To be kept by the user

April 2011

Eurocondense three

Installation operation and maintenance manual

Floor Standing Condensing Gas Boilers

125 to 300kW

Working towards
a cleaner future

POTTERTON
COMMERCIAL
heating specialists

Table of contents

1. Regarding this Manual

Read this instruction thoroughly before operating the device!

1.1 Content of this manual

This manual contains the instructions for the installation of gas-fired fuel value boilers of the series EuroCondense three for standard application with 1 pump heating circuit and 1 DHW storage tank.
Further applications can be made available (mixing heating circuit, solar connection, etc.) by installing extension modules (clip-ins).
Here, an overview of the further documents belonging to this heating system.
Keep all documents at the installation location of the gas condensing device!

1.2 Overview table

Documentation	Contents	Intended for
Technical information	- Planning documents - Description of function - Technical data/circuit diagrams - Basic equipment and accessories - Application examples - Call-for-tender texts	Planner, customer
Installation Handbook – Extended informations	- Usage according to purpose - Technical data/circuit diagram - Regulations, standards, CE - Notes for installation location - Application example Standard application - Commissioning, operation and programming - Maintenance	Heating specialist
Operating Instructions	- Commissioning - lock - User settings/programming - Disturbance table - Cleaning/maintenance - Energy saving tips	Customer
Programming and hydraulic system manual	- Setting table including all parameters and explanations - Further application examples	Heating specialist
Online-Datenbank	- Anwendungsbeispiele für registrierte Benutzer auf der Internetseite *www.broetje.de*	Planer, Heating specialist
asset ledger	- Commissioning report - Check list for commissioning - Maintenance	Heating specialist
Brief instruction	- Operation in brief	Customer
Servicing booklet	- Report of carried out services	Customer
Accessories	- Installation - lock	Heating specialist, customer

1.3 Used symbols

Danger**!** Danger exists for body and life in case it is not observed.

Danger of electric shock! In case it is not observed, danger from electricity exists for body and life!

Caution! If warning is not observed, danger exists for environment and the device.

Note/tip: Here, you can find background information and useful tips.

Reference to additional information in other documents.

1.4 For whom is this manual intended?

This installation manual is intended for the heating specialist, who installs heating plants.

2. Safety

Danger! Absolutely, observe the following safety information! Otherwise you are endangering yourself and others.

2.1 Usage according to purpose

The condesing boilers of the series EuroCondense three are intended to be used according to EN 12828 as heat generators in drinking water-heating plants.
They conform to EN 676, DIN 4702 Part 6 and EN 677, installation type B_{23}, C_{33}, C_{53}, C_{63x} and C_{83}.

In case of the installation types C_{33}, C_{53}, C_{63x} and C_{83} the instructions supplied with the accessory kit must be observed.

Destination GB: Category II_{2H3+}

2.2 General safety instructions

Danger! Danger of life!
A danger of signifficant damages to persons, environment and property exists during installation of heating plants. Therefore, heating systems must only be installed by specialist companies and commissioned by specialists of the installing company!

Danger of electric shock! Danger to life due to live components!
All electrical work in connection with the installation must only be carried out by a trained electrician!

Danger! Danger to life if heating unit used improperly!
- This device is not intended to be used by persons (including children) with limited physical, sensory or mental abilitites or lack of experience and/or lack of knowledge, only if they are supervised by a person responsible for their safety or receive intstructions on how to use the device.
- Children must be supervised to ensure that they do not play with the device.

Danger! Danger to life through modifications to the device!
Unauthorised conversions and modifications of the device are not permitted, as this can endanger persons and lead to damage of the device. In case of not observing this, the approval of the device becomes void.

Setting, maintenance and cleaning of the device must only be carried out by a qualified gas heating specialist!
Used accessories must comply with the technical rules and have been approved in connection with these device by the manufacturer.

Caution! Only original spare parts must be used.

2.3 Regulations and standards

The installation should comply with relevant British Standard Specifications, Codes of Practice and current Building Regulations, together with any special regional requirements of the Local Authorities, Gas undertaking and Insurance I.E.E. Regulations for the Electrical Equipment of Buildings. The installation of the boiler must be in accordance with the relevant requirements of:

- Health and Safety at Work act 1974
- Building Regulations 2006
- Electricity at Work Regulation 1989
- Management of H&S at Work Regulations 1998
- Manual Handling Regulations 1992
- Model Water By-Laws 1986
- BS 7671: 1992 - Requirements for Electrical Installations, IEE Wiring, Regulations 16th Edition
- BS 5440: 2000: Part 1 - Specifications for Installation of Flues
- BS 5440: 2000: Part 2 - Specifications for Installation of Ventilation for Gas Appliances
- BS 6644: 2005 - Installation of Gas Fired Hot Water Boilers for inputs between 60 kW and 2 MW
- BS 7074: 1989: Part 2 - application Selection and Installation of Expansion Vessels and Ancillary Equipment for Sealed Water Systems
- BS 6880: 1988 - codes of Practice for Low temperature Hot Water Systems
- EN 677: 1997 - Gas Fired Central Heating Boilers for Condensing Boilers with a nominal heat input not exceeding 70 kW
- CP 342:2 - Centralised Hot Water Supply Gas Safety (Installation and Use) Regulations 1998
- IM/II - Flues for commercial and Industrial Gas Fired Boilers and Air Heaters
- IGE/UP/1 - Soundness Testing and Purging Procedure for Non Domestic Installations
- IGE/UP/2 - Gas Installation Pipe work, Boosters and Compressors for Industrial Commercial Premises

Manufacturer's notes must not be taken in any way as over-riding statutory obligations.

2.4 Liquid gas under ground

The EuroCondense three complies with DIN EN 126 and DIN EN 298 and, therefore does not need an additional shut-off valve for operation with liquid gas under ground

2.5 CE-Marking

The CE-marking means that the gas condensing boilers meet the requirements of the gas devices guideline 90/396/EWG, the low voltage guideline 73/23/EWG, as well as, the guideline 89/336/EWG (electro-magnetic compatibility, EMV) of the Commission to balance the legal regulations of the member states.
Meeting the protection requirements according to guideline 04/108/EG is only guaranteed by operation of the boiler according to purpose.
The ambient conditions according EN 55014 must be met.
Operation is only allowed with correctly fitted casing.
Correct electrical earthing has to be ensured by regular check (e.g. annual inspection).
When replacing device parts, only original parts as specified by the manufacturer must be used.
The gas condensing-boilers fulfill the basic requirements of the Efficiency Guideline 92/42/EWG as condensing boiler.
When natural gas is used, the gas condensing-boiler emit less than 80 $^{mg}/_{kWh}$ NO_X corresponding to the requirements as per §7 of the Ordinance regarding small firing places dated 14.03.1997 (1. BImSchV).

