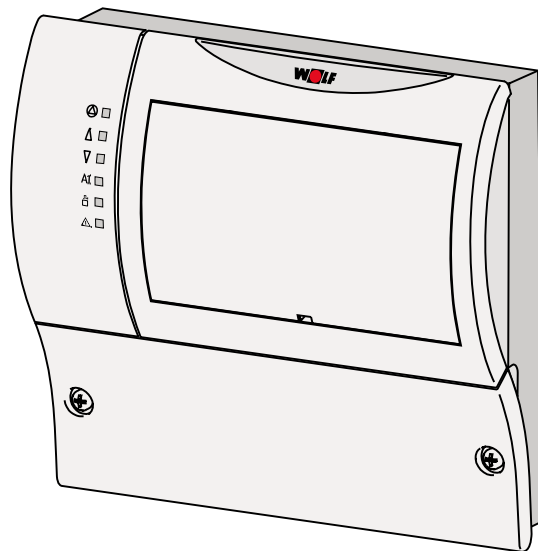




# Installation and operating instructions

## Mixer module MM



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**Safety instructions**

The following symbols are used in conjunction with these important instructions concerning personal safety as well as operational reliability.



"Safety instructions" are instructions with which you must comply exactly, to prevent injury and material losses.



Danger through 'live' electrical components.

NB Switch OFF the ON / OFF switch before removing the casing.

Never touch electrical components or contacts when the ON / OFF switch is in the ON position. This brings a risk of electrocution, which may result in injury or death.

The main supply terminals are 'live' even when the ON / OFF switch is in the OFF position.

**Attention**

This indicates technical instructions which you must observe to prevent material losses and boiler malfunctions.

**Standards and regulations**

The boiler and control accessories comply with the following regulations:

**EG Directives**

- 2006/95/EG Low Voltage Directive
- 2004/108/EG EMC Directive

**EN Standards**

- EN 60730-1
- EN 55014-2
- EN 60529

**Installation /  
Commissioning**

- According to DIN EN 50110-1, only qualified electricians may carry out the installation and commissioning of the heating control unit and connected accessories.
- Observe all regulations stipulated by your local power supply utility and all VDE or local regulations.
- DIN VDE 0100 regulations regarding the installation of high voltage systems up to 1000V
- DIN VDE 0105-100 operation of electrical systems

**Warnings**

- Never remove, bypass or disable safety and monitoring equipment.
- Only operate the system in perfect technical condition. Immediately remove / remedy any faults and damage that may impact on safety.
- Always ensure that cold water is mixed in with hot water, when the DHW temperature is set above 60 °C or when pasteurising at a temperature in excess of 60 °C (risk of scalding).

**Maintenance / Repair**

- Regularly check the perfect function of all electrical equipment.
- Only qualified personnel may remove faults or repair damage.
- Only replace faulty components or equipment with original Wolf spare parts.
- Always maintain prescribed electrical protection values (see specification).

**Attention**

Any damage or loss resulting from technical modifications to Wolf control units is excluded from our liability.

**Terminology****Heating water temperature**

The heating water temperature is the radiator flow temperature. The higher the heating water temperature, the higher the heat transfer to radiators.

**Mixer circuit temperature**

The mixer circuit temperature is the flow return temperature downstream of the mixer, with which underfloor heating systems are supplied.

**Cylinder heating**

Heating up the DHW cylinder.

**DHW Quick Start**

The heating water in the boiler will be held at a certain temperature during summer mode, to be able to supply hot water as rapidly as possible from the instantaneous water heater or combi boiler that is equipped with the DHW Quick Start function. The DHW time program switches this function on and off during summer mode.

**Heating program**

Subject to program selection, the heating time program switches the boiler from heating to setback mode or from heating mode to heating off and vice versa.

**Domestic hot water program**

In a gas fired combi boiler equipped with the DHW Quick Start function, the DHW time program controls the DHW Quick Start and, for boilers with a DHW cylinder, enables / disables the cylinder heating.

**Winter mode**

Central heating and DHW according to the heating and DHW time program.

**Summer mode**

Central heating off, DHW according to the DHW time program.

**Heating mode / Setback mode**

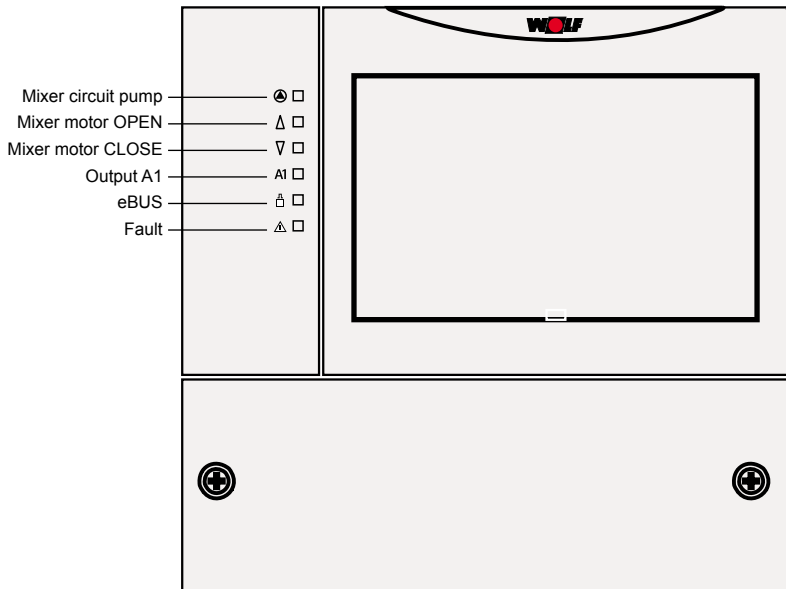
In winter mode, two room temperatures can be selected: Standard room temperature and setback temperature. In the later case the temperature will be reduced to the setback temperature. The heating program changes over between heating and setback mode.

## Abbreviations

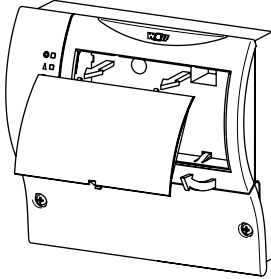
BPF - Bypass sensor	MKP - Mixer circuit pump
MKF - Mixer circuit sensor	MM - Mixer motor or Mixer module
PF - Buffer sensor	SPLP - Cyl. primary pump
PK - Floating contact as N/O	LP - Primary pump
RLF - Return sensor	BPP - Bypass pump
SPF - Cylinder sensor	3WUV - Three-way diverter valve
VF - Flow sensor	

## Equipment description

The mixer module (MM) contains a mixer circuit controller and the control for a programmable output. The mixer circuit controller can be used for the heating flow as well as for the heating return. The programmable output either regulates a direct heating circuit, a cylinder circuit, an air heater (= ext. heat demand), an electrical valve for raising the return temperature (= central heating backup) or the bypass pump in conjunction with the return temperature raising. Subject to application, select the relevant combination of the mixer circuit controller and the programmable output as configuration. Parameters can be changed and fault codes as well as sensor values can be displayed at the programming module (BM) or at the interface module ISM1 with Comfort Soft. The MM has an eBUS interface and can therefore be integrated into the Wolf control system.

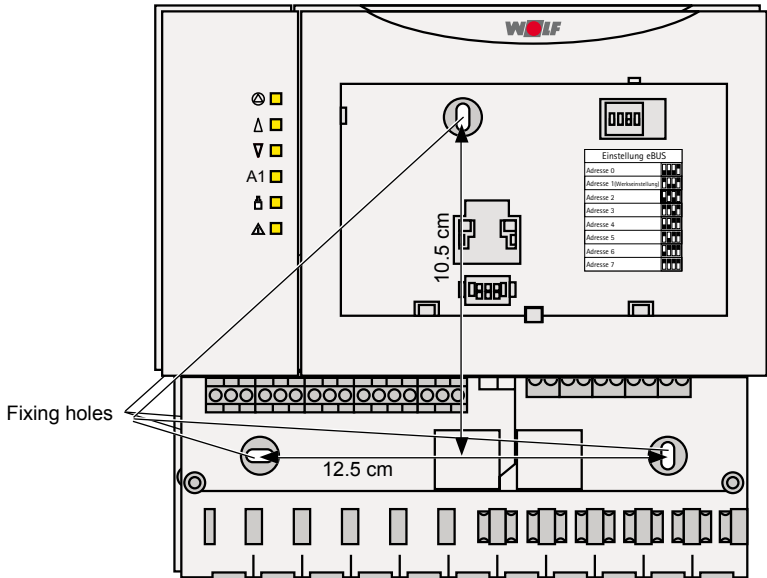


## Mixer module installation



- Remove the mixer module from the packaging.
- Fit the mixer module directly to the wall.
- Connect an outside temperature sensor to the gas fired boiler.
- Install the outside temperature sensor at a north or north eastern wall at a height of 2 - 2.5 m from the ground (cable grommet pointing downwards).
- Wire up the MM mixer module in accordance with the installation diagram.  
Cable cross-section for 230 V min. 0.75 mm<sup>2</sup>; for 24 V min. 0.5 mm<sup>2</sup>.

**Note:** Never route on-site cables / leads for outside temperature and flow temperature sensors together with mains cables.



## Output A1

### a) Electrical valve

For wall mounted boilers with integral boiler pumps, an electrical valve can be connected to output A1 in case of configuration 1, 2, 3, 9, 10 and 11, subject to the integral boiler pump matching the hydraulic design.

### b) Heating circuit / primary pump

For wall mounted boilers with low loss header and for boilers with or without low loss header, connect a pump to output A1 in case of configuration 1, 2, 3, 9, 10 and 11.

## Maximum thermostat

If the maximum thermostat is connected to terminals 4, 5 or 6 of the MM, only the mixer circuit pump will be switched off in case of faults (the mixer will no longer close); the MKP LED stays on. With the injection control, the bypass and gravity brake ensure that, if there is a fault, no heating water enters the mixer circuit, even through the pump of the wall mounted boiler. Where no hydraulic injection system is used as described on pages 41-43, either

**A)** install an electrical valve (off in the zero volt state) upstream of the mixer circuit pump, and connect it electrically in parallel to the mixer circuit pump. Application for several mixer circuits.

In case of faults (mixer no longer closes), the electrical valve prevents an overheating of the mixing circuit in conjunction with a maximum thermostat; or

**B)** for gas fired condensing centres, connect the maximum thermostat to terminal E1 of the gas fired condensing centre. E1 must then be programmed in accordance with the maximum thermostat (see installation instructions). The gas fired condensing centre will be blocked as soon as the maximum thermostat opens. Application for one mixer circuit.



Without a maximum thermostat, extremely high temperatures may occur in the underfloor heating circuit, should the MM develop a fault. This can result in the floor developing cracks.

## Outside temperature sensor

There are four options for integrating an outside temperature sensor into a system:

- Outside temperature sensor at the boiler at terminal AF, Part no. 2792021
- Outside temperature sensor at BM (address 0) in the wall mounted base at terminal 5/6 Part no. 2792021
- Radio clock module with outside temperature sensor connected to the eBUS, Part no. 2792325
- Wireless outside temperature sensor and wireless receiver connected to the eBUS. Part no. 2744081 and 2744209

## Recommended cables and cable cross-sections:

H005VV 3 x 1.0 mm <sup>2</sup>	Power supply cable
H005VV 3 x 0.75 mm <sup>2</sup>	Mixer circuit pump, max. thermostat
H005VV 4 x 0.75 mm <sup>2</sup>	Mixer motor
H005VV 3 x 0.75 mm <sup>2</sup>	Max. thermostat, electr. valve
H005VV 2 x 0.5 mm <sup>2</sup>	BUS cable

## Note:



During service work, isolate the entire system from the power supply, otherwise there will be a risk of electrocution.



