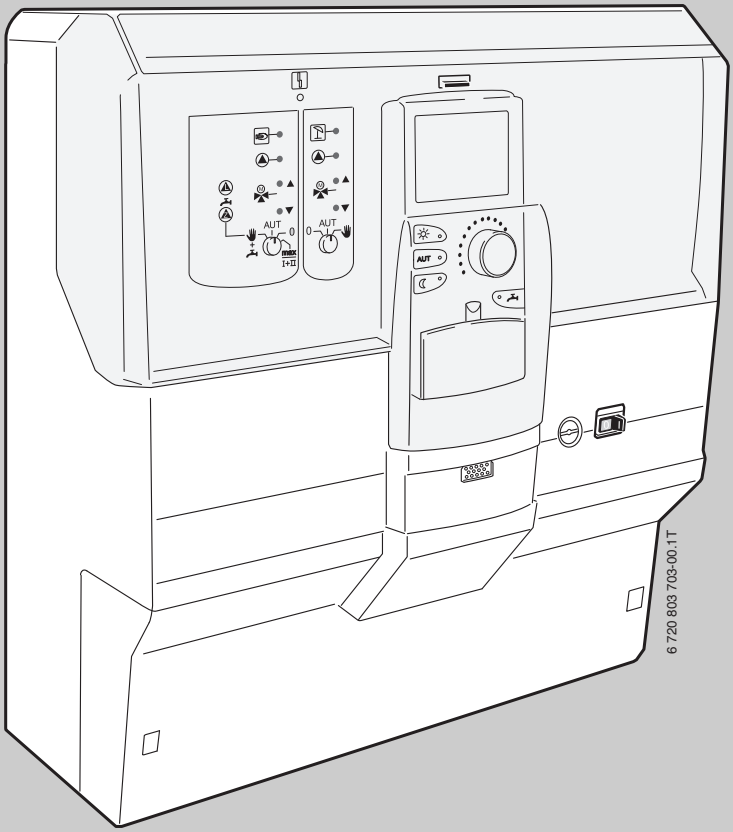
Servicing instructions for heating contractors

Control unit



Logamatic 4121, 4122 and 4126

Read carefully prior to installation and maintenance.

6 720 804 719 (2012/04) GB

Buderus

Table of contents

1 Key to symbols and safety instructions

1.1 Symbol key

Warnings

Warnings in this document are framed and identified by a warning triangle printed against a grey background.

Signal words at the start of a warning indicate the type and seriousness of the ensuing risk if measures to prevent the risk are not taken.

- **NOTICE** indicates that material losses may occur.
- **CAUTION** indicates possible minor to medium personal injury.
- **WARNING** indicates possible severe injury.
- **DANGER** indicates a risk to life.

Important information

Important information in cases where there is no risk of personal injury or material losses is identified by the symbol shown on the left. It is bordered by horizontal lines above and below the text.

Additional symbols

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

Table 1

1.2 Safety instructions

General safety instructions

Failure to observe the safety instructions can result in serious injuries and a risk to life as well as material losses and damage to the environment.

- ▶ Ensure that only a qualified contractor carries out installation, connection of exhaust system, commissioning, maintenance and service.
- ▶ Carry out maintenance at least once a year. As part of this, check that the entire system is working correctly. Immediately remedy all defects found.
- ▶ Read the safety instructions carefully prior to commissioning the system.

Original spare parts

Losses caused by the use of spare parts not supplied by the manufacturer are excluded from the manufacturer's warranty.

- ▶ Use only original spare parts and accessories from the manufacturer.

Risk of scalding

There is a risk of scalding if the required DHW temperature is set higher than 60 °C.

- ▶ Do not draw off DHW unmixed.

Damage due to operator error

Operator errors can result in injury and damage to property.

- ▶ Ensure that children never operate this appliance unsupervised or play with it.
- ▶ Ensure that only personnel who can operate this appliance correctly have access to it.
- ▶ Installation and commissioning as well as servicing and maintenance must only be carried out by a qualified contractor.
- ▶ Before unpacking the device touch a radiator or an earthed metal water pipe to discharge any electrostatic charge in your body.

Risk to life from electric shock

- ▶ Ensure that any electrical work is only carried out by an approved electrician.
- ▶ Observe the relevant requirements when working on electrical installations.
- ▶ Ensure that a circuit breaker in accordance with applicable standards is present to disconnect all poles from the mains power supply. If there is no circuit breaker, you will need to install one.
- ▶ Before opening the control unit, isolate all poles of the heating system via the circuit breaker. Secure against unintentional reconnection.

System damage through frost

When the heating system is switched off, it can freeze up if there is frost.

- ▶ Protect your heating and water system against freezing by draining the heating system and hot water pipes at the lowest point.

2 Product information

These service instructions contain important information on the safe and appropriate commissioning and servicing of the Logamatic 4121, 4122 and 4126[1)] control units.

These service instructions are designed for heating contractors, who, due to their vocational training and experience, – are knowledgeable in handling heating systems and water installations. Only carry out servicing if you have such specialist knowledge and skills.

Explain to the customer the function and operation of the appliance.

2.1 Determined use

The Logamatic 4121, 4122 and 4126 control units are only intended to control heating systems in apartment buildings, housing complexes and other buildings.

2.2 EU Declaration of Conformity

The design and operation of this product conforms to the European Directives and the supplementary national requirements. Its conformity is confirmed by the CE designation.

You can view the product Declaration of Conformity on the Internet at www.buderus.de/konfo or request a copy from your local Buderus sales office.

1) Please note that the 4126 control unit is not available in the UK.

2.3 Notes on commissioning

DANGER: Risk to life and of system damage through excessively high temperatures.
All parts directly or indirectly subject to high temperatures must be designed for use at such temperatures.

- ▶ Ensure that wiring and other lines are routed at a safe distance from hot boiler parts.
- ▶ Route wiring and other lines, if at all possible, in the wiring ducts provided or above the boiler insulation.

- ▶ Before switching the control unit on, check that its manual switches and those on the function modules are set to **AUT**.
- ▶ Enter the settings made during commissioning and the allocation of the heating circuits into the commissioning report in the operating instructions of the control unit.
- ▶ First switch on the control unit and then the boiler.
- ▶ To shut down, first switch off the boiler and then the control unit.
- ▶ Ensure that heat is transferred, otherwise the boiler will switch off and generate a fault condition.

2.4 Cleaning the control unit

- ▶ Only clean the control unit with a damp cloth.

2.5 Product description

2.5.1 Logamatic 4121

Control unit for Buderus wall mounted and compact boilers with energy management system and digital combustion controller SAFe or universal burner control unit (UBA1.5/UBA3) or as stand-alone heating circuit controller for 2 heating circuits with or without servomotor and DHW heating with cylinder primary pump and DHW circulation pump.

Suitable as an extension in conjunction with FM456/FM457 modules for the control of multi-boiler systems incorporating Buderus wall mounted boilers. Optional extension with function modules of the Logamatic 4000 system.

2.5.2 Logamatic 4122

Control unit as an extension for systems incorporating the Logamatic 4000 system (substation without feed pump) and as an extension in connection with FM456/FM457 modules for the control of multi-boiler systems incorporating Buderus wall mounted boilers. Optional extension with function modules of the Logamatic 4000 system.

2.5.3 Logamatic 4126

Control unit with LAP module FM445 for the control of DHW heating via a plate-type heat exchanger on top (LAP) or adjacent (LSP), with regulated stratification in a stratification cylinder and cyclical control of a primary and secondary circuit pump plus control of a DHW circulation pump. Extension for systems incorporating the Logamatic 4000 system (substation without feed pump) or combination with external heat sources. Optional extension with function modules of the Logamatic 4000 system.

2.6 Scope of supply

Upon receipt of the control unit, observe the following:

- ▶ Packaging for perfect condition.
- ▶ Check the delivery for completeness.

2.6.1 Logamatic 4121

- Digital Logamatic 4121 control unit with CM431 controller module
- Central module ZM424
- MEC2 programming unit including integral room temperature sensor and radio clock receiver
- 1 x Outside temperature sensor FA
- 1 x Temperature sensor FV/FZ
- 1 x boiler or low loss header temperature sensor

2.6.2 Logamatic 4122

- Digital Logamatic 4122 control unit with CM431 controller module
- MEC2 programming unit including integral room temperature sensor and radio clock receiver or boiler display
- As an option with FM456/FM457 modules for the control of multi-boiler systems incorporating Buderus wall mounted boilers

2.6.3 Logamatic 4126

The Logamatic 4126 control unit corresponds to the Logamatic 4122 with function module FM445.

MEC2 programming unit

- 1 x cylinder sensor, centre
- 1 x cylinder sensor, bottom
- 1 x heat exchanger sensor FWS

2.7 Technical data

2.7.1 Logamatic 4121, 4122, 4126 control units

	Unit	Logamatic control unit		
		4121	4122	4126
Dimensions B/H/L	mm	360/360/160	360/360/160	360/360/160
Operating voltage (at 50 Hz ±4 %)	V	230 ± 10 %	230 ± 10 %	230 ± 10 %
Power consumption	VA	8	5	8
Control unit fuse	A	10	10	10
Maximum switching current • Cylinder primary pump output • DHW circulation pump output • Heating system pump output	A	5	–	5
Heating circuit actuator control	V	230	–	–
Mixer servomotor runtime	sec	120 (adjustable from 10 to 600)	–	–
Mixer controller type		Three-point stepper controller (PI characteristics)	–	–
Ambient temperatures • Operation • Transport	°C	 +5...+50 −20...+55	 +5...+50 −20...+55	 +5...+50 −5...+55

Table 2 Specification for Logamatic 4121, 4122, 4126 control units

Sensor	lower fault limit in °C	smallest display value in °C	highest display value in °C	upper fault limit in °C
FA	−50	−40	50	> 70
FZB	< −5	0	99	> 125
FV	< −5	0	99	> 125

Table 3 Sensor measuring range

2.7.2 FM441 function module

	Unit	Value
Operating voltage (at 50 Hz ± 4 %)	V	230 ± 10 %
Power consumption	VA	2
Maximum switching current • Cylinder primary pump output • Circulation circuit pump output • Heating circuit pump output	A	10
Heating circuit actuator control	V	230
Servomotor runtime	sec	120 (adjustable 10 – 600)
Controller	–	Three-point stepper controller (PI characteristics)

Table 4 Technical data for FM441 function module

Sensor	lower fault limit in °C	smallest display value in °C	highest display value in °C	upper fault limit in °C
FV flow temp. HC	< −5	0	99	> 125
FB DHW temp.	< −7	0	99	> 125

Table 5 Sensor measuring range

2.7.3 FM442 function module

	Unit	Value
Operating voltage (at 50 Hz ± 4 %)	V	230 ± 10 %
Power consumption	VA	2
Maximum switching current - heating circuit circulation pump output	A	5
Heating circuit actuator control	V	230
Servomotor runtime	sec	120 (adjustable 10 – 600)
Type of controller	–	Three-point stepper controller (PI characteristics)

Table 6 Technical data for FM442 function module

Sensor	lower fault limit in °C	smallest display value in °C	highest display value in °C	upper fault limit in °C
FV1 flow temp. HC left	< –5	0	99	125
FB flow temp. HC right	< –5	0	99	125

Table 7 Sensor measuring range

2.7.4 FM445 function module

	Unit	Value
Operating voltage (at 50 Hz ± 4 %)	V	230 ± 10 %
Power consumption	VA	2
Maximum switching current • Primary pump outputprimary/secondary • DHW circulation pump output	A	5
Actuator/servomotor control	V	230
Servomotor runtime	sec	120 (adjustable 10 – 600)
Type of controller	–	Three-point stepper controller (PI characteristics)

Table 8 Technical data for FM445 function module

Sensor	lower fault limit in °C	smallest display value in °C	highest display value in °C	upper fault limit in °C
FWS	< –5	0	99	125
FSU	< –5	0	99	125
FSM	< –5	0	99	125

Table 9 Sensor measuring range

3 Controls and MEC2 programming unit

3.1 Controls of the control unit

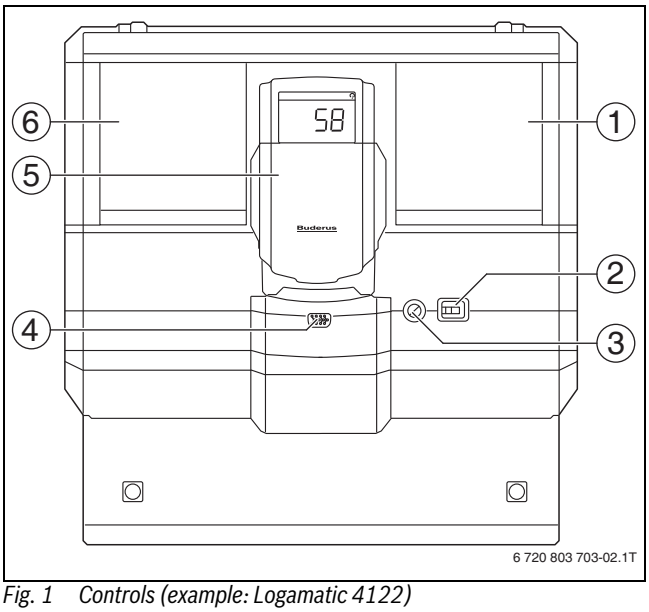


Fig. 1 Controls (example: Logamatic 4122)

[1] Slot 2
[2] On/Off switch
[3] Fuse 10 AT
[4] Connection for external service equipment and MEC2
[5] ZM435 boiler display
[6] Slot 1

The Logamatic 4122 control unit is also available with the MEC2 programming unit.

The system flow temperature is displayed on the boiler display.

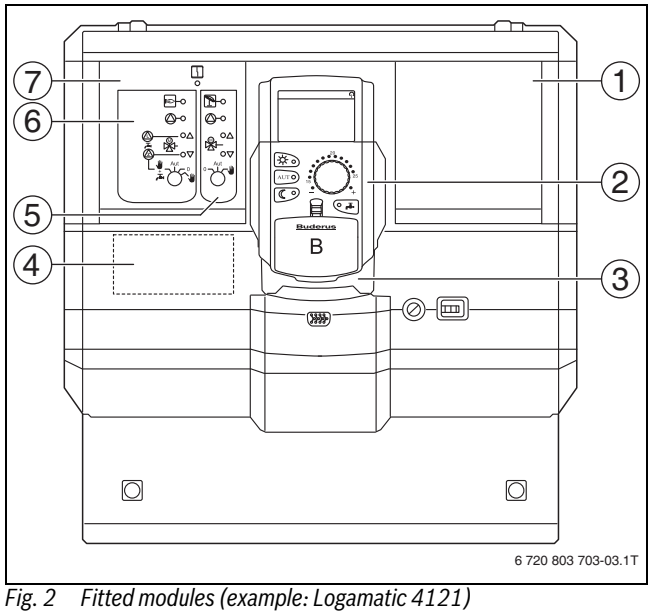


Fig. 2 Fitted modules (example: Logamatic 4121)

[1] Slot 2 for an additional module
[2] MEC2
[3] CM431
[4] Slot A for FM455 module KSE1
[5] Heating circ 2 – mixed
[6] Heating circ 1 – mixed
alternative: Heating circ 1 – unmixed + DHW and DHW circulation
[7] Slot 1 for ZM424 module, comprising: [4], [5], [6]

3.2 MEC2 programming unit

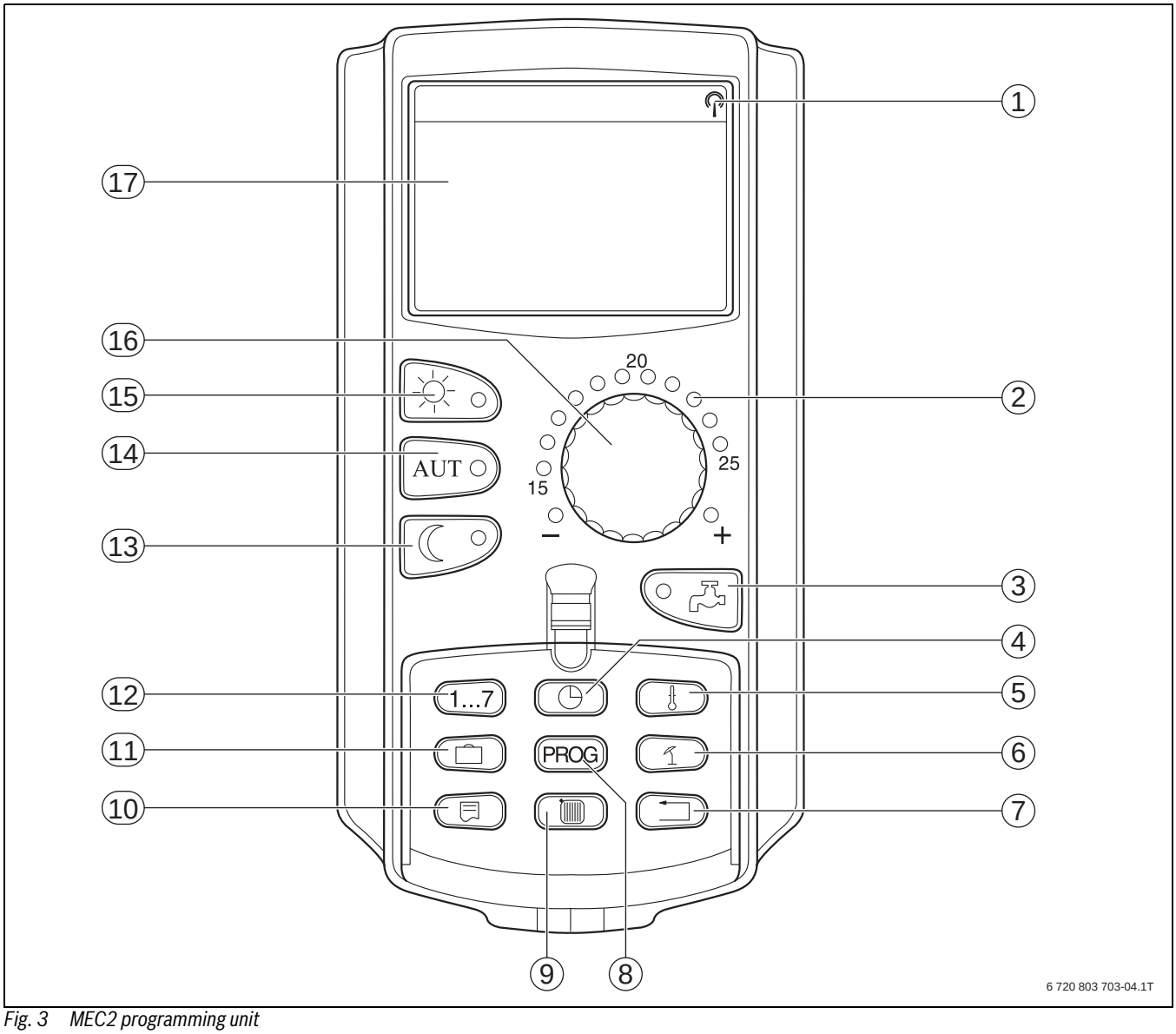


Fig. 3 MEC2 programming unit

[1] Radio clock signal (only inside Germany)
[2] Display for set room temperature
[3] Input DHW temperature/heating
[4] Setting the time
[5] Change temperature values
[6] Summer/wintertime changeover
[7] Back to the standard display
[8] Select a time switch program
[9] Selecting heating circuits/DHW circuit
[10] Select standard display
[11] Enter holidays
[12] Enter the day of the week
[13] Constant setback mode
[14] Automatic heating mode in acc. with a time switch
[15] Constant heating mode
[16] Rotary selector
[17] Display

MEC2 and RC30/RC35 programming units must not be operated simultaneously.

▶ For heating systems with Logamatic 4000 only use MEC2.

4 Modules and their functions

The following table lists all the modules that are or can be fitted in the control units.

The following pages contain information regarding the most important modules you can use.

The menus displayed on the MEC2 programming unit depend on which modules are fitted and on their respective settings.

module	Logamatic 4121	Logamatic 4122	Logamatic 4126
MEC2 programming unit	O	O[1)]	O
ZM435 boiler display	X	O[1)]	X
CM431 controller module	O	–	O
ZM424 central module – 2 heating circuits + 1 DHW circuit	O	X	–
FM441 function module – 1 heating circuit + 1 DHW circuit	–	X	–
FM442 function module 2 heating circuits	X	X	X
FM443 function module[2)] – solar circuit	X	X	X
FM444 function module[2)] – alternative heat source	X	X	X
FM445 function module[2)] – LAP/LSP (primary system)	X	X	O
FM446 function module [2)] – interface EIB	X	X	X
FM448 function module[2)] – central fault message	X	X	X
FM455 function module – KSE 1 (only with ZM424)	O	–	–
FM456 function module[2)] – KSE 2 (cascade - 2 boilers)	X	X	X
FM457 function module[2)] – KSE 4 (cascade - 4 boilers)	X	X	X
FM458 function module[2)] – strategy module	–	–	–

Table 10 Modules

1) Subject to version, either an MEC2 programming unit or a ZM435 boiler display may be fitted as standard equipment.

2) These modules in particular are described separately in the technical module documentation.

[O] Standard equipment
[X] Optional equipment
[–] Combination not possible

4.1 CM431 controller module

Setting the control unit address

The address settings ([1]) for the Logamatic 412x control unit are made on the CM431 module (behind the MEC2 programming unit).

- ▶ Remove the MEC2 programming unit.
- ▶ You can now set the control unit address using a screwdriver or similar tool.

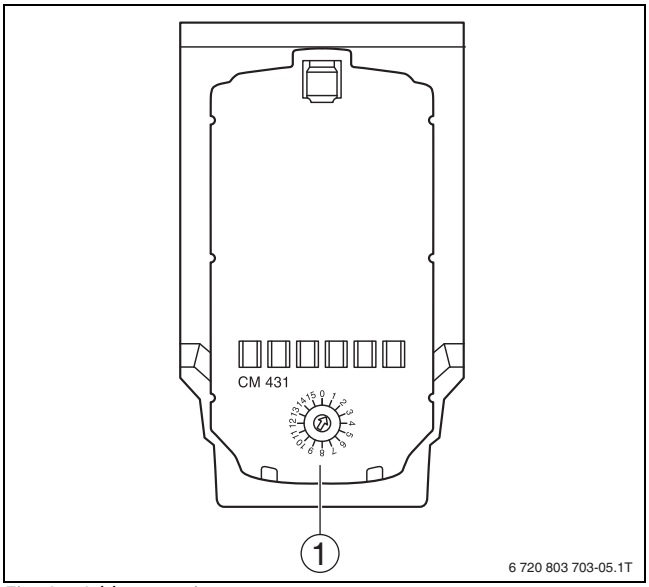


Fig. 4 Address setting

[1] Address setting

Address	Description
0	Stand-alone control unit: Set the address to 0 if the control unit operates as stand-alone equipment (factory setting).
	Each connected device must be given a different address if several devices are networked. A fault message is displayed by the MEC2 programming unit if the same address is allocated more than once.
1	Master (lead control unit): Address 1 is a special setting since the device with this address acts as the master device. The master controls the boiler. The ambient temperature sensor must always be connected to the master. The master monitors the ECOCAN BUS, which links the control units. The master recognises if an address has been allocated more than once. A fault message is displayed by the MEC2. All networked control units transfer their set values to the master, which uses them to formulate the overall set value. **Any network must only include one master.**

Table 11 Control unit addresses

4.2 NM482 power supply module

Jumper setting when networking several control units

DANGER: Risk to life from electric shock!
- ▶ Ensure that all electrical work is only carried out by an authorised electrician.
- ▶ Before opening the control unit, isolate all poles of the control unit and secure against unauthorised re-connection.

To ensure fault free data transmission between several control units,set the jumper on the two control units which are furthest apart.

The jumper is fitted to the component side of the NM482 power supply module, and is switched on by closing the jumper (Fig. 6, [2]).

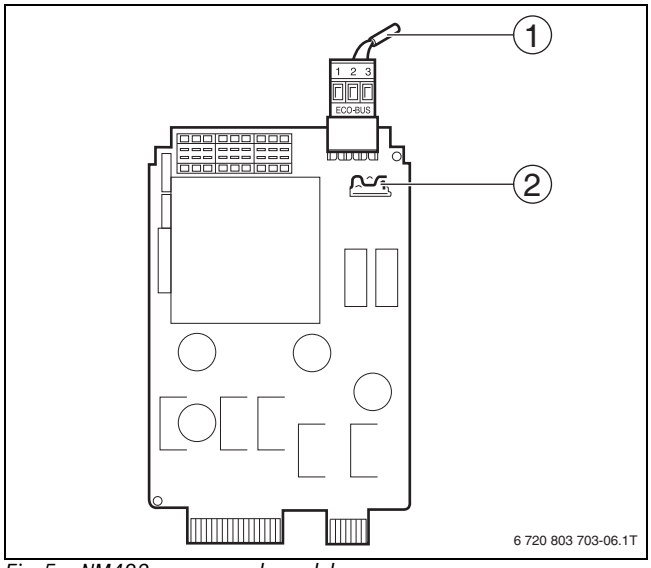


Fig. 5 NM482 power supply module

[1] ECOCAN BUS
[2] Gravity switch S1 (jumper)
factory setting: open

The factory setting is: Jumper setting S1 open = not an end node.

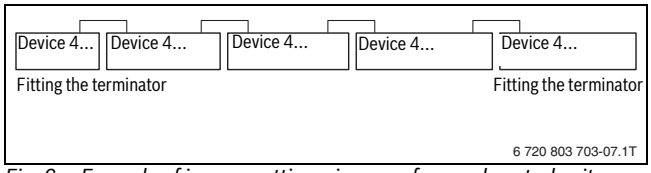


Fig. 6 Example of jumper settings, in case of several control units

4.3 ZM424 central module and FM455 function module

The ZM424 module together with the FM455 module are part of the standard equipment of the Logamatic 4121 control unit.

The ZM424 module must always be installed in the l.h. slot 1. The FM455 module must always be installed below the ZM424 in slot A.

The manual switches on the module are for service and maintenance purposes and only affect the 230 V outputs.

If the manual switches are not set to automatic, a corresponding message appears on the MEC2 programming unit, and the **Fault** indicator illuminates.

The holiday function must be used to shut down the heating system during temporary absence (→ see operating instructions for control units).

The control functions remain operational in manual mode without any restrictions.

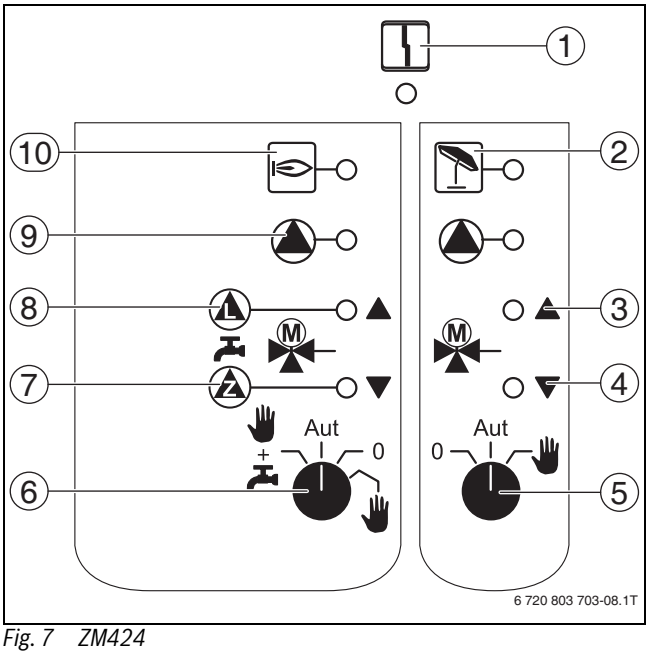


Fig. 7 ZM424

[1] General fault,
e.g. on-site fault, sensor fault, external faults, wiring fault, internal module fault, manual mode. The fault messages appear as plain text on the MEC2 programming unit.
[2] Heating circuit 2 in summer mode
[3] "Mixer opens" (hotter)
[4] "Mixer closes" (colder)
[5] Manual switch for heating circuit and DHW heating circuit 2
[6] Manual switch for heating circuit and DHW heating circuit 1
[7] DHW circulation pump operational
[8] Cylinder primary pump operational
[9] Heating circuit pump operational
[10] Burner operational

4.3.1 Jumper switch

The jumper switch is used to configure the module.

Position		Function
	open (factory setting)	The module is logged on as a new FM455/ 456/457 module.
	closed	The module logs on as FM451/452/454. Only required if the module is being used as a spare part.

Table 12 Jumper switch

The jumper switch must be open if EMS is in use.

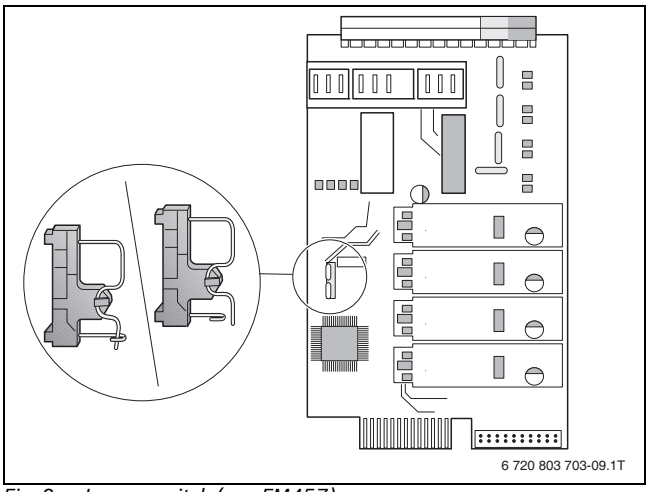


Fig. 8 Jumper switch (e.g. FM457)

4.3.2 Heating circuit and DHW function

In normal operation the manual switch should be in the **AUT** position.