2.6 Conformity declaration

CE

POTTERTON COMMERCIAL

Declaration of conformity

Product	Condensing gas boiler
Trade mark	EuroCondense
Product ID number	CE-0085 CL 0072
Type, Model	EuroCondense three 125, 170, 215, 260, 300
EU directives	2006/95/EEC, 2004/108/EEC, 90/396/EEC , 92/42/EEC
Standards	DIN EN 15417, DIN EN 15420-1, DIN EN 656/A1:2006-12 DIN EN 60335-1 (VDE 0700 Teil 1):2001-08; EN 60335-1:94+A1+A2+A11 bis A16:2001 DIN EN 50366 (VDE 0700 Teil 366):2003-11; EN 50366:2003 DIN EN 50165 (VDE 0700 Teil 450):2001-08; EN 50165:1997+A1:2001 DIN EN 55014-2 (VDE 0875 Teil 14-2):2002-08; EN 55014-2:1997+A1:2001 Requirements of category II DIN EN 55014-1 (VDE 0875 Teil 14-1):2003-09; EN 55014-1:2000+A1:2001+A2:2002 DIN EN 61000-3-2 (VDE 0838 Teil 2):2005-09; EN 61000-3-2:2000+A2:2005 DIN EN 61000-3-3 (VDE 0838 Teil 3):2002-05; EN 61000-3-3:1995+Corr.:1997+A1:2001
EC type examination	DVGW Deutsche Vereinigung des Gas- und Wasserfaches e.V. 53123 Bonn Notified Body 0085
Surveillance procedure	Yearly surveillance audit DVGW Deutsche Vereinigung des Gas- und Wasserfaches e.V. 53123 Bonn

The producer states the following:

The above named products fulfil the requirements of the directives and standards. They are identical with the prototype examined. The production process follows the guidelines of the surveillance procedure. The above named products are only for installations in hot water heating systems. The installer has to assure that the directives fot installation and operation are being followed.