**Configuration overview**

Subject to the application of the MM, there are 11 different connection methods. Select the different versions with the configuration parameter (MI05). This is found at the second control level → Contractor → Mixer.

- Configuration 01:** Mixer circuit and cylinder circuit; page 12
- Configuration 02:** Mixer circuit and air heater circuit, external heat demand; page 13
- Configuration 03:** Mixer circuit and heating circuit; page 14
- Configuration 04:** Mixer circuit and return temperature raising for heating backup; page 15
- Configuration 05:** Return temperature raising for soft starting; page 16;  
Applies to single and multi boiler systems (cascade) in conjunction with R1/R2/R3/R21 boiler control units.

In this configuration, the mixer module acts as return temperature raising facility for one boiler. In multi boiler systems, return temperature raising requires a separate mixer module for each boiler.  
On single boiler systems without cascade module, set parameter HG06 pump operating mode to "1" (1 = feed pump). This is found at control level 2 → Contractor → Boiler.

Every mixer module for return temperature raising with configuration 5 must be assigned to a boiler.

Assignment (↔) via addressing the boiler and mixer module MM:

- a) for single boiler systems without cascade module R1/R2/R21  
(address 0 = factory-set) ↔ MM (address 1 = factory-set)
- R3 (address 0 = factory-set) ↔ MM (address 2)
- b) for single and multi boiler systems with cascade module  
Boiler 1: R1/R21 (address 1) ↔ MM (address 2)  
Boiler 2: R1/R21 (address 2) ↔ MM (address 3)  
Boiler 3: R1/R21 (address 3) ↔ MM (address 4)  
Boiler 4: R1/R21 (address 4) ↔ MM (address 5)

Additional mixer modules up to address 7 can be configured individually.

**Note:** **System examples, see also Wolf hydraulic schemes for medium-sized boilers.**

**Configuration 06:** Heating circuit and return temperature raising for soft starting with bypass pump; page 17.  
Applies to single boiler systems without cascade module in conjunction with R1/R2/R3/R21 boiler control units

The mixer module with configuration 6 must be assigned to the boiler.  
Assignment (↔) via addressing the mixer module MM:

R1/R2/R21 (address 0 = factory-set)↔MM (address 1 = factory-set)

R3 (address 0 = factory-set.)↔MM (address 2)

Additional mixer modules up to address 7 can be configured individually.

**Note:** **System examples, see also Wolf hydraulic schemes for medium-sized boilers.**

**Configuration 07:** Mixer circuit with indirect return temperature raising for soft starting with bypass pump; page 18.  
Applies to single boiler systems in conjunction with R1/R2/R3/R21 boiler control units.

In conjunction with a cascade module, configuration 07 must be set at the cascade module. In that case, configuration 7 must not be assigned at the mixer modules.

The mixer module with configuration 7 must be assigned to the boiler.  
Assignment (↔) via addressing the mixer module MM:

R1/R2/R21 (address 0 = factory-set)↔MM (address 1 = factory-set)

R3 (address 0 = factory-set)↔MM (address 2)

Additional mixer modules up to address 7 can be configured individually.

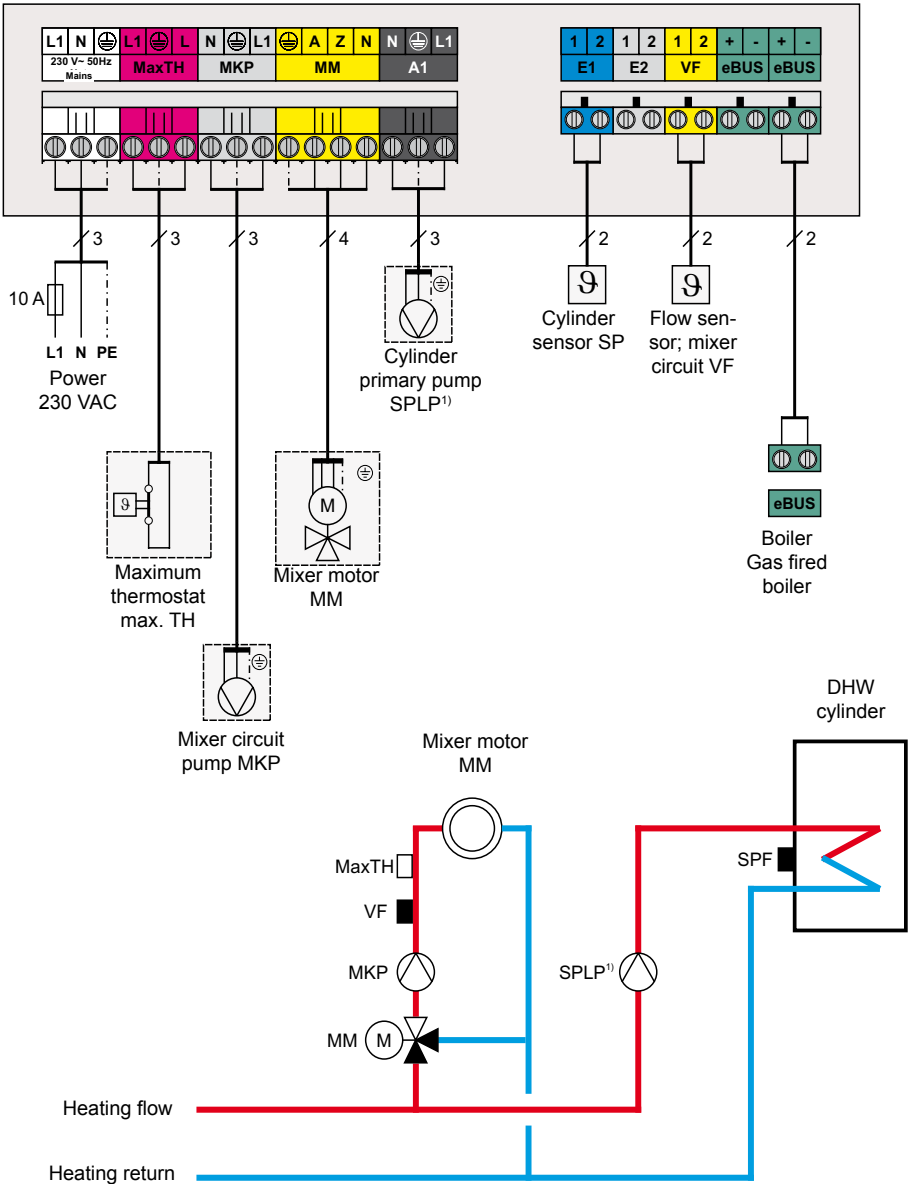
**Note:** **System examples, see also Wolf hydraulic schemes for medium-sized boilers.**

- Configuration 08:** Mixer circuit (factory setting); page 19
- Configuration 09:** Heating circuit; page 20
- Configuration 10:** Cylinder circuit; page 21
- Configuration 11:** Air heater circuit, external heat demand; page 22

**Notes:** **Restart the system after every configuration change. (Mains "On"/ mains "Off")**

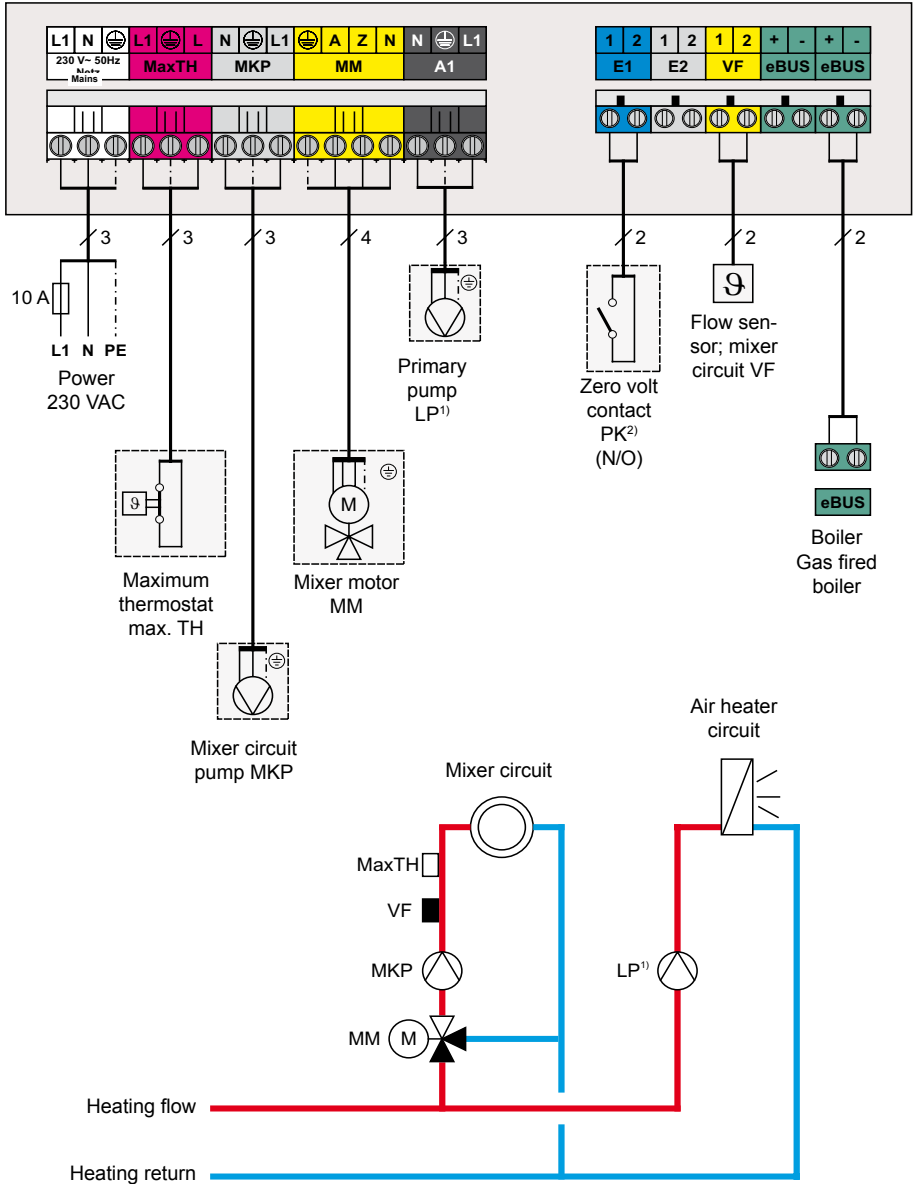
**Switch the mains power OFF and then ON again via the emergency stop switch of the heating system or via an MCB.**

## Configuration 1: Mixer circuit and cylinder circuit



<sup>1)</sup> Whether **pump** or **electrical valve**, see description "Output A1", page 8.