Positions **0** and **Manual** are special settings of the manual switch for the feed pump (→ Fig. 7, [5], [6]) reserved for contractors.

Current functions are indicated by LEDs.

Position	Function
	The heating circuit pump is switched on. The mixer is switched volt-free and can be manually operated.
	The central heating or the DHW circuit operates in automatic mode.
	The heating circuit pump and possibly the cylinder primary pump as well as the DHW circulation pump are stopped. The mixer is switched volt-free. The control functions remain active.
	The heating circuit and primary pumps start when "4000-DHW Tank" has been selected in the "DHW" menu.

Table 13 Heating circuit and DHW functions ZM424 and FM455

4.4 FM441 function module (accessory)

The FM441 module regulates one heating circuit and one DHW heating facility.

The manual switches on the module only have service and maintenance functions and only affect 230 V outputs.

Only fit this module in the control unit once.

If the manual switches are not set to automatic, a corresponding message appears on the MEC2 programming unit and the **Fault** indicator illuminates.

Never use the manual switch to shut down the heating system during temporary absence. Use the holiday function for this purpose (→ see operating instructions for control units).

The control functions remain operational in manual mode without any restrictions.

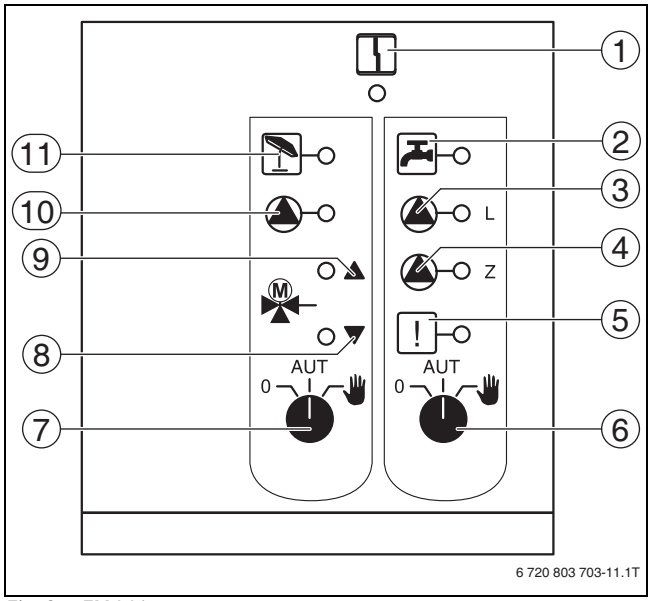


Fig. 9 FM441

[1] General fault
The error messages appear as plain text in the MEC2 programming unit.
[2] DHW in night mode below the set temperature.
[3] Cylinder primary pump operational
[4] DHW circulation pump operational
[5] Disinfection enabled
[6] DHW manual switch
[7] Manual heating circuit switch
[8] "Mixer closes" (colder)
[9] "Mixer opens" (hotter)
[10] Heating circuit pump operational
[11] Heating circuit in summer mode

Heating circuit and DHW function

In normal operation the manual switch should be in the **AUT** position.

Positions **0** and **Manual** are special settings of the manual switch for the heating circuit (→ Fig. 9, [7]) and DHW (→ Fig. 9, [6]) reserved for contractors.

Current functions are indicated by LEDs.

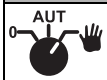
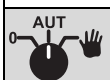
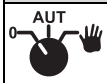
Position	Function
	The heating circuit pump or primary pump is switched on. The mixer is switched volt-free and can be manually operated. The circulation pump is switched OFF.
	The central heating or the DHW circuit operates in automatic mode.
	The heating circuit pump or cylinder primary pump as well as the DHW circulation pump are switched off. The mixer is switched volt-free. The control functions remain active.

Table 14 Heating circuit and DHW functions FM441

4.5 FM442 function module (accessory)

The FM442 module regulates two independent heating circuits with mixer. Several of these modules can be used in one control unit.

The manual switches on the module only have service and maintenance functions and only affect 230 V outputs.

If the manual switches are not set to automatic, a corresponding message appears on the MEC2 programming unit, and the **Fault** indicator illuminates.

Never use the manual switch to shut down the heating system during temporary absence. Use the holiday function for this purpose (→ see operating instructions for control units).

The control functions remain operational in manual mode without any restrictions.

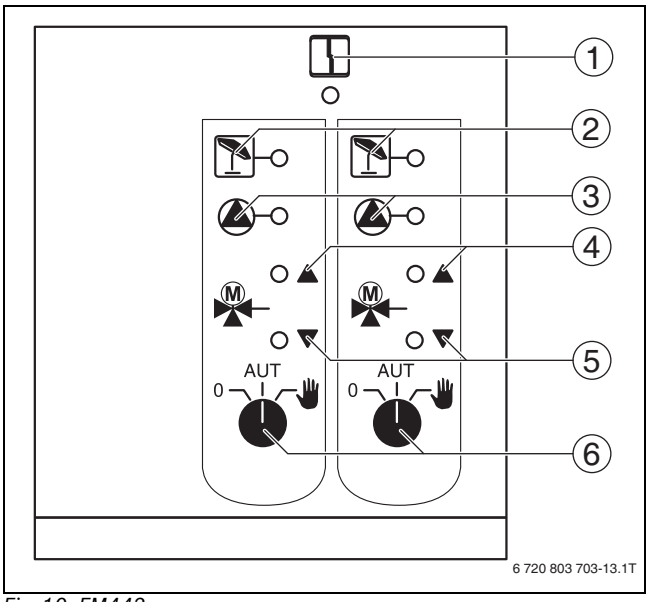


Fig. 10 FM442

[1] General fault,
e.g. on-site faults, sensor faults, external faults, wiring faults, internal module faults, manual mode. The fault messages appear as plain text on the MEC2 programming unit.
[2] Heating circuit in summer mode
[3] Heating circuit pump operational
[4] "Mixer opens" (hotter)
[5] "Mixer closes" (colder)
[6] Manual heating circuit switch
e.g. for heating circuit 1 and 2

Heating circuit function

In normal operation the manual switch should be in the **AUT** position.

Positions **0** and **Manual** are special settings of the manual switch for the heating circuit (→ Fig. 10, [6]) reserved for contractors.

Current functions are indicated by LEDs.

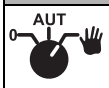
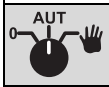
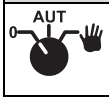
Position	Function
	The heating circuit pump is switched on. The mixer is switched volt-free and can be manually operated.
	The central heating or the DHW circuit operates in automatic mode.
	The heating circuit pump is switched off. The mixer is switched volt-free. The control functions remain active.

Table 15 FM442 heating circuit functions

4.6 FM445 function module (Logamatic 4126)

The FM445 module controls DHW heating via a primary system.

Plug it into the r.h. slot (slot 2) of the control unit; this ensures the power supply to all other modules. Only use this module if no other FM441 has already been installed in the control unit.

The manual switches on the module are only for service and maintenance purposes and only affect the 230 V outputs.

If the manual switches are not set to automatic, a corresponding message appears on the MEC2 programming unit and the **Fault** indicator illuminates.

The holiday function must be used to shut down the heating system during temporary absence (→ see operating instructions for control units).

The control functions remain operational in manual mode without any restrictions.

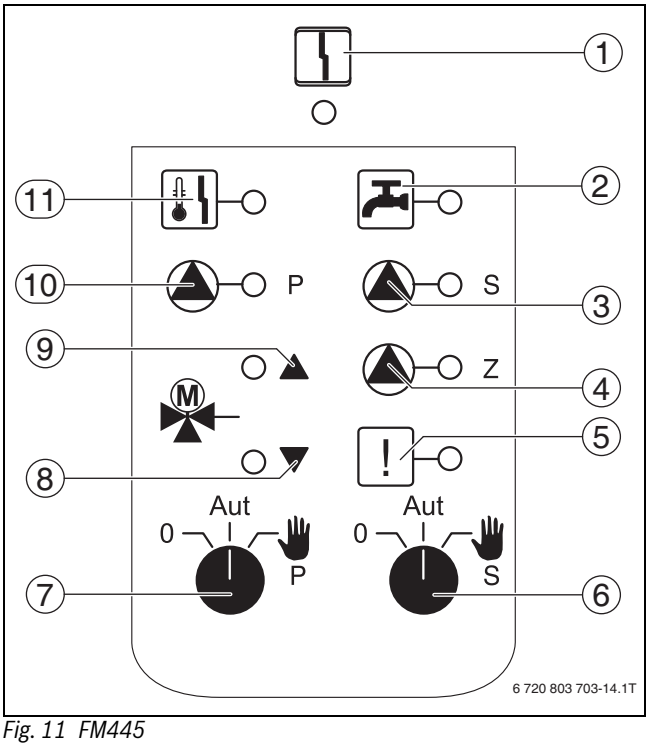


Fig. 11 FM445

[1] General fault,
e.g. on-site faults, sensor faults, external faults, wiring faults, internal module faults, manual mode. The fault messages appear as plain text on the MEC2 programming unit.
[2] DHW is/remains below the set temperature in setback (night) mode
[3] Cylinder secondary pump operational
[4] DHW circulation pump operational
[5] Thermal disinfection
[6] DHW manual switch for secondary circuit
[7] DHW manual switch for primary circuit
[8] "Mixer closes" (colder)
[9] "Mixer opens" (hotter)
[10] Primary cylinder loading pump active
[11] Anti-scaling protection enabled, secondary pump cycling

DHW function

In normal operation the manual switch should be in the **AUT** position.

WARNING: Risk of scalding through hot water temperatures!
- ► Always open the cold water tap first.
- ► Mix hot water according to requirements.

Positions **0** and **Manual** are special settings of the manual switch of the DHW for the primary circuit (→ Fig. 11, [7]) and secondary circuit (→ Fig. 11, [6]) reserved for contractors.

Current functions are indicated by LEDs.

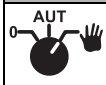
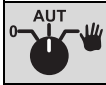
Position	Function
	The secondary/primary pump is switched on. The mixer is switched volt-free and can be manually operated.
	The DHW primary system operates in automatic mode.
	The primary and secondary pumps and the DHW circulation pump are switched off. The mixer is switched volt-free. The control functions remain active.

Table 16 DHW functions FM445

5 Burner control unit and standard operation

Buderus wall mounted boilers are equipped with a universal burner control unit UBA 1.x or UBA 3. The UBA 1.x is equipped with its own programming unit.

Wall mounted boilers with UBA 3 are controlled in the same way as floor standing boilers with EMS (Energy Management System), i.e. via the BC10 base controller.

If it is necessary to distinguish cases, the designations listed in the table below will be used.

For a list of the individual boilers, see → chapter 12.6.1, page 42.

	Wall mounted boilers without EMS	Wall mounted boilers with EMS	Floor standing boilers with EMS
Burner control	UBA 1.x	UBA 3	EMS combustion controller SAFe
Standard operation	UBA 1.x	Base controller BC10	Base controller BC10
Labelling	"UBA"	"EMS/UBA 3"	"EMS/SAFe"

Table 17 Boiler type designation

5.1 Universal burner control unit (UBA 1.x)

The UBA 1.x is used in wall mounted boilers that produce DHW via a cylinder or an internal heat exchanger according to the instantaneous water heater principle (combi boilers).

You can set both functions via the MEC2 programming unit.

During standard operation (using the MEC2 programming unit), setting the boiler water temperature at the UBA would be ineffective. If, however, communication with the control unit is interrupted, the UBA returns to the temperature value set at the boiler water thermostat (→ Fig. 12).

Therefore, select the thermostat setting so that neither the heating circuit nor the DHW are overheated, should a fault occur (→ technical documentation for the UBA).

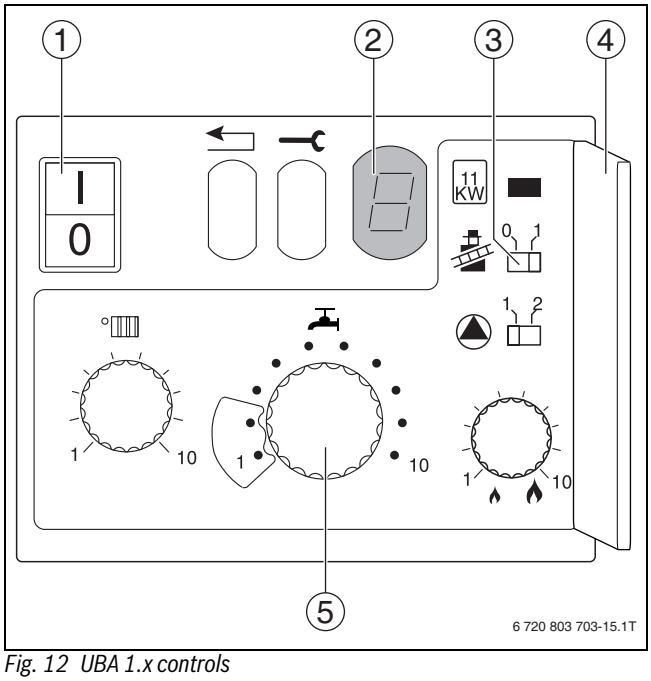


Fig. 12 UBA 1.x controls

[1] Line voltage disconnect
[2] Display
[3] Emissions test switch
[4] Flap over the second operating level
[5] Boiler water thermostat(DHW thermostat)

5.2 BC10 base controller (EMS)

The BC10 base controller enables the standard operation of boilers with EMS/UBA 3 or EMS/SAFe.

Extended functions are set via the MEC2 programming unit. Both rotary selectors must be set to **Aut** (otherwise a fault message will be issued).

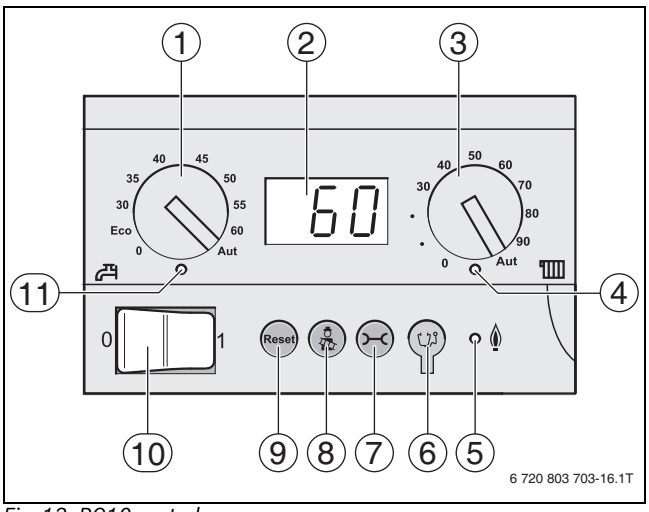


Fig. 13 BC10 controls

[1] Rotary selector for set DHW temperature
[2] Status display
[3] Rotary selector for maximum boiler water temperature in heating mode
[4] "DHW demand" LED
[5] "Burner" (On/Off) LED
[6] Diagnostic plug
[7] "Status display" key
[8] "Flue gas test" key
[9] "Reset" key (fault release button)
[10] On/Off switch
[11] "DHW heating" LED

Setting an output restriction

The boiler output can be restricted to 11 kW (or 50 kW with higher boiler output) using a jumper on the back of the base controller.

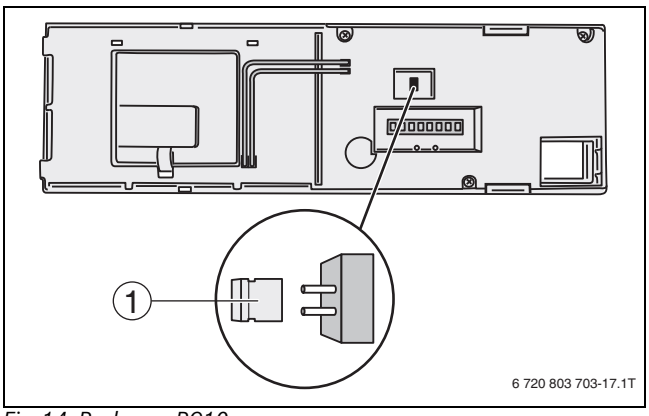


Fig. 14 Back page BC10

[1] Jumper for restricting output

▶ Remove the base controller.
▶ Remove jumper [1] to restrict the boiler output.

Jumper	Status	Explanation
	Not inserted	Output restricted to 11 kW (50 kW) (only for boilers with UBA3)
	inserted	Unrestricted output (delivered condition)

Table 18 Restricting output

5.3 Approved boiler types

Type	KIM	Designation of the boiler
UBA 1 UBA 1.5	74	Logamax plus GB112-11/s
	76	Logamax plus GB112-19/s
	81	Excellent HR 22
	83	Excellent HR 30
	84	Excellent HR 45
	85	Excellent HR 65
	91	Logamax plus GB112-24
	92	Logamax plus GB112-29/T25
	93	Logamax plus GB112-29
	94	Logamax plus GB112-43
	95	Logamax plus GB112-60/W AT
	96	Logamax plus GB112-60/W NL
	97	Logamax plus GB112-60 BE
	100	Logamax U112-19
	102	Logamax U114-19
	107	Logamax U122-20
	108	Logamax U122-24
	111	Logamax U124-20K
	113	Logamax U124-24K
	131	Logamax plus GB112-24 BE
	133	Logamax plus GB112-29 BE
	134	Logamax plus GB112-43 BE
Type	**BCM**	**Designation of the boiler**
EMS/UBA 3	1000	Logamax plus GB142-30
	1002	Logamax plus GB142-24
	1003	Logamax plus GB142-15
	1006	Logamax plus GB132T-19
	1006	Logamax plusGB132T-19 G20
	1007	Logamax plusGB132T-11 G20
	1015	Logamax plus GB142-45
	1016	Logamax plus GB142-60
	1025	Logamax plus GB132-16
	1026	Logamax plus GB162-100
	1027	Logamax plus GB162-80
	1032	Logamax plus GB132-24
	1033	Logamax plus GB132K-24
	1041	Logamax plus GB132-16 multiple
	1042	Logamax plus GB132-24 multiple
	1043	Logamax plus GB132-24K multiple
	1050	Logamax plus GB152-24K
	1051	Logamax plus GB152-24
	1052	Logamax plus GB152-16
	1060	Logamax plus GB152-24K multiple
	1061	Logamax plus GB152-24 multiple
	1062	Logamax plus GB152-16 multiple
	1078	Logamax plus GB152T-24/28 SLS 1)
	1080	Logamax plus GB152T-24/28
	1081	Logamax plus GB152T-16/19
EMS/UBA 3.5	1072	Logamax plus GB162-15
	1073	Logamax plus GB162-25
	1074	Logamax plus GB162-35
	1075	Logamax plus GB162-45
	1076	Logamax plus GB162-25 T 40 S (SLS)[1)]

Table 19 Approved boiler types

Type	BCM	Designation of the boiler
EMS/UBA 3.5	1107	Logano plus GB202-15
	1108	Logano plus GB202-25
	1109	Logano plus GB202-35
	1110	Logano plus GB202-45
TypeEMS/ SAFe	**BIM**	**Designation of the boiler**
SAFe 30	5001	Logano G135-18
SAFe 30	5002	Logano G135-25
SAFe 10	5003	Logano G125-17/21/28/34
SAFe 10	5008	Logano G225 BE-45
SAFe 10	5009	Logano G225 BE-55
SAFe 10	5010	Logano G225 BE-68
SAFe 30	5011	Logano G225 BZ-85
SAFe 30	5021	Logano SB105-19 Single
SAFe 30	5021	Logano SB105-19T
SAFe 30	5022	Logano SB105-27 Single
SAFe 30	5022	Logano SB105-27T
SAFe 10	5023	Logano plus GB125-17/21/28/34[2)]
SAFe 20	6001	Logano G144-13/16/20/24/28/32[2)]
SAFe 20	6011	Logano G244-38
SAFe 20	6012	Logano G244-44
SAFe 20	6013	Logano G244-50
SAFe 20	6014	Logano G244-55
SAFe 20	6015	Logano G244-60
SAFe 40	6031	Logano plus GB312-80
SAFe 40	6032	Logano plus GB312-120
SAFe 40	6033	Logano plus GB312-160
SAFe 40	6034	Logano plus GB312-200
SAFe 40	6035	Logano plus GB312-240
SAFe 40	6036	Logano plus GB312-280
SAFe 40	6037	Logano plus GB312-90
SAFe 40	6041	Logano plus GB312-80/NL
SAFe 40	6043	Logano plus GB312-160/NL
SAFe 40	6044	Logano plus GB312-200/NL
SAFe 40	6045	Logano plus GB312-240/NL
SAFe 40	6046	Logano plus GB312-280/NL
SAFe 40	6047	Logano plus GB312-90/NL

Table 19 Approved boiler types

1) When using this boiler, certain settings need to be observed (→ see chapter 12.1, page 39).

2) Only suitable for single boiler systems.

6 Commissioning the MEC2 programming unit

You can use the MEC2 programming unit for all Logamatic 4000 control units.

The MEC2 programming unit can be installed as follows:

- directly in the control unit
- wall-mounted as remote control unit or
- in an adaptor with separate power source.

The MEC2 commences initialisation after a power supply has been connected. The display shows **MEC is initialised**.

The control unit address is then briefly displayed.

The display shows **Connection with control unit address XX established**.

If the MEC2 is fitted in the control unit or wall retainer, the MEC2 automatically detects the control unit to which it is connected (automatic detection). You do not have to select the control unit.

Depending on the individual application, the display shows various information:

6.1 Ex works MEC2 installed in a control unit

If a brand new MEC2 has been installed in the control unit and the connections with the control unit have been established, data is immediately downloaded from the control unit.

The display shows **Monitor data are taken from ctrl unit**.

6.2 MEC2 installed in another control unit

If the MEC2 is programmed with a software version that is not able to recognise this type of control unit, the display shows **Unknown control unit**.

► Remove the MEC2 from the control unit and replace by an MEC2 with a suitable software version.

6.3 MEC2 with set parameters installed in control unit

After the MEC2 has been installed in the control unit, the two displays **MEC is initialised** and **Connection with control unit address XX established** will initially be shown again.

6.3.1 Alternative control unit type

Initially, only data from the control unit can be downloaded, if the type of control unit varies from that entered in the MEC2 programming unit. The display shows **Other Ctrl. unit type, Night button receive**.

► Press the **Night mode** button.
The display shows **Data are taken from ctrl unit**.

6.3.2 Alternative control unit of the same type

If the MEC2 is connected to a different control unit of the same type, the display will show the message **NB Other control unit** for approx. 3 seconds.

If the MEC2 programming unit is separated from the control unit and data is modified, the display shows **Aut button transmit, Night button receive**, when the unit is reinstalled into a control unit of the same type. The control unit scans whether the new data should be accepted or whether the old data from the control unit should be used again.

To adopt the new data:

► Press **AUT**.
The display shows **Data are sent to ctrl unit**.

To adopt the data from the control unit:

► Press the **Night mode** button.
The display shows **Data are taken from ctrl unit**.

6.3.3 Identical control unit

If the MEC2 programming unit is separated from the control unit and data is also modified, the display shows **Aut button transmit, Night button receive**, when the unit is reinstalled in the same control unit. The control unit scans whether the new data should be accepted or whether the old data from the control unit should be used again.

To adopt the new data:

► Press **AUT**.
The display shows **Data are sent to ctrl unit**.

To adopt the data from the control unit:

► Press the **Night mode** button.
The display shows **Data are taken from ctrl unit**.

7 Settings

7.1 Adjustable parameters and display data

Some options are only displayed subject to the installed modules and prior settings.

- **General parameters**
  - Minimum outside temperature
  - Type of building
  - Summer/winter time adjustment
  - Remote adjust.
  - Heat yield
  - Level limit transducer
  - Fault message manual control
  - Automatic maint. message
- **Module selection**
  - Slot A
  - Slot 1
  - Slot 2
- **Boiler param.**
  - Boiler type
  - Fuel
  - Ecostream control
  - Type of burner
  - Sequence reversal after ... Hours
  - Minimum modulation output
  - Burner set motor runtime
  - Load limit from outside temperature
  - Boiler pump function
  - Boiler pump run-on time
  - Minimum burner runtime
  - Pump logic temperature
  - Minimum start temperature
  - Maximum shutdown temperature
  - Flue gas temperature limit
- **Heating circ. 1**
  - Heating system
  - Heat. circ. desig.
  - Low end temp.
  - Design temperature
  - Minimum flow temperature
  - Maximum flow temperature
  - Remote control
  - Maximum room infl
  - Setback type
  - Outside hold frm.
  - Holiday setback type
  - No setback below ...
  - Flow setback
  - Room temperature offset
  - Automatic adaptation
  - Switching optimisation
  - Stop optimisation
  - Frost prot from
  - DHW priority
  - Servomotor (not on heating circuit 0)
  - Servomotor runtime
  - Boiler raising
  - External Day/Night/Aut
  - External fault message - pump
  - Screed drying
  - Screed temperature rise
  - Screed heat-up time
  - Maximum screed temperature xxxx
  - Maximum screed time
  - Screed setback temperature
  - Screed setback time
- **Heating circuit 0, 2, 3, 4 see heating circuit 1**
- **DHW**
  - DHW yes/no
  - DHW range to
  - Switching optimisation
  - Residual heat use
  - Hysteresis
  - Boiler raising
  - External fault message WF1/WF2
  - External contact WF1/WF3
  - Thermal disinfection
  - Thermal disinfection temperature
  - Thermal disinfection weekday
  - Thermal disinfection time
  - Daily heat-up
  - DHW circulation (start frequency per hour)
- **Special parameters**
- **Heating characteristics**
  - Heating curve heating circ. 0
  - Heating curve heating circ. 1
  - Heating curve heating circ. 2
  - Heating curve heating circ. 3
  - Heating curve heating circ. 4
- **Relay test**
  - Boiler
  - Heating circ. 0
  - Heating circ. 1
  - Heating circ. 2
  - Heating circ. 3
  - Heating circ. 4
  - DHW
- **LCD test**
- **Fault**
- **Monitor**
  - Boiler
  - Heating circ. 0
  - Heating circ. 1
  - Heating circ. 2
  - Heating circ. 3
  - Heating circ. 4
  - DHW
- **Version**
- **Control unit**
- **Reset**
  - Control unit settings
  - Burner Hours run
  - Fault log
  - Maximum flue gas temperature
  - Heat yield
  - Maint. message

Fig. 15 Overview of adjustable parameters and display data

7.2 Calling up the service level

Access to the Service level is password protected. The Service level is only intended for heating contractors.

Unauthorised access to the service level invalidates your warranty.

▶ Press buttons **Display**, **Heating circuit** and **Temp** simultaneously and release.

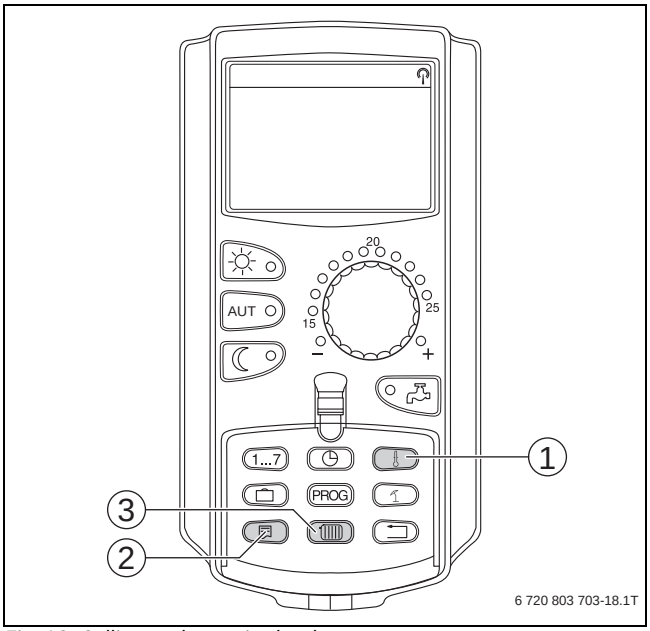


Fig. 16 Calling up the service level

[1] Temp. key
[2] Display key
[3] Heating circuit key

The service level is enabled and the display shows:

Fig. 17 Service level

7.2.1 Control system "Press and turn"

The control unit is operated by pressing the buttons and turning the rotary selector.

The Service level is split over several main menu levels. If the last line is left blank (without value entry), there are further submenus connected with the main menu selected.

7.2.2 Calling up main menus

The rotary selector is used to scroll through the main menu. The main menus are structured as a loop and recommence after the last main menu.

- General Param.
- Module selection
- ...
- ...
- General Param.

7.2.3 Calling up submenus

▶ Turn the rotary selector until the main menu containing the submenu is highlighted.
▶ Press button **Display**.
The submenu is shown.
▶ Turn the rotary selector to access all submenus of the main menu.

7.3 Calling up and modifying settings

The menus displayed on the MEC2 programming unit of the control unit depend on which modules are fitted and on their settings.

▶ Calling up the service level (→ chapter 7.2, page 18).
The first main menu is **General Param.**
▶ Press **Display** to call up a submenu.
The display shows the selected submenu.
▶ Press and hold **Display**.
▶ Turn the rotary selector to the required value.
The display shows the set value.
▶ Release **Display** to save your input.
▶ Press **Back** to return to the next higher level.

To return to the standard display:
▶ Press **Back** several times.

The control unit automatically reverts to the standard display if no key is pressed for some time or if the flap is shut.