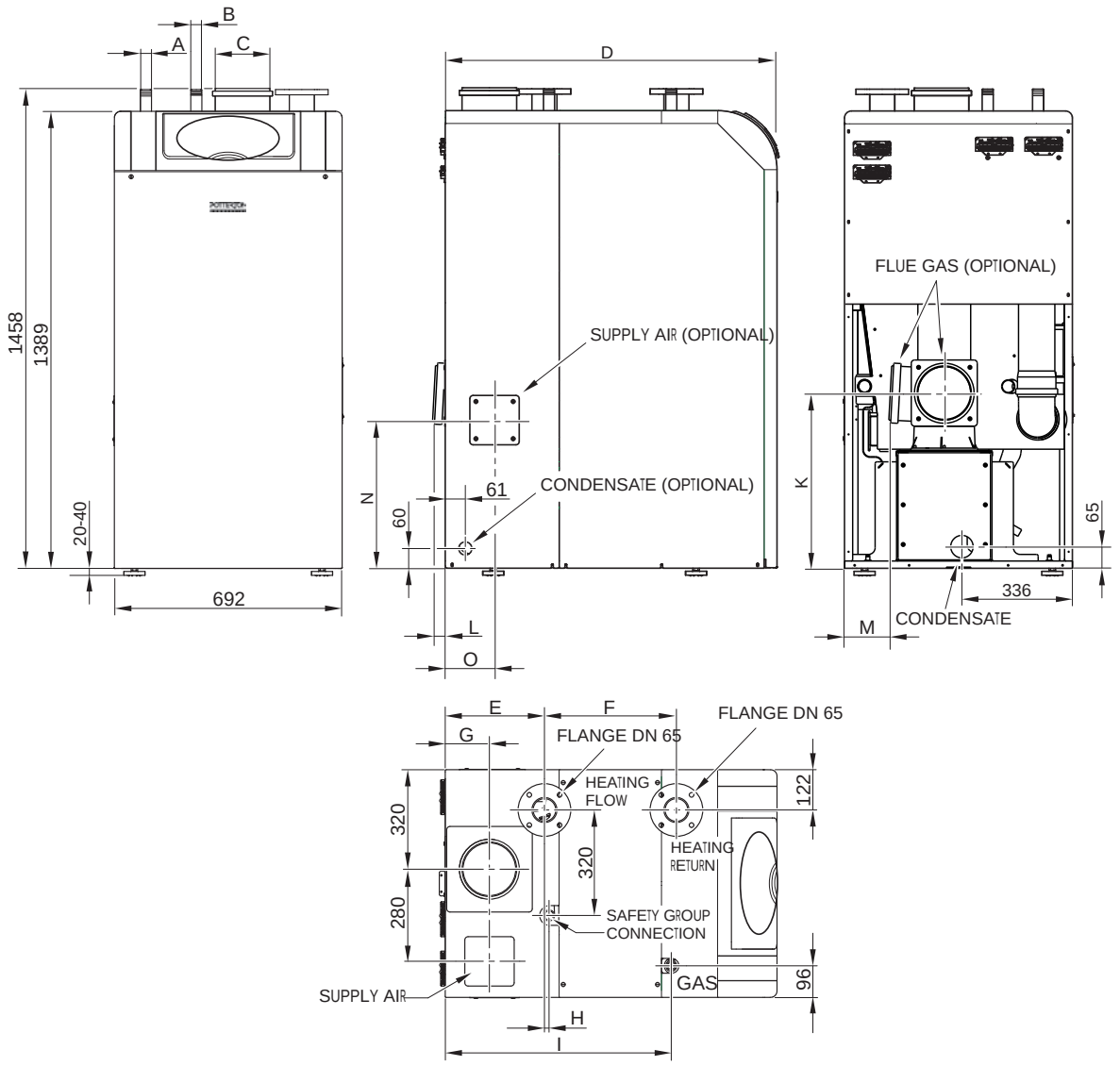
ppa. H. Wilken
Leiter Entwicklung

i.V.
i.V. U. Patzke
Leiter Versuch/Labor und
Dokumentationsbevollmächtigter

3. Technical Data

3.1 Dimensions and connections

Fig. 1: Dimensions and connections



Technical Data

Tab. 1: Dimensions

Modell	Description	EC three 125	EC three 170	EC three 215	EC three 260	EC three 300
Dimension A	Gas Connection	R 1"	R 1½"	R 1½"	R 1½"	R 1½"
Dimension B	Safety Group Connection	R 1"	R 1"	R 1¼"	R 1¼"	R 1¼"
Dimension C	Flue	160 mm	160 mm	200 mm	200 mm	200 mm
Dimension D	Depth	1008 mm	1008 mm	1171 mm	1264 mm	1357 mm
Dimension E	Centre of Return	301 mm	301 mm	351 mm	351 mm	351 mm
Dimension F	Centre of Flow	401 mm	401 mm	514 mm	607 mm	700 mm
Dimension G	Centre of Flue	134 mm	134 mm	163 mm	163 mm	163 mm
Dimension H	Centre of Safety	14 mm	14 mm	14 mm	14 mm	14 mm
Dimension I	Centre of Gas	687 mm	687 mm	851 mm	944 mm	1037 mm
Dimension K	Centre of Flue (optional)	530 mm	530 mm	530 mm	630 mm	630 mm
Dimension L	Depth of Flue (optional)	30 mm	30 mm	90 mm	90 mm	90 mm
Dimension M	Distance to Flue (optional)	139 mm	139 mm	50 mm	50 mm	50 mm
Dimension N	Centre of Supply (optional)	450 mm	450 mm	302 mm	302 mm	302 mm
Dimension O	Centre of Supply (optional)	150 mm	150 mm	167 mm	167 mm	167 mm

3.2 Technical Data

Tab. 2: Technical Data

Model			EC three 125	EC three 170	EC three 215	EC three 260	EC three 300
Product-ID-No.			CE-0085 CL 0072				
Nominal heat input range							
Natural gas	heating	kW	20.0-125.0	28.0-170.0	35.0-215.0	42.0-260.0	48.0-300.0
LPG	heating	kW	35.0-125.0	35.0-170.0	48.0-215.0	58.0-260.0	58.0-300.0
Nominal heat output range							
Natural gas	80/60°C	kW	19.2-121.6	26.8-165.8	33.5-210.1	40.2-254.5	45.9-294.0
	50/30°C	kW	21.3-133.1	29.8-181.3	37.4-229.6	44.9-278.1	51.4-321.3
LPG	80/60°C	kW	33.5-121.6	33.5-165.8	46.0-210.1	55.5-254.5	55.5-294.0
	50/30°C	kW	37.2-133.1	37.3-181.3	51.2-229.6	62.0-278.1	62.1-321.3
Gross efficiency 100% load	80/60°C	% Gross	87.74	87.94	88.13	88.28	88.37
	50/30°C	% Gross	96.03	96.17	96.31	96.45	96.57
Gross efficiency 16% load	80/60°C	% Gross	86.38	86.36	86.34	86.31	86.29
	50/30°C	% Gross	96.62	96.74	96.88	97.02	97.13
Data for design of the chimney to EN 13384 (room air-depending operation)							
Exhaust gas temperature	80/60°C	°C	57-61	57-61	57-61	57-61	57-61
	50/30°C	°C	30-37	30-37	30-37	30-38	30-38
Exhaust gas mass flow							
Natural gas	80/60°C	m^3/hr	24.5-152.9	34.3-208.0	42.8-263.1	51.4-318.1	58.7-367.1
	50/30°C	m^3/hr	22.5-142.0	31.5-193.0	39.3-243.9	47.1-294.7	53.9-339.7
LPG	80/60°C	m^3/hr	40.6-145.1	40.6-197.4	55.7-249.6	67.3-301.8	67.3-348.3
	50/30°C	m^3/hr	38.6-134.2	37.8-182.3	52.2-230.4	63.1-278.4	62.5-320.9
Supply pressure for natural gas			min. 18 mbar - max. 25 mbar				
CO_2-content natural gas *		%	9.3 (9.1-9.5 allowed)				
Supply pressure LPG			nominal 37 mbar				
CO_2-content LPG		%	11.0 (10.8-11.2 allowed)				
Gas consumption							
Natural Gas		m^3/hr	2.1-13.2	3.0-18.0	3.7-22.8	4.4-27.5	5.1-31.7
LPG		kg/hr	2.7-9.7	2.7-13.2	3.7-16.7	4.5-20.2	4.5-23.3
NOx emission at 0% O_2 (dry)		mg/kWh	35	35	35	35	35
Max. delivery pressure at flue gas outlet		mbar	1.0				
Flue gas connection		mm	160		200		
Flow connection			DN 65				
Return connection			DN 65				
Connected loads							
International protection			IP 22				
Electrical connection		V/Hz	230 / 50				
Max. electr. power consumption		W	170	200	330	350	410
Max. water pressure		bar	6.0				

