2) (à Table 6, page 22)	22
Floor-standing appliance; heat exchanger, pump outlet is specified via rotary selector (1, 2) (à Tab. 6, page 22)	23
Wall-mounted indoor unit CerapurMaxx ZBR … -3/GB162 V2; low loss header, pulse width modulation pump (can not be altered)	24 and 25

Table 6 A brief description of the system schematics is provided at the end of this document



Caption to the figure above and connection diagrams with system schematics at end of document:

Ground conductor

Connecting terminal designations:

- 230 V AC Mains voltage connection
- BUS BUS system connection
- BMS Building Management System with 0-10 V interface
- HS Heat Source on BUS system

- OE1-74 Mains voltage output, solenoid valve
- OE1-75 Fault output (230 V)
- PC0 Mains voltage output, pump (230 V)
- IE0 Pump alarm output (default setting: N/O contact) OP0 Pump on/off (output/potential-free contact ≤ 24 V), coding position 3–5: potential-free fault output
- T0 Low loss header temperature sensor input1)
- IO1-1(+),2(-)Feedback output for heat source power (0-10 V)
- IO1-3(+),4(-)Input for heat source activation (setpoint value 0–10 V)
- OC0 1-2 Output for pump control signal (setpoint value 0-10 V/PWM)2)
- OC0 1-3 Pump feedback input (pulse width modulation), optional2)
- CON Control unit with BUS system (Controller)
- MC Boiler control device (Master Controller)
- MM 100 Heating circuit module (EMS/EMS 2/EMS plus)
- MU 100 Extension module

1. The heat exchanger sensor is T0 with the heat exchanger.
2. Observe coding switch position.

Commissioning

Ensure all connections are correctly made before carrying out commissioning!

- Observe the installation instructions for all components and assemblies in the system.
- Only switch on the power supply if the coding switch is correctly set.
- If a control unit is connected, it is recommended to start the configuration wizard.

NOTICE
Risk of damage to system through pump failure!

- Fill and vent the system before switching it on so that the pumps do not run dry.

Setting the coding switch
The coding switch serves as On/Off indicator of the module and status display of the connected heat sources or modules:

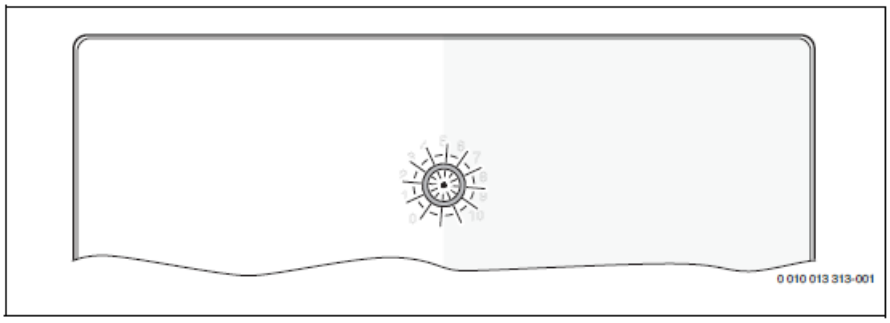


Fig. 5 Coding switch

Coding	Function of module							
	Actuation 2 Solenoid valve	Fault output OE1-75	Fault output OP0	Flow temperature control of the heat source	Output control of the heat source	Pump control via 0-10 V	Pump control via PWM	Efficiency and energy calculation
0[1)]	–	–	–	–	–	–	–	–
1	●	●	–	●	–	●	–	–
2	●	●	–	●	–	–	●	–
3[2)]	●	●	●	●	–	–	–	–
4[2)]	●	●	●	–	●	–	–	–
5	●	●	●	–	–	–	–	–
6 – 9[3)]	–	–	–	–	–	–	–	–
10[4)]	–	–	–	–	–	–	–	●

1. Off (delivered condition)
2. In the case of simple systems, which operate with the standard settings, no control unit CW 400/RC310 is necessary in positions 3 and 4. This is optional.
3. Unused
4. Two MU 100 can be used simultaneously in the system (one with coding 10, the second with coding 1 – 5).

Table 7 Coding and function

EMS 2/EMS plus heat pumps without own fault output: with coding 5, the fault output OE1-75 is available. Other functions cannot be used. More information (heat pump installation instructions).

Commissioning of the system and module

If a control unit is connected, start the automatic configuration wizard.

Settings menu MU 100
The settings on the MU 100 can be performed via the control unit. Depending on the software version, certain settings are displayed.

NOTICE
Danger of data loss in combination with MC 400
Follow the sequence during commissioning.

- First put heat source into operation with MU 100, then put MC 400 into operation.
- The factory settings are highlighted in the following table.