8 General specification data

In the **General Param.** main menu, values can be adjusted for the submenus listed above and the building characteristics. The following pages explain how to adjust values relating to the submenus.

▶ Call up the service level.
The first main menu is **General Param.**
▶ Press button **Display**.
▶ Turn the rotary selector until the required submenu is shown.

Turn the rotary selector to scroll through the following submenus:

- Minimum outside temperature
- Type of building
- Summer/wintertime changeover
- Remote adjust.
- Amount of heat
- Manual switch fault message
- Automatic maint. message
- Temperature control 0 V corresponds to ...
- Temperature control 10 V corresponds to ...

▶ Press button **Display** to call up a submenu.
The display shows the selected submenu.

8.1 Minimum outside temperature

The minimum outdoor temperature is an average value of the lowest outdoor temperatures of the past years and characterises together with the design temperature the end point of the heating curve.

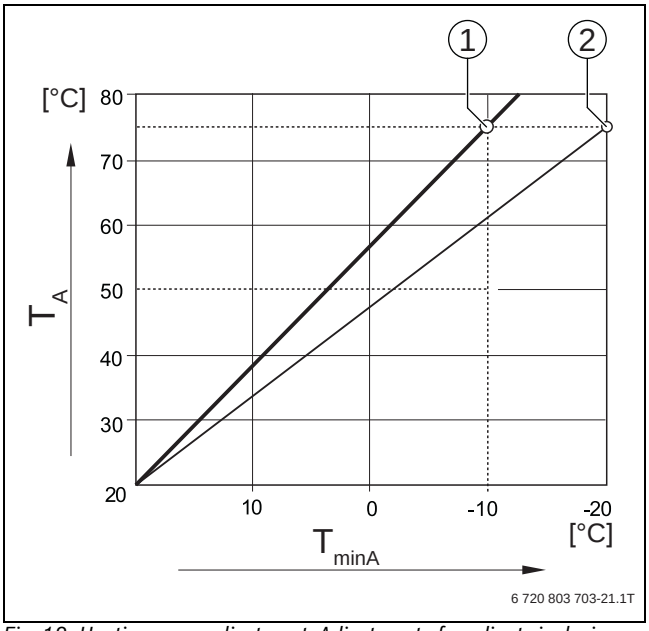


Fig. 18 Heating curve adjustment: Adjustment of gradient via design temperature and minimum outside temperature

[T_{minA}] Minimum outside temperature
[T_A] Design temperature (flow temperature that should be achieved at min. outside temperature)
[1] Adjustment: Design temperature 75 °C, minimum outside temperature −10 °C (standard curve)
[2] Adjustment: Design temperature 75 °C, minimum outside temperature −20 °C

The minimum outside temperature for your region (average value) is stated in tab. 21. If your particular region is not shown in the table, set an average value between the two cities closest to you or take the value from the heat demand calculation for your building.

- ▶ Call up the service level.
  The first main menu is **General Param**
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Min. outside temp** appears.

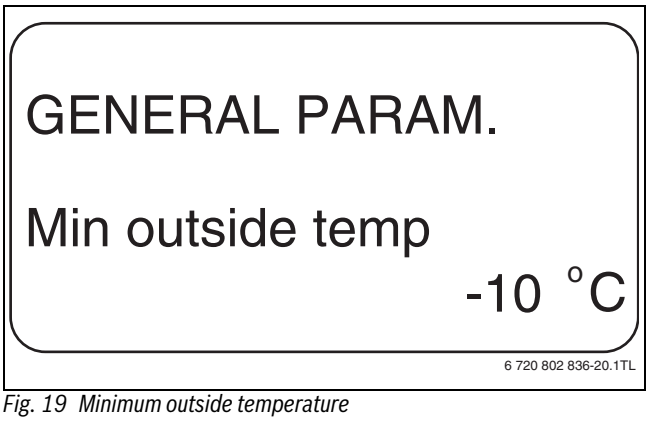


Fig. 19 Minimum outside temperature

- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.
  The display shows the set value.
- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Min outside temp	-30 °C – 0 °C	-10 °C

Table 20 Setting range Minimum outside temperature

Town	Minimum outside temperature in °C
Athens	−2
Berlin	−15
Brussels	−10
Budapest	−12
Bucharest	−20
Frankfurt/M	−14
Hamburg	−12
Helsinki	−24
Istanbul	−4
Copenhagen	−13
Lisbon	0
London	−1
Madrid	−4
Marseilles	−6
Moscow	−30
Munich	−16
Naples	−2
Nice	0
Paris	−10
Prague	−16
Rome	−1
Sevastopol	−12
Stockholm	−19
Valencia	−1
Vienna	−15
Zurich	−16

Table 21 Minimum outside temperature in Europe

8.2 Type of building

In the **Type of building** submenu, the heat storage capacity of the building is entered. Different types of construction have different heat storage capacities. This function sets the heating system to the specified construction type.

The heat storage capacity is divided into three categories.

Class	Explanation
light	heat storage capacity e.g. prefabricated building, wood-frame construction
medium	medium heat storage capability, e.g. house built with breeze blocks
heavy	heat storage capacity e.g. brick house

Table 22 Heat storage capacity

- ▶ Call up the service level.
  The first main menu is **General Param.**
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Type of building** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.
  The display shows the set value.
- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Type of building	medium heavy light	medium

Table 23 Setting range Building type

8.3 Summer/wintertime changeover

Three different date and time setting options are available for all connected control units:

Setting option	Explanation
Radio clock	The adjustment is made completely automatically by the radio time signal.
automatic	Date and time input with keypad. The change from summer to wintertime and vice versa is made automatically on the last weekend in March and October.
manual	Single date and time input via keypad. There will be no automatic summer/wintertime adjustment.

Table 24 Setting options Date and time

The MEC2 contains a radio clock receiver, which constantly monitors and corrects the time switch inside the control unit. You never need to set the time during commissioning, after prolonged power failure, after the heating system has been switched off for longer periods on its mains electrical isolator or for changing from summer to wintertime and vice versa.
Well screened boiler rooms in cellars can restrict the reception of the radio clock signal, which makes it necessary for you to set the date and time manually.

Never enable the "Radio clock" function outside Germany.

When using the MEC2 as a remote control, the reception of the radio time signal depends on location and position. Reception of the radio clock signal is indicated by symbol on the display. Normally, reception is possible within a radius of approx. 1000 miles around Frankfurt/Main [Germany].

In case of reception problems, please observe the following:

- The radio reception is weaker in rooms surrounded by steel-reinforced walls, cellars, high-rise buildings etc.
- Maintain a minimum distance of 1.5 m from sources of interference, such as computer monitors and TV sets.
- The radio reception tends to be better at night than during the day.

▶ Call up the service level.
The first main menu is **General Param.**
▶ Press **Display** to call up a submenu.
▶ Turn the rotary selector until submenu **Summer / Winter Time adjustment** appears.
▶ Hold down button **Display** and turn the rotary selector until the required value is shown.
The display shows the set value.

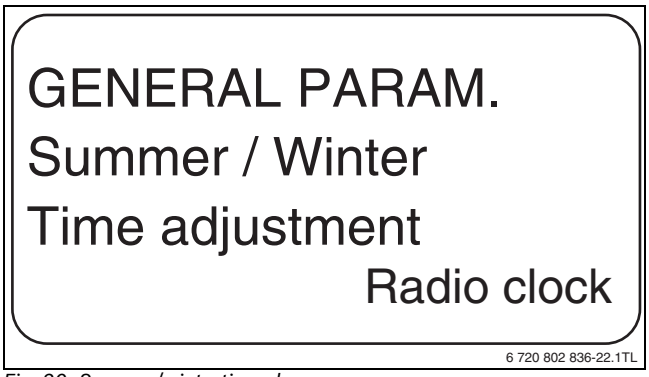


Fig. 20 Summer/wintertime changeover

▶ Release **Display** to save your input.
▶ Press **Back** to return to the next higher level.

If **Radio clock** is not selected, the reception of the atomic clock signal will be turned off for all networked control units. This also applies to the radio time signals of the BFU/F remote control and other MEC2 programming units with radio clock reception. The last input at a control unit in the network is valid.

	Input range	Factory setting
Summer/wintertime changeover	Radio clock automatic manual	automatic

Table 25 Setting range Summer/wintertime changeover

8.4 Remote adjust.

The remote adjustment offers the option of external data input or modification via telecontrol systems, such as the Logamatic telecontrol system.

Setting option	Explanation
yes	Optional remote adjustment e.g. via Logamatic telecontrol system.
no	Remote adjustment is not possible, but system data can be downloaded and monitored.

Table 26 Setting options Remote adjustment

▶ Call up the service level.
The first main menu is **General Param.**
▶ Press **Display** to call up a submenu.
▶ Turn the rotary selector until submenu **Remote adjust.** appears.
▶ Hold down button **Display** and turn the rotary selector until the required value is shown.
The display shows the set value.
▶ Release **Display** to save your input.
▶ Press **Back** to return to the next higher level.

This parameter cannot be adjusted via the telecontrol system; it is only intended to be used in situ.

	Input range	Factory setting
Remote adjust.	Yes No	yes

Table 27 Setting range Remote adjustment

8.5 Manual switch fault message

A fault message can be shown in the display of the MEC2 programming unit if a manual switch of a function module is set to **Manual**.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Fault message manual control** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.
  The display shows the set value.

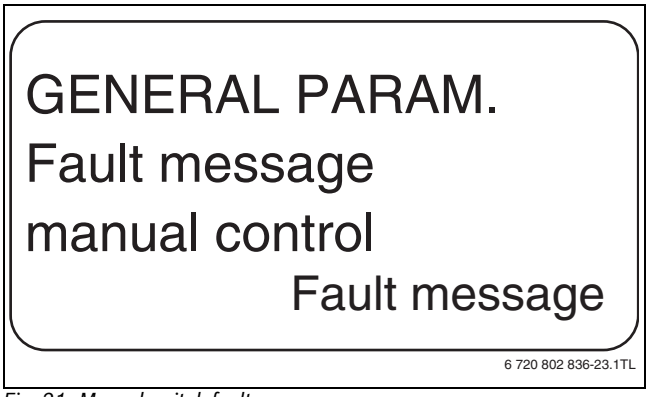


Fig. 21 Manual switch fault message

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

If **No** is shown, a warning notice appears if the flap is closed.
If **Fault message** is shown an entry also appears in the fault log. Automatic forwarding via the Logamatic telecontrol system is then possible.
In the case of **Central fault message**, the output of a central fault message also appears via a zero volt contact e.g. via the FM448 function module.

	Input range	Factory setting
Fault message manual control	No Fault message central fault message	no

Table 28 Setting range Manual switch fault message

8.6 Automatic maint. message

At the user level an automatic maintenance message to appear on the MEC2 programming unit display can be generated.

The following settings are possible:

- Maintenance message by date. Entry of the next service date (01.01.2000 – 31.12.2088).
- Maintenance after hours (only for control units with direct boiler control).

The maintenance message "after hours run" is not possible with this control unit.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **automatic maint. message** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.
  The display shows the set value.

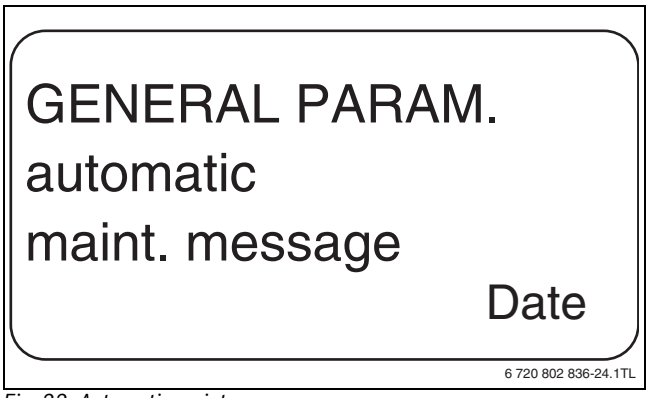


Fig. 22 Automatic maint. message

- ▶ Release **Display** to save your input.
- ▶ Turn the rotary selector one increment clockwise.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.
  The display shows the set value.

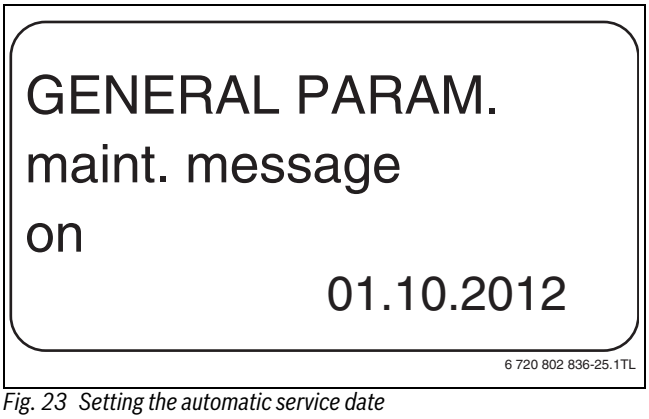


Fig. 23 Setting the automatic service date

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

The maintenance message is recorded in the fault log and can be transferred via the Logamatic telecontrol system.

The status of the maintenance message can be checked in the **Monitor** menu. The maintenance message can be reset using the **Reset** menu.

	Input range	Factory setting
automatic maint. message	No Operating hours Date	no

Table 29 Setting range Automatic maintenance message

8.7 0 – 10 V input

As soon as a module with 0 – 10 V input has been fitted in the control unit, the following masks appear as listed in tab. 30.

module	Name	Temperature-based control	Output-based control
FM447	Strategy module	X	
FM448	Fault message module	X	
FM452	KSE 2 (UBA 1)	X	X (CM431 V6.xx or higher)
FM454	KSE 4 (UBA 1)	X	X (CM431 V6.xx or higher)
FM456	KSE 2 (EMS)	X	X (CM431 V6.xx or higher)
FM457	KSE 4 (EMS)	X	X (CM431 V6.xx or higher)
FM458	Mixed cascade	X	X (CM431 V8.xx or higher)
ZM433	Substation	X	

Table 30 Modules

This chapter only describes temperature control. For output control, see → chapter 10.3, page 25.

- ▶ Call up the service level.
  The first main menu is **General Param.**
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **0 – 10 V input** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.
  The display shows the set value.
- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
0 – 10 V input	off temp. control output control	temp. control

Table 31 Setting range for 0 – 10 V input

8.8 Temperature control 0 – 10 V input

If you have selected "Temp. contr" for the 0 – 10 V input, you can adapt the start and stop point, if required, for the external 0 – 10 V input.

The following settings can be made:

- The set value in °C for 0 V (**Temp control 0V equiv to**)
- The set value in °C for 10 V (**Temp control 10V equiv to**).

The following linear curve is calculated from these values.

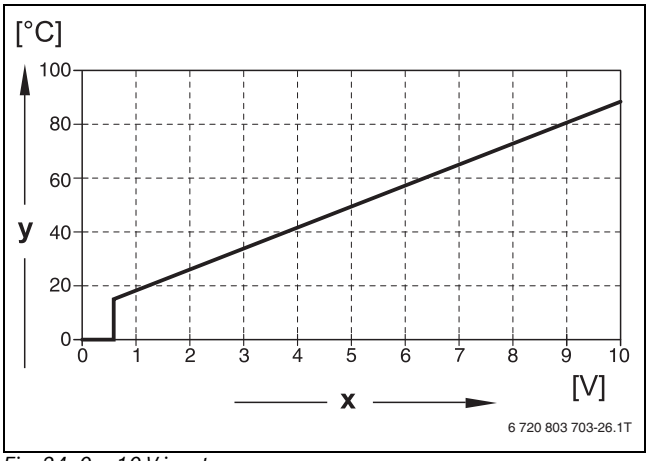


Fig. 24 0 – 10 V input curve

[x] Input voltage in V (factory setting)
[y] Set boiler temperature in °C

The start value (start point) of the curve is set to 0.6 V for a positive curve; Fig. 24 shows the factory setting.

- ▶ Call up the service level.
  The first main menu is **General Param.**
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Temp control 0V equiv to** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.
  The display shows the set value.

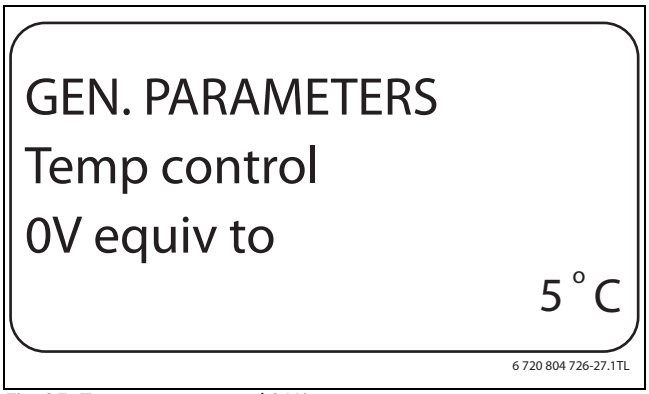


Fig. 25 Temperature control 0 V input

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.
- ▶ Turn the rotary selector until submenu **Temp control 10V equiv to** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.
  The display shows the set value.

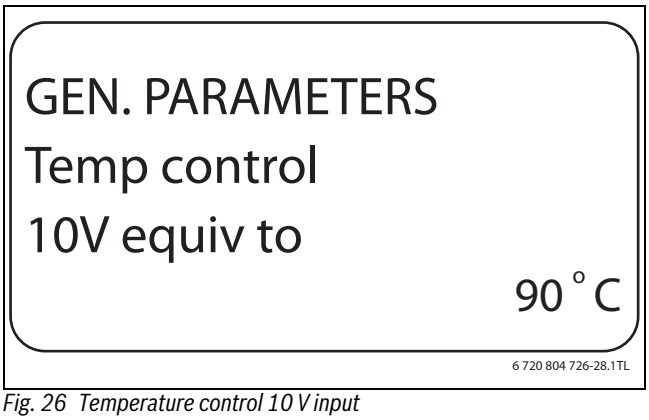


Fig. 26 Temperature control 10 V input

▶ Release **Display** to save your input.
▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Temperature control 0 V	off 5 °C – 99 °C	5 °C
Temperature control 10 V	5 °C – 99 °C	90 °C

Table 32 Setting range for temperature control 0 – 10 V input

If a curve with a negative incline is programmed, e.g. 0 volt = 90 °C, ensure that all 0 – 10 volt inputs of a control unit are controlled. An open input corresponds to 0 V and thus to a heat demand of e.g. 90 °C.
The demand should be set parallel at all inputs of a control unit, if applicable.

9 Module selection

On starting the control units or after a system reset, the modules are automatically recognised and their information downloaded.

Example:
- Slot 1: ZM424
- Slot 2: free

However, these modules can also be set manually if required.

▶ Call up the service level.
The first main menu is **General Param**.
▶ Turn the rotary selector until main menu **Module selection** appears.
▶ Press **Display** to call up a submenu.
▶ Turn the rotary selector until submenu **Pos. 1** appears.
The display shows the set value.
▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

We recommend the setting **Function module none/auto**. The modules are automatically recognised and installed.

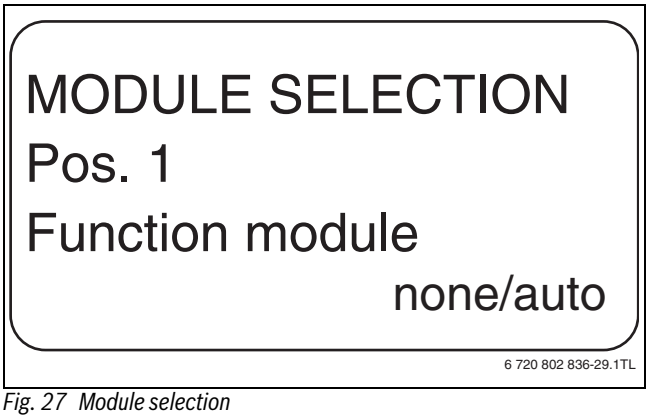


Fig. 27 Module selection

▶ Release **Display** to save your input.
▶ Press **Back** to return to the next higher level.

10 Boiler parameters

If the control unit contains a multi-boiler module, e.g. KSE module, FM456 or FM457, you can set up the boiler parameters with this menu.

10.1 No. of boilers

This function allows you to set the number of boilers in line with the module selection.

▶ Call up the service level.
The first main menu is **General Param**.
▶ Turn the rotary selector until main menu **Boiler param.** appears.
▶ Press **Display** to call up a submenu.
▶ Hold down button **Display** and turn the rotary selector until the required value is shown.
The display shows the set value.

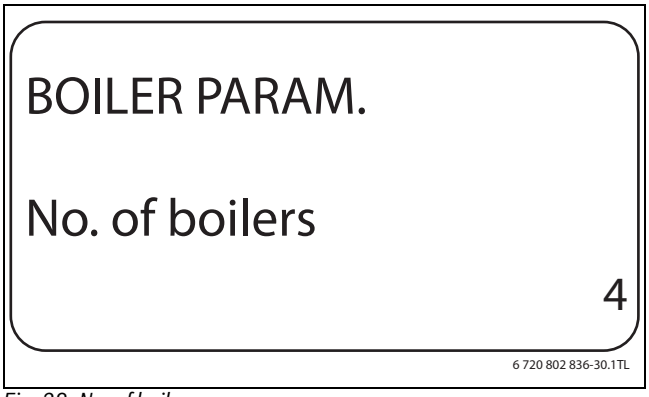


Fig. 28 No. of boilers

▶ Release **Display** to save your input.
▶ Press **Back** to return to the next higher level.

You can set the maximum **number of boilers to 8**, if two multi-boiler FM457 modules are used in one control unit.
With **number of boilers = 0** the control unit operates as a heating circuit controller.

	Input range	Factory setting
No. of boilers (subject to module selection)	0 – 8	1

Table 33 Setting range for number of boilers

10.2 Hydraulic system

10.2.1 Single-boiler system

You may use this function if the no. of boilers is 1. You can choose whether the boiler hydraulics operate with or without a boiler pump and low loss header

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **Boiler param.** appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Hydraulics** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.
  The selected value flashes on the display.

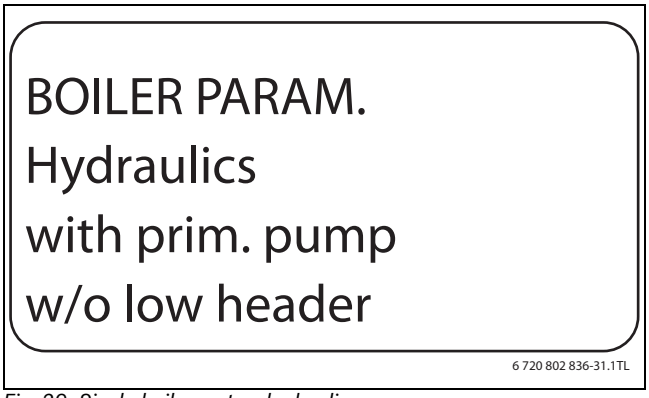


Fig. 29 Single-boiler system hydraulics

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

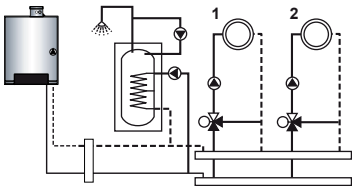
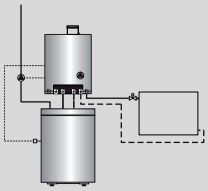
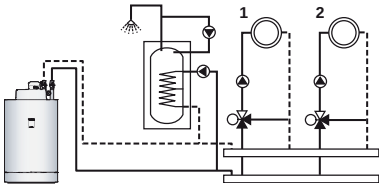
	Input range		Factory setting	Own input
Hydraulic system	with boiler pump/with low loss header		with boiler pump/with low loss header	
	with boiler pump/without low loss header			
	without boiler pump/ without low loss header			

Table 34 Setting range for single-boiler system hydraulics

[1] HK1
[2] HK2

10.2.2 Multi boiler systems

In conjunction with modulating EMS boilers, the hydraulic integration can be selected for multi-boiler cascades.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **Boiler param.** appears.
- ▶ Press **Display** to call up a submenu.

The **No. of boilers** set must be > 1 (→ chapter 10.1, page 23)!

- ▶ Turn the rotary selector until submenu **Hydraulics** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.
  The selected value flashes on the display.

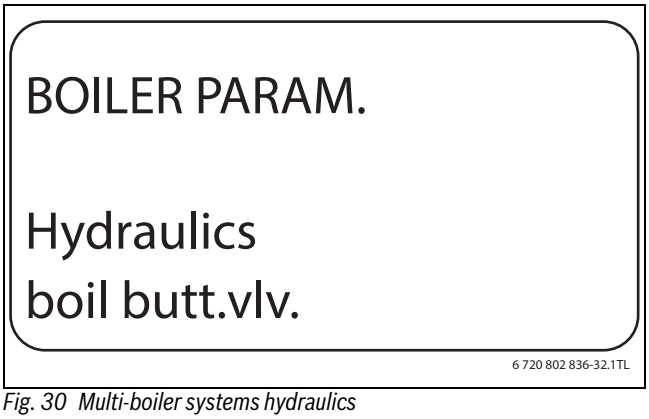


Fig. 30 Multi-boiler systems hydraulics

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Hydraulics	with header boil butt.vlv.	with header

Table 35 Setting range for multi-boiler systems hydraulics

The **Butterfly valve boiler** can only be selected in connection with the Logano GB312.
The butterfly valves are controlled via the optional DM 10 EMS module that can be fitted in the EMS boiler (accessory may not be available in certain countries).

10.3 Output control for 0 – 10 V input

In conjunction with modulating EMS boilers, the 0 – 10 V input can also be used for output control.

Output control works with a single boiler or with a cascade of identical boilers (type and output).

Where required, the curve for external output control can be adapted.

The following settings can be made:

- Set output value for 0 volt (**Output control 0V equiv to**).
- Set output value for 10 volt (**Output control 10V equiv to**).

The linear curve shown in the graph below is calculated from these values.

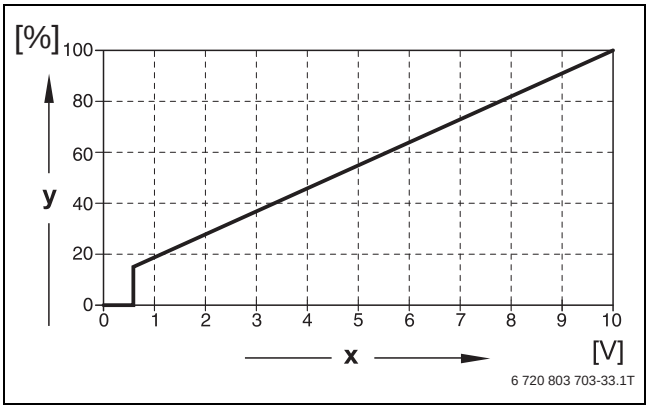


Fig. 31 Input 0 – 10 V

[x] Input voltage in V (factory setting)
[y] Output demand in %

The start value (start point) of the curve is set to 0.6 V with a positive curve.

In case of external output control, the control units can no longer take internal heat demands, e.g. from heating circuits or DHW function, into consideration.

If a curve with a negative incline is programmed, e.g. 0 volt = 100 % output, ensure that all 0 – 10 volt inputs present in this control unit are also controlled. An open input corresponds to 0 volt and would demand 100 % output.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **Boiler param.** appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Output control** appears.DHW
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.
  The selected value flashes on the display.

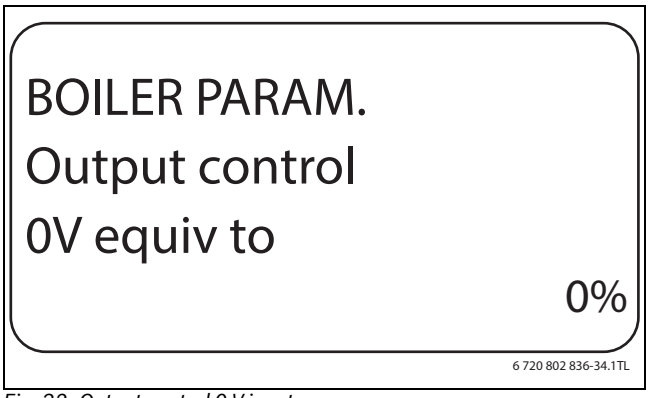


Fig. 32 Output control 0 V input

- ▶ Release **Display** to save your input.
- ▶ Turn the rotary selector until submenu **10V equiv to...%** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.
  The selected value flashes on the display.
- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Output control 0V equiv to	Off 0% – 100%	Off
Output control 10V equiv to	0% – 100%	100%

Table 36 Setting range for output control 0 – 10 V input

10.4 Recognising an external heat source

This function allows you to set the temperature differential for the low loss header from which the external heat source is recognised.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **Boiler param.** appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Detection alt ht off** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.
  The selected value flashes on the display.

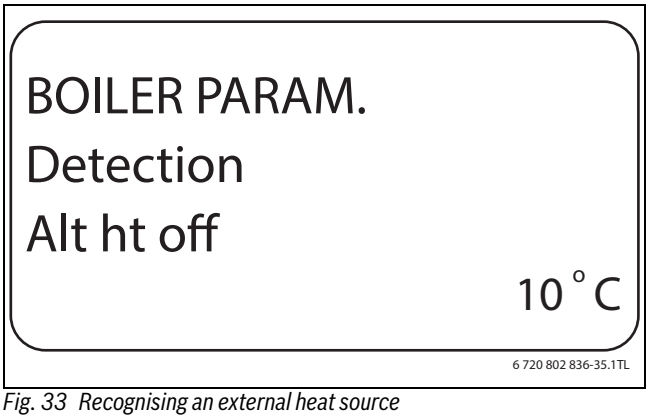


Fig. 33 Recognising an external heat source

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

Example: When 10 °C is set, the boiler/s shut down as soon as the actual temperature is 10 °C above the set flow temperature.