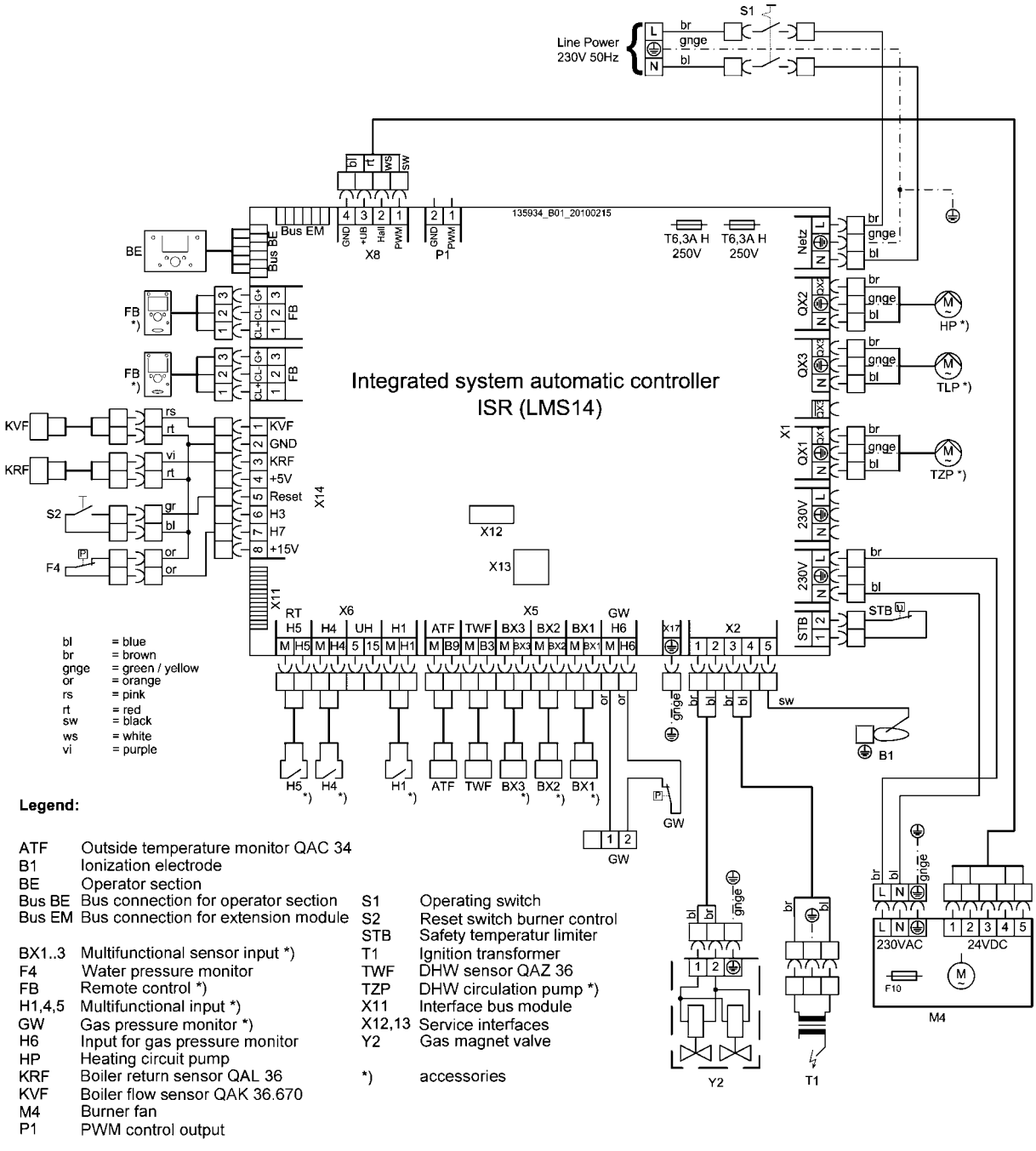
Technical Data

Model		EC three 125	EC three 170	EC three 215	EC three 260	EC three 300
Min. water pressure	bar	1.0				
Max. flow temp	°C	86				
Hydraulic resistance						
ΔT=20 K	kPa	2.80	3.40	3.70	3.90	4.00
ΔT=11 K	kPa	9.00	11.00	12.10	12.70	12.90
Boiler weight (dry)	kg	205	240	285	314	344
Boiler water content	l	29	34	38	45	53
Height above everything	mm	1455				
Width	mm	692				
Depth	mm	1008		1171	1264	1357

* in case of fluctuating natural gas composition see section *5.11 CO_2-content*

3.3 Wiring Diagram

Fig. 2: Wiring Diagram



3.4 Sensor value tables

Tab. 3: Resistance values for outside temperature sensor ATF

Temperature [°C]	Resistance [Ω]
-20	8194
-15	6256
-10	4825
-5	3758
0	2954
5	2342
10	1872
15	1508
20	1224
25	1000
30	823

Tab. 4: Resistance values for flow sensor KVS, drinking water sensor TWF, return sensor KRV, sensor B4

Temperature [°C]	Resistance [Ω]
0	32555
5	25339
10	19873
15	15699
20	12488
25	10000
30	8059
35	6535
40	5330
45	4372
50	3605
55	2989
60	2490
65	2084
70	1753
75	1481
80	1256
85	1070
90	915
95	786
100	677

4. Before installation

4.1 Inlet and outlet air openings

For trouble-free operation of the EuroCondense three sufficiently dimensioned inlet and outlet air openings are necessary. It has to be checked that these exist and are fully functional.

Caution! It has to be pointed out to the customer that these inlet and outlet air openings must always be functional, i.e. they must not be restricted or blocked and that the inlet area for combustion air at the boiler bottom must be kept free.

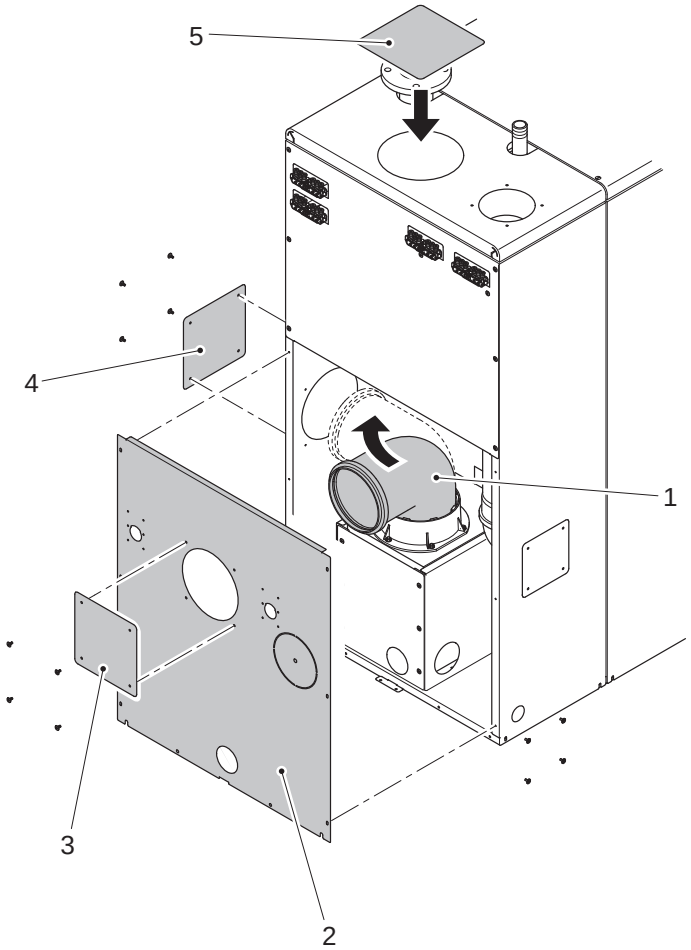
4.2 Converting the exhaust and supply air connection

Exhaust and supply air connection can be converted to adapt to the local conditions of the installation room.

Converting the exhaust connection

In the following picture the conversion of the top passage to the side or rear passage of the exhaust connection is represented..