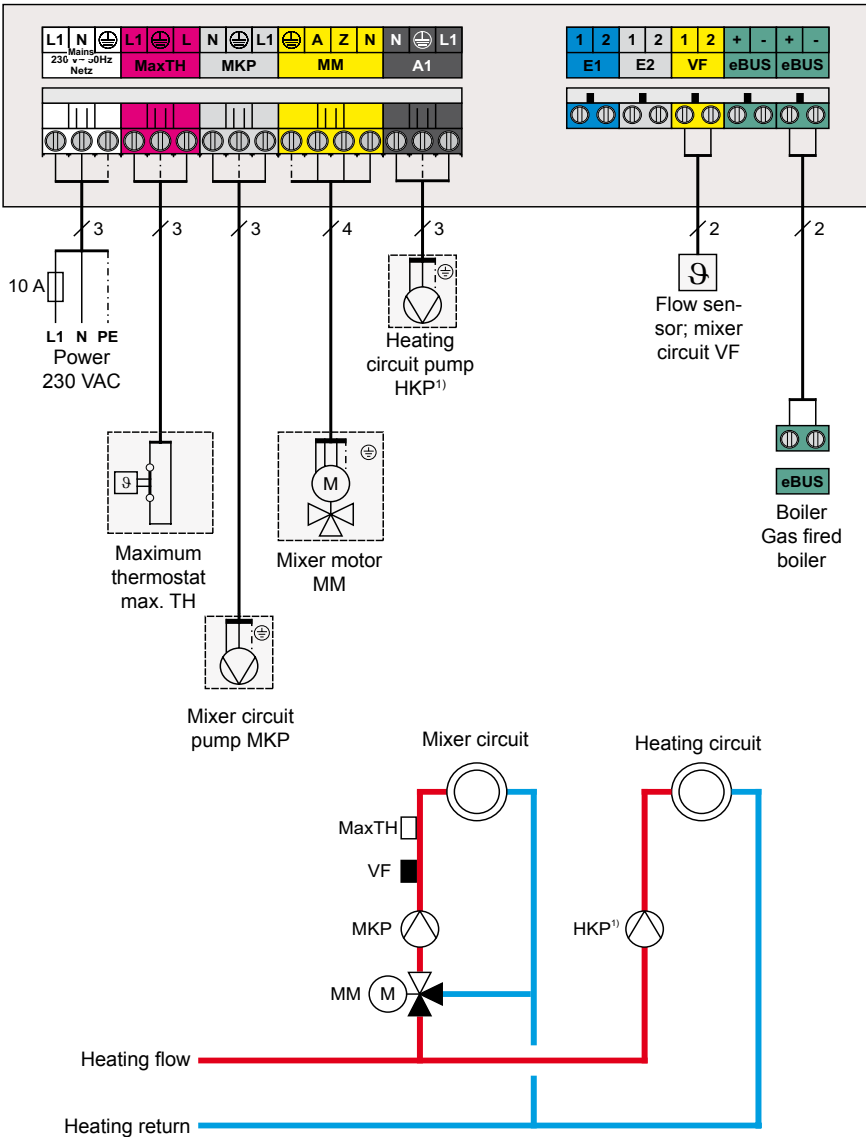
### Configuration 2: Mixer circuit and air heater circuit / external heat demand



<sup>1</sup>) Whether **pump** or **electrical valve**, see description "Output A1", page 8.

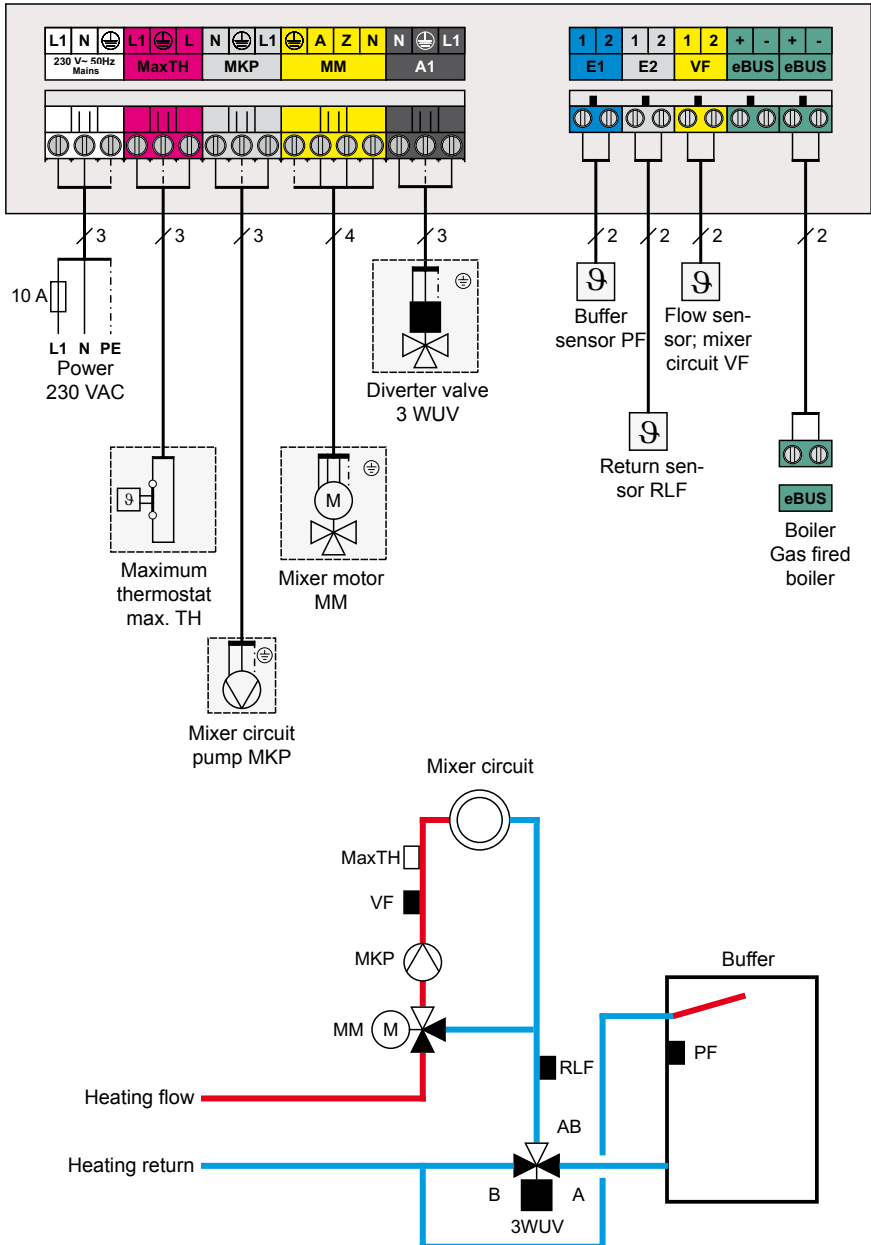
<sup>2</sup>) Heat demand for air heater circuit / external heat demand.

## Configuration 3: Mixer circuit and heating circuit

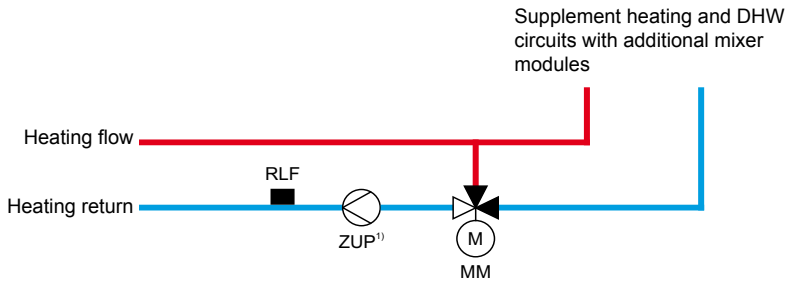
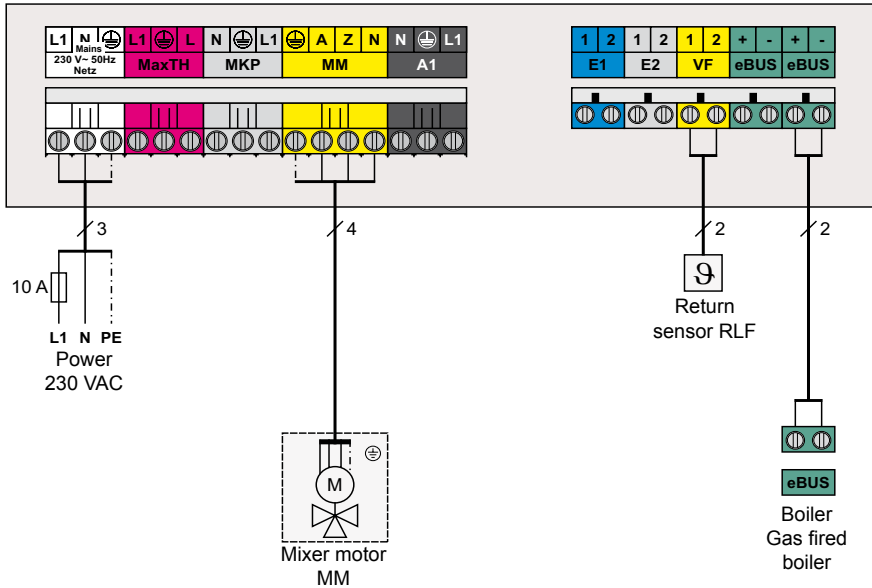


<sup>1</sup>) Whether **pump** or **electrical valve**, see description "Output A1", page 8.

**Configuration 4: Mixer circuit and return temperature raising for heating backup**



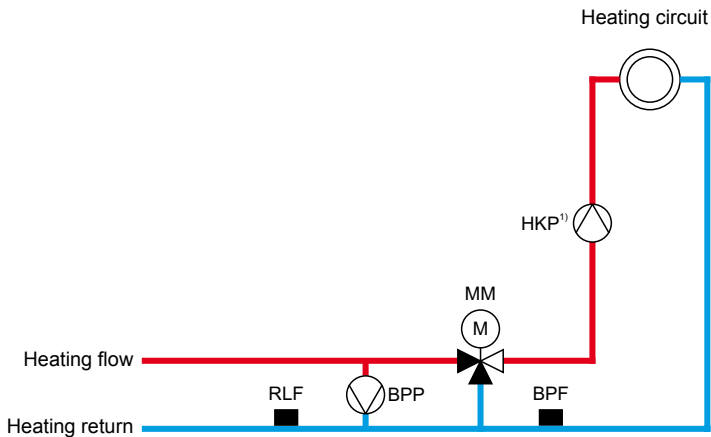
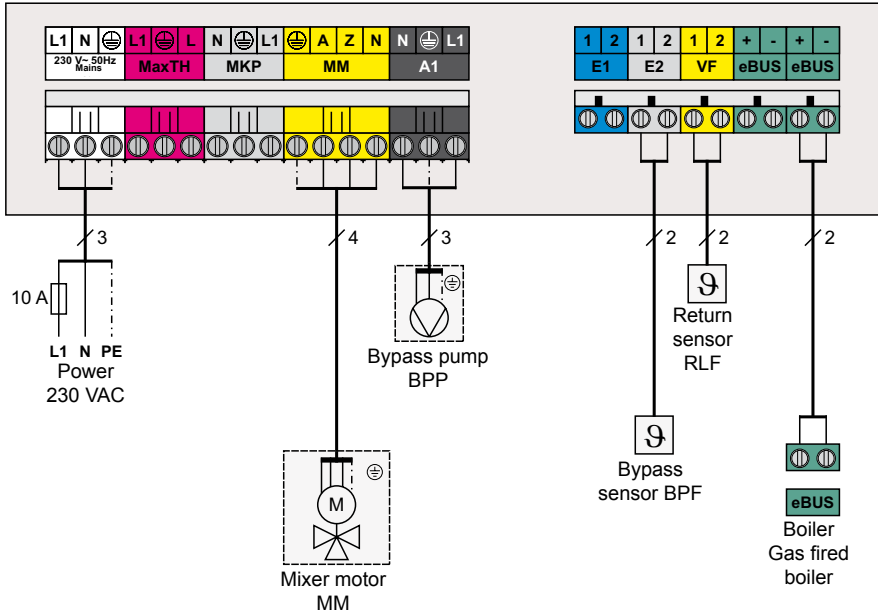
## Configuration 5: Return temperature raising for soft starting



<sup>1)</sup> Connect the feed pump (ZUP) to the boiler control unit (at slot KKP).