	Input range	Factory setting
Temperature for external heat source recognition	5 °C – 20 °C none	none

Table 37 Setting range for external heat source recognition

10.5 Setting the boiler type

This function allows you to select from the various types of boilers.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **Boiler param.** appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Boiler type** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.
  The selected value flashes on the display.

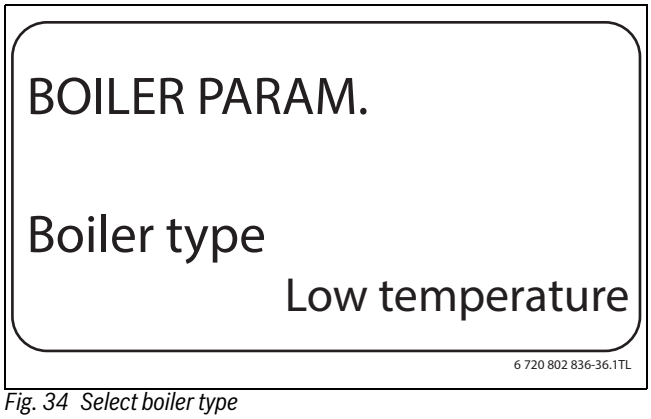


Fig. 34 Select boiler type

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

In a multi-boiler system, the setting **Low temperature** must be selected as soon as a non-condensing boiler is installed.

For boilers with integral three-way valves, electrically isolate this valve if DHW is not directly heated by the boiler.

	Input range	Factory setting
Boiler type	Condensing Low temperature	Condensing

Table 38 Setting range Boiler type

10.6 Limiting boiler output

You may only use this function if the no. of boilers is 1. The maximum output of the boiler can be entered as a percentage of the rated output.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **Boiler param.** appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Boiler output** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.
  The selected value flashes on the display.

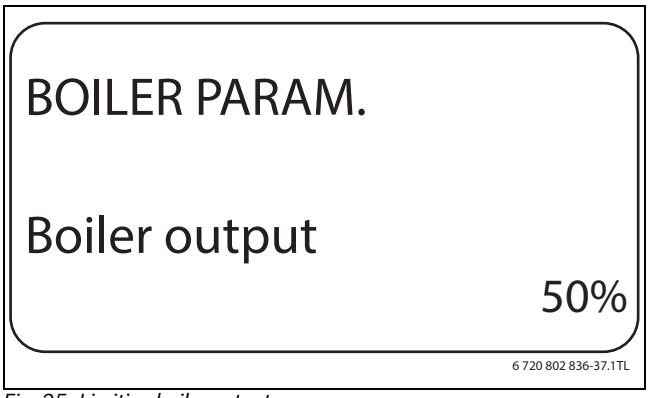


Fig. 35 Limiting boiler output

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Boiler output	50% – 100%	100%

Table 39 Setting range for boiler output

10.7 Maximum boiler temperature

This function allows you to set the maximum set boiler temperature.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **Boiler param.** appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Maximum Boiler temp.** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.
  The selected value flashes on the display.

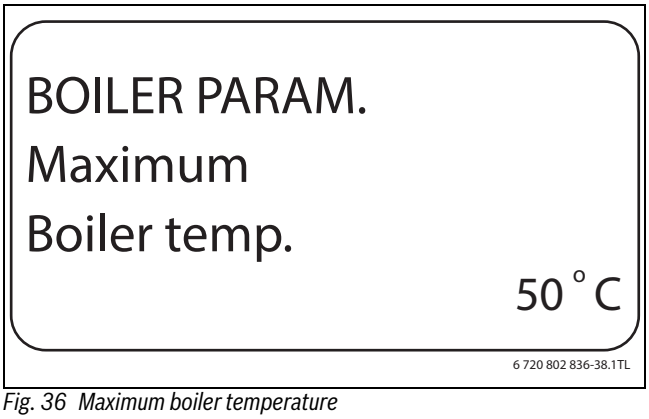


Fig. 36 Maximum boiler temperature

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Maximum Boiler temp.	50 °C – 90 °C	85 °C

Table 40 Setting range for maximum boiler temperature

10.8 Selecting the type of sequence control

You may use this function if the **no. of boilers is at least 2**. This function allows you to set the type of sequence control.

If you select "fixed", the boilers are controlled in the following order: 1 – 2 – 3 – 4. First, boiler 1 is switched on, then boiler 2, etc.

If you select "automatic", the lead boiler is selected according to date.

Date	Sequence
On the 1st of every month	1 – 2 – 3 – 4
On the 2nd of every month	2 – 3 – 4 – 1
On the 3rd of every month	3 – 4 – 1 – 2
On the 4th of every month	4 – 1 – 2 – 3
On the 5th of every month	1 – 2 – 3 – 4

Table 41 "automatic" sequence control

If you have selected one of these settings: "UBA throughput", "EMS DHW heater", "UBA cylinder" or "EMS three-way valve", boiler 1 always appears last in the sequence:
On the 1st of every month: 2 – 3 – 4 – 1
On the 2nd of every month: 3 – 4 – 2 – 1
On the 3rd of every month: 4 – 2 – 3 – 1
On the 4th of every month: 2 – 3 – 4 – 1, etc.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **Boiler param.** appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Sequence contrl** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.
  The selected value flashes on the display.

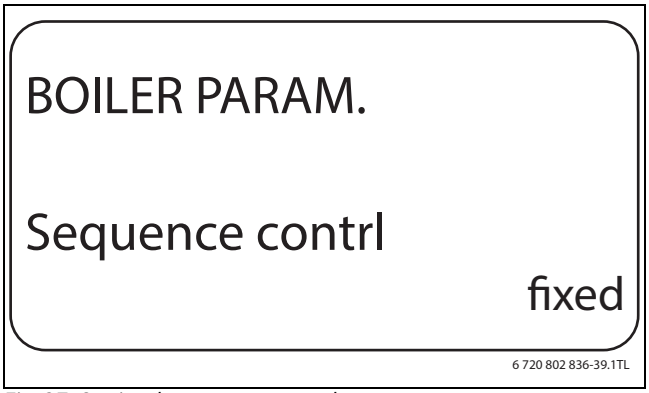


Fig. 37 Setting the sequence control

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Sequence contrl	automatic fixed	automatic

Table 42 Setting range for sequence control

11 Heating circuit data

The following heating systems can be selected:

Heating system	Explanation
None	The heating circuit function is not required. All subsequent submenu points relating to Heat circ. data no longer apply.
Radiators or convector heater	The heating curve is automatically calculated for radiators or convector heaters, subject to the required curve.
Underfloor	A flatter heating curve is automatically calculated for lower design temperatures.
Low end	The level of the flow temperature is a linear consequence of the outside temperature. The resulting heating curve connects as a straight line the low end with a second point that depends on the design temperature.
Constant	Use this system for controlling a swimming pool heating system or to pre-control air conditioning if the heating system must always provide the same set flow temperature, independent of the outside temperature. A remote control cannot be installed for this heating circuit if this system has been selected.
Room controller	The required CH flow temperature is dependent only on the measured room temperature. For this, you must install a remote control inside the room. The heating system is switched off if the room becomes too hot.

Table 43 Heating systems

11.1 Select the heating system

A heating system can be assigned to every available heating circuit.

Example: In main menu **Heating circ. 2**, **Underfloor** should be selected for submenu **Heating system**.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **Heating circ.** + no. appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Heating system** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

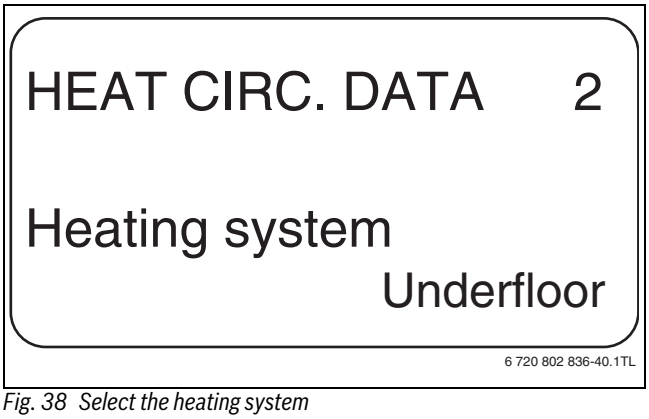


Fig. 38 Select the heating system

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Heating system	none Radiator Convector Underfloor Constant Low end Room controller	Radiator

Table 44 Setting range Heating system

11.2 Rename the heating circuit

Instead of the designation **Heating circ.** + no., another name can be selected from a default list.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **Heating circ.** + no. appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Heat circ desig.** appears.

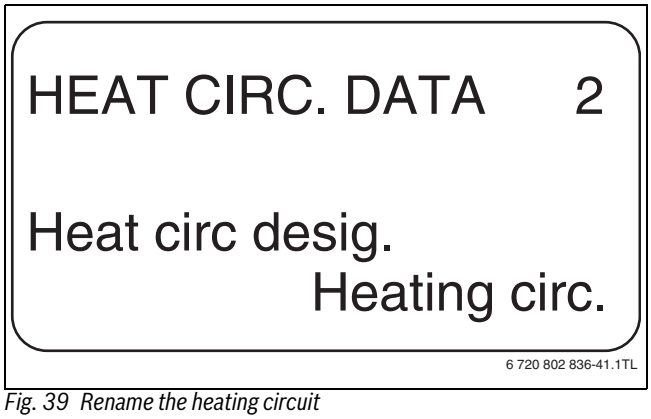


Fig. 39 Rename the heating circuit

- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.
- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Heat circ desig.	Heating circuit Apartment Underfloor Bathroom Swimming pool Floor Cellar Building	Heat.circuit

Table 45 Setting range Heating circuit name

11.3 Setting the low end temperature

This function will only be displayed for "Low end" heating systems.

With the **Base point heating system** setting, you have determined a straight heating curve using the base point temperature and the design temperature.

The base point [Low end] temperature determines the start of the heating curve. The low end temperature is applicable for an outside temperature of 20 °C.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **Heating circ.** + no. appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Heating system** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.
- ▶ Release **Display** to save your input.
- ▶ Turn the rotary selector until submenu **Base point temp.** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

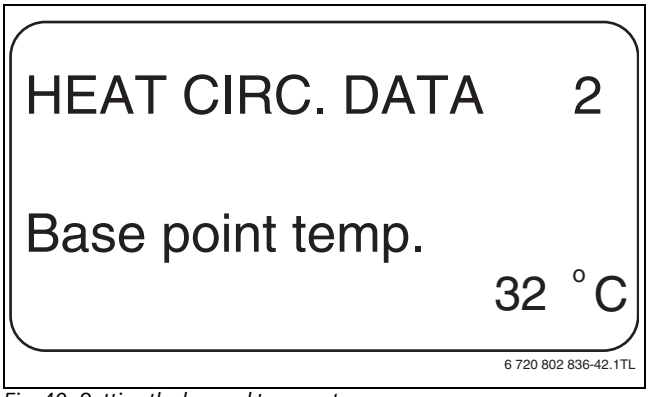


Fig. 40 Setting the low end temperature

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Base point temp.	20 °C – 80 °C	30 °C

Table 46 Setting range Low end temperature

11.4 Setting the design temperature

The design temperature is the flow temperature at the adjusted minimum outside temperature.

The instructions for setting the heating curves in→ chapter 23.2, page 62 must be observed.

The following applies for the **Base point** heating system:

- Set the design temperature at least 10 °C higher than the low end temperature.
- Changing the design temperature allows the heating system to operate with a flatter or steeper heating curve.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **Heating circ.** + no. appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Design temp.** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

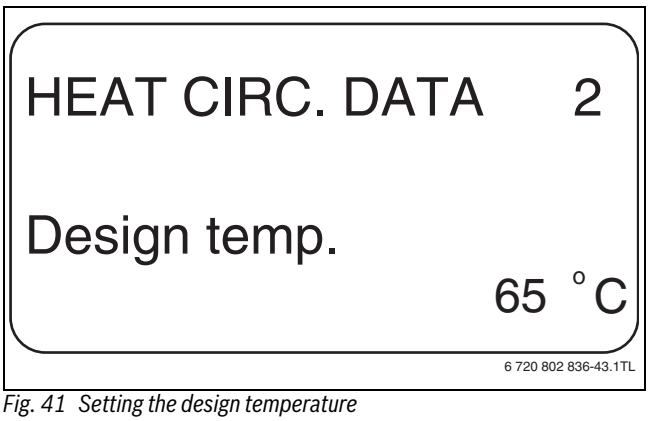


Fig. 41 Setting the design temperature

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Design temp.	30 °C – 90 °C	75 °C for radiator/ convector/low end/ constant 45 °C for underfloor heating

Table 47 Setting range Design temperature

11.5 Setting the Minimum flow temperature

The minimum flow temperature limits the heating curve to a minimum set value.

This function will not be displayed with "Constant" heating systems.

Change value only if necessary.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **Heating circ.** + no. appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Minimum Flow temp.** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

This value sets the temperature below which the flow temperature must not drop.

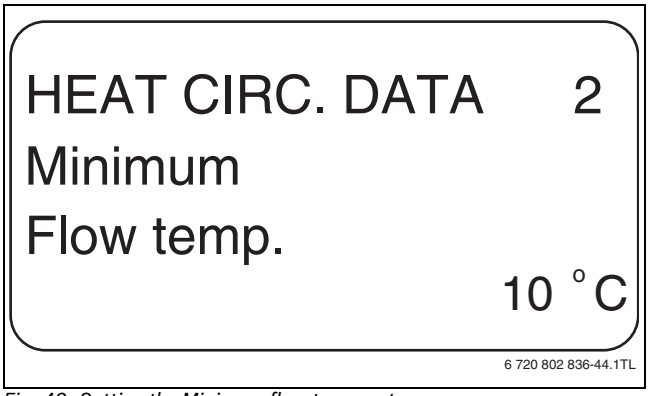


Fig. 42 Setting the Minimum flow temperature

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Minimum Flow temp.	5 °C – 70 °C	5 °C

Table 48 Setting range Minimum flow temperature

11.6 Setting the maximum flow temperature

The maximum flow temperature limits the heating curve to a maximum set value.

This function will not be displayed with "Constant" heating systems.

Change value only if necessary.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **Heating circ.** + no. appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Maximum Flow temp.** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

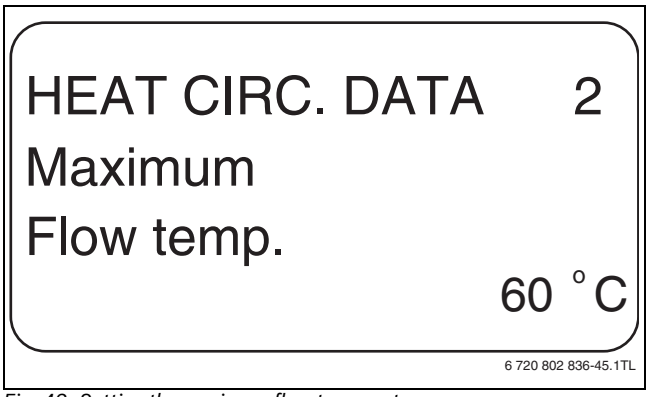


Fig. 43 Setting the maximum flow temperature

This value sets the temperature above which the flow temperature must not rise.

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Maximum flow temperature for underfloor heating	30 °C – 60 °C	50 °C
Maximum supply temperature for radiators, convector heaters, base point	30 °C – 90 °C	75 °C

Table 49 Setting range Maximum flow temperature

11.7 Select the remote control

Under this menu item, it can be determined whether a remote control will be installed for the heating circuit concerned. Here you can select the following:

- No remote control
- Remote control with display (MEC2) "MEC heat. circ."
- Remote control without display (BFU)

A remote control cannot be installed for the **Constant** heating circuit system or if **External changeover** has been activated.

A remote control unit must be installed to enable the following functions, which monitor the room temperature:

- Night setback with hold room temperature
- Max. room influence
- Automatic adaptation
- Optimisation
- **Room controller** heating system

Explanations relating to "MEC heating circuits"

With the MEC2 you can control several heating circuits simultaneously. These are grouped together under the term "MEC heat. circ.".

The following functions can be carried out for "MEC heat circ":

- Changing the operating mode
- Adjusting the set value
- Summer/wintertime changeover
- holiday function
- Party function
- Pause function

The heating circuits grouped together under "MEC heat. circ." can, for specific settings, also be selected as "Single heat circ".

The timer program "PROG" function is only available for each individual heating circuit.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **Heating circ.** + no. appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Remote control** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

Turn the rotary selector to **with display** when the selected heating circuit has been assigned to the MEC2.

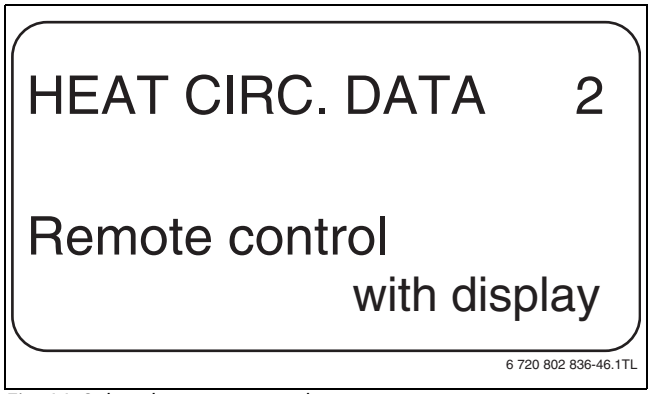


Fig. 44 Select the remote control

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Remote control	none without display with display	none

Table 50 Setting range Remote control

11.8 Maximum room influence setting

This function only appears if a remote control has been selected, but not if the **Room controller** heating system has been set.

The maximum room [ambient] influence limits the influence of the room temperature (room temperature hook-up) on the set flow temperature. The value determines the maximum room temperature setback for rooms which are not equipped with remote controls.

Ensure that the MEC2 programming unit and BFU remote control are not exposed to the influence of external heat sources, such as lamps, TV sets or other heat sources.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **Heating circ.** + no. appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Max room infl** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

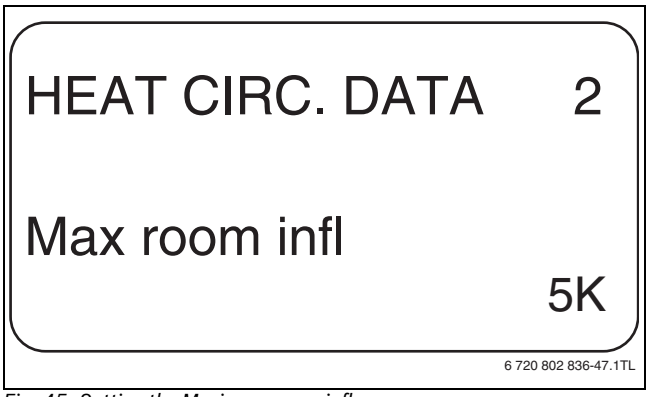


Fig. 45 Setting the Maximum room influence

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Max room infl	0 K – 10 K	3 K

Table 51 Setting range Maximum room influence

11.9 Select the type of setback

The following functions are available for setback mode or night mode:

Setback type	Explanation
Outside setback	**Outside setback** determines the outside temperature limit. The heating circuit is switched off when this value is exceeded. Below this limit, the heating system heats to the set night temperature.
Hold room temp	**Hold room temp** determines a night temperature as the room temperature. The heating circuit is switched off when this value is exceeded. Below this limit, the heating system heats to the set night temperature. For this function a remote control must be located in the relevant room.
Standby	In **Standby** mode, the heating circuit is generally switched off in standby.
Reduced	In **Reduced** mode, the system heats to the set night temperature if setback mode is selected. The heating circuit pumps operate constantly.
Room controller	Setting the heating system to **Room controller** and setback type to **Reduced** achieves the same effect for temperature setback as **Hold room temp**.

Table 52 Setback types

If **Constant** has been selected under the Heating system menu item, only setback types **Reduced**, **Outside setback** or **Off** can be selected.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **Heating circ.** + no. appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Setback type** appears.

▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

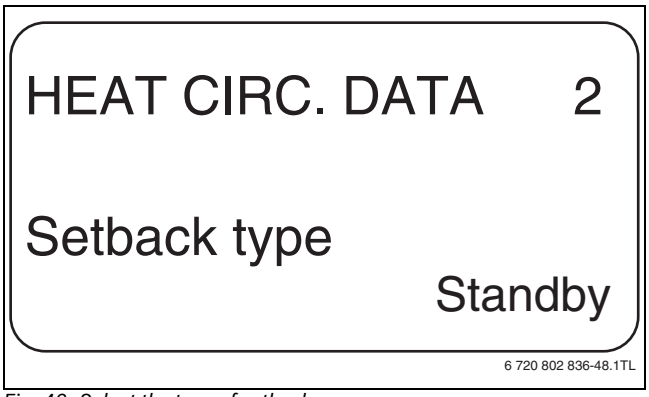


Fig. 46 Select the type of setback

▶ Release **Display** to save your input.
▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Setback type	Outside setback Standby Reduced Hold room temp	Outdoor setback

Table 53 Setting range setback type

11.10 Setting the outside stop temperature

If **Outside setback** has been selected as the setback type, the outside temperature must be entered at which the heating operation should change over from **Off** to **Reduced**.

▶ Call up the service level.
The first main menu is **General Param**.
▶ Turn the rotary selector until main menu **Heating circ.** + no. appears.
▶ Press **Display** to call up a submenu.
▶ Turn the rotary selector until submenu **Outdoor from** appears.
▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

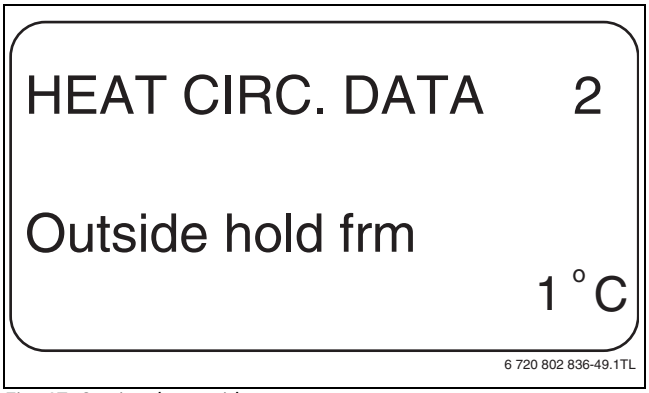


Fig. 47 Setting the outside stop temperature

▶ Release **Display** to save your input.
▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Outside hold frm	–20 °C – 10 °C	5 °C

Table 54 Setting range setback type

11.11 Setting holiday mode

A separate setback type can be set for the duration of your holiday. (For explanations of setting options see → chapter 11.9, page 30).

▶ Call up the service level.
The first main menu is **General Param**.
▶ Turn the rotary selector until main menu **Heating circ.** + no. appears.
▶ Press **Display** to call up a submenu.
▶ Turn the rotary selector until submenu **Holiday Set-back type** appears.
▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

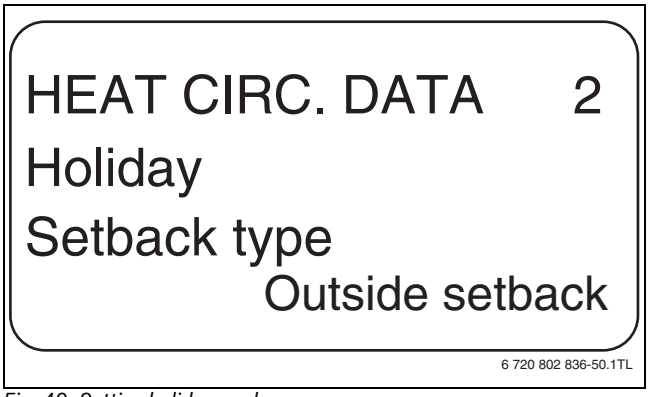


Fig. 48 Setting holiday mode

▶ Release **Display** to save your input.
▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Holiday setback type	Hold room temp Outside setback[1)] Standby reduced	Room setback

Table 55 Setting range Holiday setback type

1) In setting Holiday outside setback the rotary selector can be used to call the additional menu the temperature setting (between –20 °C and 10 °C).

11.12 Stopping setback at low outside temperatures

In very cold weather the setback can be disabled when the outside temperature falls below a set threshold. This prevents the room temperature falling down excessively.

Setback will not be blocked in manual or in holiday mode.

▶ Call up the service level.
The first main menu is **General Param**.
▶ Turn the rotary selector until main menu **Heating circ.** + no. appears.
▶ Press **Display** to call up a submenu.
▶ Turn the rotary selector until submenu **No setback Below outs temp** appears.
▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

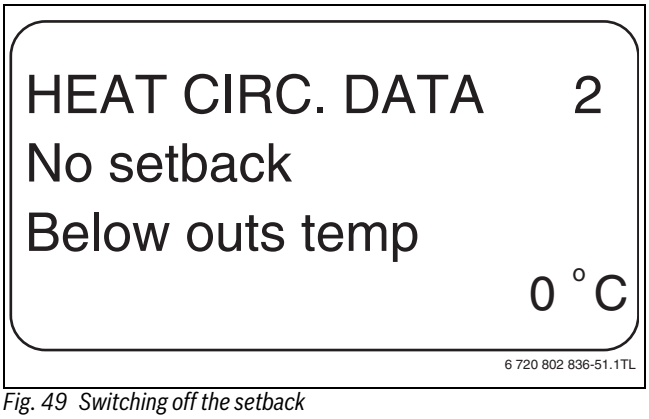


Fig. 49 Switching off the setback

▶ Release **Display** to save your input.
▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
No setback Below outs temp	inactive –20 °C – 10 °C	Inactive

Table 56 Setting range No setback below outside t.

11.13 Setting flow setback

Since you cannot connect a remote control to heating systems set to **Constant**, you may enter a setback setting for the **Reduced** and **Outside setback** types.

▶ Call up the service level.
The first main menu is **General Param**.
▶ Turn the rotary selector until main menu **Heating circ.** + no. appears.
▶ Press **Display** to call up a submenu.
▶ Turn the rotary selector until submenu **Heating system** appears.
▶ Hold down button **Display** and turn the rotary selector until the required value is shown.
▶ Release **Display** to save your input.
▶ Turn the rotary selector until submenu **Flow Setback by** appears.
▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

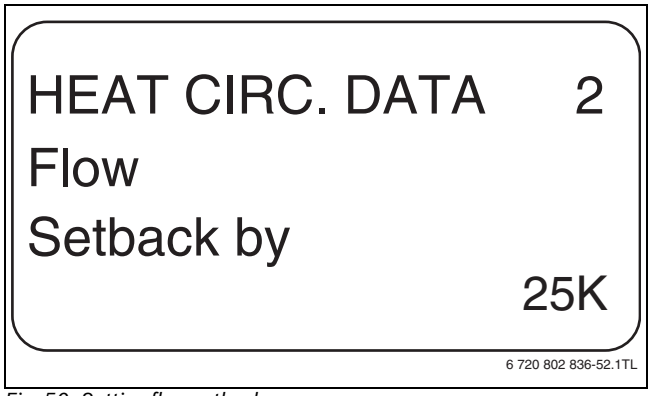


Fig. 50 Setting flow setback

▶ Release **Display** to save your input.
▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Flow setback	0 K – 40 K	30 K

Table 57 Setting range Flow setback

11.14 Setting the room temperature offset

This setting is only recommended if no remote control has been installed inside the living space.

If the average actual temperature measured with a thermometer deviates from the selected temperature, this function enables a matching of both values.

This adjustment moves the heating curve in parallel.

Example:

Displayed set room temperature	22 °C
Actual room temperature	24 °C

Table 58 Example: room temperature offset

The set value lies 2 °C below the actual value.

▶ Call up the service level.
The first main menu is **General Param**.
▶ Turn the rotary selector until main menu **Heating circ.** + no. appears.
▶ Press **Display** to call up a submenu.
▶ Turn the rotary selector until submenu **Room temperature Offset** appears.
▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

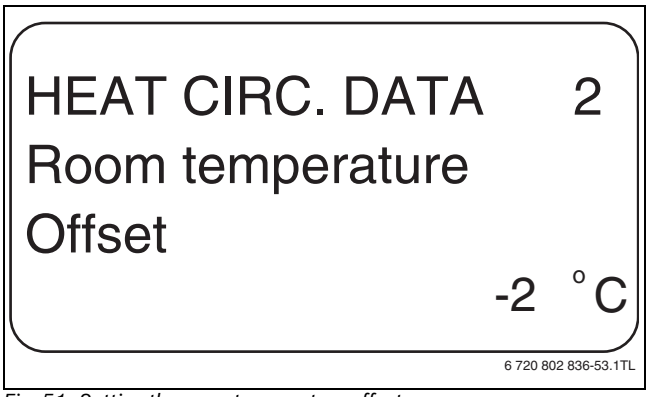


Fig. 51 Setting the room temperature offset

▶ Release **Display** to save your input.
▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Room temperature offset	–5 °C – 5 °C	0 °C

Table 59 Setting range Room temperature offset

11.15 Automatic adaptation setting

This function can only be selected if **Radiators**/**Convector**/**Underfloor** has been set as the heating system.

"Autom adaptation" is not enabled at the factory. Where a remote control is installed in the room, the heating curve is automatically adjusted to the building by constantly monitoring the room and flow temperatures.

Conditions are:
- A representative room with reference temperature.
- Fully opened thermostatic valves in the room.
- No constantly fluctuating external heat influence.