Meu item	**Settings/adjustment range**	**Remark/restriction**
PM10 pump modulation	**Yes** | No	
PM10 control type	**Output** | 0.5 … 2.5 … 10 K	Selection of output control or temperature control.
PM10 voltage min. vol.	**0** … 10 V	
PM10 voltage max. vol.	0 … **10 V**	

Table 8 Menu MU 100 (for RC310 with NF18.xx)

	Meu item	Settings/adjustment rang e	Remark/restriction
Pump config. (boiler circulation pump PC0)			
	Activate pump control	**Yes** | No	Activate pump control
	Output config.	PWM | InversePWM | **0 – 1 0 V**	How is the pump to be modulated? (e.g. wall-mounted indoor unit with internal pump: inverted pulse width modulation, floor-standing heat sou rce with external boiler circulation pump: 0-10 V)
	Pump output 230V	**Permanent** | Switched	Select supply voltage for pump
	Control mode Pump (à Cha pter 2, page 17)	Diff-T.Flow/Return boiler | **Burner output** | Diff.-Flow-T.Boiler-header	Select pump control mode
	Max. pump output	0 … **100** %	Set maximum output signal for pum p
	Min. pump output	**0** … 100 %	Set minimum output signal for pum p
	Pump fault input	**Close** | Open	Fault signal when opening or closin g the contacts?
Pump run-on			
	Overrun time	0 … **3** …60 min	Set the pump overrun time
	Temp.dep. overrun	on | **off**	Switch on temperature-dependent pump overrun
	Set temperature differential	2 … **3** … 10 K	Enter set temperature differential fo r end of overrun
Pump control			

	Meu item	**Settings/adjustment rang e**	**Remark/restriction**
Max. value c ontrol	Max. flow temp	**85** … 100 °C	Enter maximum flow temperature
	Maximum range	1 … **4** … 20 K	Enter width of max. range
	Proportional range	1 … **5** … 20 K	Enter width of proportional range
dT control	dT set value	**off** | 0.5 … **2.5** … 20 K	Enter temperature differential set v alue
	Proportional factor	1 … **10** … 100 K	Set proportional factor for controller
	Integral factor	0 … **60** … 600 s	Set integral factor for control unit
	Differential factor	**0** … 150 s	Set differential factor for control unit
Max diff contr ol	Max. differential	25 … **40** … 85 K	Set maximum temperature different ial
	Maximum range	1 … **10** … 20 K	Enter width of max. range
	Proportional range	1 … **5** … 20 K	Enter width of proportional range
	Ramp	**off** | 1 … 5 … 20 %/s	Enter ramp for pump modulation
Heat source control (setpoint value)			
	Config mode 0-10V	**Temp.** | **Output**	Boiler control via temperature or ou tput?
	Input value f. off	**0** … 10 V	Switch off boiler with voltage
	Input value f. max.	0 … **10 V**	Boiler at max. output with voltage
	Max. temp. set v.	0 … **90** … 100 °C	Set max. set temperature
	Min. temp. set v.	0 … **20** … 100 °C	Set min. set temperature

Table 9 Menu MU 100 (for CW 400/RC310 from NF74.xx)

	Meu item	**Settings/adjustment rang e**	**Remark/restriction**
Heat source control (setpoint value)			
	Config mode 0-10V	**Temp.** | **Output**	Heat source via temperature or out put?
	Input value f. off	**0** … 10 V	Switch off heat source with voltage
	Input value f. max.	0 … **10 V**	Heat source at max. output with vol tage
	Max. temp. set v.	0 … **90** … 100 °C	Set max. set temperature
	Min. temp. set v.	0 … **20** … 100 °C	Set min. set temperature

Table 10 Menu for building management system (for CW 400 RC310 from NF74.xx)

Fault output
The fault outputs (OE1-75 and OP0 in coding positions 3-5) are only activated following a delay 10 of minutes after the fault has occurred. If no faults are present, the fault output is deleted immediately. Faults, which disappear within the delay time of 10 minutes, are not displayed on the fault output.

Troubleshooting

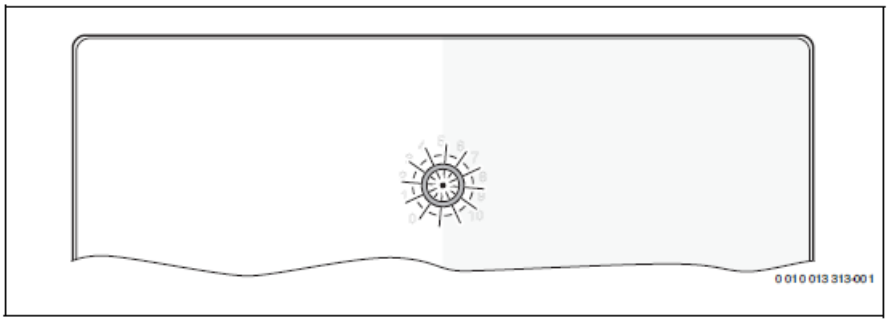
Use only original spare parts. Damage caused by the use of spare parts not supplied by the manufacturer is excluded from the warranty.

- If a fault cannot be rectified, please contact your local service engineer.

If the coding switch is turned to 0 when the power supply is switched on for >2 s, all the module outputs are reset to the factory settings, the faults are deleted and all settings are reset to the factory settings.

- Restart the module.

The On/Off indicator indicates the operating condition of the module.



Status indicator	Possible causes	Remedy	
Constantly red	Invalid switch position or internal fault	▶	Replace the module or select valid switch position.
Red flashing	Temperature sensor faulty or pump alarm output	▶	Replace temperature sensor or eliminate pump fault.
Constantly yellow	Coding switch set to **0**	▶	Select the correct encoding position.
Green flashing	No communication with the BUS system	▶	Establish the BUS connection to the EMS-BUS or check it.
Constantly green	No fault, normal operation	▶	–
Constantly OFF	Lack of electrical supply	▶	Supply the module with mains voltage.

Environmental protection and disposal

Environmental protection is a key commitment of the Bosch Group.
Quality of products, efficiency and environmental protection are equally important objectives for us. Environmental protection laws and regulations are strictly observed.
To protect the environment, we use the best possible technology and materials while taking into account economic considerations.