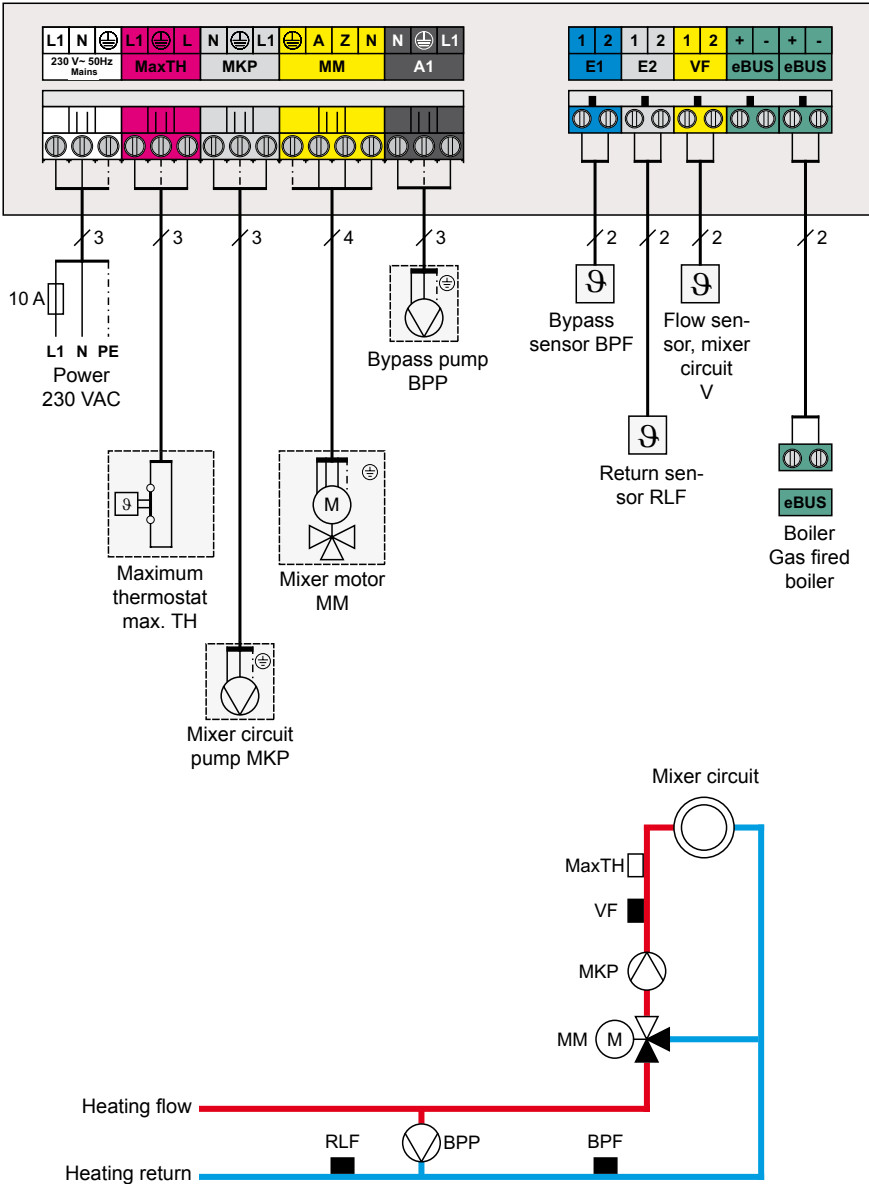


**Configuration 6: Heating circuit and return temperature raising for soft starting with bypass pump**

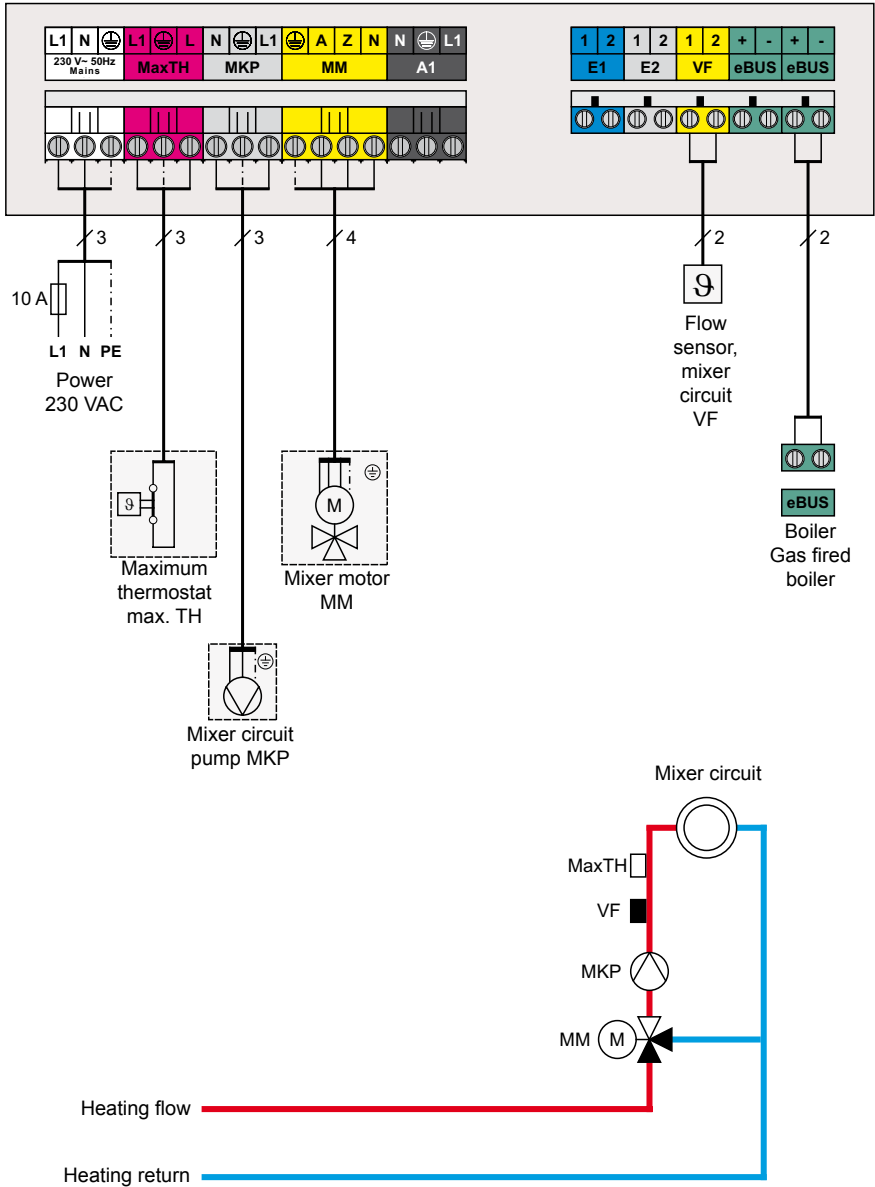


<sup>1)</sup> Connect the heating circuit pump (HKP) to the boiler control unit.

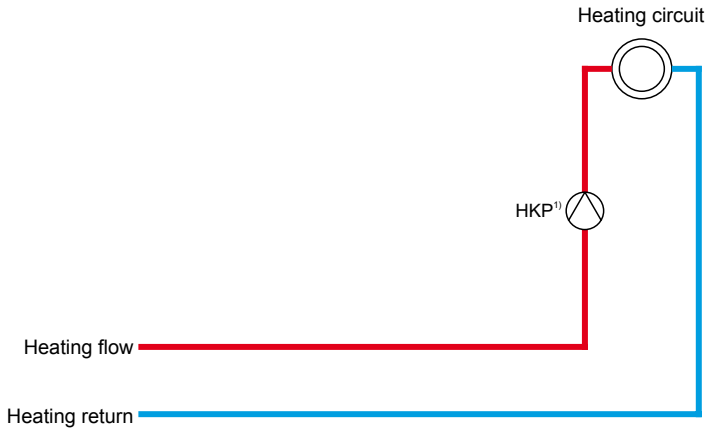
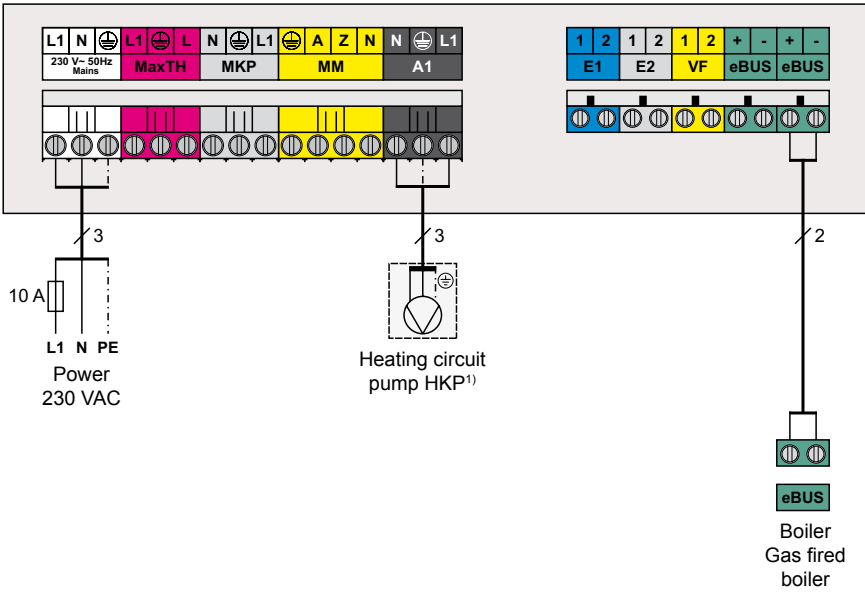
**Configuration 7: Mixer circuit with indirect return temperature raising for soft starting with bypass pump**



Configuration 8: Mixer circuit (factory setting)

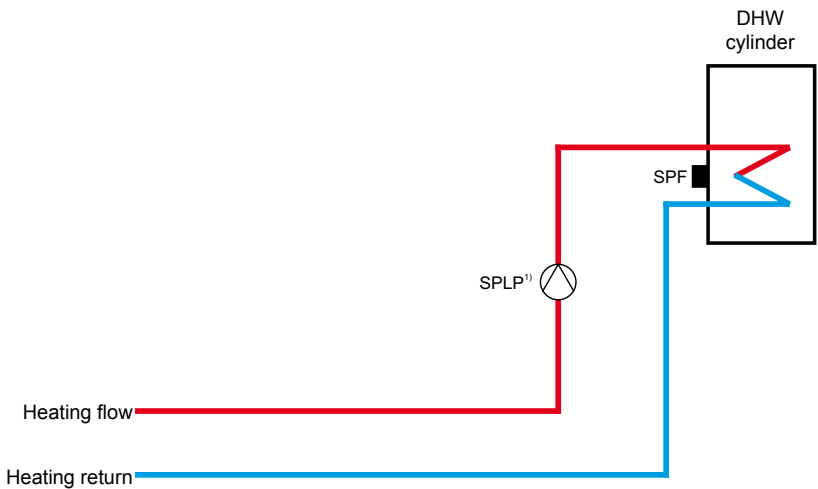
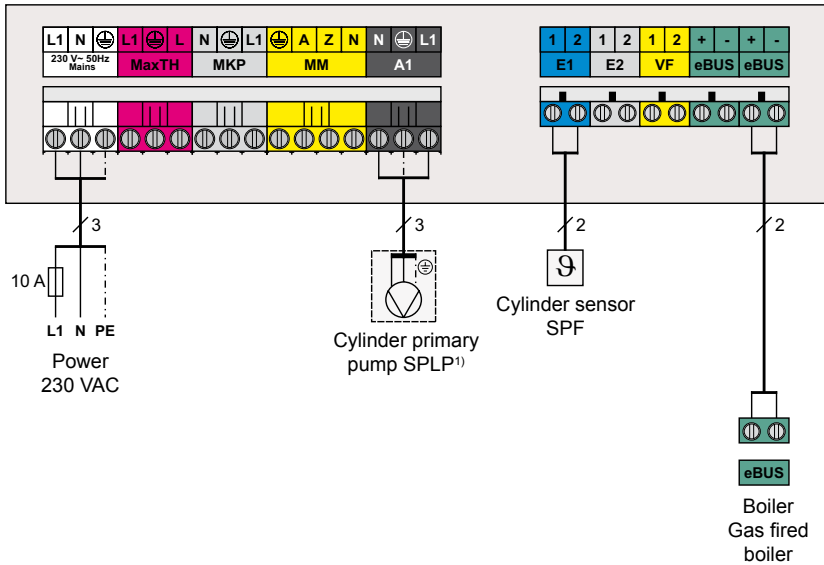