▶ Call up the service level.
The first main menu is **General Param**.
▶ Turn the rotary selector until main menu **Heating circ.** + no. appears.
▶ Press **Display** to call up a submenu.
▶ Turn the rotary selector until submenu **Autom adaptation** appears.
▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

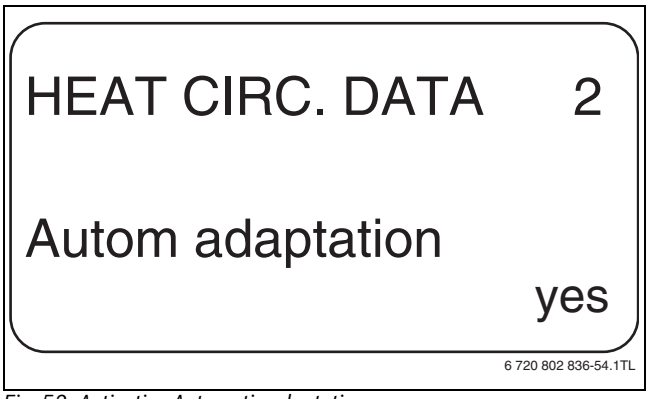


Fig. 52 Activating Automatic adaptation

▶ Release **Display** to save your input.
▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Autom adaptation	Yes No	no

Table 60 Setting range Automatic adaptation

11.16 Setting switching optimisation

A remote control with a room temperature sensor must be installed for the **Optimisation** function.

The function **Optimisation for** is not activated in the factory.

The following variations are possible:

Optimisation	Explanation
Start	If **Start** is selected, heat-up commences before the actual switching time. The control calculates the start-up time, so that the set room temperature is achieved at the set switching point.
Stop	If **Stop** is selected, the system begins the setback, where possible, prior to the actual setback time to save energy. If a room cools down unexpectedly or suddenly, the stop optimisation is terminated and heating continues normally up to the programmed setback time.
switch-on/off	If **switch-on/off** is selected, both optimisation versions are used.
none	If **none** is selected, no switching optimisation is performed.

Table 61 Switching optimisation

As the start optimisation is limited to 240 minutes, start optimisation is frequently inappropriate for systems with a long heat-up time.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **Heating circ.** + no. appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Optimisation for** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

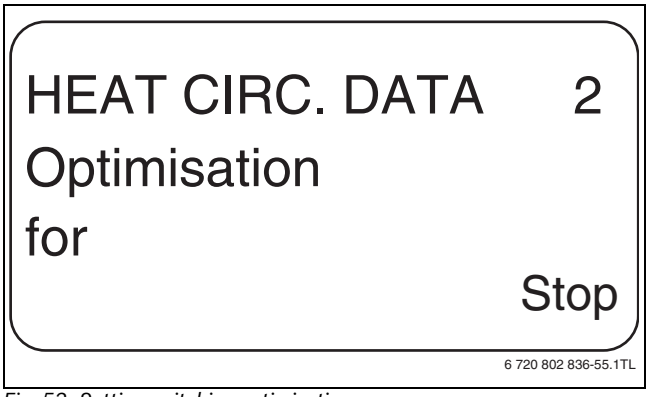


Fig. 53 Setting switching optimisation

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Optimisation	none Start Stop Start/Stop	none

Table 62 Setting range Optimisation

11.17 Set stop optimisation time

If switching optimisation is set to **Stop** or **Start/Stop**, you can enter when the setback operation should begin. The setting must only be changed if so required.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **Heating circ.** + no. appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Stop optim. time** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

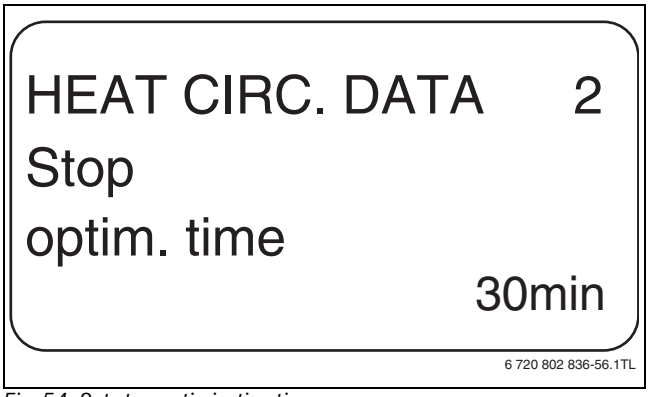


Fig. 54 Set stop optimisation time

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Stop optim. time	10 min – 60 min	60 min

Table 63 Setting range Stop optimisation time

11.18 Setting frost protection temperature

Only change the frost protection temperature in special circumstances.

The circulation pump is automatically switched on as soon as a set outside temperature threshold is reached.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **Heating circ.** + no. appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Frost prot from** appears.

▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

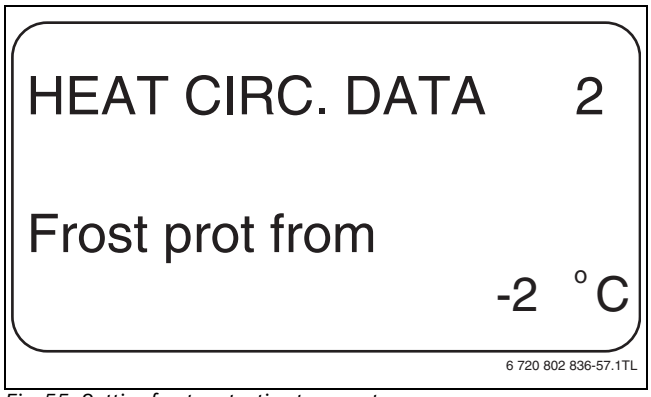


Fig. 55 Setting frost protection temperature

▶ Release **Display** to save your input.
▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Frost prot.	−20 °C – 1 °C	1 °C

Table 64 Setting range Frost protection

11.19 Setting DHW priority

If you activate the function **DHW priority**, the circulation pumps of all heating circuits are switched off whilst DHW is being heated.

In mixed heating circuits, the mixer is moved towards "Mixer closes" (colder).

▶ Call up the service level.
The first main menu is **General Param**.
▶ Turn the rotary selector until main menu **Heating circ.** + no. appears.
▶ Press **Display** to call up a submenu.
▶ Turn the rotary selector until submenu **DHW priority** appears.
▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

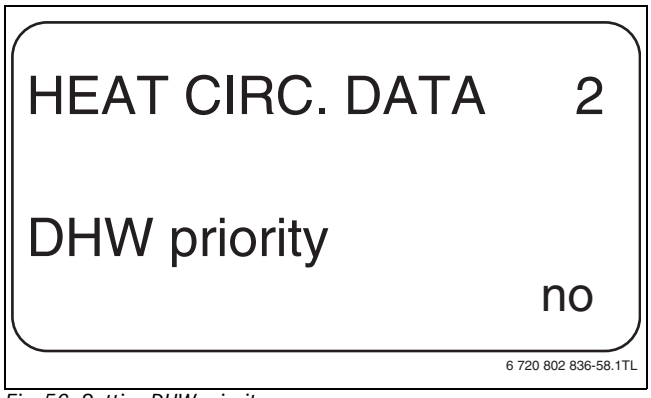


Fig. 56 Setting DHW priority

▶ Release **Display** to save your input.
▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
DHW priority	Yes No	yes

Table 65 Setting range DHW priority

11.20 Setting the heating circuit actuator

The **Actuator** function enables you to enter whether a heating circuit actuator (mixer) is installed or not.

The control unit drives the actuator if it is installed in the heating circuit (mixer).

The heating circuit is regulated via the boiler flow temperature if no heating circuit actuator is installed.

▶ Call up the service level.
The first main menu is **General Param**.
▶ Turn the rotary selector until main menu **Heating circ.** + no. appears.
▶ Press **Display** to call up a submenu.
▶ Turn the rotary selector until submenu **Actuator** appears.
▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

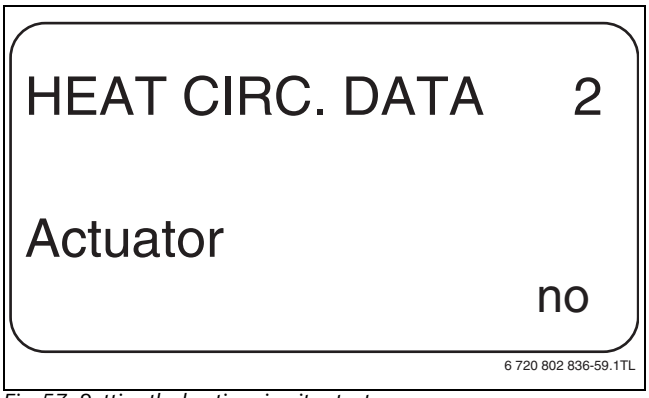


Fig. 57 Setting the heating circuit actuator

▶ Release **Display** to save your input.
▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Actuator	Yes No	yes

Table 66 Setting range Actuator

11.21 Set the actuator run-time

This parameter determines the runtime of the existing actuators. Generally, servomotors have a runtime of 120 s.

If a constant oscillation of the mixer is noticeable, slow down the control characteristics by reducing the actuator runtime. Then the constant cycling of the mixer will stop.

▶ Call up the service level.
The first main menu is **General Param**.
▶ Turn the rotary selector until main menu **Heating circ.** + no. appears.
▶ Press **Display** to call up a submenu.
▶ Turn the rotary selector until submenu **Actuator runtime** appears.

▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

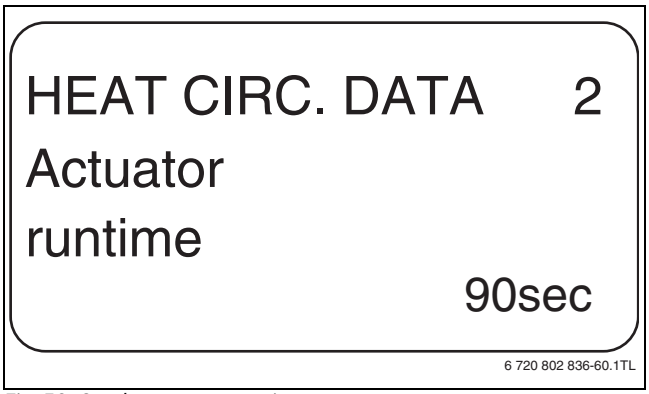


Fig. 58 Set the actuator run-time

▶ Release **Display** to save your input.
▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Actuator runtime	100 sec – 600 sec	120 sec

Table 67 Setting range Actuator runtime

11.22 Setting the Boiler raising

If a heating circuit is controlled with an actuator, a higher set value should be set for the boiler than the normal set value for the heating circuit.

The **Boiler raising** setting corresponds to the temperature differential between the set boiler temperature and the set heating circuit temperature.

▶ Call up the service level.
The first main menu is **General Param**.
▶ Turn the rotary selector until main menu **Heating circ.** + no. appears.
▶ Press **Display** to call up a submenu.
▶ Turn the rotary selector until submenu **Boil.raising** appears.
▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

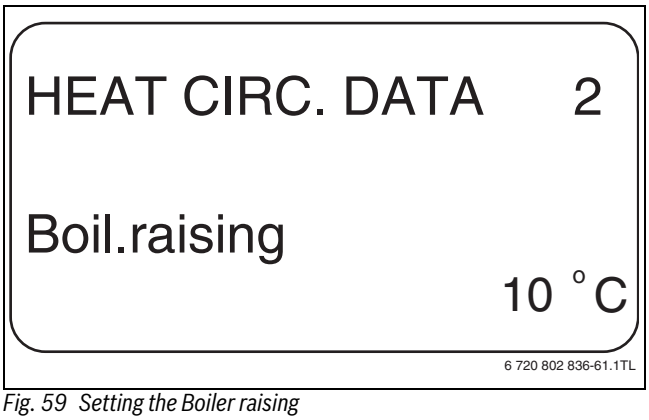


Fig. 59 Setting the Boiler raising

▶ Release **Display** to save your input.
▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Boil. raising	0 °C – 20 °C	5 °C

Table 68 Setting range Boiler raising

11.23 Setting the external changeover

Not available for **Room controller** heating system.

The **External changeover** menu item is only displayed if **none** was selected under menu item **Remote control** and the Logamatic 4121 control unit has been installed.

Terminals WF1 / 2 / 3 of the control unit can be used in either of the areas DHW, heating circuit 1 or heating circuit 2.

The menu item also does not appear if the **Room controller** heating system has been selected, as this requires a remote control to be installed. This function is turned off at the factory.

Either of the following two changeover functions can be selected:

- **1. changeover** Day/night via the terminals WF1 and WF3
  - Contact WF1 and WF3 closed = day mode
  - contact WF1 and WF3 open = night mode
- **2. changeover** day/night/aut via terminals WF1, WF2, WF3
  - Contact WF1 and WF3 closed = day mode
  - Contact WF1 and WF2 closed = night mode
  - all contacts open = automatic mode

Activation of **2. changeover** is only possible if terminals WF1 and WF2 are not assigned via the "External fault message - pump".

Day mode will be run constantly if both contacts are simultaneously closed.

▶ Call up the service level.
The first main menu is **General Param**.
▶ Turn the rotary selector until main menu **Heating circ.** + no. appears.
▶ Press **Display** to call up a submenu.
▶ Turn the rotary selector until submenu **External Day/night/aut** appears.
▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

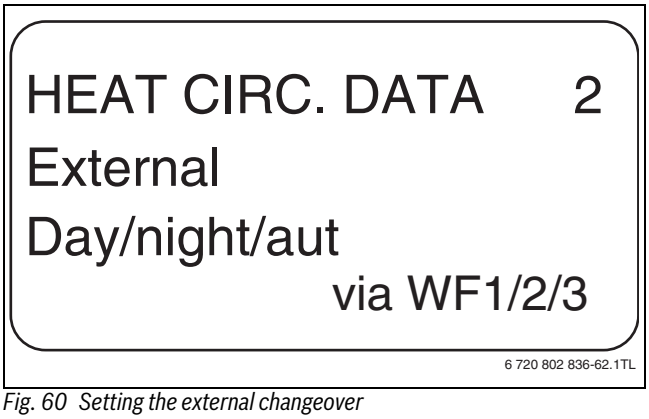


Fig. 60 Setting the external changeover

▶ Release **Display** to save your input.
▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
External Day/night/ aut	none day via WF1/3 via WF1/2/3	none

Table 69 Setting range External changeover

11.24 External fault message - pump

This function is turned off at the factory.

This menu item determines whether fault messages relating to a pump should be displayed.

You may connect an external zero volt fault relay to terminals WF1 and WF2. A fault message will be displayed if the contact is open.

Terminals WF1 / 2 / 3 of the control unit can be used in either of the areas DHW, heating circuit 1 or heating circuit 2.

If an entry was made under menu item **External day/night/aut via WF1/2/3**, this menu item cannot be called up as the input contacts are already assigned.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **Heating circ.** + no. appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **External fault message pump** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

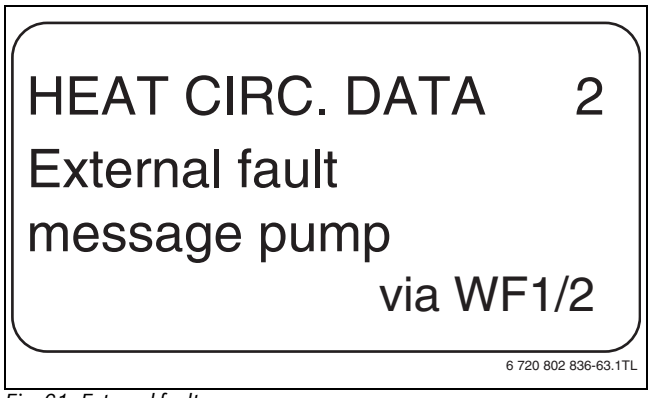


Fig. 61 External fault message - pump

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
External fault message pump	none via WF1/2	none

Table 70 Setting range External fault message - pump

11.25 Cement drying

If the heating system comprises underfloor heating, this control unit a drying program for the screed can be entered. The heating system must be set to **Underfloor**.

Check with your screed contractor for special requirements for cement drying prior to enabling this function.

After a power failure, cement drying continues from where it was interrupted.

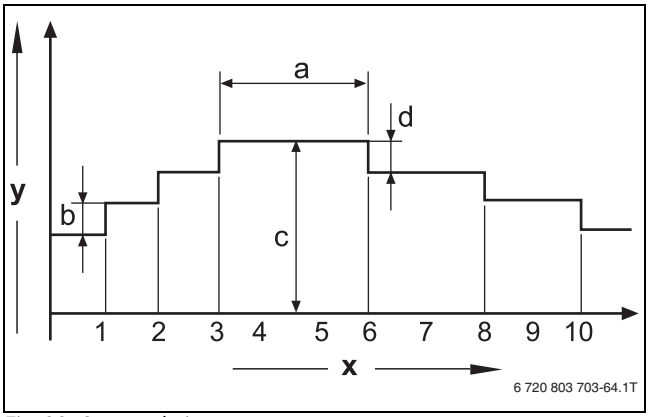


Fig. 62 Cement drying

[x] Time (days)
[y] Temperature
[a] 3 days' hold time
[b] Temp increase by
[c] max. temperature
[d] Setback by

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **Heating circ.** + no. appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Screed drying** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

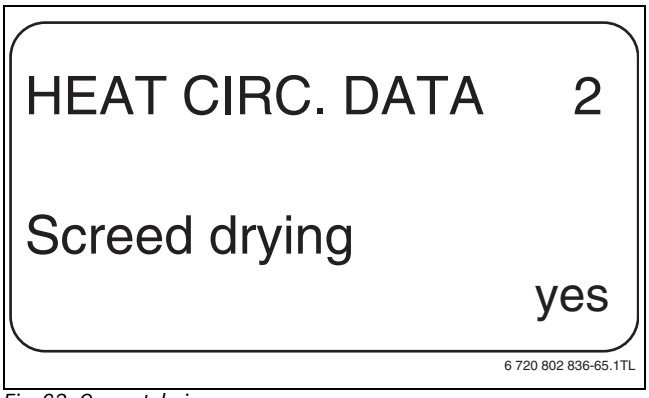


Fig. 63 Cement drying

- ▶ Release **Display** to save your input.

	Input range	Factory setting
Screed drying	no yes	no

Table 71 Setting range Cement drying

Parameters on the following pages enable you to select the temperatures and settings for the drying period. The setting reverts automatically to **No** as soon as the drying process has been completed.

11.25.1 Setting the temperature rise

This option determines the steps in which the temperature should increase to dry out the screed.

Temperature rise begins at 20 °C.

- ▶ Turn the rotary selector until submenu **Screed drying Temp increase by** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

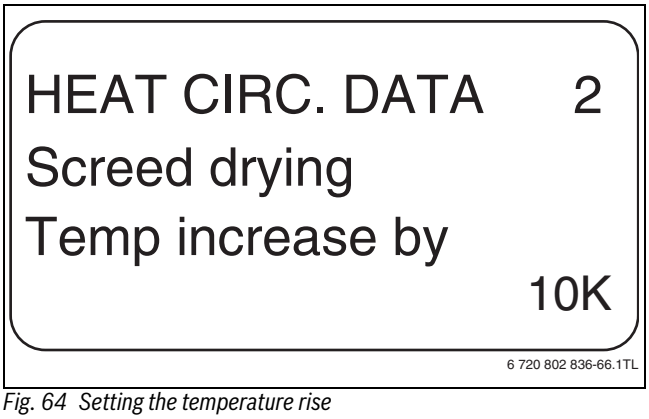


Fig. 64 Setting the temperature rise

- ▶ Release **Display** to save your input.

	Input range	Factory setting
Screed drying Temp increase by	1 K – 10 K	5 K

Table 72 Setting range Temp increase by

11.25.2 Setting the heat-up time

By setting the **Increase** parameter, you can determine in which daily cycle the temperature should increase to dry out the screed.

- ▶ Turn the rotary selector until submenu **Screed drying Increase** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

Fig. 65 Setting the heat-up time

- ▶ Release **Display** to save your input.

	Input range	Factory setting
Increase in daily cycles	every day – every 5th days	every day

Table 73 Setting range Increase in daily cycles

11.25.3 Setting the maximum temperature

This setting determines the maximum temperature for cement drying.

- ▶ Turn the rotary selector until submenu **Screed drying Max. temperature** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

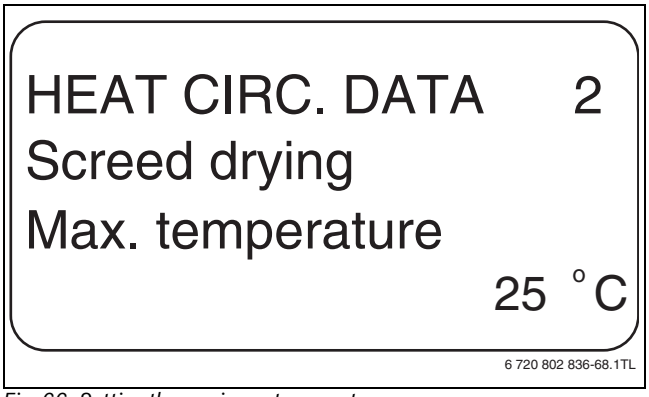


Fig. 66 Setting the maximum temperature

- ▶ Release **Display** to save your input.

	Input range	Factory setting
Max. temperature	25 °C – 60 °C	45 °C

Table 74 Setting range Maximum temperature

11.25.4 Setting the hold time

This setting determines the holding period of the maximum temperature for cement drying.

- ▶ Turn the rotary selector until submenu **Screed drying Hold max temp** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

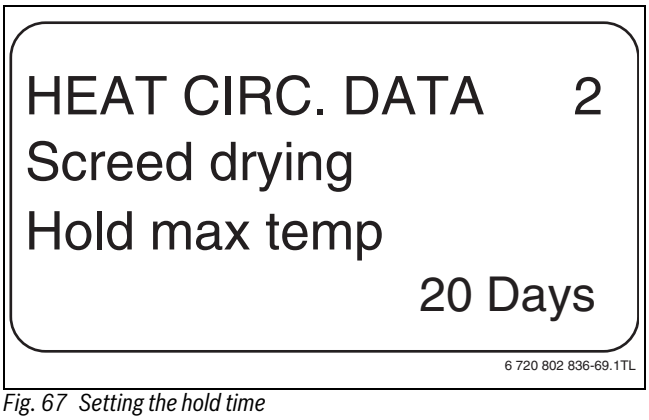


Fig. 67 Setting the hold time

- ▶ Release **Display** to save your input.

	Input range	Factory setting
Hold max temp	0 days – 20 days	4 days

Table 75 Setting range Hold max temp

11.25.5 Setting the setback temperature

This option determines the steps in which the temperature should decrease to dry out the screed.

- ▶ Turn the rotary selector until submenu **Screed drying T. setback by** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

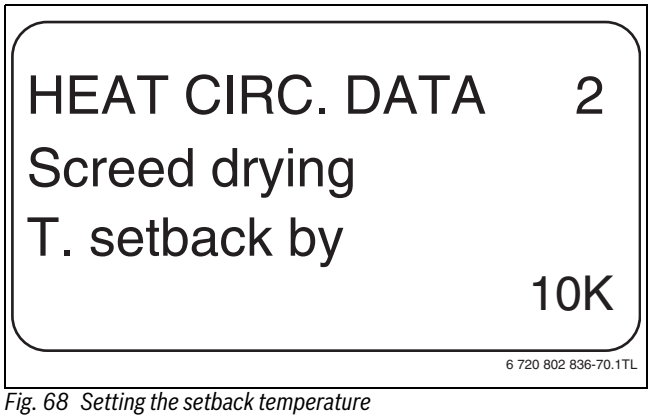


Fig. 68 Setting the setback temperature

- ▶ Release **Display** to save your input.

	Input range	Factory setting
Setback by	1 K – 10 K	5 K

Table 76 Setting range Setback by

11.25.6 Setting the setback time

This option determines in which daily cycle the temperature should fall to dry out the screed.

- ▶ Turn the rotary selector until submenu **Screed drying Setback** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

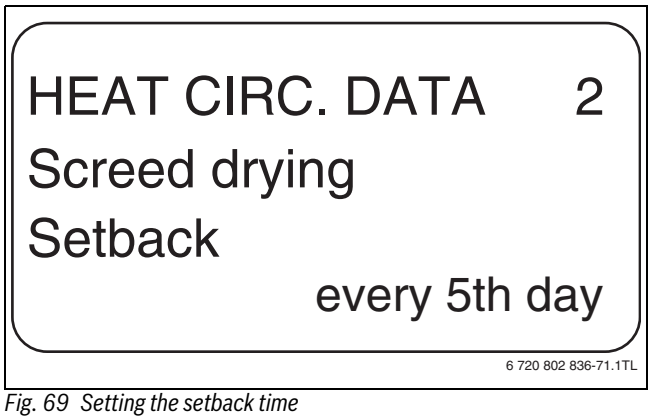


Fig. 69 Setting the setback time

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

By setting **None**, cement drying will be completed at the end of the maximum hold time.

	Input range	Factory setting
Setback in daily cycles	none every day – every 5th day	every day

Table 77 Setting range Setback in daily cycles

12 DHW data

The **DHW** menu can only be called up if a module with DHW function has been installed in the control unit. The available settings are subject to the installed module.

12.1 Select DHW cylinder

Here you can select the type of hydraulic connection for the DHW cylinder.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **DHW** appears.
- ▶ Press **Display** to call up a submenu.
  The first menu item **4000-DHW Tank** is displayed. The setting must be selected if DHW sensors and a cylinder primary pump are connected to the Logamatic 4000 control unit.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

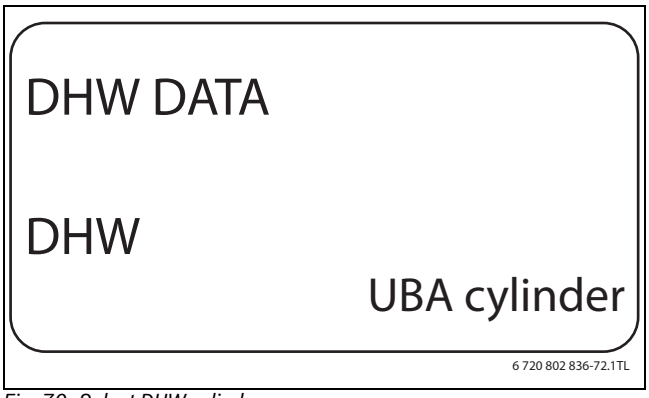


Fig. 70 Select DHW cylinder

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

Subject to boiler type, the UBA or EMS settings will be hidden. The settings are internally checked for plausibility, and adjusted if required.

	Input range	Factory setting
DHW cylinder	No 4000-DHW Tank UBA cylinder UBA throughput EMS 3-way valve EMS primary pump EMS DHW heater	4000-DHW Tank

Table 78 Setting range for DHW cylinder

Parameter	4000-DHW Tank	UBA cylinder	UBA throughout	EMS 3-way valve	EMS primary pump	EMS DHW-heater
Setting the temperature range	X	X	X	X	X	X
Selecting switching optimisation	X	X		X	X	
Selecting residual heat use	X			X	X	
Setting hysteresis	X			X	X	
Thermal disinfection[1)]	X	X		X	X	
Daily heat-up	X	X	X	X	X	X
DHW circulation pump[1)]	X			X	X	

Table 79 Possible parameters, subject to hydraulic connection

1) with subsequent settings

Please observe the following if a wall mounted boiler using stratification technology is installed, e.g. Logamax plus GB152 xx T xx S or Logamax plus GB162 xx T xx S:

- Parameter settings
  - DHW type: **EMS 3-way valve**
  - Thermal disinfection: **No**
  - DHW circulation pump: **No**
  - Max. setting for DHW temperature (range): **60 °C**
- No solar DHW heating
- The DHW hysteresis is permanently set inside the boiler. This setting has priority over any change that may be made in the menu.
- DHW comfort function: In night mode, the boiler may start when DHW is drawn (subject to the actual DHW temperature and amount of DHW drawn).
- Display of the throughput (via flow meter) via BC10.

12.2 Setting the temperature range

This function determines the upper limit for the set DHW temperature.

WARNING: Risk of scalding through hot water.
Setting the temperature above 60 °C creates a risk of scalding.
▶ Do not draw off DHW unmixed.

▶ Call up the service level.
The first main menu is **General Param**.
▶ Turn the rotary selector until main menu **DHW** appears.
▶ Press **Display** to call up a submenu.
▶ Turn the rotary selector until submenu **Range to** appears.
▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

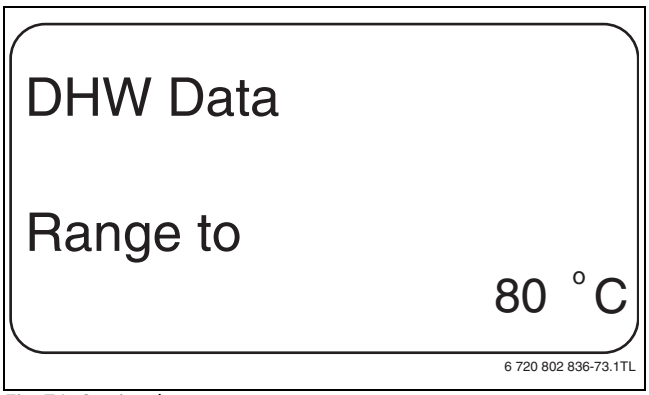


Fig. 71 Setting the temperature range

▶ Release **Display** to save your input.
▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Range to	60 °C – 80 °C	60 °C

Table 80 Setting range Range to

12.3 Selecting switching optimisation

If the **Optimisation** function has been selected, the DHW starts to heat up before the actual start point. The control unit calculates the start time, taking into consideration the residual cylinder heat and the commencement of heating for the heating circuits, so that the DHW temperature is reached at the time you have selected.