Packaging
Where packaging is concerned, we participate in country-specific recycling processes that ensure optimum recycling. All of our packaging materials are environmentally compatible and can be recycled.

Used appliances
Used appliances contain valuable materials that can be recycled.
The various assemblies can be easily dismantled. Synthetic materials are marked accordingly. Assemblies can therefore be sorted by composition and passed on for recycling or disposal.

Old electrical and electronic appliances

This symbol means that the product must not be disposed of with other waste, and instead must be taken to the waste collection points for treatment, collection, recycling and disposal.
The symbol is valid in countries where waste electrical and electronic equipment regulations apply, e.g. “European Directive 2012/19/EC on old electronic and electrical appliances”. These regulations define the framework for the return and recycling of old electronic appliances that apply in each country.
As electronic devices may contain hazardous substances, it needs to be recycled responsibly in order to minimize

any potential harm to the environment and human health. Furthermore, recycling of electronic scrap helps preserve natural resources.
For additional information on the environmentally compatible disposal of old electrical and electronic appliances, please contact the relevant local authorities, your household waste disposal service or the retailer where you purchased the product.
You can find more information here: **www.weee.bosch-thermotechnology.com/**

Used Commercial Source Components

This product contains software developed and licensed by SEGGER Software GmbH

List of used Open Source Components.

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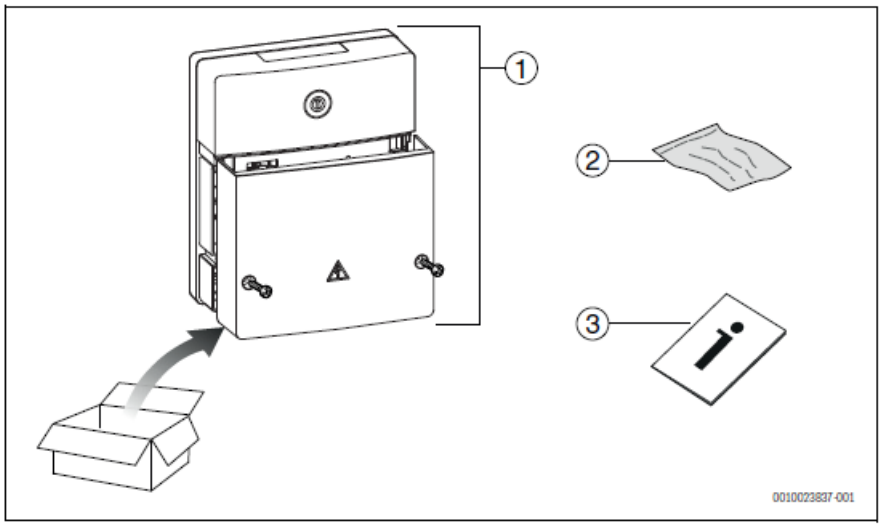

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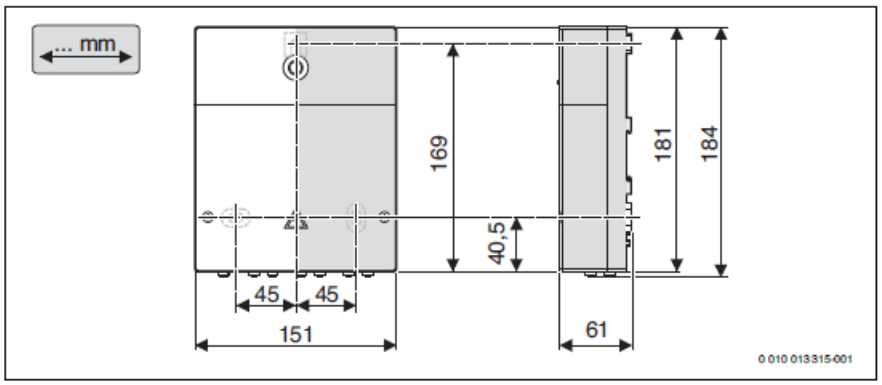

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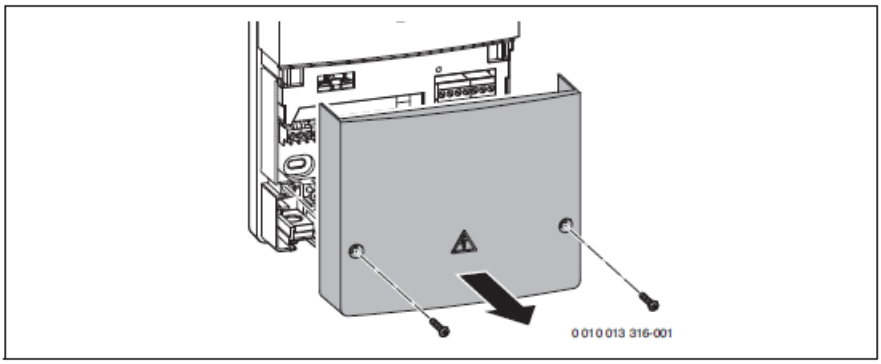