## Configuration 9: Heating circuit



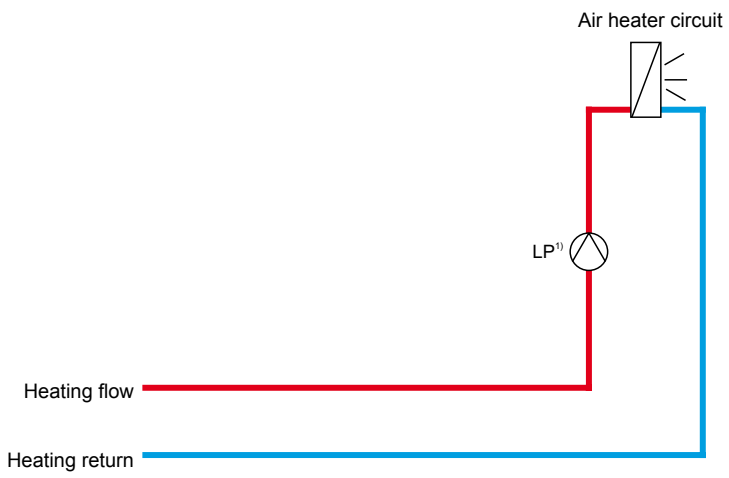
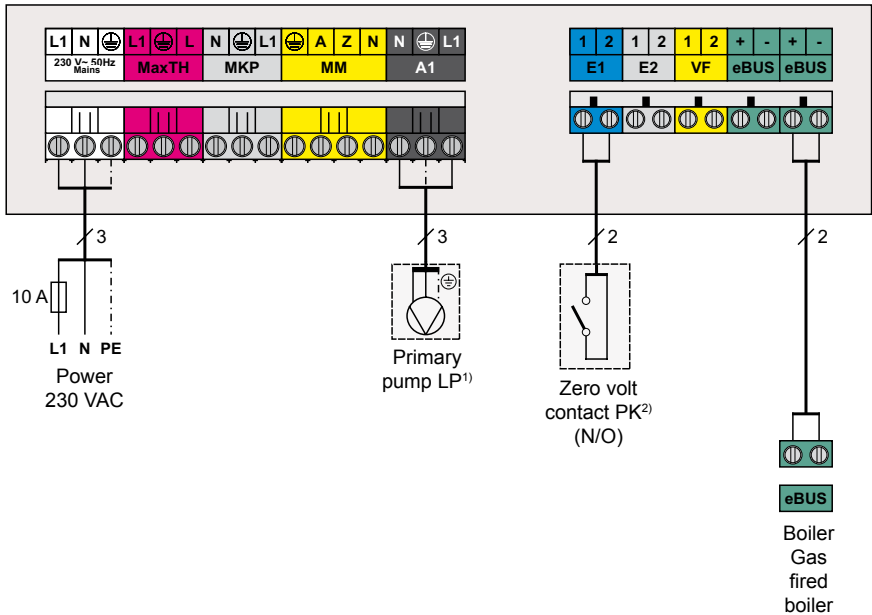
<sup>1)</sup> Whether **pump** or **electrical valve**, see description "Output A1", page 8.

Configuration 10: Cylinder circuit



¹) Whether **pump** or **electrical valve**, see description "Output A1", page 8.

## Configuration 11: Air heater circuit / external heat demand










1) Whether pump or electrical valve, see description "Output A1" page 8.  
 2) Heat demand for air heater circuit (external heat demand).

**Commissioning guidelines**

Implement the following steps in the order in which they are listed to achieve successful commissioning with regards to addressing and programming all control components and the system configuration.

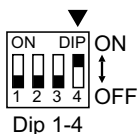
**Note:** HG, KM, MM and SOL parameters are found at control level 2 → Contractor → Boiler (HG) / Cascade (KM) / Mixer (MM) / Solar (SOL) in the programming module (BM). If a cascade module is installed in the system, use the commissioning guidelines from the installation and operating instructions of the cascade module.

- Step 1**  Implement the "Installation" and "Electrical connection" of all extension and programming modules in accordance with the instructions in the associated manual.
- Step 2**  For further details regarding the setting of the eBUS address (DIP switches) of the extension and programming modules (MM and BM), see "Setting the eBUS address - extension modules".
- Step 3**  Start the system via the system On/Off switch (mains "On").
- Step 4**  Configuration of the extension modules just like mixer module and solar module.  
The configuration of the MM mixer module and SM2 solar module is made in parameter MI 05 (= mixer module configuration) and parameter SOL 12 (= solar module configuration) in accordance with the hydraulic scheme. See "Electrical connection" in the mixer module or solar module installation instructions regarding the selection of the correct configuration.
- Step 5**  Programming the Wolf boiler control unit.  
When selecting configuration 5 at the mixer module, select pump operating mode 1 at the R1/R2/R3/R21 boiler control unit. → HG06 = 1.
- Step 6**  Programming the following components
1. In BM programming module, set parameters, such as time, day, time programs etc.
  2. Adjust MM and SM extension module parameters according to requirements.
- Step 7**  Restart the system by means of the system On/Off switch (switch the mains OFF and then ON again). The system is ready for operation after approx. 1 min.

**Note:** If mixers 2-7 are operated / programmed by the BM (o), the status display of the BM will show the "Sun" and "Moon" symbols simultaneously, as soon as one of the mixers calls for heat.

## Setting the eBUS-Address of the extension and programming modules (MM, BM)

Settings eBUS	
Address 0	
Address 1 (factory setting)	
Address 2	
Address 3	
Address 4	
Address 5	
Address 6	
Address 7	



Subject to the installed Wolf boiler, up to seven mixer modules per system can be connected. The MM addresses are assigned in sequence from 1 to 7 in conjunction with the Wolf control unit for wall mounted boilers, MGK or the Wolf boiler control units R1/R2/R21/COB. In conjunction with the Wolf control unit R3, the addresses of the MM are allocated from 2 to 7.

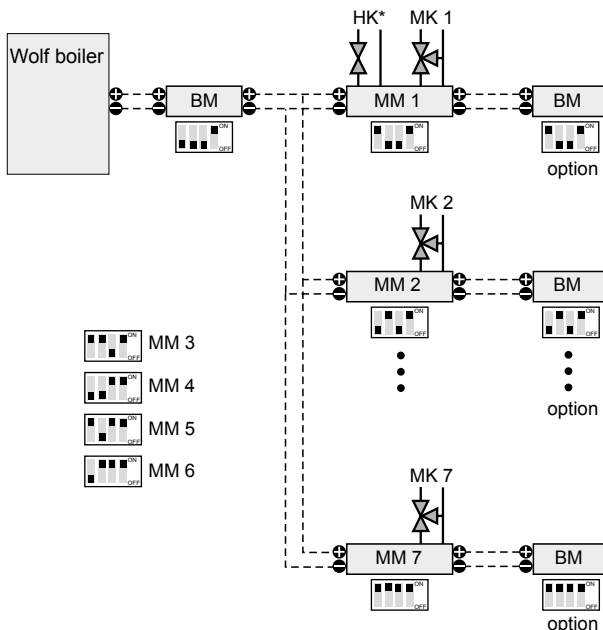
The functions of each mixer module are determined via the configuration settings (see also electrical connection).

Each system can comprise up to seven mixer circuits and one direct heating circuit.

This direct heating circuit can either be connected to the boiler control unit (R1/R2/R3/R21/COB) or the mixer module (config. 3 or 9). On systems with KM cascade module, the direct heating circuit must be connected to the KM or MM.

In addition, each mixer module (mixer circuit) may be supplemented with a BM programming module to complete the control. The heating circuit is always controlled by the programming module with address 0.

### a) Max. expansion with Wolf boiler control unit for wall mounted appliances, MGK control unit or Wolf boiler control units R1/R2/R21/COB

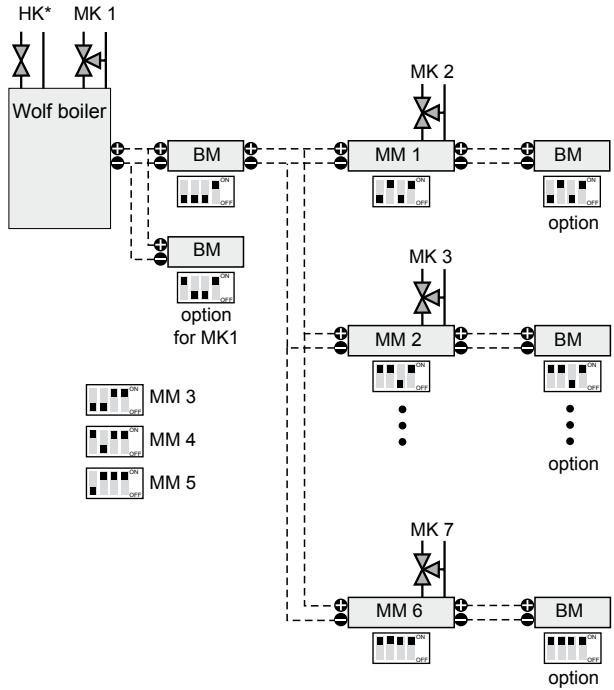


\* In conjunction with a control unit for Wolf wall mounted boilers or MGK control unit, always connect the direct heating circuit to the MM mixer module.

In conjunction with a Wolf boiler control unit R1/R2/R21/COB, the direct heating circuit can be installed either directly on the boiler or on a mixer module. The factory setting provides for the installation of the heating circuit on the boiler. If the direct heating circuit is connected to the mixer module, set Pump operating mode parameter HG06 to "1" (1 = feed pump). This is found at the second control level → Contractor → Boiler.



## b) Max. expansion with Wolf boiler control unit R3



\* In conjunction with a Wolf boiler control unit R3, the direct heating circuit can either be installed directly on the boiler or on a mixer module. The factory setting provides for the installation of the heating circuit on the boiler. If the direct heating circuit is connected to the mixer module, set Pump operating mode parameter HG06 to "1" (1 = feed pump). This is found at the second control level → Contractor → Boiler.

**Commissioning and setting of the eBUS-Address of the extension and programming modules (BM, MM)**

- c) Max. expansion without Wolf boiler control unit or MGK standard control unit

The MM can also be used as a stand-alone mixer circuit controller, if no boiler with eBUS interface is installed. The MM can also be used as stand-alone mixer circuit controller, if no boiler with interface is installed. In that case, connect an outside temperature sensor to the BM (0) or a DCF receiver with outside temperature sensor to the eBUS. System examples, see "Setting an eBUS interface with Wolf boilers", point a).

Configurations 5, 6 and 7 may not be set without a Wolf boiler being installed.

## Setting parameters

The standard setting for all parameters and switching times are fixed and stored in a non-volatile memory. All changes are permanently stored and will not be lost, even if the power fails for several weeks.