Fig. 3: Conversion of the exhaust connection



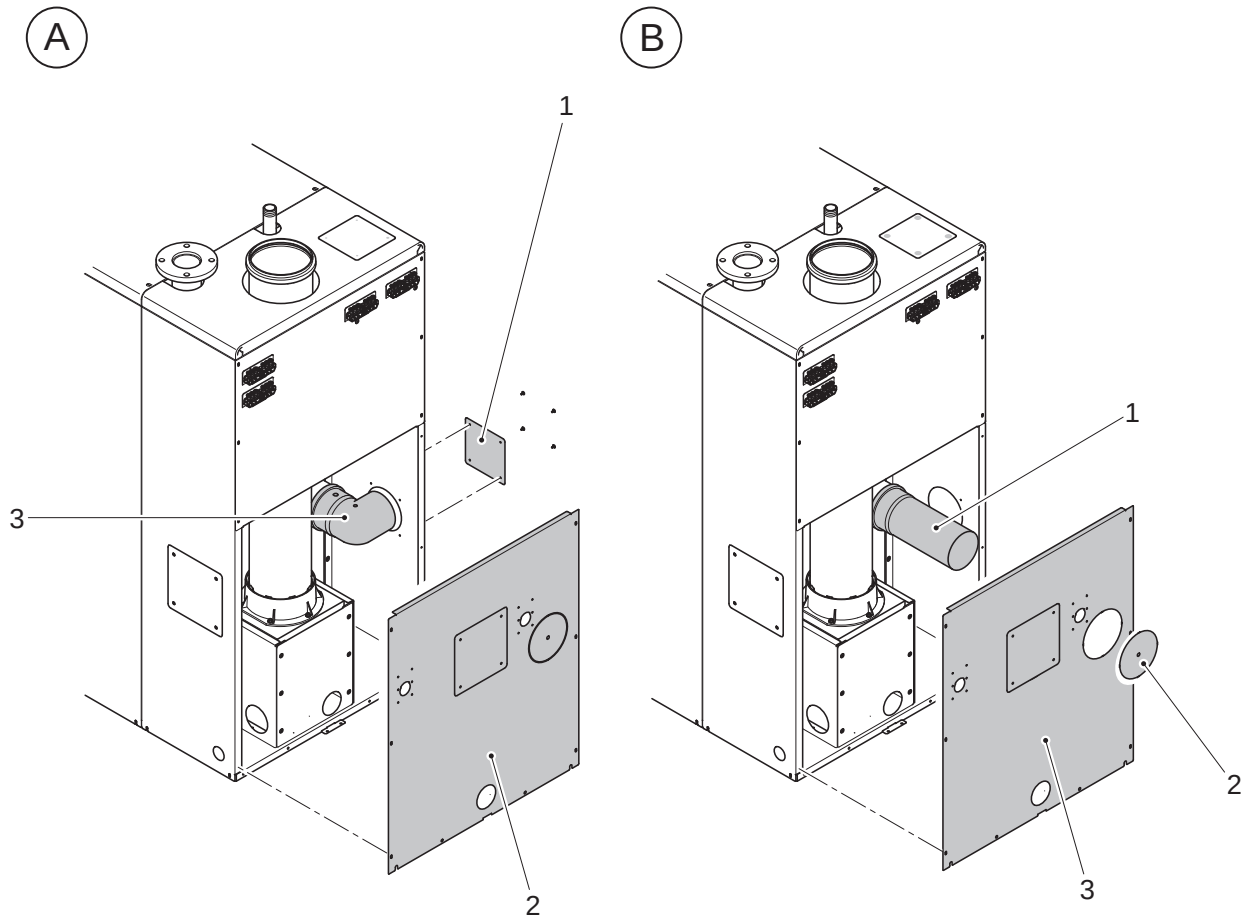
1. Remove lower rear wall (2) of the EuroCondense three
2. Remove the gas connection leading upward and make a 87°arc (1)
3. Turn 87°arc (1) in the desired position (side or towards the rear)
4. Remove either the rear cover plate (3) or the side cover plate (4)

5. Mount lower rear wall (2)
6. Glue upper cover plate (5)

Converting the supply air connection

In the following picture the conversion of the top passage to the side or rear passage of the supply air connection is represented.

Fig. 4: Conversion of the supply air connection



Side supply air connection (A)

1. Remove lower rear wall (5) of the EuroCondense three
2. Loosen screws and remove the cover plate (2)
3. Remove the intake pipe leading upward from the intake pipe elbow (6)
4. Turn intake pipe elbow (6) into the side position
5. Mount lower rear wall (5)
6. Close top supply air opening acc. to *Fig. 3* with cover plate (1)

Rear supply air connection (B)

1. Remove lower rear wall (5) of the EuroCondense three
2. Take out cover plate (4) from lower rear wall (5)
3. Remove the intake pipe leading upward with intake pipe elbow
4. Mount straight intake pipe (3)
5. Mount lower rear wall (5)
6. Close top supply air opening acc. to *Fig. 3* with cover plate (1)

4.3 Corrosion protection

Caution! Risk of damage of the device!

Before operation the system must be thoroughly flushed and re-filled with cold water. The pH of filling water must be between 7.0 and 8.3. The pH value can change based on CO_2 formation in connection with the calcium loss during system operation. This must be inspected in the yearly service however, in known hard water areas this may need to be more frequently i.e. 6 monthly, 3 monthly etc.
For systems with under floor heating and pipe work which is not oxygen-tight, system separation from the boiler and other corrosion endangered components must be installed i.e. a heat exchanger.

4.4 Requirements for heating circuit water

To ensure economical operation and keep the heat exchanger in serviceable condition it may be necessary to treat the filling water with additives. If the water hardness is greater than 17.5 degrees Clarke or 259mg/litre of Calcium then, this must be treated. This depends on the total water hardness, system volume and the size of the boiler.
If, in a special case, a need exists to use additives in a mixture (e.g. hardness stabilser, frost protecion agent, sealing agent,etc.) it has to be observed that the agents are compatible with each other and the pH-value is not altered. Preferably, agents from the same manufacturer should be used.
The instructions of the additive manufacturer have to be observed.

Released additives
Currently, the following agents have been approved by POTTERTON Commercial:
- “Full heating protection“ from Fernox
- “Sentinel 100“ from GE Betz

As a single frost protection agent, also Tyfocor® L may be used.
If not approved agents are used, the guarantee becomes void!
When softener facilities are used, water softening to a hardness of minimum 6 to 8 °dH is recommended.
The pH-value must not exceed the permissable value of 8.3.

Maintenance instructions
The water hardness of the heating water has to be checked within the scope of the recommended maintenance of the boiler (every two years) and, possibly, the respective amount of additive has to be added.

4.5 Notes for installation location

Caution! Danger of damage from water!
The following has to be observed for the installation of the EuroCondense three: In order to prevent damage due to water, particularly due to leakages in the DHW storage tank, suitable precautionary measures should be taken regarding installation.