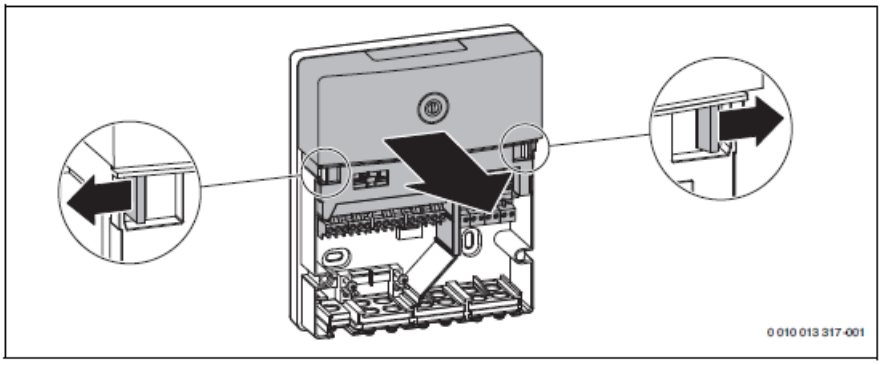

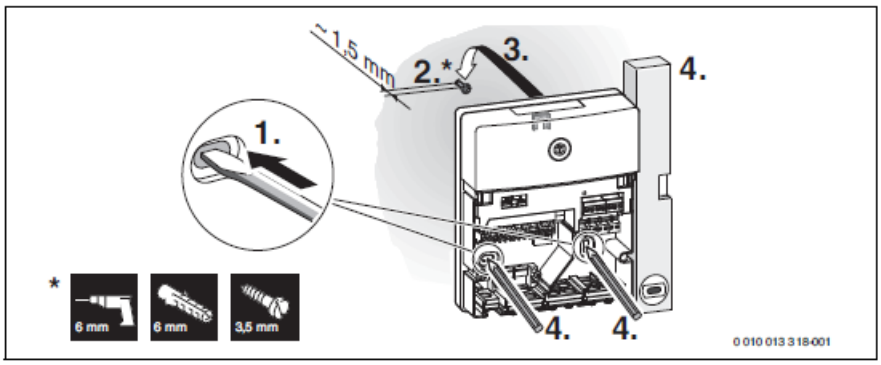
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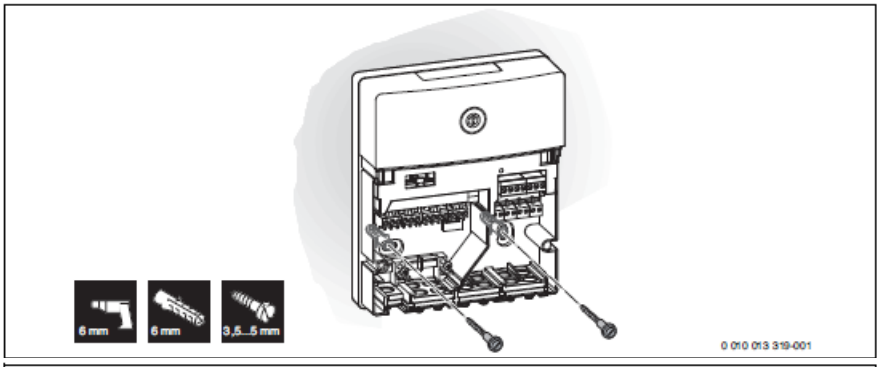
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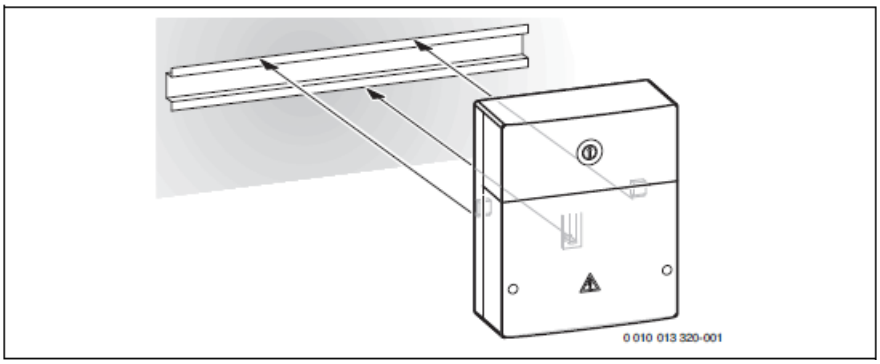
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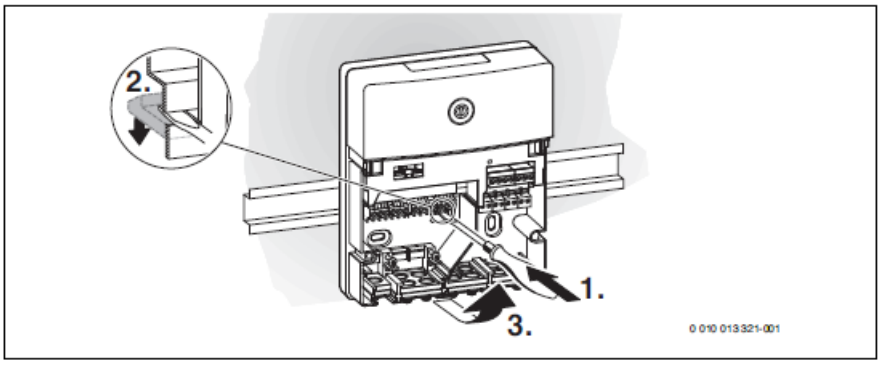