This function is not possible if **UBA throughput** or **EMS DHW heater** have been set in the **DHW** function (→ chapter 12.1, page 38).

▶ Call up the service level.
The first main menu is **General Param**.
▶ Turn the rotary selector until main menu **DHW** appears.
▶ Press **Display** to call up a submenu.
▶ Turn the rotary selector until submenu **Optimisation for switch-on** appears.
▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

Fig. 72 Selecting switching optimisation

▶ Release **Display** to save your input.
▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Optimisation	Yes No	no

Table 81 Setting range DHW optimisation

12.4 Selecting residual heat use

if the **Resid. heat use** function has been selected, the residual heat from the boiler can be used to heat the cylinder.

The **Resid. heat use** function cannot be used with multi-boiler systems. It is inappropriate for wall-mounted boilers as the low water content means hardly any residual heat is available. In such cases we recommend that you turn "Resid heat use" OFF.

Residual heat utilisation	Explanation
yes	If "Resid. heat use yes" is selected, the control unit calculates the shutdown temperature of the burner and the runtime of the primary pump via the residual boiler heat, until the cylinder is fully heated. The burner is switched OFF before the set domestic hot water temperature is reached. The cylinder primary pump continues to operate. The control unit calculates the temperature.
no	If "Resid. heat use no" is selected, only little residual heat is used. The burner runs until the set DHW temperature is reached. The cylinder primary pump runs on for 3 minutes after the burner has been switched off.

Table 82 Residual heat utilisation

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **DHW** appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Rest heat use** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

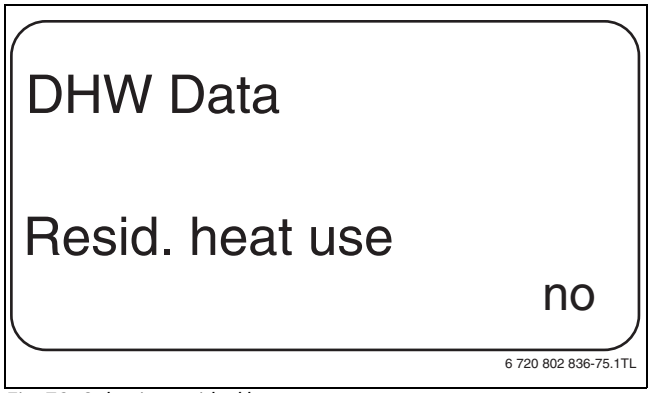


Fig. 73 Selecting residual heat use

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Residual heat utilisation	Yes No	yes

Table 83 Setting range Residual heat utilisation

12.5 Setting hysteresis

With the **Hysteresis** function you can determine, at how many Kelvin (K) below the set DHW temperature the reheating of the cylinder begins.

This function is only possible if **4000-DHW Tank** has been set in the **DHW** function (→ chapter 12.1, page 38).

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **DHW** appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Hysteresis** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

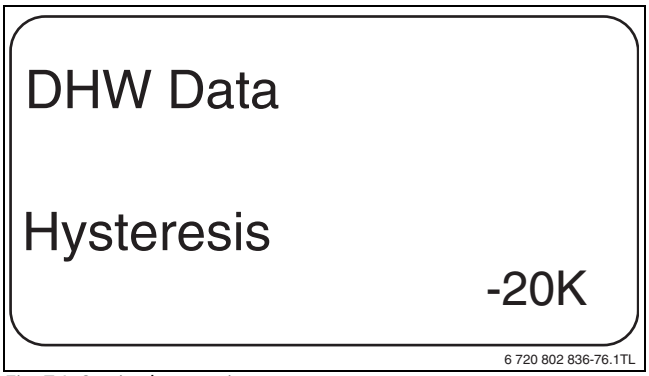


Fig. 74 Setting hysteresis

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Hysteresis	–20 K to 2 K	–5 K

Table 84 Setting range Hysteresis

12.5.1 Setting stop hysteresis

If you selected the FM445 LAP module, you can determine with the **Stop hysteresis** function, how close the temperature of the "Stop sensor" must be to the set DHW temperature to end heating.

The stop sensor is generally located in the lower part of the cylinder.

Stop temperature = set DHW temperature – stop hysteresis

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **DHW** appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Stop Hysteresis** appears.

▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

Fig. 75 Setting stop hysteresis

▶ Release **Display** to save your input.
▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Stop hysteresis	–15 K to –2 K	–5 K

Table 85 Setting range for stop hysteresis

12.5.2 Setting start hysteresis

If you selected the FM445 LAP module, you can determine with the **Start hysteresis** function, by what setting the temperature of the "Start sensor" can drop in relation to the stop temperature (but not in relation to the set DHW temperature), before reheating can begin.

Start temperature = Stop temperature - start hysteresis

▶ Call up the service level.
The first main menu is **General Param**.
▶ Turn the rotary selector until main menu **DHW** appears.
▶ Press **Display** to call up a submenu.
▶ Turn the rotary selector until submenu **Start Hysteresis** appears.
▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

Fig. 76 Setting start hysteresis

▶ Release **Display** to save your input.
▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Start hysteresis	–15 K to –2 K	–5 K

Table 86 Setting range for start hysteresis

12.6 Primary LAP circuit selection

If you selected the FM445 LAP module, you can use the **LAP primary circuit** function to determine the type of primary circuit control.

WARNING: Risk of scalding through overheating the system!
▶ Only use the UBA or EMS settings if the boiler used incl. KIM number, BCM number and BIM number are approved for this purpose (→ chapter 12.6.1, page 42).
▶ Only use the UBA or EMS settings if the UBA 1.5 software is version 3.4 or higher.

▶ Call up the service level.
The first main menu is **General Param**.
▶ Turn the rotary selector until main menu **DHW** appears.
▶ Press **Display** to call up a submenu.
▶ Turn the rotary selector until submenu **LAP prmary circ.** appears.
▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

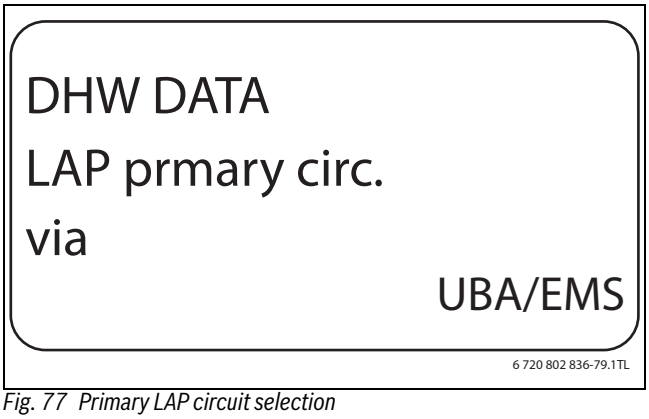


Fig. 77 Primary LAP circuit selection

▶ Release **Display** to save your input.
▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
LAP primary circ.	Pump Actuator UBA/EMS	Pump

Table 87 Setting range for LAP primary circuit

12.6.1 Approved boiler types

Only use the **UBA/EMS** setting for the **LAP primary circuit** for the boilers specified in the list below. Please note the BCM, KIM and BIM numbers.

Type	BCM	Designation of the boiler
EMS/UBA3	1000	Logamax plus GB142 - 30
	1002	Logamax plus GB142 - 24
	1003	Logamax plus GB142 - 15
	1015	Logamax plus GB142 - 45
	1016	Logamax plus GB142 - 60
	1025	Logamax plus GB132 - 16
	1026	Logamax plus GB162 - 100
	1027	Logamax plus GB162 - 80
	1032	Logamax plus GB132 - 24
	1041	Logamax plus GB132 - 16 multiple
	1042	Logamax plus GB132 - 24 multiple
	1051	Logamax plus GB152 - 24
	1052	Logamax plus GB152 - 16
	1061	Logamax plus GB152 - 24 multiple
	1062	Logamax plus GB152 - 16 multiple
Type	**BCM**	**Designation of the boiler**
EMS/UBA 3.5	1072	Logamax plus GB162 - 15
	1073	Logamax plus GB162 - 25
	1074	Logamax plus GB162 - 35
	1075	Logamax plus GB162 - 45
	1107	Logano plus GB202 - 15
	1108	Logano plus GB202 - 25
	1109	Logano plus GB202 - 35
	1110	Logano plus GB202 - 45
Type	**BIM**	**Designation of the boiler**
EMS/SAFe SAFe 40	6031	Logano plus GB312 - 80
	6032	Logano plus GB312 - 120
	6033	Logano plus GB312 - 160
	6034	Logano plus GB312 - 200
	6035	Logano plus GB312 - 240
	6036	Logano plus GB312 - 280
	6037	Logano plus GB312 - 90
	6041	Logano plus GB312 - 80 / NL
	6043	Logano plus GB312 - 160 / NL
Type	**BIM**	**Designation of the boiler**
EMS/SAFe SAFe 40	6044	Logano plus GB312 - 200 / NL
	6045	Logano plus GB312 - 240 / NL
	6046	Logano plus GB312 - 280 / NL
	6047	Logano plus GB312 - 90 / NL

Table 88 Approved boiler types

Type	KIM	Designation of the boiler
UBA 1 UBA 1.5	74	Logamax plus GB112 - 11/s
	76	Logamax plus GB112 - 19/s
	91	Logamax plus GB112 - 24
	93	Logamax plus GB112 - 29
	94	Logamax plus GB112 - 43
	97	Logamax plus GB112 - 60 BE
	100	Logamax U112 - 19
	102	Logamax U114 - 19
	107	Logamax U122 - 20
	108	Logamax U122 - 24
	131	Logamax plus GB112 - 24 BE
	133	Logamax plus GB112 - 29 BE
	134	Logamax plus GB112 - 43 BE

Table 88 Approved boiler types

12.6.2 Set the actuator run-time

If an actuator was selected in the **LAP prmary circ.** menu, the actuator runtime can be set here.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **DHW** appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Actuator runtime** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

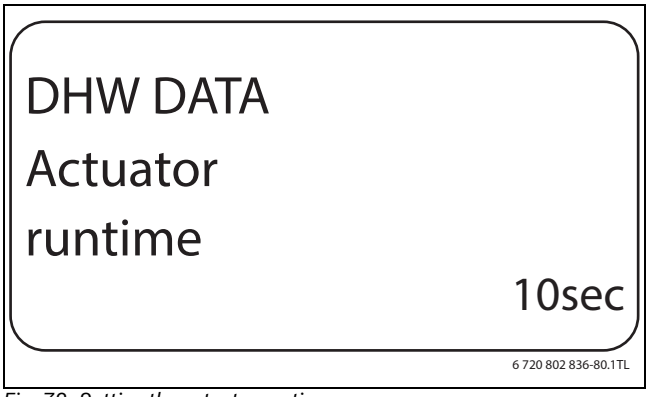


Fig. 78 Setting the actuator runtime

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Actuator runtime	10 sec – 600 sec	120 sec

Table 89 Setting range Actuator runtime

12.7 Setting LAP anti-scaling protection

Scaling may affect the LAP heat exchanger, requiring the anti-scaling protection temperature to be altered.

After DHW heating, the heat exchanger is flooded with DHW until the temperature at the FWS sensor has dropped to the set value. This is designed to prevent the heat exchanger from scaling up. However, a setting that is too low would result in constant mixing of the DHW cylinder content.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **DHW** appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Anti-scale from** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

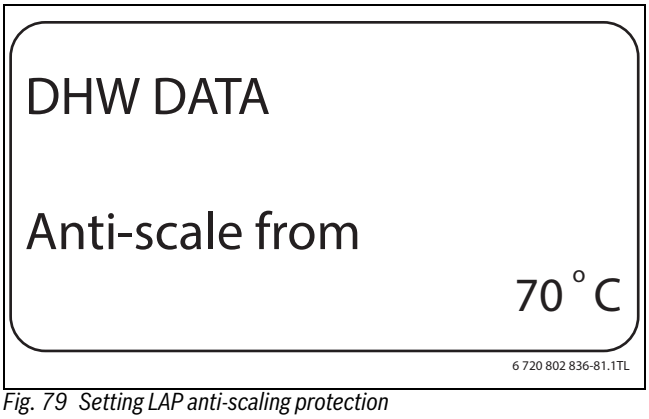


Fig. 79 Setting LAP anti-scaling protection

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Therm. disinfect temperature	50 °C – 80 °C	65 °C

Table 90 Setting range for anti-scaling protection

12.8 Raising the boiler temperature

The **Boiler temperature raising** function allows you to specify the boiler water temperature while the DHW is heating up.

The boiler water temperature raising value is added to the required DHW temperature, and results in the required boiler flow temperature for DHW heating.

The factory setting is best suited for rapid DHW heating.

This function is only possible if **4000-DHW Tank** has been set in the **DHW** function (→ chapter 12.1, page 38).

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **DHW** appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Boiler t raising** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

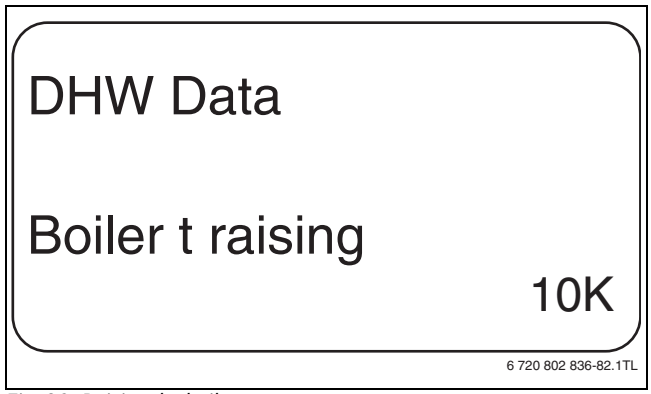


Fig. 80 Raising the boiler temperature

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Boiler t raising	0 K – 40 K	20 K

Table 91 Setting range Boiler temperature raising

12.9 External fault indication (WF1/WF2)

An external zero volt fault indicator contact from a primary pump, a three-way valve or an inert anode can be connected at terminals WF1 and WF2 of modules ZM 424, FM441 and FM445.

For the ZM424, terminals WF1 and WF2 are only available if these inputs are not required for the heating circuits 1 or 2.

- Contacts WF1 and WF2 closed = no fault
- Contacts WF1 and WF2 open = fault condition

Terminals WF1/2/3 of the control unit can optionally be used for DHW, heating circuit 1 or heating circuit 2.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **DHW** appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **External fault Indicator WF1/2** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

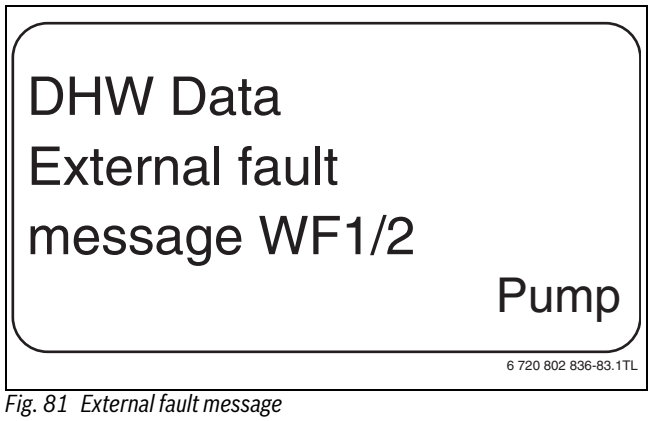


Fig. 81 External fault message

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Fault message (dependent on heat source and module)	None Inert anode Pump 3-way valve	none

Table 92 Setting range External fault message

12.10 External contact (WF1/WF3)

If a zero volt pushbutton is connected at terminals WF1 and WF3 in module ZM424, either **Heating once** or **Therm. disinfect** can be triggered, depending on the setting.

Terminals WF1 and WF3 are, however, only available if these inputs are not already required for heating circuits 1 or 2.

For **Therm. disinfect**, the time switch is then switched off automatically.

Terminals WF1/2/3 of the control unit can optionally be used for DHW, heating circuit 1 or heating circuit 2.

Heating once

If DHW heating has been switched off according to the switching times of the DHW program, Single loading can be started by pushing the pushbutton. The DHW circulation pump starts simultaneously.

Contrary to heating once via the MEC2 programming unit, the heating once process cannot be stopped.

Heating once will only be stopped when the cylinder has been fully heated.

Disinfection

If **Therm. disinfect** is enabled for the external contact, then the zero-volt pushbutton stated above can be used to start thermal disinfection. This disables any existing disinfection programs.

Setting the External contact

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **DHW** appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **External contact WF1/3** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

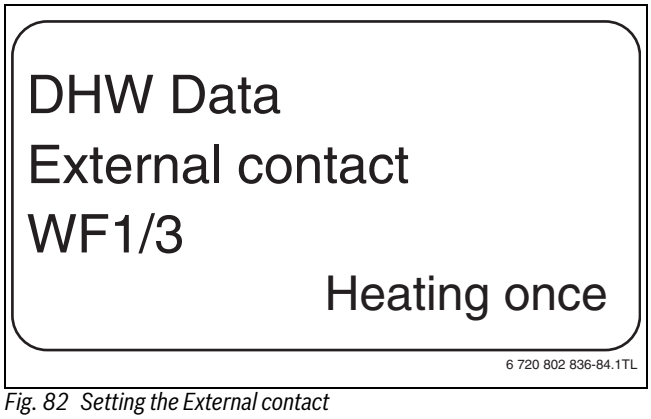


Fig. 82 Setting the External contact

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
External contact	Heating once Therm. disinfect none	none

Table 93 Setting range External contact

12.11 Thermal disinfection

If the Thermal disinfection function is selected, the DHW is brought to a temperature (70 °C) once or several times a week which is high enough to kill off germs (e.g. legionella bacteria).

Both the cylinder charging pump and the DHW circulation pump run constantly during the thermal disinfection process.

If **Therm. disinfect yes** has been selected, disinfection starts according to the factory settings or individual settings that have been made.

Operation of thermal disinfection will be shown via the LED display on the FM441 module.

The factory settings for thermal disinfection can be changed in further menus.

The **Therm. disinfect** function will not be displayed if thermal disinfection was previously set via the **External contact WF 1/3** function.

The system tries to reach the set disinfection temperature for three hours. If it fails, the fault message **Therm. disinfect failed** appears.

The thermal disinfection function can also be set via a proprietary control programme.

12.11.1 Setting thermal disinfection

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **DHW** appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Therm. disinfect** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

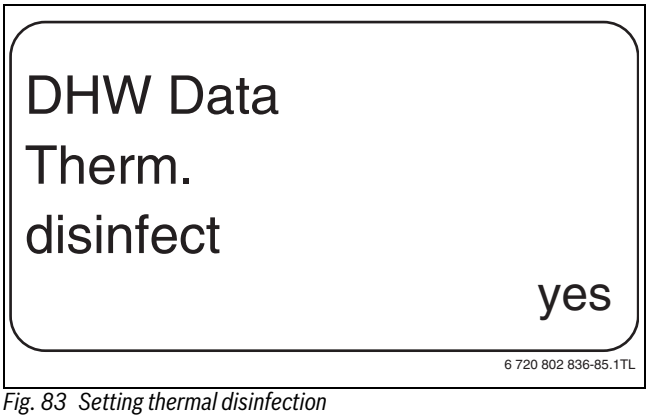


Fig. 83 Setting thermal disinfection

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Therm. disinfect	Yes No	no

Table 94 Setting range Thermal disinfection

12.11.2 Setting the disinfection temperature

The **Temperature Therm. disinfect** function enables the disinfection temperature for thermal disinfection to be set (→ chapter 12.11, page 44).

WARNING: Risk of scalding through hot water.
- ▶ If the DHW circuit is not equipped with a thermostatic mixer, never open the hot water taps/valves on their own (i.e. without mixing in cold water) during or immediately after thermal disinfection.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **DHW** appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Temperature Therm. disinfect** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

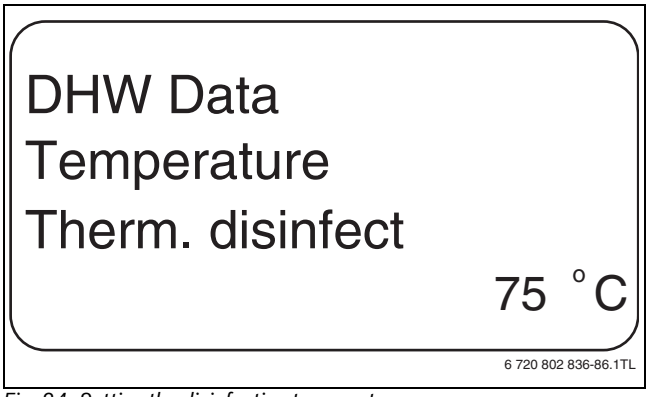


Fig. 84 Setting the disinfection temperature

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Therm. disinfect temperature	65 °C – 75 °C	70 °C

Table 95 Setting range Thermal disinfection temperature

12.11.3 Setting the day of the week for disinfection

The **Weekday Therm. disinfect** function enables the weekday on which disinfection should be performed to be set.

The **Weekday Therm. disinfect** function will not be displayed if thermal disinfection was previously set via the **External contact WF 1/3** function.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **DHW** appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Weekday Therm. disinfect** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

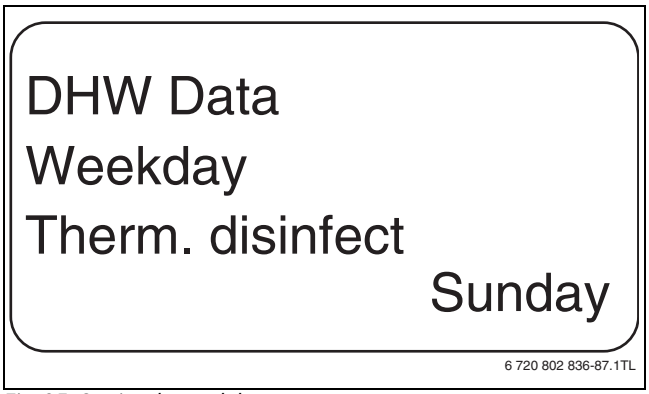


Fig. 85 Setting the weekday

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Weekday Therm. disinfect	Monday – Sunday daily	Tuesday

Table 96 Setting range Weekday Thermal disinfection

12.11.4 Setting the time for disinfection

The **time Therm. disinfect** function enables the time at which disinfection should be performed to be set.

The **time Therm. disinfect** function will not be displayed if thermal disinfection was previously set via the **External contact WF 1/3** function.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **DHW** appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **time Therm. disinfect** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

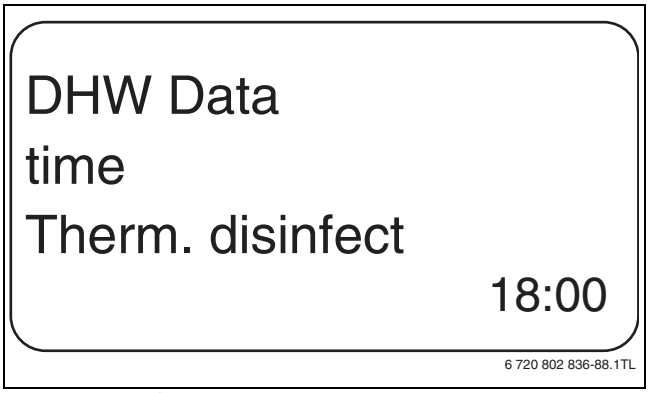


Fig. 86 Setting the time

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
Time Therm. disinfect	00:00 – 23:00 hours	01:00 hours

Table 97 Setting range Time of disinfection

12.12 Setting range Daily heat-up

When daily heat-up is set, the DHW (which may include a solar cylinder, if installed) is heated to 60 °C once a day to prevent legionella bacteria from multiplying in the DHW.

The time when the cylinder is heated can be selected.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **DHW** appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **Daily Heat-up** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

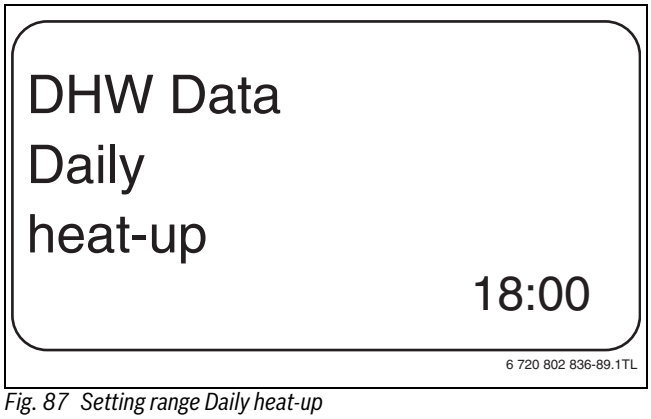


Fig. 87 Setting range Daily heat-up

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

If the DHW was heated to 60 °C within the last 12 hours, it is not heated at the specified time.

	Input range	Factory setting
Daily heat-up	inactive 00:00 – 23:00 hours	Inactive

Table 98 Setting range Daily heat-up

12.13 DHW circulation pump

12.13.1 Selecting the DHW circulation pump

The **DHW Circulat.** function enables DHW to be used immediately at the taps.

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **DHW** appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **DHW Circulat.** appears.
- ▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

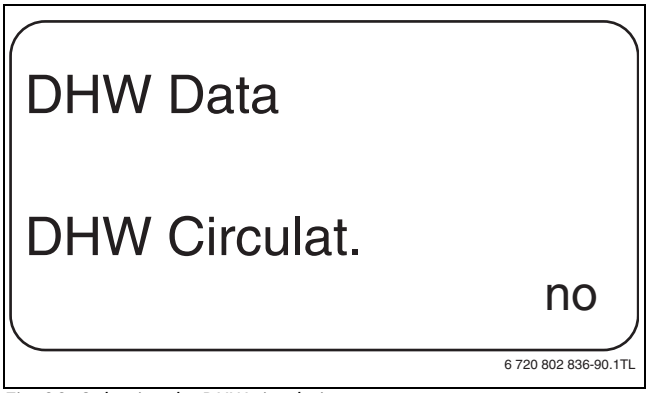


Fig. 88 Selecting the DHW circulation pump

- ▶ Release **Display** to save your input.
- ▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
DHW circulat.	Yes No	yes

Table 99 Setting range DHW circulation

12.13.2 Setting intervals

Operation in intervals saves operating costs for the circulation pump. The **DHW circulation per hour** function enables DHW to be used immediately at the taps.

The set interval applies during the period when the time program enables the DHW circulation pump. This comprises:

- The factory-set DHW circulation pump program
- Your own DHW circulation pump program
- A connection to the heating circuit switching times.

In constant mode the DHW circulation pump operates continuously when in day mode, and is switched off in night mode.

Example

An individual time program has been entered which switches the DHW circulation pump on for the period between 05:30 and 22:00 with the setting **DHW circulation per hour 2 times on**.

The circulation pump is enabled in cycles:

- at 05:30 h for 3 minutes
- at 06:00 h for 3 minutes
- at 06:30 h for 3 minutes
- etc., until 22:00 hours

Setting intervals

- ▶ Call up the service level.
  The first main menu is **General Param**.
- ▶ Turn the rotary selector until main menu **DHW** appears.
- ▶ Press **Display** to call up a submenu.
- ▶ Turn the rotary selector until submenu **DHW Circulat. per hour** appears.

▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

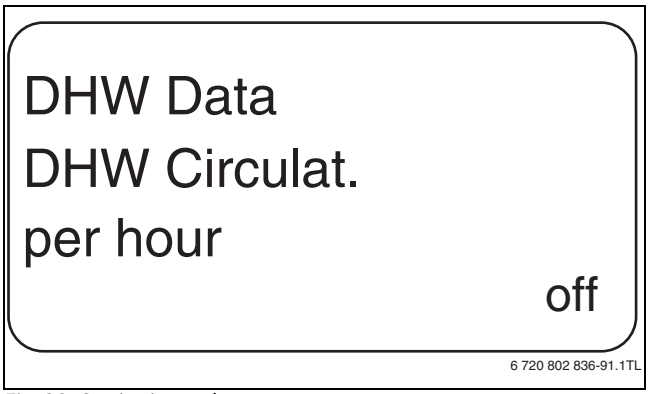


Fig. 89 Setting intervals

▶ Release **Display** to save your input.

▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
DHW circulation per hour	Off 1 time on 2 times on 3 times on 4 times on 5 times on 6 times on Constant operation	2 times on

Table 100 Setting range DHW circulation per hour

12.13.3 Switching off the DHW circulation pump during DHW heating

If the FM445 LAP module has been installed, you can switch the DHW circulation on or off during DHW heating.

The **DHW circ. OFF DHW heating** function can only be used if the FM445 LAP module has been installed.

▶ Call up the service level.
The first main menu is **General Param**

▶ Turn the rotary selector until main menu **DHW** appears.

▶ Press **Display** to call up a submenu.

▶ Turn the rotary selector until submenu **DHW circ. OFF DHW heating** appears.

▶ Hold down button **Display** and turn the rotary selector until the required value is shown.
The DHW circulation pump will now only operate during heating once.