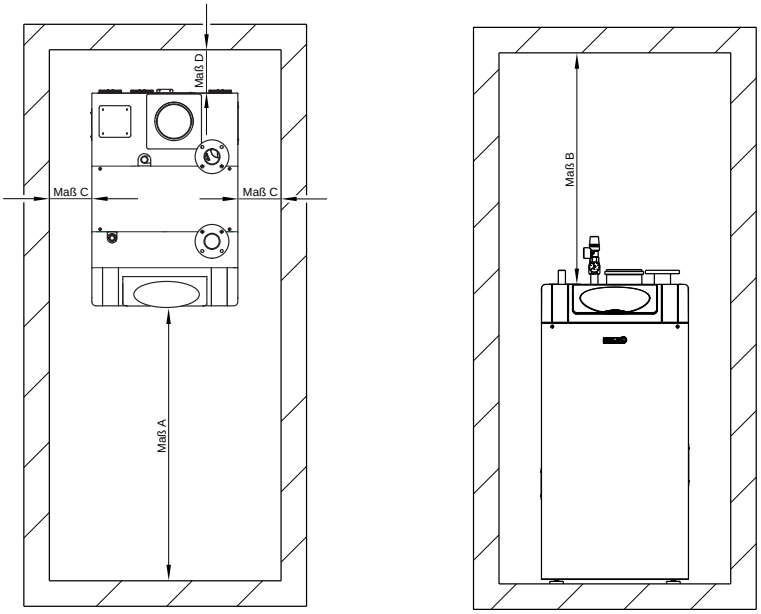
The installation room must be dry and the room temperature must be between 0 and 32°C.
The installation location has to be selected, especially, with respect to ducting of the exhaust gas ducts. When installing the boiler, the specified wall clearances have to be maintained.
Along with the general rules of the technology, especially the regulations of the states, such as fire and construction ordinances as well as heating room guidelines, are to be observed. Sufficient space should exist in the front to carry out inspection and maintenance work.

Caution! Danger of damaging the device!
Aggressive foreign substances in the combustion supply air can destroy or damage the heat generator. Therefore the installation in rooms with high humidity (see also "Operation in wet rooms") or heavy dust accumulation is only allowed with room air independent operating modes.
If the EuroCondense three is operated in rooms in which solvents, chorine containing cleaning agents, paint, glues or similar substances are worked with or in which such substances are stored, only room air independent operation is permissible. This applies especially for rooms in which ammonia and its compounds are heavily used, as well as nitrites and sulphides (animal breeding and recycling facilities, battery and galvanising rooms, etc.).

For damages occurring due to the installation in an unsuitable location or based on improper combustion air supply, there is no warranty claim.

4.6 Space requirement

Fig. 5: Recommended space requirement

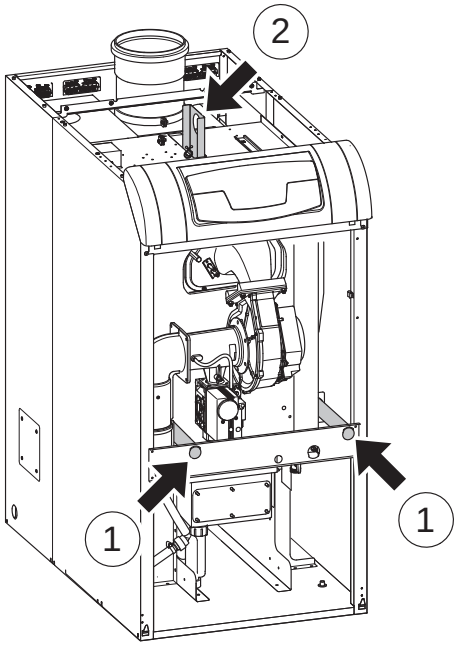


	EC three 125	EC three 170	EC three 215	EC three 260	EC three 300
Dimension A (front)	60 cm	70 cm	80 cm	90 cm	100 cm
Dimension B (above)	50 cm				
Dimension C (sides)	50 cm				
Dimension D (rear)	10 cm				

*The above dimensions are guidelines and there may be occasions where these dimensions can be reduced.
Please speak to our technical department for more information.