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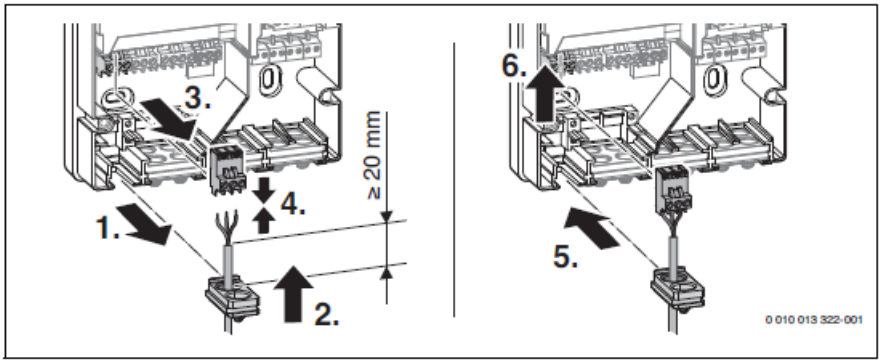
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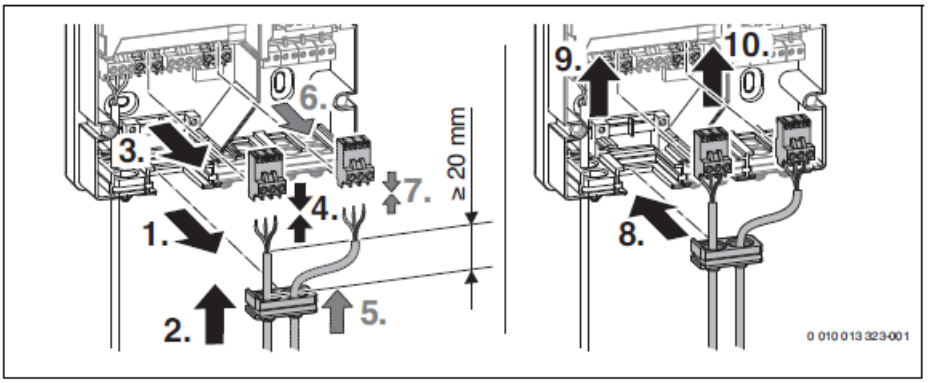
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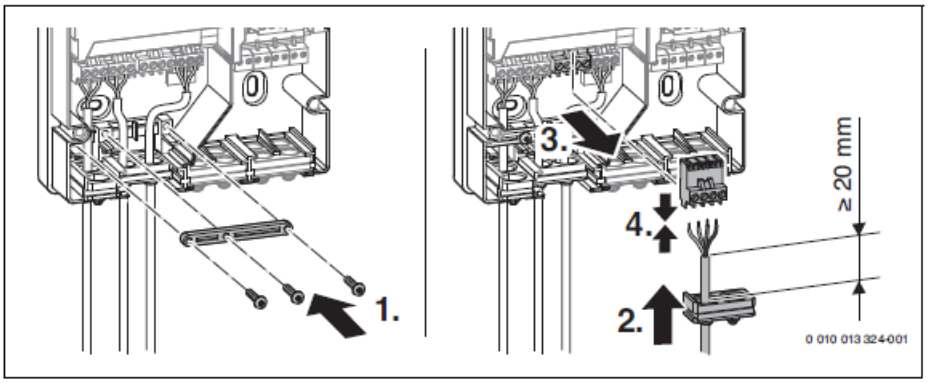
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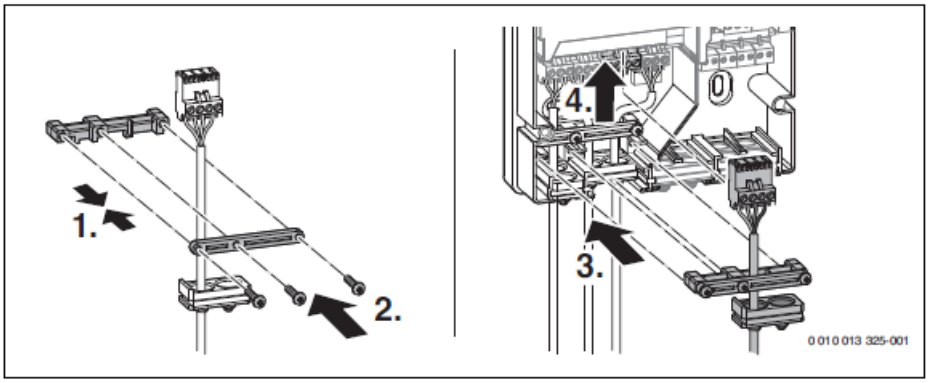