Parameters are set / modified via the BM programming module. Check the description of operation and setting / modifying parameters in the BM installation and operating instructions.

## Switching times

**Mixer circuit:** The switching times for the mixer are stored in the respective mixer module.

This is found at the second control level → Time program → Heating → Mixer.

**Heating circuit and cylinder:** The switching times for the heating circuit and cylinder are stored in the BM programming module.

Time program	Block	Switching time	Mixer		Program	Block	Switching time	Mixer	
			ON	OFF				ON	OFF
Time prog. 1	Mo-Su	1	5:00	21:00	Time prog. 3	Mo	1	4:30	20:00
		2					2		
		3					3		
	Sa-Su	1	6:00	22:00		Tu	1	4:30	20:00
		2					2		
		3					3		
Time prog. 2	Mo-Fr	1	5:00	7:00		We	1	4:30	20:00
		2	14:00	21:00			2		
		3					3		
	Sa-Su	1	6:00	21:00		Th	1	4:30	20:00
		2					2		
		3					3		
						Fr	1	4:30	20:00
							2		
							3		
						Sa	1	4:30	20:00
							2		
							3		
						Vu	1	4:30	20:00
							2		
							3		

## Parameter list Standard setting

This is found at the second control level → Standard setting → Mixer.

Parameters	Setting range	Factory setting	Individual setting
STANDARD TEMP	5 °C - 30 °C	20 °C	
RED TEMP	5 °C - 30 °C	12 °C	
GRADIENT	0 - 3	0.8	
ROOM INFLU	OFF - ON	OFF	
W/S SWITCH	0 °C - 40 °C	20 °C	
ECO-RED	-10 °C - 40 °C	10 °C	

Check the BM installation and operating instructions for a description of the parameters standard temperature, reduced temperature, gradient, room influence, W/S changeover and ECO / RED.

## Parameter list Contractor system

System parameters A09, A10, A12 and A14 can only be set in the programming module with address 0; all other system parameters can be found in the associated programming modules. These are found at the second control level → Contractor → System.

Parameters	Setting range	Factory setting	Individual setting
A00	Room influence	1 - 20	4
A09	Frost protection limit	-20 - 10	2
A10	Parallel pump mode	0 - 1	0
A11	Pump stop with room controller	off - on	on
A12	Setback stop	-40 - 0	16
A14	Maximum DHW temperature	60 - 80	60

Check the description of the parameters room influence, frost protection limit, pump stop with room controller, setback stop and maximum DHW temperature in the BM installation and operating instructions.

A10: Parallel pump operation

Parameter A10 = 0: Priority mode

Priority mode for cylinder heating (at the mixer module) or primary pump for external heat demand ahead of a heat demand for the mixer output.

Parameter A10 = 1: Parallel operation

Parallel mode for cylinder heating (at the mixer module) or external heat demand with a heat demand for the mixer output.

**Note:**

In parallel mode, the highest possible flow temperature is applied.

**Parameter list,  
contractor, boiler**

This is found at control level 2 → Contractor → Boiler.

To safeguard the required flow temperatures for cylinder and central heating (at the mixer module), set parameters HG08 (= maximum limit, boiler circuit TV-max.) and HG22 (= maximum boiler water temperature TK-max) to the highest required temperature level.

**Note:**

Parameters HG08 and HG22 do not need to be changed for those heating and cylinder circuits, for which the corresponding parameters for calculating the set flow temperature are left at their factory setting (e.g. set cylinder temperature). Parameters HG08 and HG22 will need to be modified, if the factory settings for heating and cylinder circuits are changed or if configurations 2 or 11 have been selected at the mixer module. For this, HG22 only needs to be changed in conjunction with the R1/R2/R3/R21 or COB boiler control unit.

**HG08 settings:**

- a) Cylinder heating at the mixer module  
 $HG08 \geq \text{set cylinder temperature} + \text{R17} + HG01$
- b) External heat demand (convector heater) at the mixer module (configuration 2 or 11)  
 $HG08 \geq \text{R14} + HG01$
- b) Heating circuits (boiler or mixer module)  
 $HG08 \geq \text{R102} + \text{R103} + HG01$

**HG22 settings:**

$HG22 \geq HG08$

Parameter list		Parameters, individual settings
HG01	Burner switching differential	
HG08	Maximum limit, boiler circuit TV-max	
HG22	Maximum boiler limit TK-max	

This is found at control level 2 → Contractor → Mixer

Parameter	Setting range	Factory setting	Configuration MM												
			1	2	3	4	5	6	7	8	9	10	11		
MI01	Min. mixer circuit temp	0 °C – 80 °C	x	x	x	x	-	-	x	x	-	-	-	-	-
MI02	Max. mixer circuit temp	20 °C – 80 °C	x	x	x	x	-	-	x	x	-	-	-	-	-
MI03	Heating curve gap	0 K – 30 K	x	x	x	x	-	-	x	x	-	-	-	-	-
MI04	Screed drying	0 (Off) - 2	x	x	x	x	-	-	x	x	-	-	-	-	-
MI05	Configuration	1 - 11	1	2	3	4	5	6	7	8	9	10	11		
MI06	Run-on time, heating circuit	0 – 30min	x	x	x	x	-	-	x	x	-	-	-	-	-
MI07	P range, mixer	5 K – 40 K	x	x	x	x	x	x	x	x	-	-	-	-	-
MI08	Set return temperature	20 °C – 80 °C	-	-	-	-	-	x	x	x	-	-	-	-	-
MI09	Max. cylinder heating time	0 - 5h	x	-	-	-	-	-	-	-	-	-	-	x	-
MI10	BUS feed (1 = On)	0 (Off) - 2 (Auto)	X <sup>(1)</sup>	X <sup>(1)</sup>	X <sup>(1)</sup>	X <sup>(1)</sup>	X <sup>(1)</sup>	X <sup>(1)</sup>	X <sup>(1)</sup>	X <sup>(1)</sup>	X <sup>(1)</sup>	X <sup>(1)</sup>	X <sup>(1)</sup>	X <sup>(1)</sup>	X <sup>(1)</sup>
MI11	Hysteresis, bypass sensor	0 °C – 30 °C	-	-	-	-	-	-	x	x	-	-	-	-	-
MI12	Primary pump blocking	0 - 1	x	x	-	-	-	-	-	-	-	-	-	x	x
MI13	Primary pump, run-on time	0 - 10min	x	x	x	x	-	-	-	-	-	-	-	x	x
MI14	Constant temperature	50 °C – 80 °C	-	x	-	-	-	-	-	-	-	-	-	-	x
MI15	ΔTOff (shutdown differential)	2 – 20 K	-	-	-	x	-	-	-	-	-	-	-	-	-
MI16	ΔTON (start-up differential)	4 – 30 K	-	-	-	x	-	-	-	-	-	-	-	-	-
MI17	Boiler excess temp. during cylinder heating	0 – 40 K	x	-	-	-	-	-	-	-	-	-	-	-	x
MI18	Burner blocked during return temp. raising	0 – 300s	-	-	-	-	-	-	-	-	-	-	-	-	-
MI50	Test function	1 - 8	x	x	x	x	x	x	x	x	x	x	x	x	x
Display of the input sensor values															
MI70	Analogue input E1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MI71	Analogue input E2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MI72	Analogue input, flow sensor VF	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Subject to the configuration of the mixer module, only specific parameters are effective and able to be adjusted as an option.

"X" = optionally adjustable

"-" = not active

"X"<sup>(1)</sup> = never change the factory setting

**MI 01 Minimum mixer circuit temperature**

This minimum mixer circuit temperature limits the low end of the set mixer circuit flow temperature.

**MI 02 Maximum mixer circuit temperature**

The maximum mixer circuit temperature limits the set flow temperature of the mixer circuit upwards, for example to prevent damage to floor coverings. This does not, however, replace a maximum thermostat for shutting down the pump.

**MI 03 Heating curve gap**

The heating water temperature will be raised by the set value against the mixer circuit temperature.

**MI 04 Screed drying**

If an underfloor heating system is started for the first time in new buildings, the set flow temperature may, as an option, be controlled independent of the outside temperature either to a constant value or to control the set flow temperature in accordance with an automatic screed drying program.

If this function has been enabled (setting 1 or 2), it can be terminated by resetting parameter MI 04 to 0.

MI 04 = 0 N / A

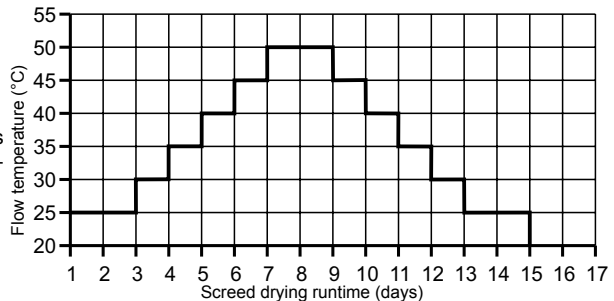
MI 04 = 1 constant temperature mixer circuit

The mixer circuit is heated to the set flow temperature. The set flow temperature is regulated accurately to the temperature selected in parameter MI 01.

MI 04 = 2 screed drying temperature

For the first two days, the set flow temperature will remain constant at 25 °C. It will then be automatically raised every day (at 0:00 h) by 5 °C up to the maximum mixer circuit temperature (MI 02). That temperature will then be held for two days. Subsequently, the flow temperature is automatically reduced again in 5 °C steps per day to 25 °C. The program sequence is terminated after a further two days.

Fig.:  
Flow temperature progress  
over time during screed drying

**Attention**

Agree the time sequence and the maximum flow temperature with the screed contractor, otherwise the screed may be damaged, particularly through cracking. The screed drying program continues after a power failure. The remaining time in days is displayed at the BM.

## MI 05 Configuration

The corresponding configuration may, subject to the application of the MM, have to be selected. Up to 11 configurations can be selected. For matching wiring diagrams, see "Electrical connection".

- Configuration 01: Mixer circuit and cylinder circuit
- Configuration 02: Mixer circuit and air heater circuit / external heat demand
- Configuration 03: Mixer circuit and heating circuit
- Configuration 04: Mixer circuit and return temperature raising for heating backup
- Configuration 05: Return temperature raising for soft starting
- Configuration 06: Heating circuit and return temperature raising for soft starting with bypass pump
- Configuration 07: Mixer circuit with return temperature raising for soft start with bypass pump
- Configuration 08: Mixer circuit (factory setting)
- Configuration 09: Heating circuit
- Configuration 10: Cylinder circuit
- Configuration 11: Air heater circuit / external heat demand

## MI 06 Pump run-on time, heating circuit

The mixer circuit pump / heating circuit pump will run on according to the set value after the mixer circuit / heating circuit has been switched OFF.

## MI 07 Proportional range, mixer circuit

Subject to application, the mixer circuit control can be configured for the mixer circuit in the heating flow (configuration 1, 2, 3, 4, 7, 8) or for the mixer circuit for return temperature raising (configuration 5, 6). The mixer circuit temperature is regulated to the set value by means of the mixer circuit sensor / return temperature sensor (mixer circuit in the heating flow / mixer circuit for raising the return temperature) via terminal VF and a motorised mixer. The output of the mixer controller for regulating the mixer motor features P characteristics. The P band can be changed for every parameter "P range mixer".

The pulse duration (= activation of mixer motor) is directly proportional to the mixer flow deviation ( $\Delta T = \text{Set} - \text{Actual}$ ). Parameter MI 07 determines the temperature deviation, for which the pulse duration = 100%. Outside this range the mixer is either not regulated at all ( $\Delta T < 1 \text{ K}$ ) or is regulated constantly ( $\Delta T > \text{setting of par. MI 07}$ ). Within the temperature range, the system exerts constant control. Adjust the proportional range so that stable regulation is ensured. This depends on the runtime of the mixer motor. For mixer motors with a short runtime, select a wide proportional range and vice versa for mixer motors with longer runtimes, select a narrower proportional range.