4.7 Transportation

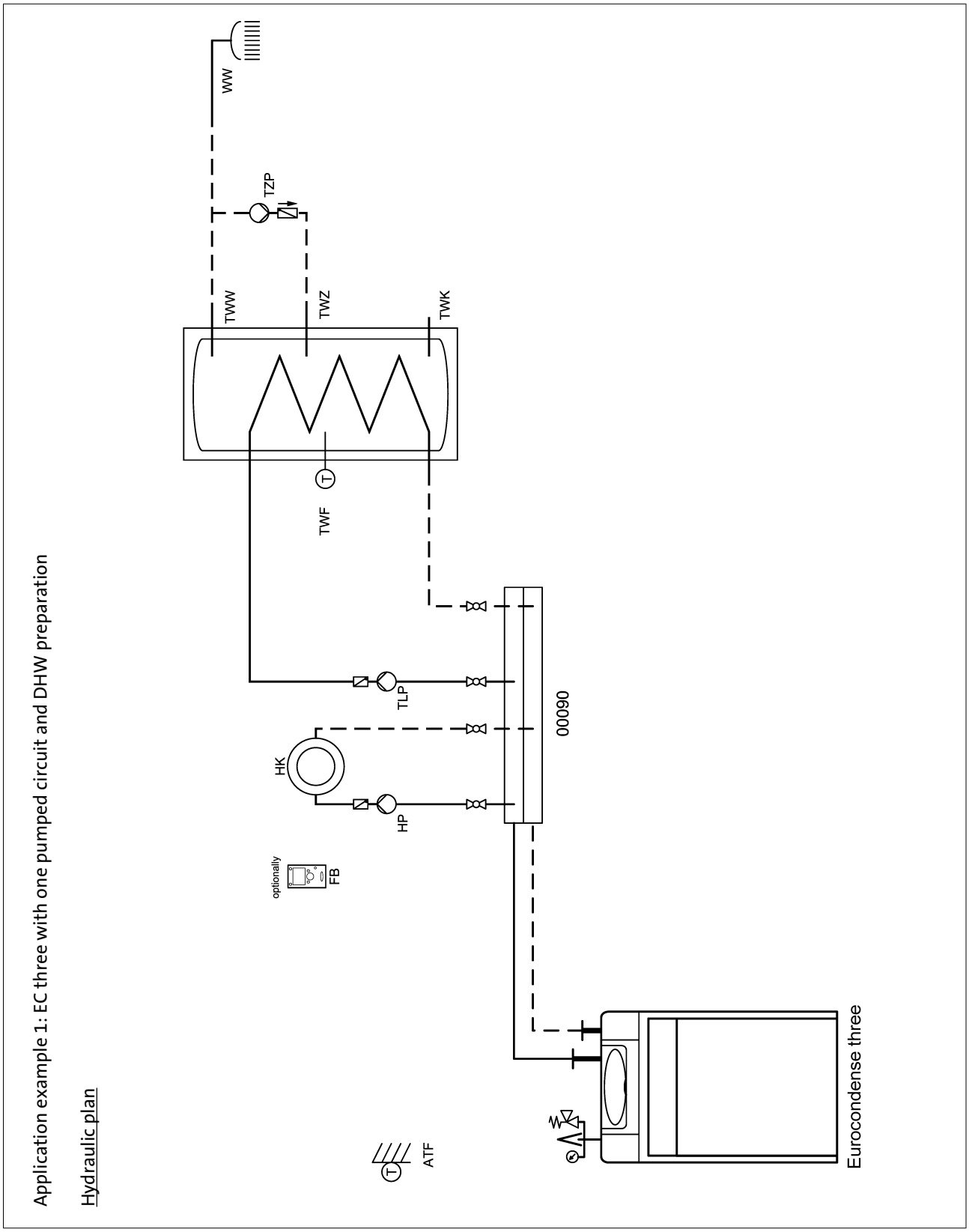
Fig. 6: Transport equipment

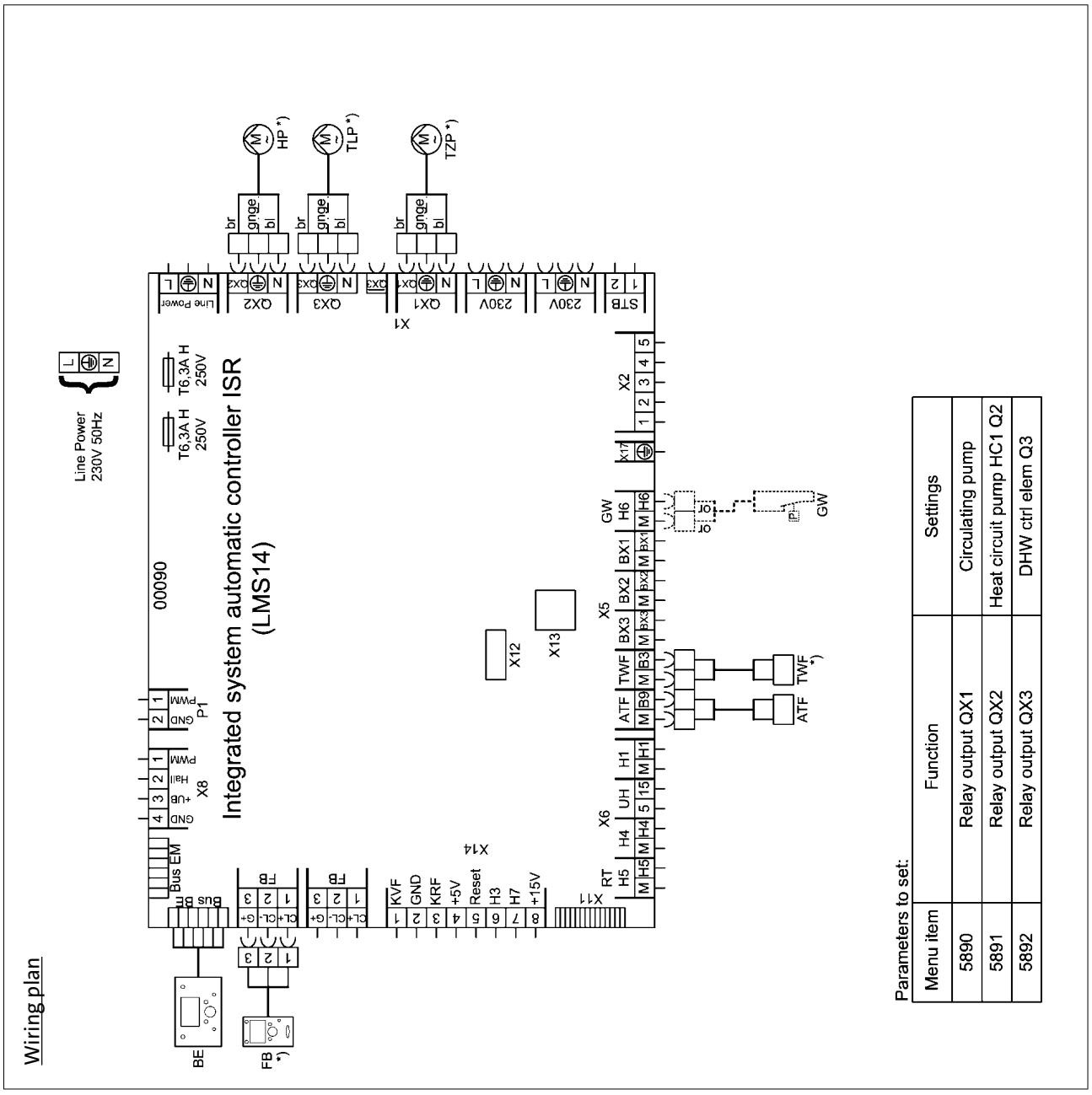


For transporting the boiler to the installation location using a crane, transport eyes found on the top of the boiler (*Fig. 6, Pos. 1*) can be used. Remove the centre covering lid of the EuroCondense three to do this.
For the transport of the boiler to installation location manually, push 2 sufficiently large steel pipes (Ø = 1", not included!) through the carrying fixture (*Fig. 6, Pos. 2*), so that the boiler can be lifted and transported.

Danger of injury! The boiler must absolutely be secured from sliding on the steel pipes! For transport manually safety shoes must be worn! For transport with the aid of a carrier fixture at least 4 persons are required.