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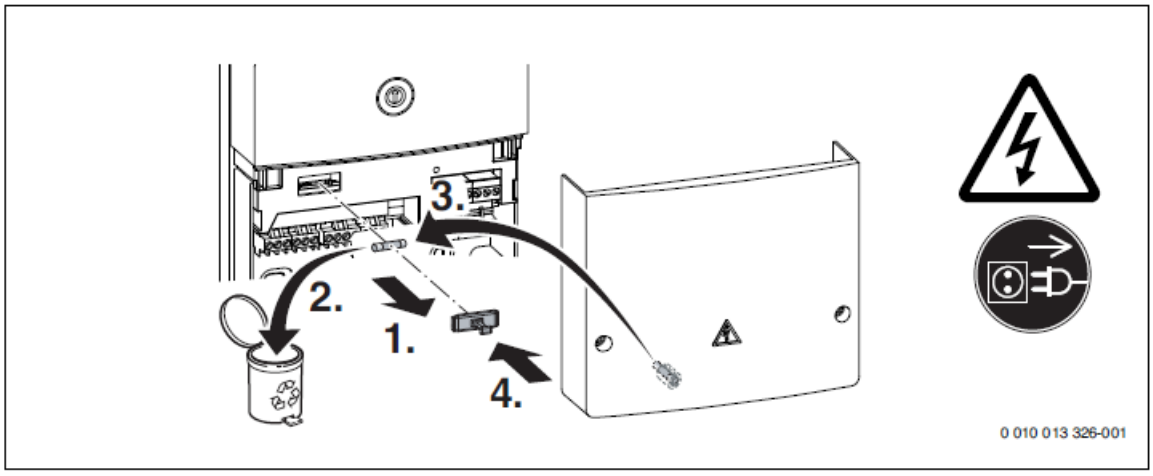
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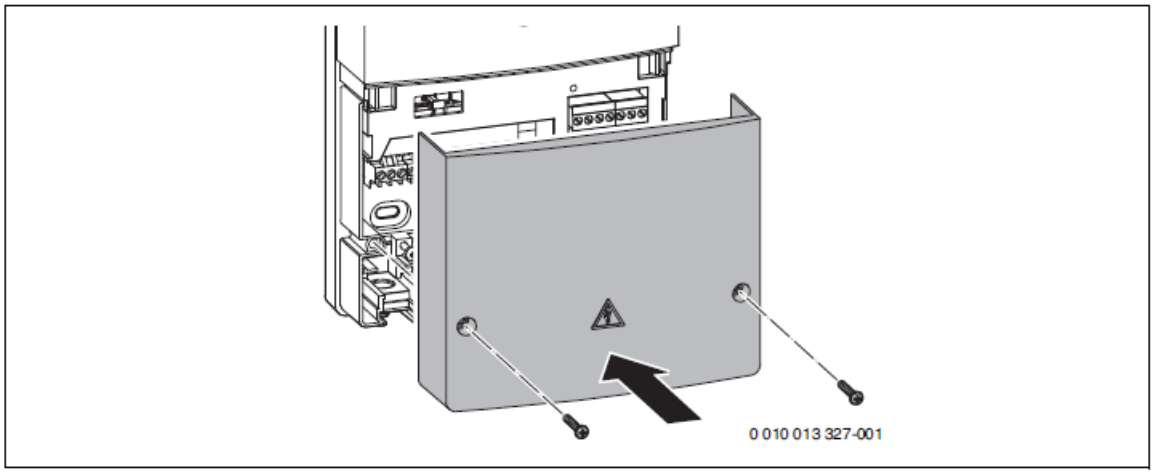
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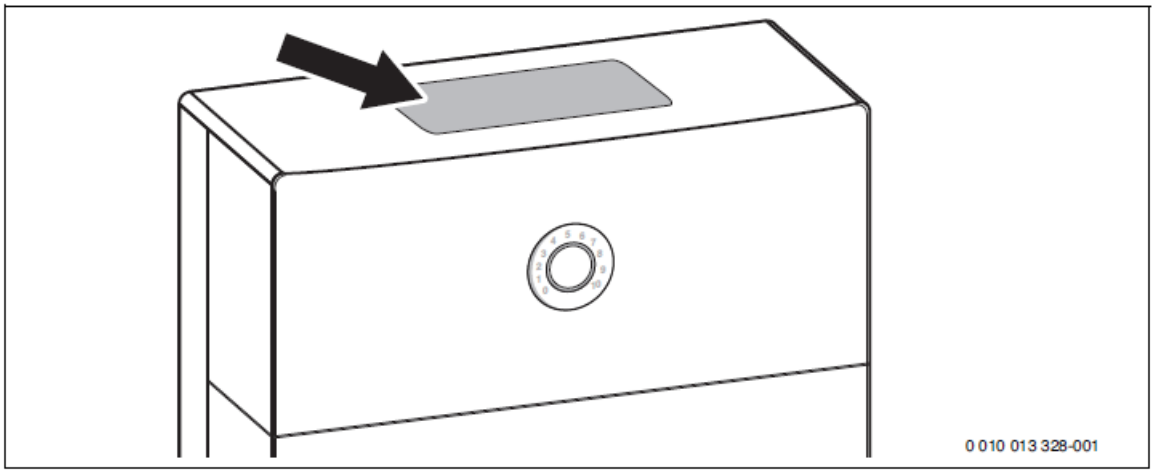
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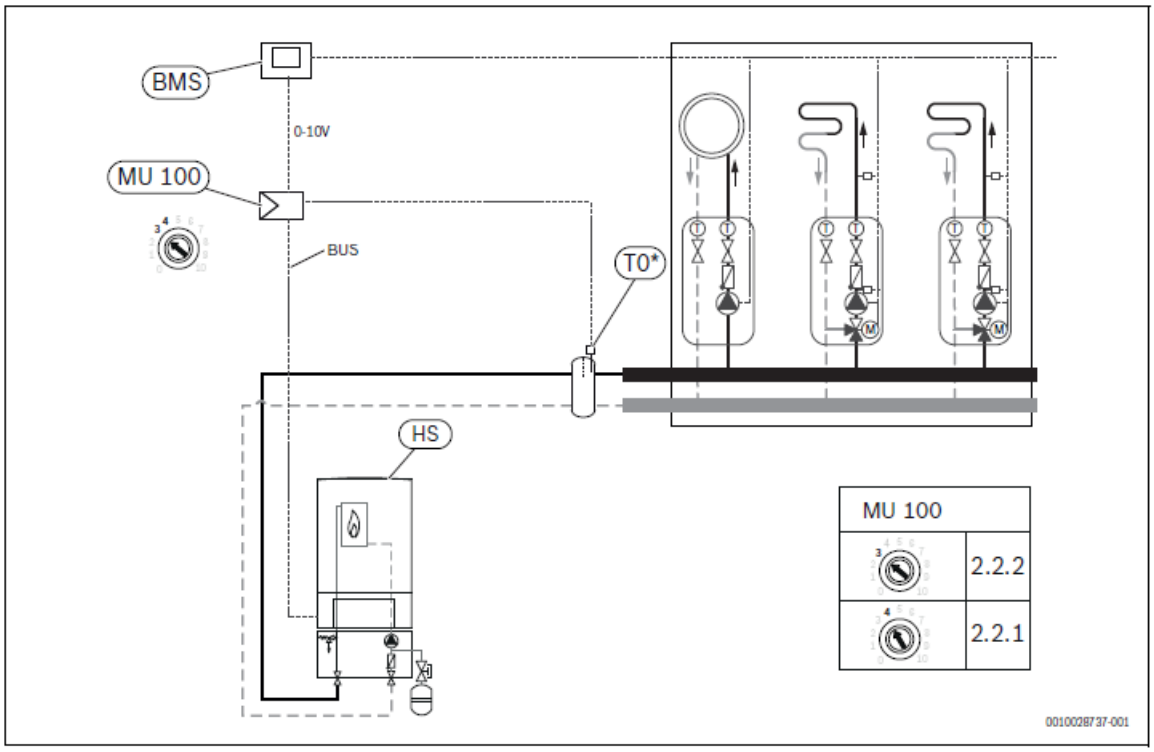