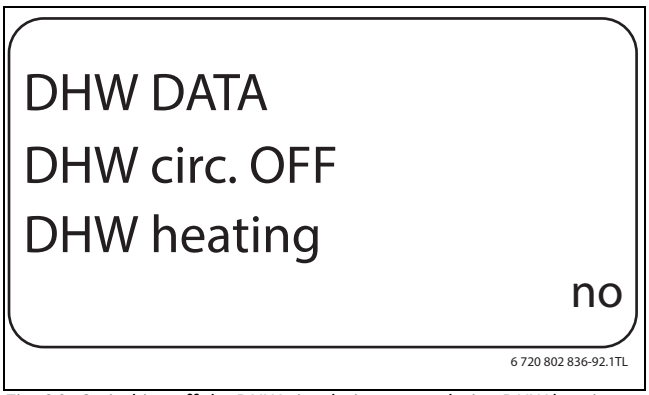


Fig. 90 Switching off the DHW circulation pump during DHW heating

▶ Release **Display** to save your input.

▶ Press **Back** to return to the next higher level.

	Input range	Factory setting
DHW circ. OFF DHW heating	Yes No	yes

Table 101 Setting range for DHW circulation off during DHW heating

13 Special parameter

This parameter enables experts to optimise the system beyond the standard parameters by fine-tuning the sub-parameters.

This level is reserved for trained contractors. Therefore, settings are not made in plain text but in code. These are explained in a separate document.

The "Logamatic 4000 special parameters" document is available on request.

14 Heating curve

Using the **Heat. curves** menu you can display the current heating curves of the relevant heating circuit.

The flow temperatures (VL), which depend on the outside temperature (AT), are displayed.

▶ Call up the service level.
The first main menu is **General Param**

▶ Turn the rotary selector until main menu **Heat. curves** appears.

▶ Press **Display** to call up a submenu.

▶ Turn the rotary selector to display the heating curves of all heating circuits.

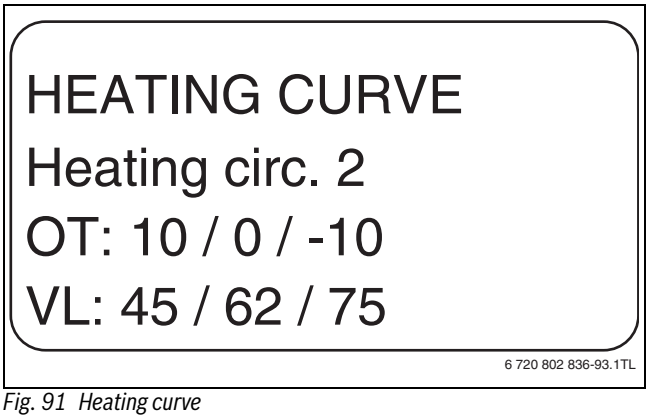


Fig. 91 Heating curve

▶ Press **Back** to return to the next higher level.

15 Relay test

With the **Relay test** menu, you can check whether the external components (e.g. pumps) have been connected correctly.

The display depends on which modules are installed. Depending on the current operating conditions, there may be a time delay between demand and display.

CAUTION: System damage through disabled functions!
The heat supply of the heating system is not assured during the relay test. The control system disables all functions.

▶ Quit the **Relay test** function once the test has been completed to prevent damage to the system.

With the most commonly used modules for the control units, you may call up the following relays:

- Heating circuit 1 – 4
  - Circulation pump
  - Actuator
- Domestic hot water
  - Cylinder primary pump
  - DHW circulation pump

Relay test example

▶ Call up the service level.
The first main menu is **General Param**
▶ Turn the rotary selector until main menu **Relay test** appears.
▶ Press **Display** to call up a submenu.
▶ Turn the rotary selector until submenu **Heating circ. 2** appears.
▶ Press **Display** to call up a submenu.
▶ Turn the rotary selector until submenu **Actuator** appears.
▶ Hold down button **Display** and turn the rotary selector until the required value is shown.

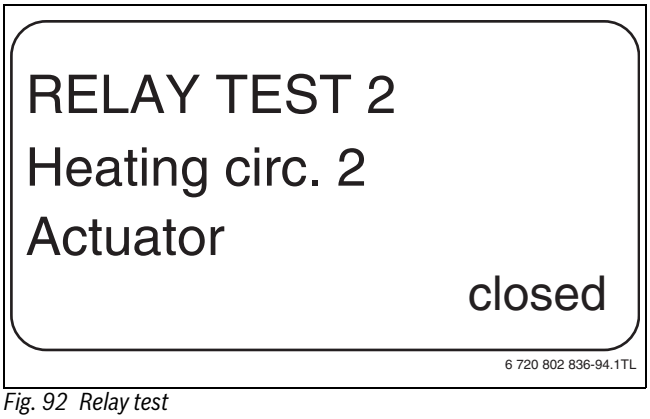


Fig. 92 Relay test

▶ Release **Display** to save your input.
▶ Press **Back** twice to return to the next higher level.
The relay test is terminated.

At the end of the Relay test, all adjustments are cancelled.

16 Carrying out an LCD test

Using the **LCD test** menu, you can check whether all characters and symbols are fully displayed.

▶ Call up the service level.
The first main menu is **General Param**.
▶ Turn the rotary selector until main menu **LCD test** appears.
▶ Press button **Display**.
The LCD is OK, when all symbols are correctly displayed.
▶ Press **Back** to return to the next higher level.

17 Fault log

Using the **Fault log** menu you can display the last four fault messages for the heating system. The MEC2 can only display the fault messages of the control unit with which it is connected.

▶ Call up the service level.
The first main menu is **General Param.**
▶ Turn the rotary selector until main menu **Fault log** appears.
▶ Press button **Display**.
The fault message is displayed.
If the control unit has recorded fault messages, these will be displayed together with the time for the beginning and end of the fault.
The **No fault** message is shown if the connected control unit has not recorded any faults.

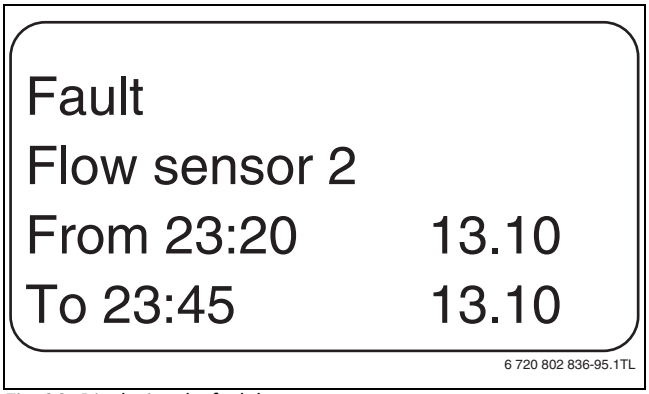


Fig. 93 Displaying the fault log

▶ Turn the rotary selector and scroll through recent fault messages.
▶ Press **Back** to return to the next higher level.

Fault displays

The following faults can be displayed on the control unit if alongside the ZM424, the most commonly used function module FM442 has been installed.

- Outs.temp.sensor
- Flow sensor x
- DHW temp. sensor
- DHW cold
- DHW warning
- Therm. disinfect
- Remote control x
- Communicat. HC x
- Burner x
- Ext. fault ES
- ECOCAN BUS reception
- No master
- BUS Addr confl
- Addr conflict x
- Incorr module x
- Unknown module x

- Inert anode
- ext. fault input
- HE DHW sensor
- DHW sensor off
- Connection BRx
- LLH sensor
- Reversing valve
- Manual mode XX
- Solar cyl. X manual
- Maintenance hours run
- Maint. date
- EMS fault boiler x
- EMS fault DHW
- Maintenance boiler x

18 Monitor data

Using the **Monitor** menu you can display the set and actual settings. The display depends on which modules are installed.

Some display values are separated by a slash. The number in front of the slash specifies the set value of each corresponding parameter and the figure after the slash is the actual value.

The data for the following components (if installed) is displayed:

- Low loss header
- heating circuits
- Domestic hot water (DHW)
- Monitor data of other installed modules

18.1 Shunt monitor data

Using the Monitor menu **Low loss header** you can display the low loss header data.

▶ Call up the service level.
The first main menu is **General Param.**
▶ Turn the rotary selector until main menu **Monitor** appears.
▶ Press **Display** to call up a submenu.
▶ Turn the rotary selector until submenu **Low loss header** appears.
▶ Press **Display** to call up a submenu.
The low loss header data is then displayed.
The **Adjusted** setting describes the outside temperature, taking the type of building into consideration which has already been entered, and with which the heating curves were calculated.

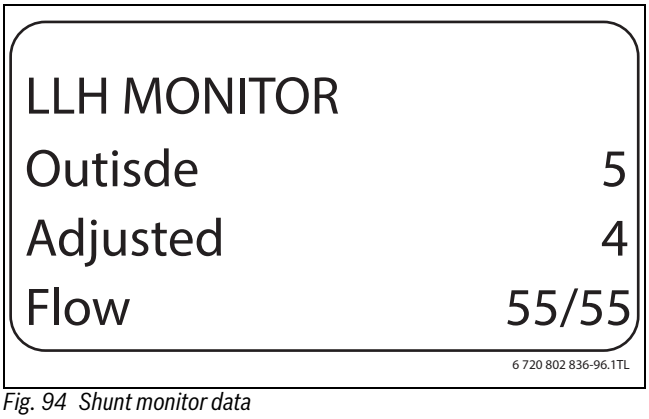


Fig. 94 Shunt monitor data

▶ Press **Back** to return to the next higher level.

18.2 Boiler monitor data

Using the Monitor menu **Boiler** you can display the boiler data.

▶ Call up the service level.
The first main menu is **General Param.**
▶ Turn the rotary selector until main menu **Monitor** appears.
▶ Press **Display** to call up a submenu.
▶ Turn the rotary selector until submenu **Boiler 1** appears.
▶ Press **Display** to call up a submenu.
The data for the monitor are shown in the display.
The **Adjusted** setting describes the outside temperature, taking the type of building into consideration which has already been entered, and with which the heating curves were calculated.

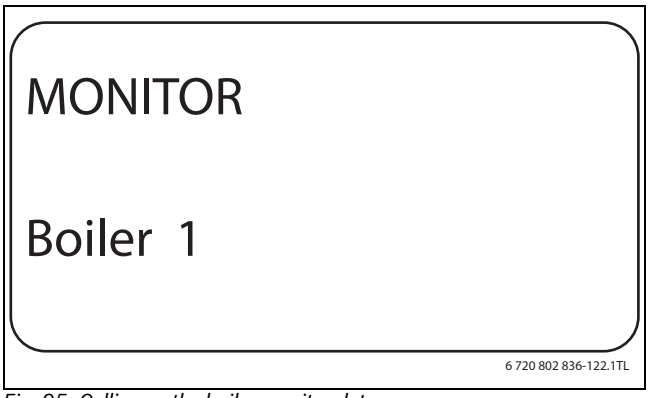


Fig. 95 Calling up the boiler monitor data

▶ Turn the rotary selector to scroll through the boiler monitor data.
Other boiler monitor data is displayed according to the boiler type.
▶ Turn the rotary selector further. Finally, any maintenance messages will be displayed if appropriate.

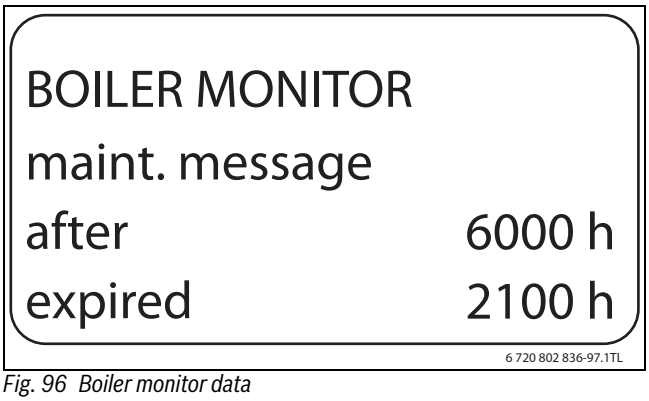


Fig. 96 Boiler monitor data

▶ Press **Back** to return to the next higher level.

The maintenance message **after hours run** is only applicable when there is only one boiler.
The maintenance message **according to date** is only displayed under boiler 1, but applies to all boilers.

Display	Explanation	Unit	Value range
Outside	Outside temperature	°C	
Time del.	Adjusted outside temperature considering the building type entered for calculating the heating curve	°C °C	
Ext. demand	Set value for the boiler flow temperature, only with function module FM456 or FM457 (→ page 12)		

Table 102 Boiler monitor data for boilers with UBA 1.x

Display	Explanation	Unit	Value range
Flow	Set/actual flow temperature	°C	
Return	Return temperature (actual value)	°C	
B starts	Number of burner starts		
Status	Current operating status		
KIM no.	Boiler type (KIM = boiler identification module)		
UBA version	Software version for universal burner control unit		
Output	Current boiler output	%	0 – 100
Max. output	Maximum approved boiler output	%	0 – 100
Pump	Current boiler pump output with modulating pumps or switching state for single stage pumps	%	0 – 100 or on/off

Table 102 Boiler monitor data for boilers with UBA 1.x

Display	Explanation	Unit	Value range
Outside	Actual outside temperature	°C	
Time del.	Adjusted outside temperature considering the building type entered for calculating the heating curve	°C °C	
Ext. demand	Set value for the boiler flow temperature, only with function module FM456 or FM457 (→ page 12)		
Flow	Set/actual flow temperature	°C	
Return	Return temperature (actual value)	°C	
B starts	Number of burner starts		
Status	Current operating status		
Service code	Service code to differentiate between status messages		
KIM	Boiler type and KIM version (KIM = boiler ID module)		
UBA3	Software version for universal burner control unit		
Output	Current boiler output	%	0 – 100
Max. output	Maximum approved boiler output	%	0 – 100 or EMS-WW
Pump	Current boiler pump output with modulating pumps or switching state for single stage pumps	%	0 – 100 or on/off
Maximum	Maximum boiler output	kW	
Max. output	Upper modulation limit	%	0 – 100
Min. output	Lower modulation limit	%	0 – 100
Flue gas	Actual flue gas temperature	°C	
Air	Actual combustion air temperature	°C bar	
Pressure	Actual heating system operating pressure		

Table 103 Boiler monitor data for boilers with EMS/UBA3

Display	Explanation	Unit	Value range
Flame current	Actual flame current	µA	
Pilot	Pilot		on/off
Flame	Flame		on/off
Valve 1	Burner valve stage 1		open/ closed
Valve 2	Burner valve stage 2		open/ closed

Table 103 Boiler monitor data for boilers with EMS/UBA3

Display	Explanation	Unit	Value range
Outside	Actual outside temperature	°C	
Time del.	Adjusted outside temperature considering the building type entered for calculating the heating curve	°C °C	
Ext. demand	Set value for the boiler flow temperature, only with function module FM456 or FM457 (→ page 12)		
Flow	Set/actual flow temperature	°C	
Return	Return temperature (actual value)	°C	
B starts	Number of burner starts		
Status	Current operating status		
Service code	Service code to differentiate between status messages		
BIM	Burner type and BIM version (BIM = burner ID module)		
MC10	Software version of the Logamatic MC10 control unit		
SAFe	Type and software version of the combustion controller SAFe		
Output	Current boiler output	%	0 – 100
Max. output	Maximum approved boiler output	%	0 – 100 or EMS-WW
Pump	Current boiler pump output with modulating pumps or switching state for single stage pumps	%	0 – 100 or on/off
Maximum	Maximum boiler output	kW	
Max. output	Upper modulation limit	%	0 – 100
Min. output	Lower modulation limit	%	0 – 100
Flue gas	Actual flue gas temperature	°C	
Air	Actual combustion air temperature	°C bar	
Pressure	Actual heating system operating pressure		
Flame current	Actual flame current	µA	on/off
Pilot	Pilot		on/off
Flame	Flame		
Valve 1	Burner valve stage 1		open/ closed
Valve 2	Burner valve stage 2		open/ closed

Table 104 Boiler monitor data for boilers with EMS/SAFe

18.3 Heating circuit monitor data

Using the Monitor menu **Heating circ.** you can display the data for one heating circuit.

▶ Call up the service level.
The first main menu is **General Param.**
▶ Turn the rotary selector until main menu **Monitor** appears.
▶ Press **Display** to call up a submenu.
▶ Turn the rotary selector until submenu **Heating circ. 2** appears.
▶ Press **Display** to call up a submenu.
The set and actual values for the flow and room temperatures are displayed.

The last line displays one of the following operating modes:

- Constant night
- Constant day
- Automatic night
- Automatic day
- Holiday
- Summer
- Start optimising
- Stop optimising
- Screed
- DHW Priority
- No setback

▶ Turn the rotary selector to scroll through the heating circuit monitor data.

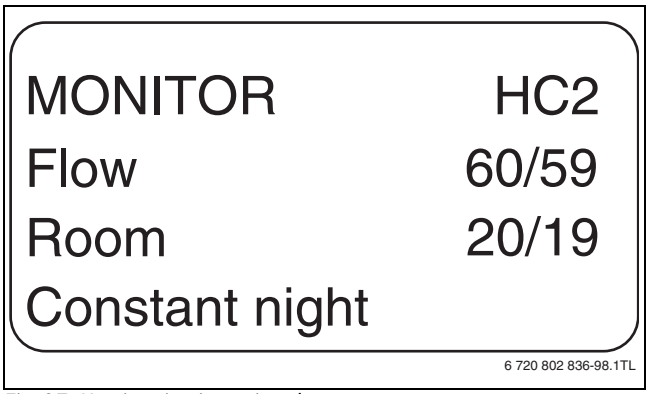


Fig. 97 Heating circuit monitor data

- **Design temperature adaptation**
  This value displays the design temperature calculated by adaptation.

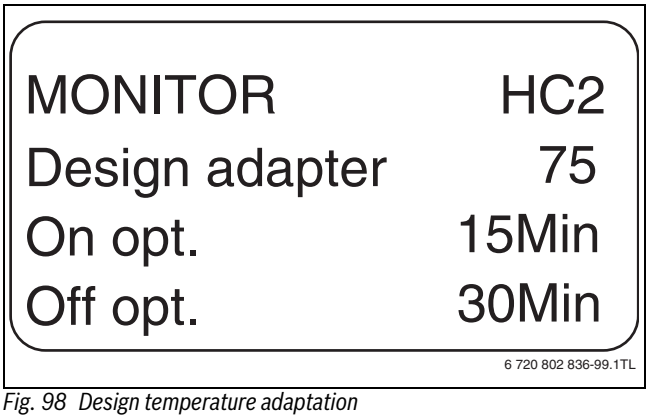


Fig. 98 Design temperature adaptation

- **Start optimisation**
  A calculated period, by which the heating system starts its heating operation prior to the actual switching point, so that the set room temperature is reached by the actual start time.
- **Stop optimisation**
  A calculated period to commence an early setback to save energy.
- **Actuator**
  Indicates the calculated regulating pulse in percent. Example:
  – 0 % = no control
  – 50 % = actuator is regulated in a cycle of 10 seconds for 5 seconds towards "Mixer closes" (hotter).
  – –100 % = actuator is commanded in a cycle of 10 seconds for 10 seconds in the direction "Mixer closes" (colder) (constant).

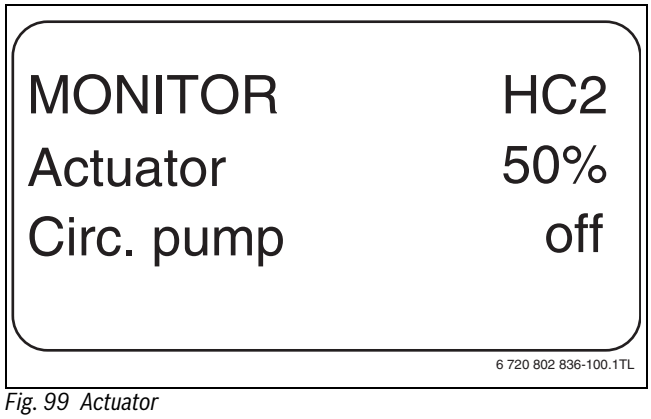


Fig. 99 Actuator

- **Circulation pump**
  Indicates the operating state of the circulation pump.

▶ Press **Back** to return to the next higher level.

18.4 DHW monitor data

Using the Monitor menu **DHW** you can display the data for the DHW settings.

The displays depend on the settings selected under the **DHW** function (→ chapter 12, page 38ff.).

▶ Call up the service level.
The first main menu is **General Param.**
▶ Turn the rotary selector until main menu **Monitor** appears.
▶ Press **Display** to call up a submenu.
▶ Turn the rotary selector until submenu **DHW** appears.
▶ Press **Display** to call up a submenu.
The calculated set value and the actual value for the **DHW temperature** are displayed.

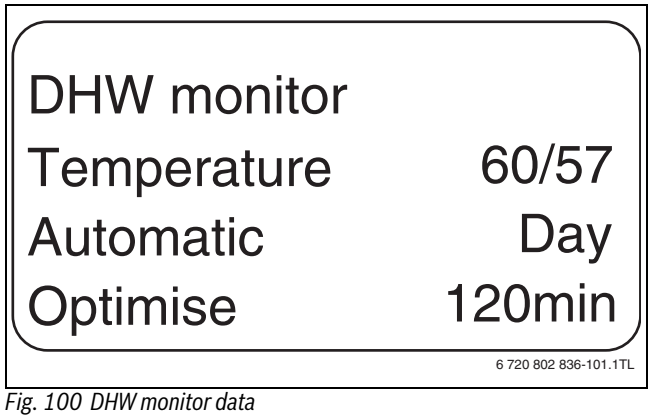


Fig. 100 DHW monitor data

- Possible operating modes:
  – Off
  – Constant operation
  – Automatic night
  – Automatic day
  – Holiday
  – Optimisation
  – Disinfection
  – Reheating
  – Daily heat-up

- **Optimise**
  Indicates the period during which the system commences DHW heating before the actual switching point, to achieve the set DHW temperature in good time.

▶ Turn the rotary selector to scroll through the DHW monitor data.

- **Heating**
  Indicates the operating condition of the cylinder primary pump.
- **DHW circulat.**
  Indicates the operating condition of the DHW circulation pump.

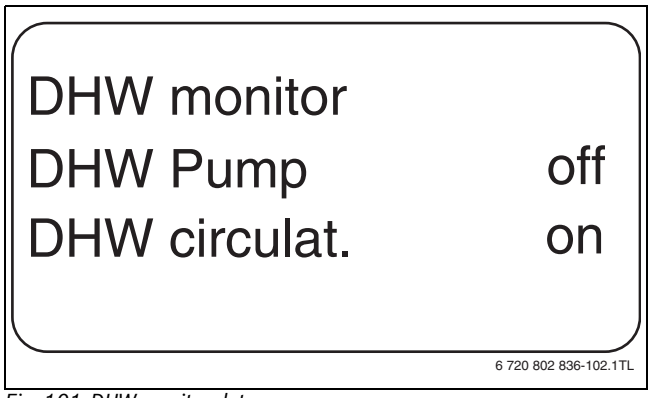


Fig. 101 DHW monitor data

▶ Press **Back** to return to the next higher level.

19 Display version

Using the **Version** menu, the version of the MEC2 programming unit and the selected control unit can be displayed.

▶ Call up the service level.
The first main menu is **General Param.**
▶ Turn the rotary selector until main menu **Version** appears.
▶ Press **Display** to call up a submenu.
The versions for the MEC2 programming unit and the control unit are displayed.

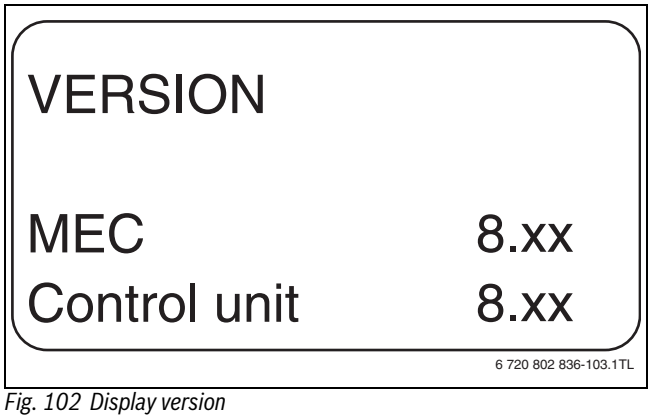


Fig. 102 Display version

▶ Press **Back** to return to the next higher level.

20 Selecting the control unit

Using the **Control unit** menu, a control unit can be selected if the MEC2 is operated **offline**, i.e. without a connected control unit or with a separate power supply unit.

▶ Call up the service level.
The first main menu is **General Param.**
▶ Turn the rotary selector until main menu **Control unit** appears.
▶ Press **Display** to call up a submenu.
The display shows the selected submenu.

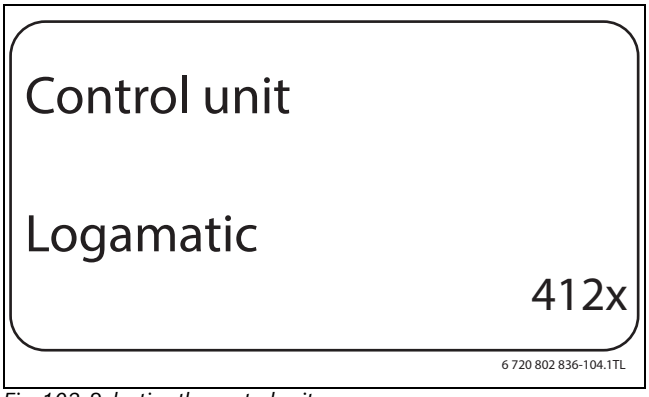


Fig. 103 Selecting the control unit

▶ Press **Back** to return to the next higher level.

21 Reset

With the **Reset** menu, all settings of the operator or service level are reset to the factory settings.
Exception: The timer programme remains in place.

21.1 Resetting all adjustments

All values are automatically reset.

▶ Call up the service level.
The first main menu is **General Param.**
▶ Turn the rotary selector until main menu **Reset** appears.
▶ Press **Display** briefly to call up a submenu.
Control unit settings is shown as first submenu.

All settings may be lost if you press for too long.

▶ Press and hold button **Display**.
The blocks in the last line disappear one after the other. The settings are reset when no further blocks are displayed. If the button is released while a block is still being displayed, then the reset will be terminated. After implementing a reset, the display automatically reverts to the next level up.

Fig. 104 Resetting all adjustments

▶ If the reset is terminated, press **Back** to return to the next higher level.

21.2 Resetting the fault log

Using the **Reset fault log** function you can reset the whole fault memory. This deletes all entries in the fault log.

▶ Call up the service level.
The first main menu is **General Param.**
▶ Turn the rotary selector until main menu **Reset** appears.
▶ Press **Display** briefly to call up a submenu.
The display shows the selected submenu.

All settings may be lost if you press for too long.

▶ Turn the rotary selector until submenu **Fault log** appears.
▶ Press and hold **Display**.
The blocks in the last line disappear one after the other. The fault log is reset after the final block has disappeared. If the button is released before all blocks have disappeared, then the reset will be terminated. After implementing a reset, the display automatically reverts to the next level up.

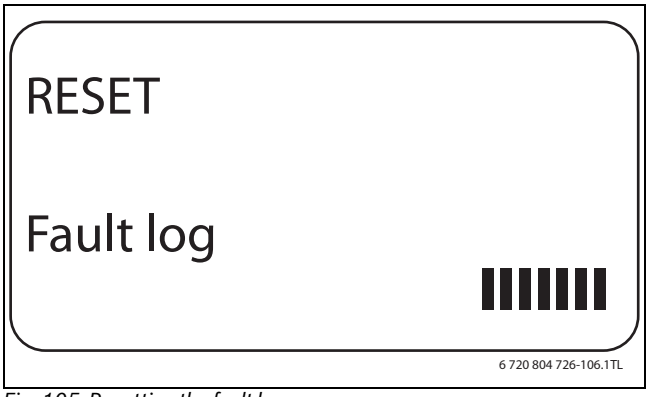


Fig. 105 Resetting the fault log

▶ If the reset is terminated, press **Back** to return to the next higher level.

21.3 Resetting the maintenance message

After servicing has been completed, reset the maintenance message. This means that the maintenance message no longer appears if the flap is closed.

Resetting the maintenance message restarts the maintenance interval. Note that with maintenance messages set according to date, the next maintenance date will be fixed one year in the future.

▶ Call up the service level.
The first main menu is **General Param.**
▶ Turn the rotary selector until main menu **Reset** appears.
▶ Press **Display** briefly to call up a submenu.
The display shows the selected submenu.

All settings may be lost if you press for too long.

▶ Turn the rotary selector until submenu **Maint. message** appears.
▶ Press and hold **Display**.
The blocks in the last line disappear one after the other. The maintenance message is reset after the final block has disappeared. If the button is released before all blocks have disappeared, then the reset will be terminated. After implementing a reset, the display automatically reverts to the next level up.

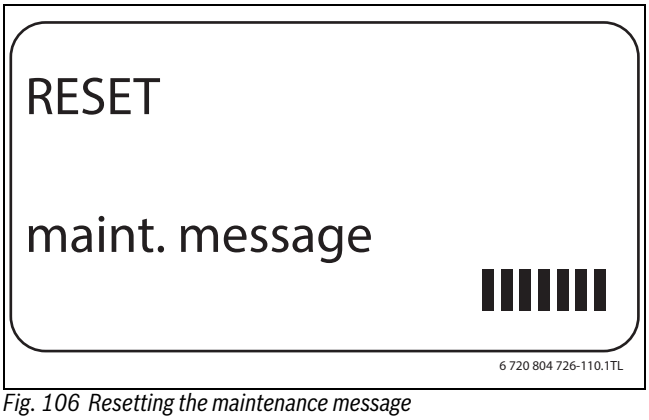


Fig. 106 Resetting the maintenance message

▶ If the reset is terminated, press **Back** to return to the next higher level.