Setting information: These settings are only approximate guidelines.

**Change factory settings only where required.**

Mixer runtime in min.	2-3	4-6	7-10
Temperature window in K (par. 27)	25-14	15-9	10-5



**MI 08 Set return temperature****Mixer circuit for return temperature raising with configuration #1 05 = 5 or 6**

Configurations 5 and 6 include a mixer circuit control for return temperature raising. Return temperature raising with configuration 5 is active, if the boiler assigned to the mixer module (assignment by addressing boiler and mixer module) is switched by the cascade module (= burner "On"). The bypass is fully opened at the end of the demand. With configuration 6, return temperature raising is always active when at least one heating or cylinder circuit is active. The bypass is fully opened when no heating or cylinder circuit is active.

**Return control:**

If the actual return temperature falls below the set return temperature, then the mixer bypass is opened further by switching the mixer, enabling a greater amount of heating water to flow through the mixer bypass.

If the actual return temperature rises above the set return temperature, then the mixer bypass is closed further by switching the mixer, restricting the amount of heating water to flow through the mixer bypass.

**Indirect return temperature raising with configuration #1 05 = 7**

Configuration 7 includes an indirect return temperature raising to regulate the mixer circuit. The indirect return temperature raising is always active when at least one heating or cylinder circuit is active.

When the actual return temperature drops with indirect return temperature raising, the actual return temperature is forced higher for all heating and cylinder circuits through enforcing a higher output. This forced higher output has two stages. At stage 1, all system mixers are switched to move towards "Close"; and, in addition in stage 2, all heating and primary pumps at stage 1 are switched off.

**Falling return temperature:**

$RL_{act} < RL_{set} + \text{hysteresis}$ , return temperature  $\Rightarrow$  mixer towards CLOSE

$RL_{act} < RL_{set} \Rightarrow$  mixer towards CLOSE and all heating circuit pumps OFF

**Rising return temperature:**

$RL_{act} > RL_{set} + 2 \text{ K} \Rightarrow$  mixer towards CLOSE

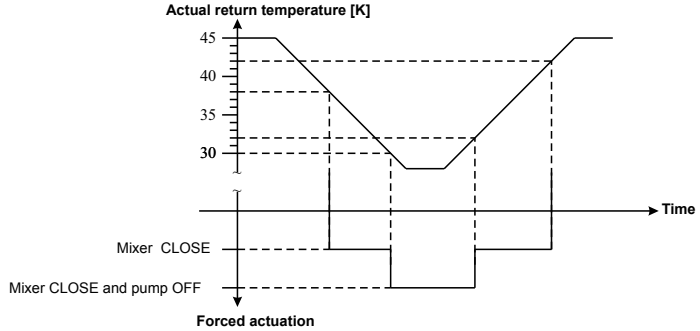
$RL_{act} < RL_{set} + \text{hysteresis}$ , return temperature + 4 K  $\Rightarrow$  no forced actuation

Hysteresis, return temperature = 8 K

Example of a set return temperature = 30 °C:

**Note:**

**The set return temperature applies to configuration 5, 6 and 7.**



### Bypass pump monitoring with configuration

*PI 05 = 6 or 7*

To monitor the return temperature, a timer is set (30 min) each time the bypass pump is started.

Timer ON:  $RL_{act} \leq RL_{set}$  for  $> 30 \text{ min} \Rightarrow$  fault code 97

$RL_{act} > RL_{set} + 2 \text{ K} \Rightarrow$  reset timer and fault code

### MI 09 Maximum cylinder heating time

Cylinder heating is deemed to have been completed when the cylinder temperature is  $\geq$  set cylinder temperature. Fault code 52 is issued and the control unit switches over to heating mode for the Max. cylinder heating time, if cylinder heating is not completed within the max. cylinder heating time (this does not apply to the status heating = summer mode). This cycle continues until the actual cylinder temperature is  $\geq$  set cylinder temperature or parameter MI09 is set to 0.

### MI 10 BUS feed

MI 10 = 0: BUS feed OFF, i.e. the BUS feed is always switched OFF.

MI 10 = 1: BUS feed ON, i.e. the BUS feed is always switched ON.

MI 10 = 2: BUS feed Auto, i.e. the mixer module automatically switches the BUS feed ON or OFF.

**MI 11 Hysteresis,  
bypass sensor**

With configuration 6 / 7, the programmable output A1 acts as bypass pump in conjunction with a bypass sensor. One condition for starting the bypass pump is, that at least one pump (pump for heating circuit, cylinder or air heater) has been enabled in the system.

Bypass pump ON:  $BPF\_act < RL\_set + \text{hysteresis bypass sensor}$

Bypass pump OFF:  $BPF\_act > RL\_set + \text{hysteresis bypass sensor} + 5 K$

**MI 12 Primary pump,  
blocking**

For starting the primary pump, cylinder primary pump (configuration 1 and 10) or for ext. heat demand (configuration 2 and 11), we differentiate between two cases:

a) Par. MI12 = 0: The primary pump is started immediately after the command is issued.

b1) Par. MI12 = 1 with configuration 1 and 10:

Primary pump ON: Boiler flow temperature > actual cylinder temperature + 5 K

Primary pump OFF: Boiler flow temperature  $\leq$  actual cylinder temperature + 2 K

b2) Par. MI12 = 1 with configuration 2 and 11:

Primary pump ON: Boiler flow temperature  $\geq$  constant temperature - 5 K

Primary pump OFF: Boiler flow temperature < constant temperature - 8 K

If a cascade module is also installed in the system, instead of the "Boiler flow temperature", the "Actual collector temperature" is included in the determination whether the primary pump is started or stopped.

**Note:**

The primary pump block must only be activated in the mixer module, if at least one Wolf boiler or one cascade module is linked to the mixer module via eBUS.

**MI 13 Primary pump,  
run-on time**

The primary pump run-on starts after cylinder heating or ext. heat demand has been terminated (configuration 1, 2, 10 and 11).

**MI 14 Constant temperature**

The system regulates to the selected set flow temperature, and output A1 is regulated in case of an external heat demand via a zero volt contact at input E1 and parameter configuration = 2 or 11. External heat demand takes priority over any heat demand from the heating circuits. The primary pump run-on starts after the external heat demand has terminated. The program selector and time channel heating or DHW have no influence.

**MI 15  $\Delta T$ Off  
(shutdown differential)**

Configuration 4 comprises a mixer circuit control and a  $\Delta T$  control for central heating backup. A condition for central heating backup is that, either a heating circuit demands heat or that the cylinder heating / ext. heat demand is enabled. Otherwise central heating backup is always OFF.

Output 1 ON, if  $PF\_act > RL\_act + \Delta TOn$

Output 1 OFF, if  $PF\_act < RL\_act + \Delta TOff$

**MI 16  $\Delta T_{On}$   
(start-up differential)**

See "MI 15  $\Delta T_{Off}$  (shutdown differential)"

**MI 17 Boiler excess temperature during cylinder heating**

Cylinder heating starts when the actual cylinder temperature < set cylinder temperature - 5 K. The set flow temperature then results from the set cylinder temperature + excess boiler water temperature during cylinder heating.

**MI 18 Burner blocked when the return temperature is raised****Configuration  $\#11 \ 01 = 4$** 

For raising the return temperature during central heating backup, a three-way diverter valve is controlled to raise the heating return temperature via a buffer cylinder that has been heated up.

When the MM is operated as part of the Wolf WRS control system, the boilers are blocked when the start conditions have been met. If a demand is issued by at least 1 heating circuit or 1 cylinder, the three-way diverter valve will be switched, and the blocking time set in parameter MI 18 (= blocking time for burner blocking) starts. The burner will be enabled again after the blocking time has expired. The burner will be disabled for the set time when the start conditions have been met whilst the burner is already active.

Start conditions:  $PF\_act (E1) > RLF\_act (E2) + \Delta T_{On} (\#11 \ 15)$

Stop conditions:  $PF\_act (E1) < RLF\_act (E2) + \Delta T_{Off} (\#11 \ 15)$

When setting a blocking time of 0 s ( $\#11 \ 18$ ) the three-way diverter valve will be controlled independently of any heat demand.

**MI 50 Test function**

Parameter MI50 enables the individual control of relays.

MI50 = 1  $\Rightarrow$  Control of relay mixer circuit pump MKP

MI50 = 2  $\Rightarrow$  Control of relay mixer motor OPEN MM

MI50 = 3  $\Rightarrow$  Control of relay mixer motor CLOSE MM

MI50 = 4  $\Rightarrow$  Control of relay output A1

**Cylinder frost protection**

The set cylinder temperature when cylinder heating is blocked is 10 °C. Cylinder frost protection is activated when the actual cylinder temperature < set cylinder temperature - 5 K. The set flow temperature then results from the set cylinder temperature + excess boiler water temperature during cylinder heating.

**Anti-seizing pump protection**

To prevent the pumps from seizing because of long idle periods, the mixer circuit pumps MKP and output A1 will be operated daily for approximately five seconds (12:00 h at the mixer module) after they have been idle for more than one day.

**Anti-seizing mixer protection**

Subject to configuration (MI 05) = 1 / 2 / 3 / 4 / 7 / 8, the mixer will be regulated to drive to OPEN for approx. 10 seconds daily (12:00 h at the mixer module) and then for 20 seconds to CLOSE to prevent the mixer from seizing up; if the configuration = 5 / 6, the mixer is driven for 10 seconds to CLOSE followed by 20 seconds to OPEN.

**Emissions test**

Emissions test enabled ⇒ Heating and DHW are enabled until the emissions test has been completed.

**Loading the standard values**

Set DIP 4 to OFF and then back to ON. The standard values are now loaded again. All LEDs illuminate briefly as confirmation.

When MM recognises a fault, the red LED flashes and the mixer module fault code is displayed on the associated BM as well as at the central BM (address 0). The following MM fault is transmitted via the BUS and is displayed.

<b>Fault-code</b>	<b>Fault</b>	<b>Cause</b>	<b>Remedy</b>
FC52	Max. cylinder heating time	Max. cylinder heating time exceeded	See parameter description #109
FC70	Mixer circuit sensor or return sensor fault (terminal VF)	Faulty sensor or lead	Check sensor and lead, replace, if required
FC71	Cylinder sensor, or buffer sensor bypass sensor fault (terminal E1)	Faulty sensor or lead	Check sensor and lead, replace, if required
FC79	Return sensor or bypass sensor faulty (terminal E2)	Faulty sensor or lead	Check sensor and lead, replace, if required
FC97	Bypass pump faulty	Bypass pump short circuit Faulty bypass pump cable	Check bypass pump, check cable and connection replace, if required
FC81	EEPROM fault	Parameter values outside the valid range	Return to standard values by briefly turning OFF, and check values
FC91	BUS address	Two or several accessory controllers have the same BUS address	Check address settings

**Changing a fuse:**

If the MM indicates no function at all and there is no LED display, although power is on, check the appliance fuse and change it, if required.

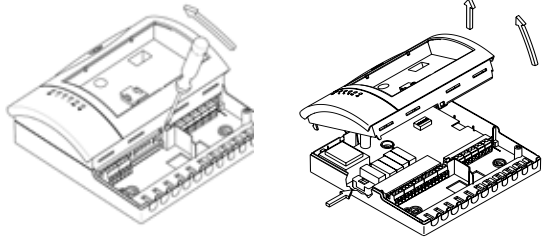
**Note:** If the MM is operated as part of the Wolf control system, the display of one of the existing BM programming modules is retained, as this is supplied via the eBUS link to the other control components.