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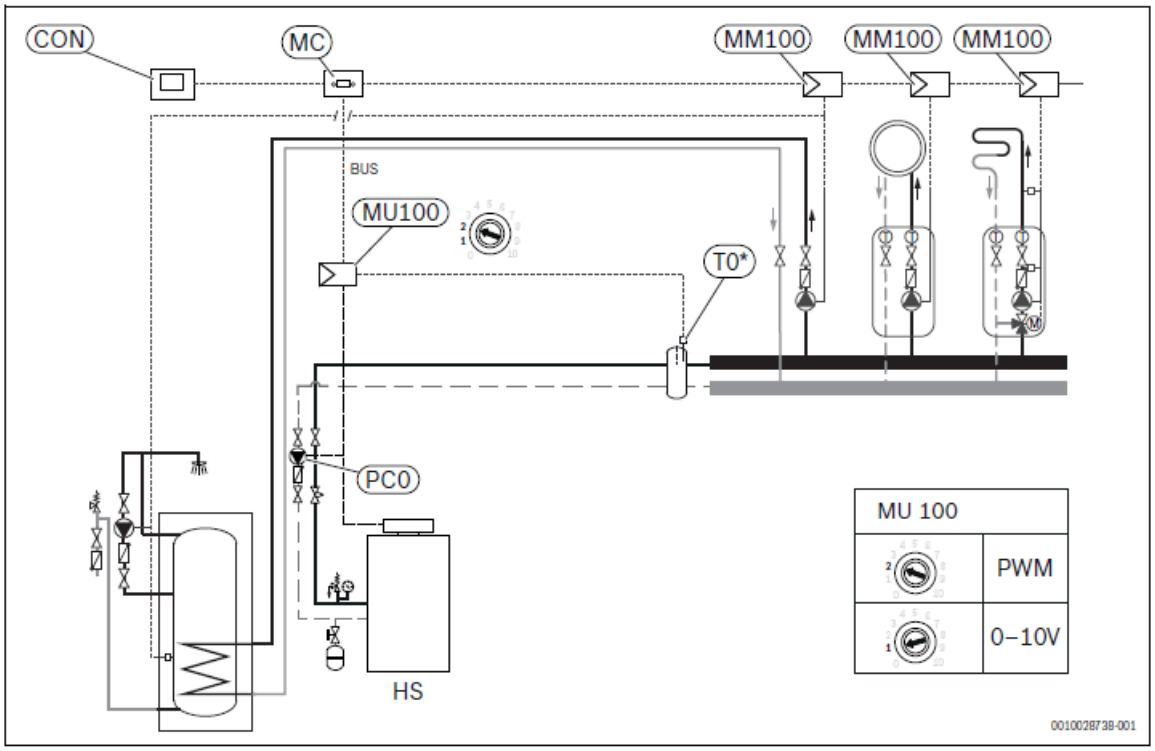
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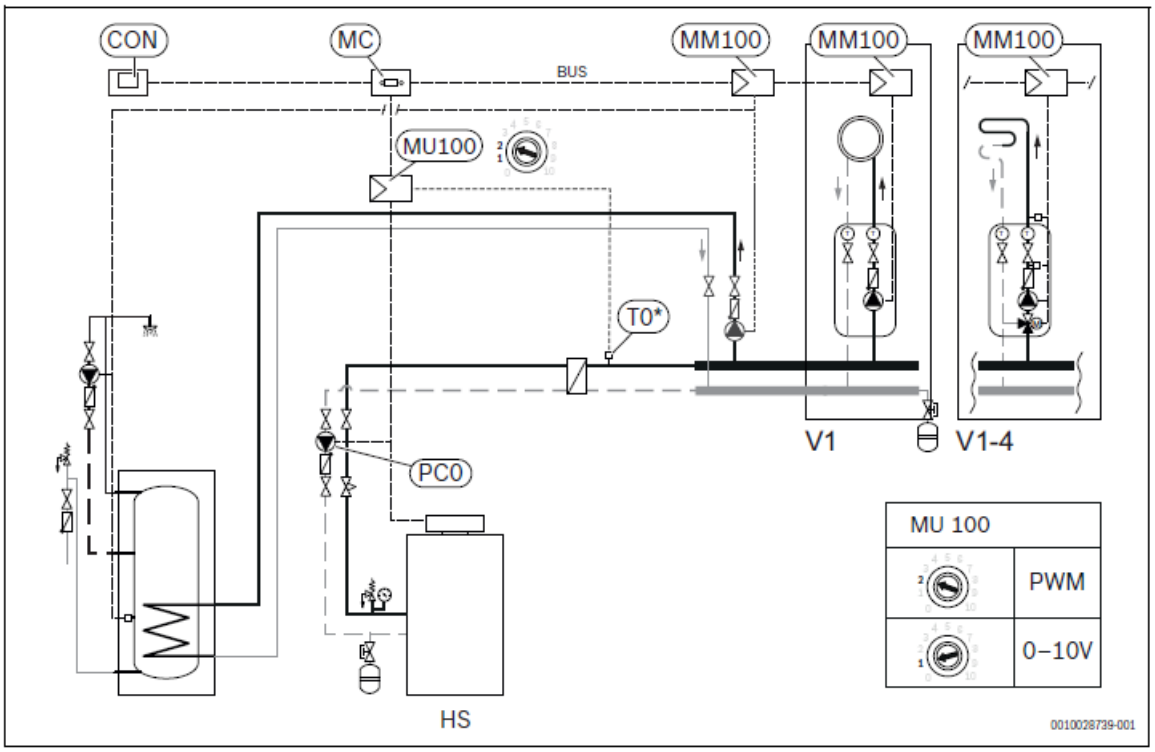
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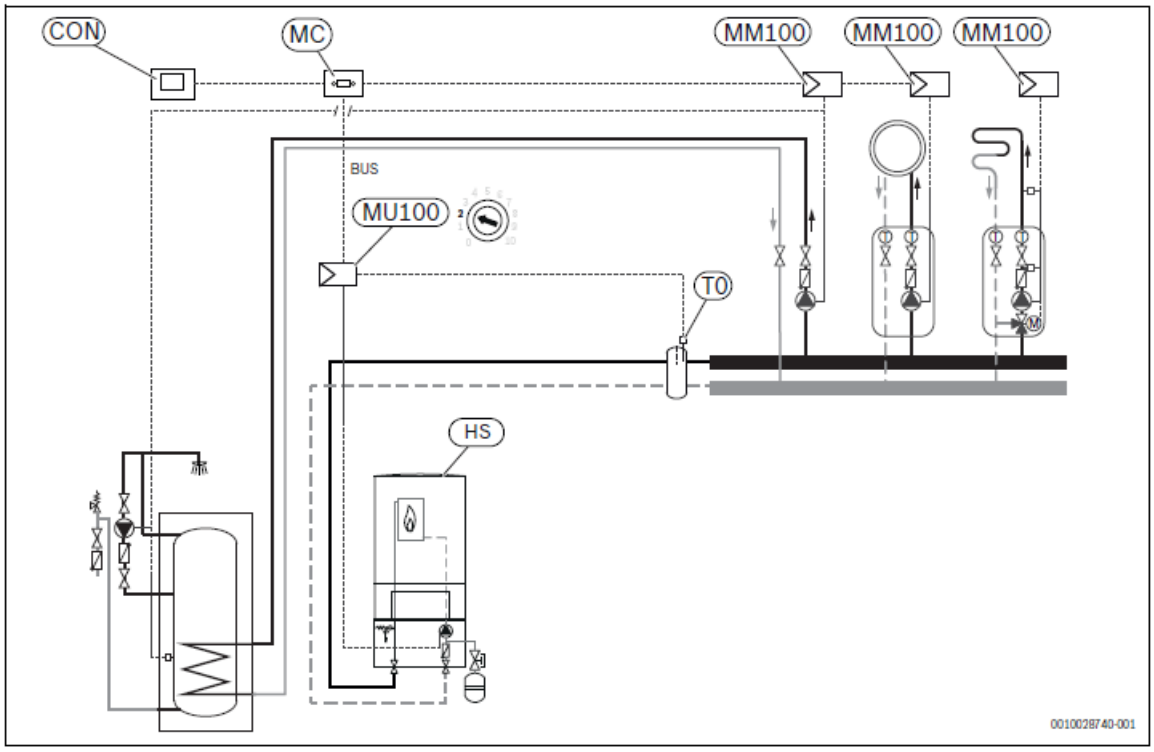

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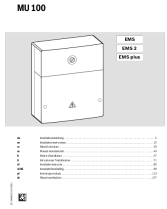	BOSCH MU 100 BMS Interface Module [pdf] Instruction Manual MU 100 BMS Interface Module, MU 100, BMS Interface Module, Interface Module, Module

References

- Dif.temp.im
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- Open Source Initiative – The steward of the Open Source Definition, setting the foundation for the Open Source Software ecosystem.