22 Faults and fault finding

22.1 Fault messages

Fault	Effect on control characteristics	Cause	Remedy
Outs.temp.sensor	The minimum outside temperature is applied.	• The outside temperature sensor is either incorrectly connected, e.g. not to the control unit with address 1 in a multi-boiler system, is not connected at all, or is faulty. • Central module or control unit faulty. • Communication to control unit with address 1 is interrupted.	▶ Check whether the outside temperature sensor has been connected to the correct control unit (in multi-boiler systems to the control unit with address 1). ▶ Check communication with address 1. ▶ Replace outside temperature sensor or central module.
Flow sensor x	Mixer is no longer being controlled.	• Sensor incorrectly connected, not connected at all, or faulty. The control unit requires the appropriate flow sensor if an actuator (mixer) was selected in MEC2. • Module or control unit faulty.	▶ Check sensor connection. ▶ If the faulty heating circuit should be operated without a mixer, check in MEC2/Service level/Heating circ., whether **Actuator No** has been selected. ▶ Replace module.
DHW temp. sensor	DHW heating has stopped.	• Sensor incorrectly connected, not connected at all, or faulty. • Module or control unit faulty.	▶ Check sensor connection. ▶ Replace sensor or module. ▶ Check sensor connection on DHW cylinder.
DHW warning	The system tries constantly to load the domestic hot water cylinder.	• Temperature controller/hand switch is not set to **AUT**. • The sensor is incorrectly connected or faulty. • Incorrect sensor arrangement. • Primary pump incorrectly connected or faulty. • Module ZM424 or control unit faulty.	▶ Check that temperature controller or hand switch is set to **AUT**. ▶ Check function of sensor and tank primary pump. ▶ Replace ZM424 module. ▶ Check sensor connection on DHW cylinder.
DHW cold	DHW heating has stopped. Current DHW temperature is below 40 °C.	• Primary pump faulty. • Function module ZM424 faulty. • More DHW is removed than newly heated.	▶ Check that temperature controller or hand switch is set to **AUT**. ▶ Check function of sensor and tank primary pump. ▶ Replace ZM424 module. ▶ Check sensor connection on DHW cylinder.
Therm. disinfect	Thermal disinfection has been interrupted.	• The boiler output is insufficient because e.g. other heat consumers (heating circuits) demand heat during disinfection. • The sensor is incorrectly connected or faulty. • Primary pump incorrectly connected or faulty. • Module or control unit faulty.	▶ Select disinfection at a time when no other heat demand is made. ▶ Check sensor and primary pump function and replace if necessary.
Remote control x	• Because no actual room temperature is available, the effect of the following features is disabled: Room influence, start and stop optimisation, and automatic adaptation. • The control unit works with the last values set on the remote control.	• The remote control unit is incorrectly connected or faulty.	▶ Check function/connection of remote control. Also check the addressing of the remote control. ▶ Replace remote control/function module.
Communicat. HC x	Because no actual room temperature is available, the effect of the following features is disabled: Room influence, start and stop optimisation, and automatic adaptation.	• Incorrect address allocated to remote control. • Remote control is incorrectly wired up. • Remote control is faulty. • Control unit is faulty.	▶ Check function/connection of remote control. Also check the addressing of the remote control. ▶ Replace remote control/function module.

Table 105 fault overview

Fault	Effect on control characteristics	Cause	Remedy
Boiler x	• The boiler protection (frost protection) is not assured. • No DHW. • No heating.	• The UBA reports a locked fault.	▶ Press the burner reset key. ▶ Check the UBA wiring. ▶ Check boiler (→ technical documentation for the boiler).
Boiler x Status: Display code/ Service code	• The boiler protection (frost protection) is not assured. • No DHW. • No heating.	• The EMS boiler reports a lockout fault with display code and service code.	▶ Refer to the detailed fault descriptions in the boiler documentation and take the measure described there. ▶ Press **Reset** on the BC10.
Boiler x EMS fault	• The boiler protection (frost protection) is not assured. • No DHW. • No heating.	• The EMS boiler reports a lockout fault.	▶ Check the display and service code on the BC10. ▶ Refer to the detailed description of the fault provided in the tab. 107, page 58 and take the measures described there. ▶ Press **Reset** on the BC10.
DHW EMS fault	No DHW.	• The EMS boiler reports a fault with the DHW function.	▶ Check the display and service code on the BC10. ▶ Refer to the detailed description of the fault provided in tab. 107, page 58 and take the measures described there.
Boiler x Maintenance Hxx	• None. • Service message, not a plant error	• Example: maintenance interval has expired.	▶ Maintenance required (→ boiler documentation or table providing an overview of the maintenance messages).
Boiler x in manual mode	No automatic functions, e.g. heating program.	• This is not a fault.	▶ If you no longer require manual mode, turn the rotary selectors on the BC10 base controller to **Aut**.
Ext. fault ES	The control characteristics remain unaffected.	• Fault input of module was incorrectly enabled. • Externally connected components are faulty or a fault is pending.	▶ Check the function of external components and repair or replace, if required.
ECOCAN BUS Reception	No effect on control characteristics.	• The rotary encoder behind the MEC2 in the control unit (on CM431) has an incorrect address. • Fault example: System with a control unit and rotary encoder position > 0.	▶ Check rotary encoder position: – Position 0: Only 1 BUS subscriber present. – Position 1: Master control unit (other BUS subscriber is expected). – Setting > 1: another BUS subscriber is expected.
No master	• Boiler protection cannot be ensured. • DHW priority is no longer possible. • Minimum outside temperature is expected. • It goes cold.	• Master control unit (address 1) is switched off or no master (address 1) is available.	▶ Check all BUS subscriber addresses. Address 1 must be allocated to the master control unit (rotary encoder behind MEC2 on CM431 of the control unit). ▶ Checking the BUS connection to address 1.
BUS Addr confl	• BUS communication no longer possible. • All control functions requiring data exchange via the ECOCAN BUS can no longer be implemented.	• Multiple identical addresses are present. • Each address must only be allocated once in the ECOCAN BUS network.	▶ Check the addresses of all BUS subscribers (rotary encoder behind MEC2 on CM431 of the control unit).
Addr conflict x	The functions of the module with the address conflict can no longer be carried out. However, communication of all other modules and control units via the ECOCAN BUS is still possible.	• The module has been plugged into the wrong control unit: Modules can only be operated at specified ECOCAN addresses. • The boiler module ZM424 and modules FM456 and FM457 must not be installed in any control unit with the address > 1.	▶ Check the control unit address.

Table 105 fault overview

Fault	Effect on control characteristics	Cause	Remedy
Incorr module x	Module switches all outputs off and corresponding fault LED on.	• Incorrect module default in MEC2. • Incorrect module installed in the control unit. • The MEC2, corresponding module or control unit is faulty.	▶ Check module defaults at the MEC2 service level. ▶ Check the modules installed in the control unit. ▶ Replace the MEC2 or module.
Unknown module x	Module switches all outputs off and corresponding fault LED on.	• The controller software is too old to recognise the module. • The module or control unit is faulty.	▶ Check the version of the control unit in the MEC2. ▶ Replace module.
Inert anode	No effects on control characteristics.	• Voltage is present at the external input WF1/2. • The module or the control unit is faulty.	▶ Replace inert anode.
ext. fault input	No effects on control characteristics.	• Voltage is present at the external input WF1/2. • The module or the control unit is faulty.	▶ Check connection and function of external components (cylinder primary and DHW circulation pumps) and replace, if required.
HE DHW sensor	DHW heating has stopped.	• Sensor incorrectly connected, not connected at all, or faulty. • Module FM445 or control unit faulty.	▶ Check sensor. ▶ Replace the sensor or the FM445 module. ▶ Check sensor mounting.
DHW sensor off	DHW heating has stopped.	• Sensor incorrectly connected, not connected at all, or faulty. • Module FM445 or control unit faulty.	▶ Check sensor. ▶ Replace the sensor or the FM445 module. ▶ Check sensor mounting.
Connection BRx	• Frost protection cannot be assured. • DHW heating has stopped. • No heating output.	• UBA incorrectly connected. • UBA switched off. • UBA faulty. • Module faulty.	▶ Check connection. ▶ Switch on UBA. ▶ Replace UBA. ▶ Replace KSE module.
LLH sensor	• With single boiler systems: Flow temperature can drop below set value. • With multi-boiler systems: Only one boiler operational.	• Sensor faulty. • Module ZM424, FM456 or FM457 faulty. • Sensor connected to the wrong module.	▶ Check sensor. ▶ Replace module. ▶ Connect sensor to the module in slot 1.
Manual mode XX	Control unit operates in manual mode.	• It is possible that the manual switch of a function module has not been set to **AUT**.	▶ Set the corresponding function module manual control to **AUT**.
Solar cyl. X manual	Solar cylinder X on solar module operates in manual mode.	• It is possible that the manual switch of function module FM443 has not been set to **AUT**.	▶ Set the corresponding function module manual control to **AUT**.
Maintenance hours run/date	No influence on control characteristics.	• The specified period before the next service has expired.	▶ Perform maintenance and then reset maintenance message.

Table 105 fault overview

22.2 Supplementary fault messages for boilers with EMS

Calling up status (display code) and service codes

If a fault occurs, the status is immediately displayed by the control unit. The display flashes when a locking safety shutdown occurs.

- ▶ Press **Status display** to read off the service code.
- ▶ Press **Status display** several times to display other service information until the boiler's status is displayed once more.

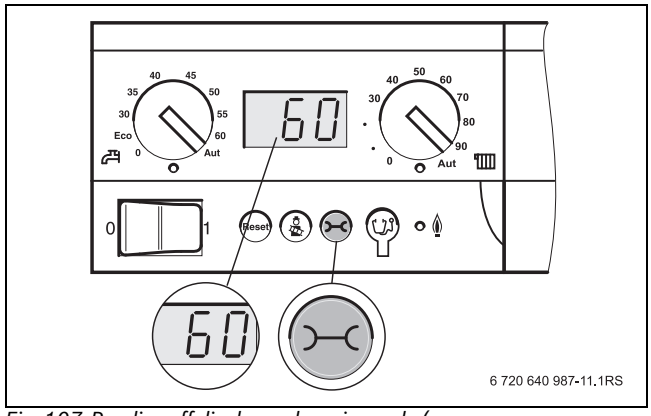


Fig. 107 Reading off display and service code (e.g. Logamatic MC10control unit/BC10 base controller)

DHW EMS faults

DC	SC	Fault	Effect on control characteristics	Cause	Remedy
A01	808	DHW sensor defective	DHW not heated.	• Sensor incorrectly connected or faulty. • Sensor lead break or short circuit. • Sensor aged.	▶ Check DHW sensor connection and replace if necessary.
A01	810	DHW remains cold	• There is a constant attempt to heat the DHW storage tank. • Solar thermal system does not start	• Constant drawing or system leak. • Sensor incorrectly connected or faulty. • Sensor lead break or short circuit. • Sensor aged. • Primary pump incorrectly connected or faulty.	▶ Remedy leaks. ▶ Check DHW sensor connection and replace if necessary. ▶ Check function of sensor and primary pump. ▶ Check sensor connection on DHW cylinder.
A01	811	Thermal disinfection	Thermal disinfection has been interrupted.	• Constant drawing or system leak. • Sensor incorrectly connected or faulty. • Sensor lead break or short circuit. • Sensor aged. • Primary pump incorrectly connected or faulty.	▶ Remedy leaks. ▶ Check DHW sensor connection and replace if necessary. ▶ Check function of sensor and primary pump. ▶ Check sensor connection on DHW cylinder.

Table 106 Possible messages when DHW EMS faults occur

[DC] Display code (status)
[SC] Service code

EMS faults

Other faults are described in the documents relating to the individual boiler.

DC	SC	Fault	Effect on control characteristics	Cause	Remedy
AD1	817	Air temperature sensor is faulty	Fan speed cannot be optimally matched.	• This fault message is generated if the air temperature sensor records a temperature that is too low (< -3 °C) or too high (> +100 °C).	▶ Check the air temperature sensor incl. the plug-in connection on the SAFe and replace if necessary.
AD1	818	Boiler remains cold	Insufficient supply to heating system.	• This fault message appears if the boiler stays below the pump logic temperature (47 °C) for a certain length of time, even though the burner is ON.	▶ Check system design and pump parameters; correct if required. ▶ Check the non-return valve is working and replace if required. ▶ Check whether gravity brakes are in working position.
AD1	819	Oil preheater permanent signal	Burner attempts to start.	• The oil preheater receives an enable signal, even though it is switched off.	▶ Check the plug assignment on the SAFe and oil preheater, and correct if required.
AD1	820	Oil too cold	Burner attempts to start.	• The oil preheater does not respond within 6 minutes indicating that the oil has reached operating temperature.	▶ Check the electrical connection of the oil preheater; if OK, replace the oil preheater.

Table 107 Possible messages when EMS faults occur

[DC] Display code (status)
[SC] Service code

22.3 Maintenance messages for boilers with EMS

DC	Maintenance	Cause	Remedy	EMS with boiler
H1	Flue gas temperature high	• As soon as the flue gas temperature has exceeded a certain limit (110 °C), the burner is switched to stage 1, and this service message is generated. The message will only be cleared when the command **Reset service message** is issued.	▶ Cleaning the boiler. ▶ Check the position, equipment level and state of the turbulator insert and correct if necessary.	SAFe
H2	Burner fan too slow	• The SAFe must generate an unusually high PWM signal for the required speed.	▶ Check the burner fan for contamination and clean or replace if required.	SAFe
H3	Hours run expired	• Does not occur in conjunction with this control unit.		SAFe
H4	Low flame sensor current	• The flame signal is only just above the SAFe shutdown threshold. – Flame sensor or bracket (on G135) is dirty. – Mixing system incorrectly aligned in relation to sight tube. – Faulty flame sensor/SAFe electrical connection. – Flame sensor or SAFe faulty.	▶ Check flame sensor and bracket (mirror) for dirt, and clean if required. ▶ Check the alignment of the mixing system to the sight tube and correct if required. ▶ Check the mixing system for contamination and clean if required. ▶ Check the flame sensor plug-in connection on the SAFe. ▶ Check burner setting and correct if necessary. ▶ Check the flame sensor signal for stages 1 and 2 using the RC30. If not OK, replace the flame sensor.	SAFe
H5	Long ignition delay	• At the last burner start, the flame was established after a long delay: – Faulty oil supply – Faulty ignition system – Faulty burner setting – Faulty burner components.	▶ Check oil supply. ▶ Check the ignition using a relay test (RC30); check the ignition electrode for contamination or damage (electrode gap) and replace if necessary. ▶ Replace the oil nozzle. ▶ Replace the oil cut-off valve of the oil preheater. ▶ Check the mixing system and clean if necessary. ▶ Check burner setting, correct if necessary.	SAFe
H6	Frequent flame interruption	• During the last burner starts, the flame blew off frequently. – Faulty oil supply – Faulty ignition system – Faulty burner setting – Faulty burner components.	▶ Call up the fault memory of blocking type errors to check in which operating phase the flame blew off. If only 6U/511 (no flame established) is present: ▶ Check the oil supply. ▶ Check the flame sensor current using RC30. ▶ Check the ignition via a relay test (RC30). ▶ Replace the oil nozzle. ▶ Replace the oil cut-off valve of the oil preheater. ▶ Check the mixing system and clean if necessary. ▶ Check and correct burner setting if necessary. If other blocking faults (flame blow-off after the flame was established successfully) are present: ▶ Check and correct burner setting if necessary. ▶ Check the oil supply equipment. ▶ Check the pin assignments of 1st/2nd solenoid valve (fault 6L/516). ▶ Check the flame sensor current during operation. ▶ If signal < 50 μA, check the holding bracket (on G135) and clean if necessary or replace the flame sensor.	SAFe
H7	System pressure	• The operating pressure in the heating system has dropped too low.	▶ Top up heating water until the operating pressure > 1.0 bar.	UBA3
H8	By date	• Does not occur in conjunction with this control unit.		SAFe
H11	SLS sensor fault	• Cold water inlet sensor lead break	▶ Check the sensor and replace if required.	UBA3.5
H12	SLS sensor fault	• Cylinder sensor lead break	▶ Check sensor; replace if required	UBA3.5

Table 108 Service messages

23 Appendix

23.1 Sensor curves

DANGER: Danger to life from electric shock!
- ▶ Before opening the appliance, isolate all poles of the mains power supply and secure against unauthorised re-connection.

Fault checking (without room temperature sensor)
- ▶ Remove sensor terminals.
- ▶ Check the resistance at the sensor lead ends using an ohmmeter.
- ▶ Check the temperature of the sensor with a thermometer.

Using the diagram, determine whether temperature and resistance correlate.

The sensor tolerance for all curves is max. 3 %/25 °C.

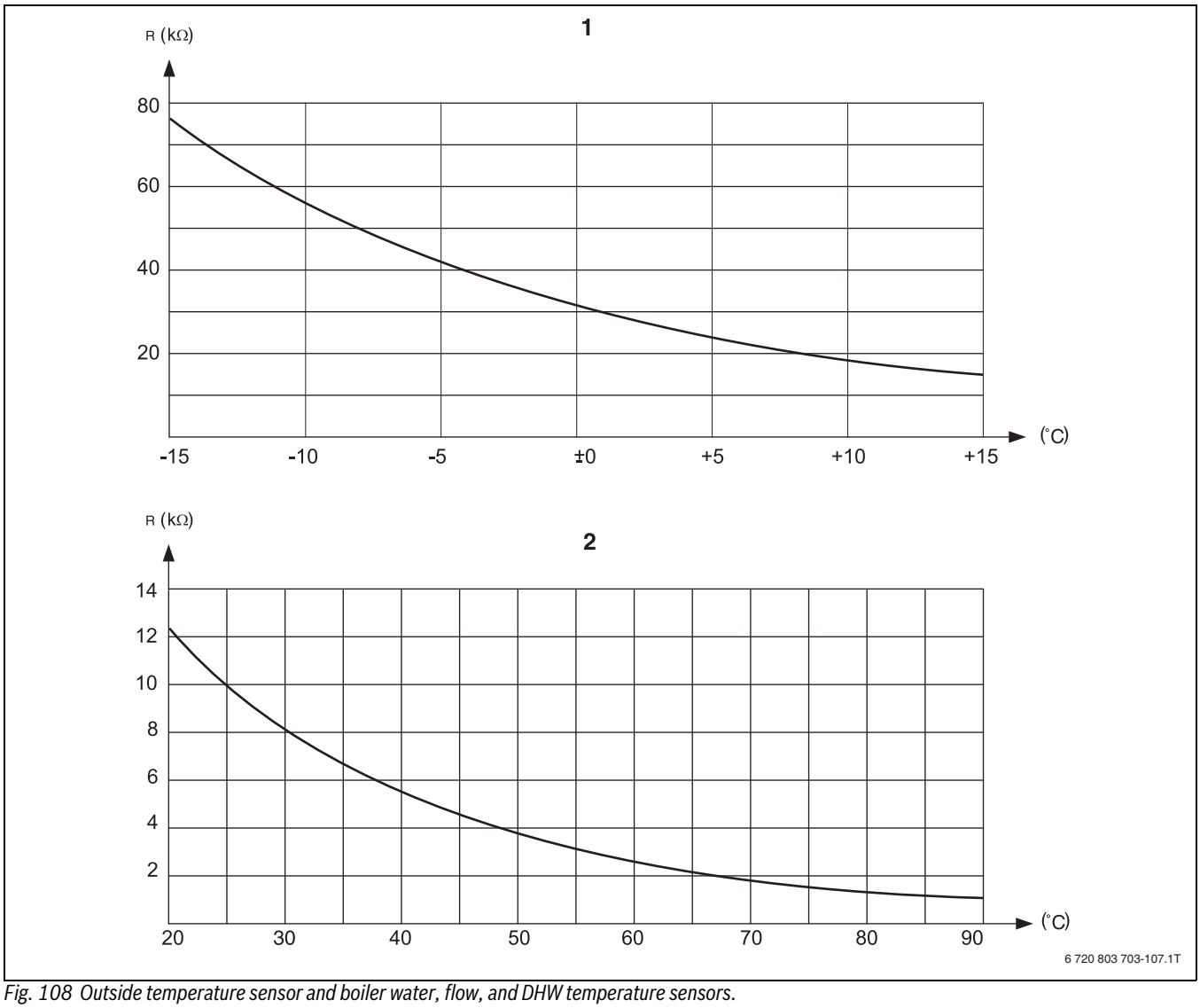


Fig. 108 Outside temperature sensor and boiler water, flow, and DHW temperature sensors.

[1] Outside temperature sensor curve
[2] Sensor curves - boiler water, flow and DHW temperature

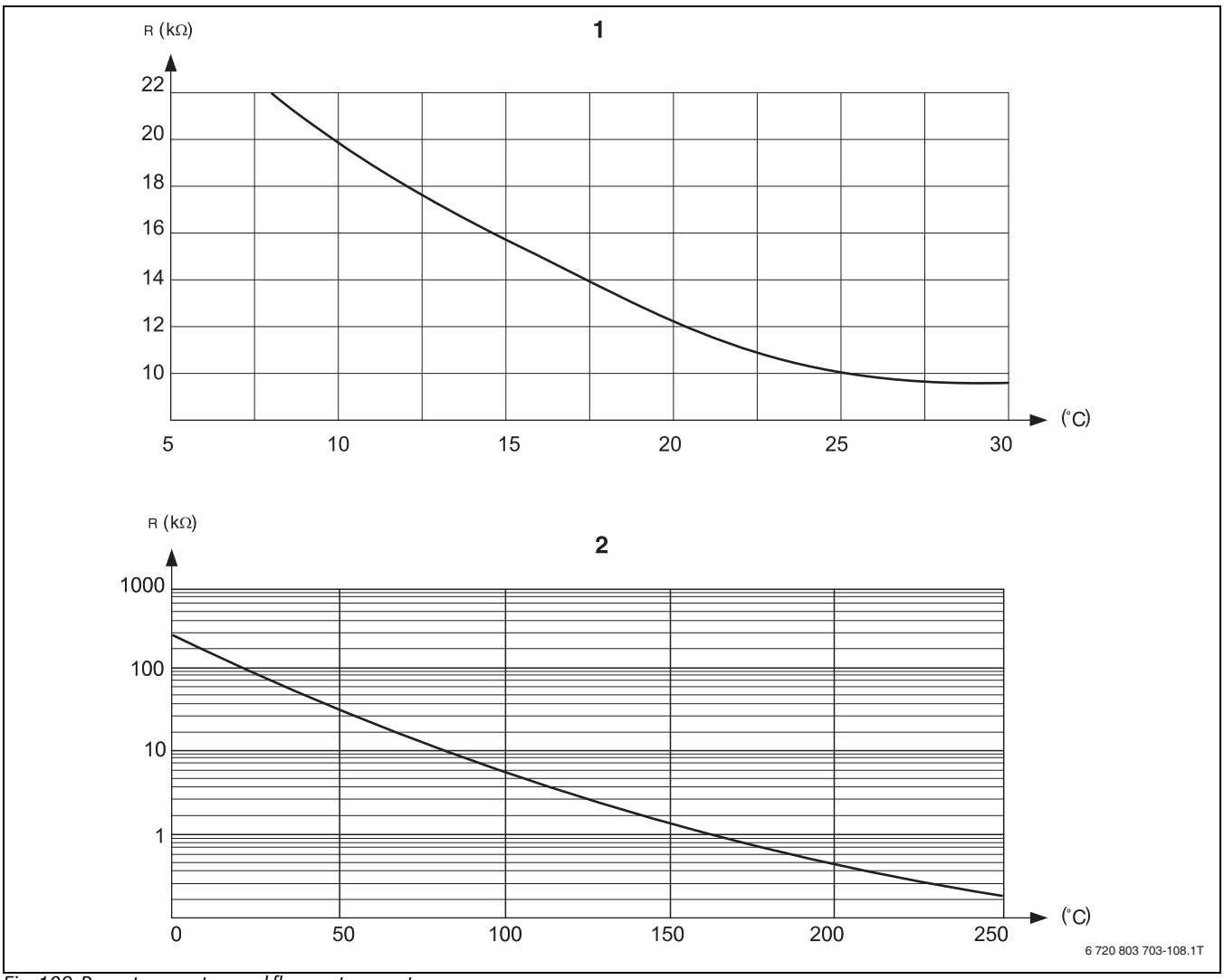


Fig. 109 Room temperature and flue gas temperature sensors

[1] Room temperature sensor curve
[2] Flue gas temperature sensor (FG) curve

23.2 Heating curves

Notes on adjusting the heating curve

You can adjust the heating curve slope using the design point. The design point consists of the minimum outside temperature for the region and the design temperature of the selected heating system (e.g. "Radiators").

Adjusting the set room temperature moves the heating curve in parallel. If you change the room temperature by 1 K, the flow temperature changes by approx. 3 K.

Fig. 110 shows how heating curve [a] for design point −10 °C/75 °C moves in parallel ([b], [c] and [d]) through various set room temperatures. The heating curves [e] and [f] show the changed slope for other design points.

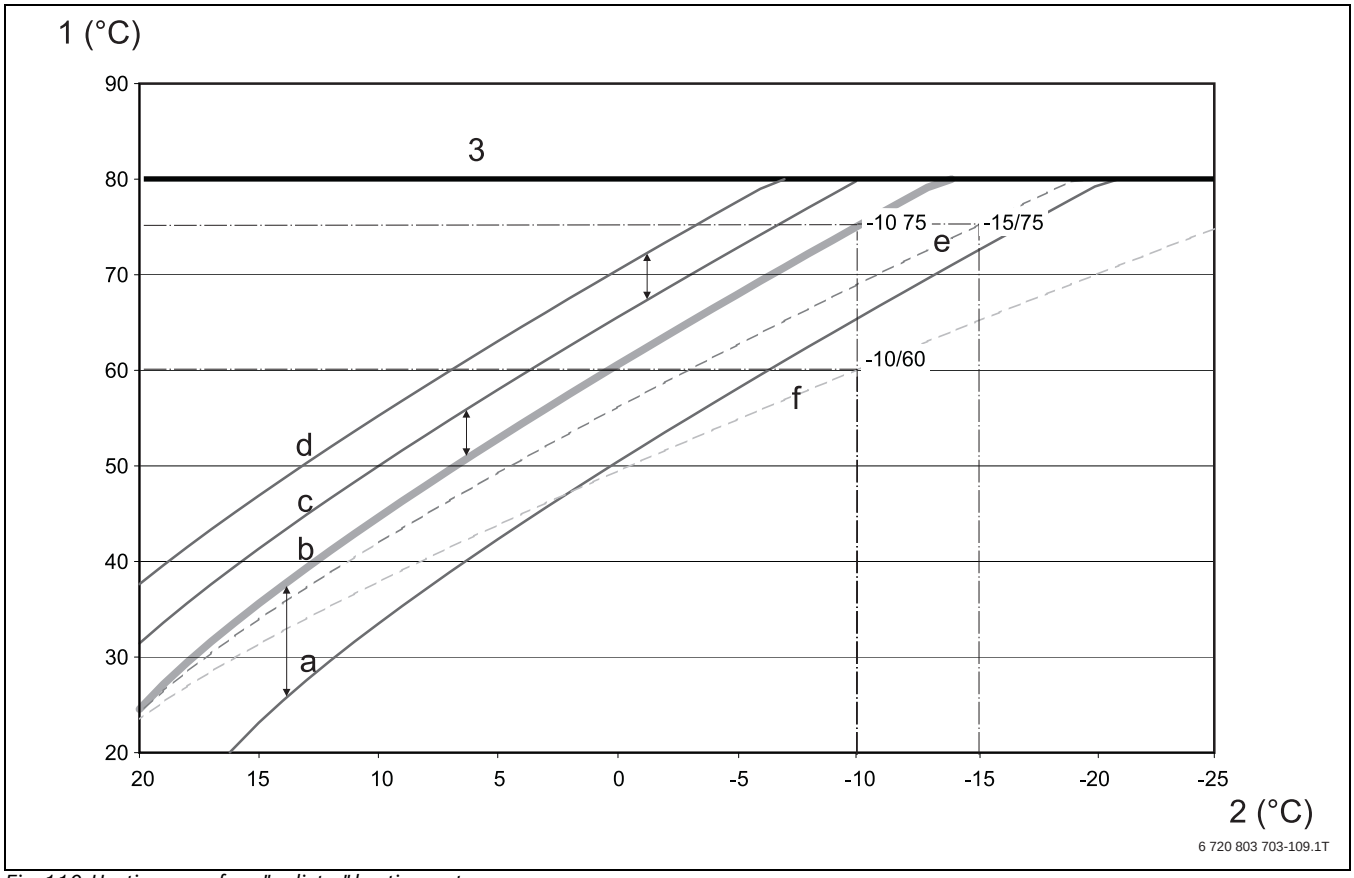


Fig. 110 Heating curve for a "radiator" heating system

[1] Flow temperature in °C
[2] Outside temperature in °C
[3] Adjustable maximum heating circuit temperature
[a] Set room temperature 17 °C, min. outside temperature −10 °C, design temperature 75 °C
[b] Set room temperature 21 °C, min. outside temperature −10 °C, design temperature 75 °C
[c] Set room temperature 23 °C, min. outside temperature −10 °C, design temperature 75 °C
[d] Set room temperature 25 °C, min. outside temperature −10 °C, design temperature 75 °C
[e] Set room temperature 21 °C, min. outside temperature −15 °C, design temperature 75 °C
[f] Set room temperature 21 °C, min. outside temperature −10 °C, design temperature 60 °C

Keyword

Buderus

Cotswold Way, Warndon, Worcester WR4 9SW
All Enquiries: 0844 892 3004

www.buderus.co.uk

Buderus