Prior to opening the casing, isolate the mixer module from the power supply.

**Changing a fuse:**

1. Isolate the unit from the power supply
2. Remove the lid from the terminal chamber by undoing both screws
3. Remove the casing top with a screwdriver
4. The fuse is located on the l.h. side of the PCB below the transformer (fine-wire fuse 5x20/6.3A/M)

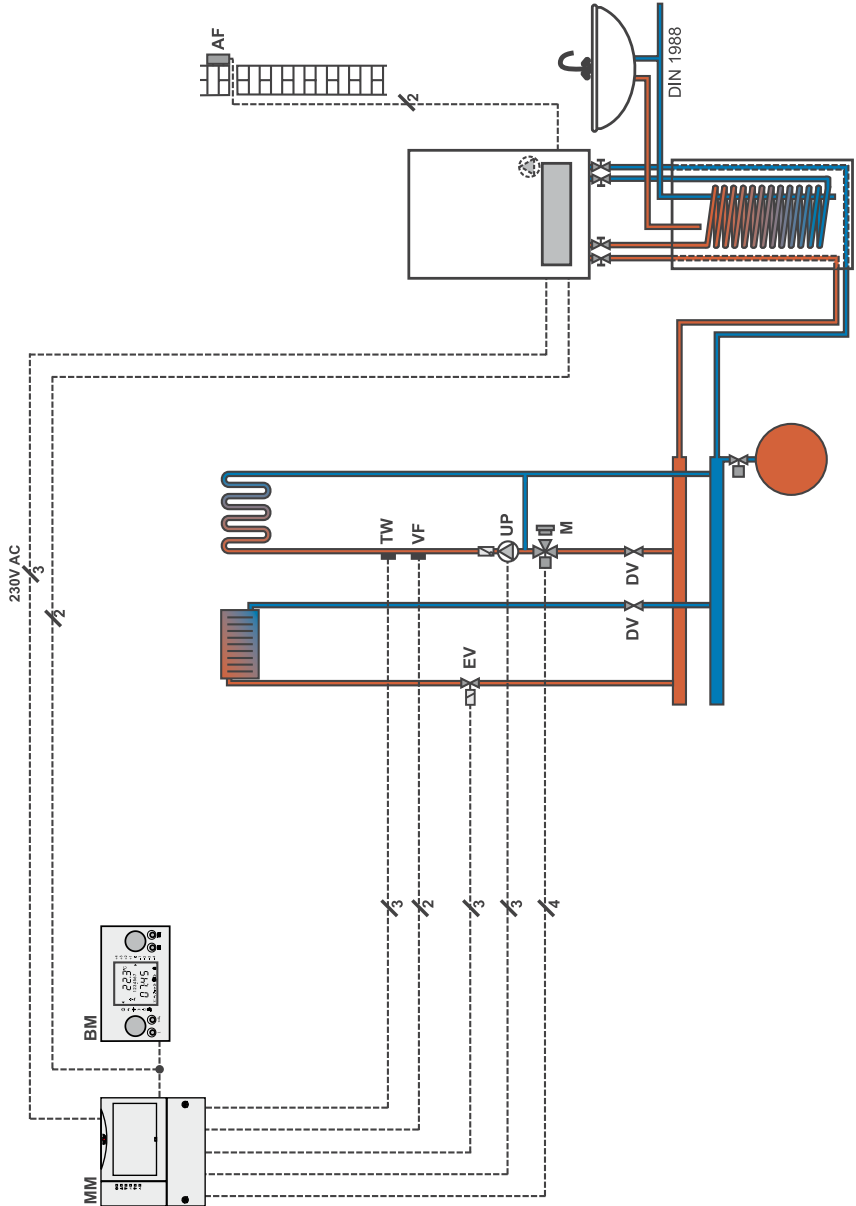


**NTC Sensor resistances**











Boiler sensor, cylinder sensor, solar cylinder sensor, outside temperature sensor, flow sensor, central sensor

Temp. °C	Resist. Ohm	Temp. Ohm °C	Resist. Ohm	Temp. °C	Resist. Ohm	Temp. °C	Resist. Ohm
-21	51393	14	8233	49	1870	84	552
-20	48487	15	7857	50	1800	85	535
-19	45762	16	7501	51	1733	86	519
-18	43207	17	7162	52	1669	87	503
-17	40810	18	6841	53	1608	88	487
-16	38560	19	6536	54	1549	89	472
-15	36447	20	6247	55	1493	90	458
-14	34463	21	5972	56	1438	91	444
-13	32599	22	5710	57	1387	92	431
-12	30846	23	5461	58	1337	93	418
-11	29198	24	5225	59	1289	94	406
-10	27648	25	5000	60	1244	95	393
-9	26189	26	4786	61	1200	96	382
-8	24816	27	4582	62	1158	97	371
-7	23523	28	4388	63	1117	98	360
-6	22305	29	4204	64	1078	99	349
-5	21157	30	4028	65	1041	100	339
-4	20075	31	3860	66	1005	101	330
-3	19054	32	3701	67	971	102	320
-2	18091	33	3549	68	938	103	311
-1	17183	34	3403	69	906	104	302
0	16325	35	3265	70	876	105	294
1	15515	36	3133	71	846	106	285
2	14750	37	3007	72	818	107	277
3	14027	38	2887	73	791	108	270
4	13344	39	2772	74	765	109	262
5	12697	40	2662	75	740	110	255
6	12086	41	2558	76	716	111	248
7	11508	42	2458	77	693	112	241
8	10961	43	2362	78	670	113	235
9	10442	44	2271	79	649	114	228
10	9952	45	2183	80	628	115	222
11	9487	46	2100	81	608	116	216
12	9046	47	2020	82	589	117	211
13	8629	48	1944	83	570	118	205





## Key

-  **UP** Circulation pump (230 V AC min. 0.75 mm<sup>2</sup>)
-  Butterfly valve
-  Shut-off valve
-  **M** Mixer (230 V AC min. 0.75 mm<sup>2</sup>)
-  Gravity brake (opening pressure > 25 mbar)
-  Cap valve
-  **TW** Temperature controller for underfloor heating system (230 V AC)
-  **VF** Flow sensor
-  **AF** Outside temperature sensor
-  **EV** Electrical valve, N / C (230 V AC min. 0.75 mm<sup>2</sup>)

## Direct connection of a mixer circuit via **injection control**

### 1. Applications

The injection control is used, if a mixer circuit with pump is to be directly connected (i.e. without low loss header) to a gas fired boiler with integral pump. The injection control offers many benefits compared to a conventional dual shunt pump control.

### 2. Description

The injection control includes an open bypass between flow and return in the mixer circuit, that separates the mixer circuit pump from the boiler circuit.

The mixer equipped with a dummy plug controls the mass flow, that is injected into the mixer circuit, subject to the flow temperature.

### Benefits of injection control over shunt pump control:

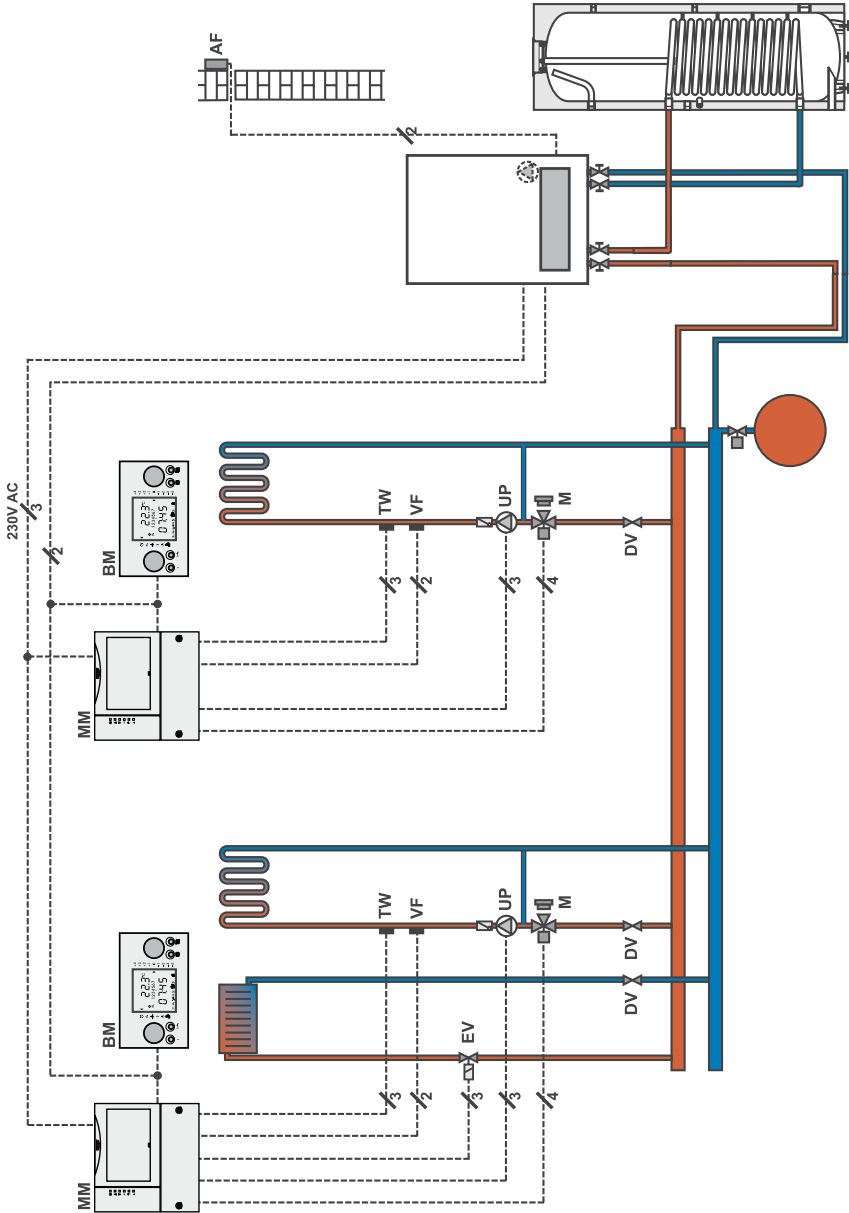
- A hydraulic separation is created, thereby preventing the boiler pump and the mixer circuit pump from affecting each other.
- The hydraulic balance is substantially easier to achieve, since every consumer circuit requires only one butterfly valve.
- The pump capacity in the mixer circuit is reduced, because the mixer pressure drop must be added to the boiler circuit.
- The mixer circuit pump will be switched OFF if, in an underfloor heating system, an excess temperature occurs in the mixer circuit. No additional solenoid valve – like those required for dual shunt pump circuits – is required for interrupting the mixer circuit supply.

### Installation requirements:

- Insert a dummy plug into the three-way mixer (see diagram).
- Size the mixer circuit pipework correctly.

Pump rate	$\Delta T$	Rated output	Internal diameter – pipework incl. bypass
up to 1720 l / h	10 K	up to 25 kW	DN 25

- Match up the mixer circuit and any existing consumer circuits with butterfly valves, thereby preventing a shortage of supply for individual consumers.



**Specification**

Supply voltage .....	230 VAC (+10 /-15%) / 2A / 50 Hz
Power consumption – electronics .....	< 8 VA
Max. power consumption – mixer motor .....	30 VA
Max. power consumption per pump outlet .....	250 VA
Protection according to DIN 40050 .....	IP 30
Protection class according to VDE 0100 .....	I I
Permissible ambient temperature in operation .....	0 to 50 °C
Permissible ambient temperature during storage .....	-30 to +60 °C
Data memory .....	EEPROM (non-volatile)