4.8 Application examples



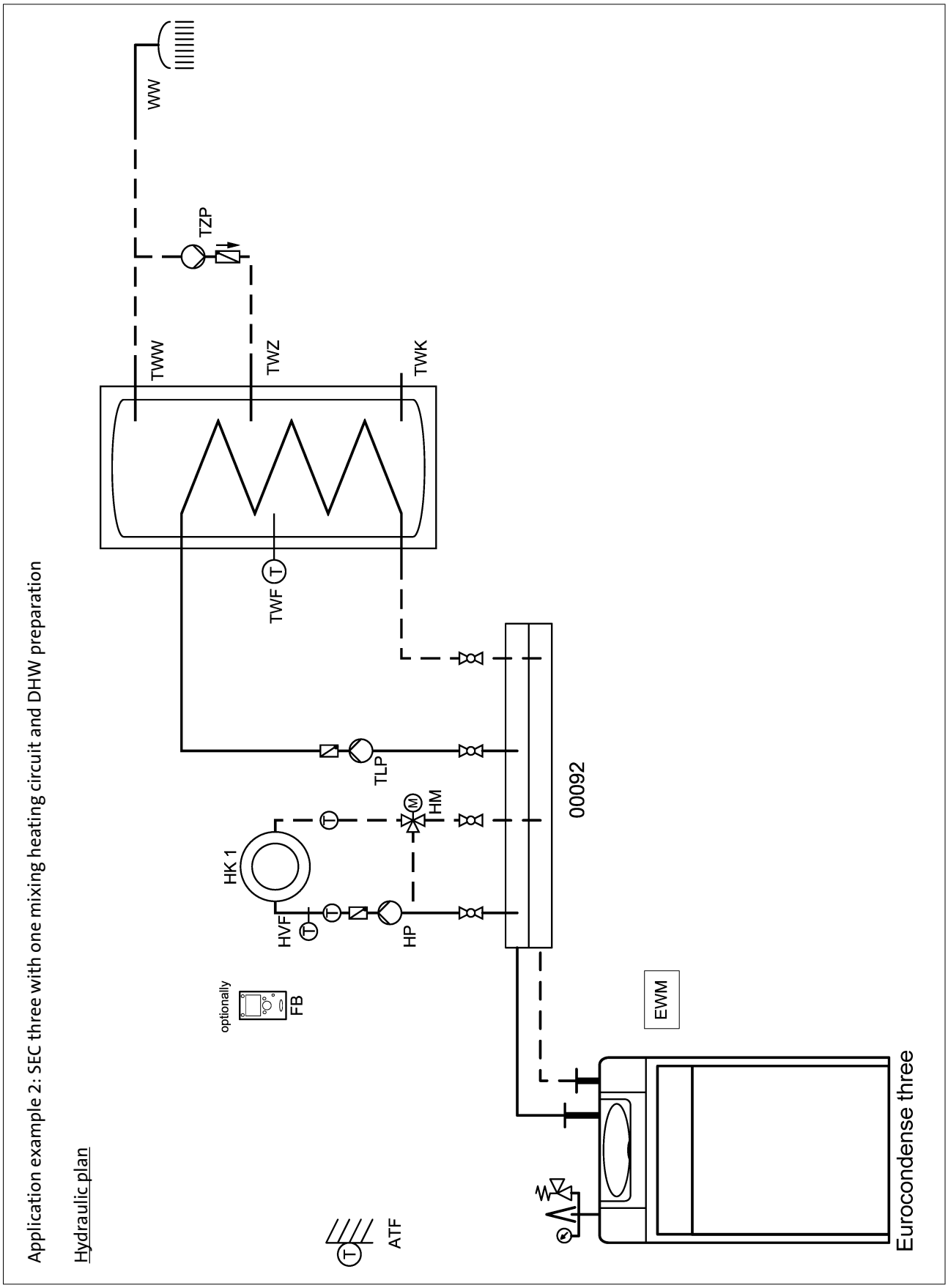


Parameters to set:

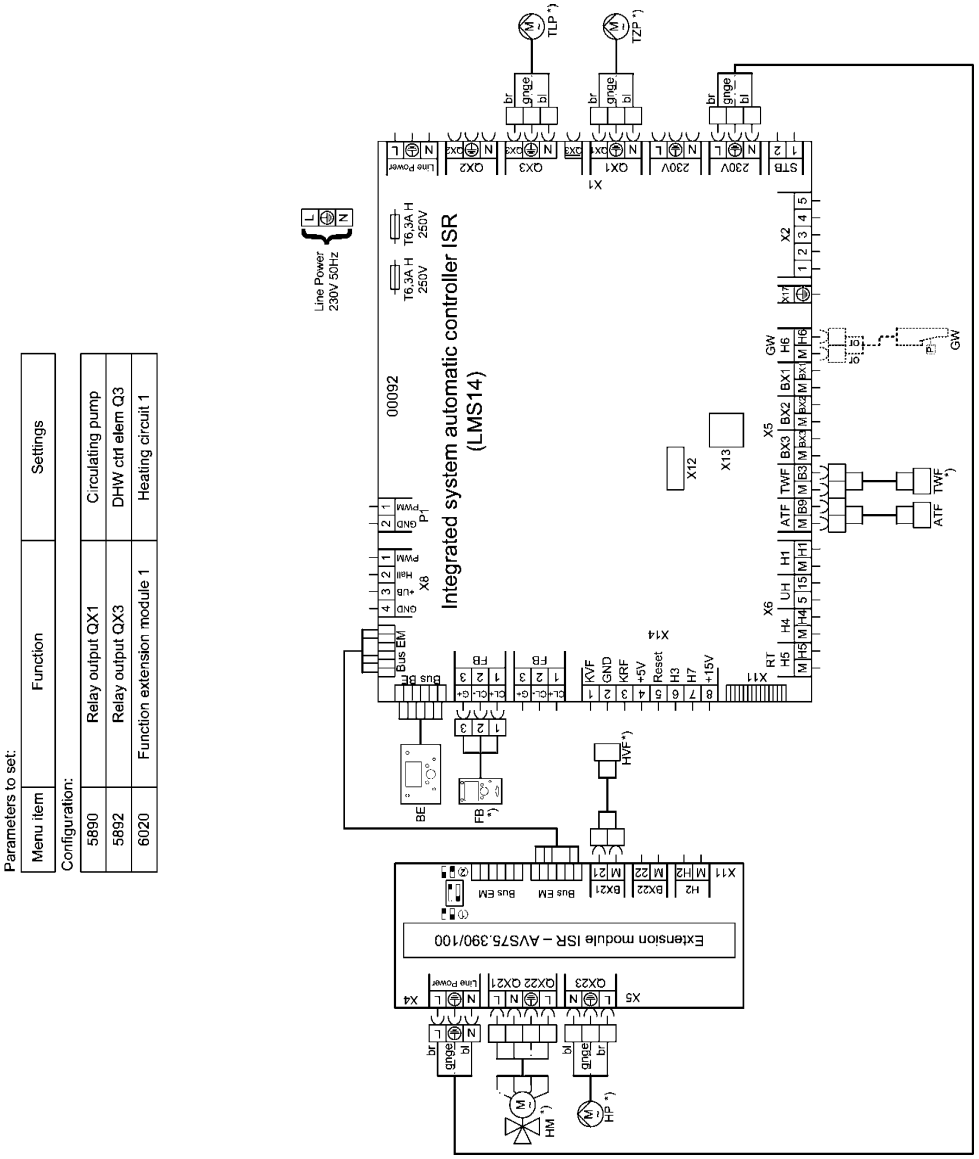
Menu item	Function	Settings
5890	Relay output QX1	Circulating pump
5891	Relay output QX2	Heat circuit pump HC1 Q2
5892	Relay output QX3	DHW ctrl elem Q3

Application example 2: SEC three with one mixing heating circuit and DHW preparation

Hydraulic plan

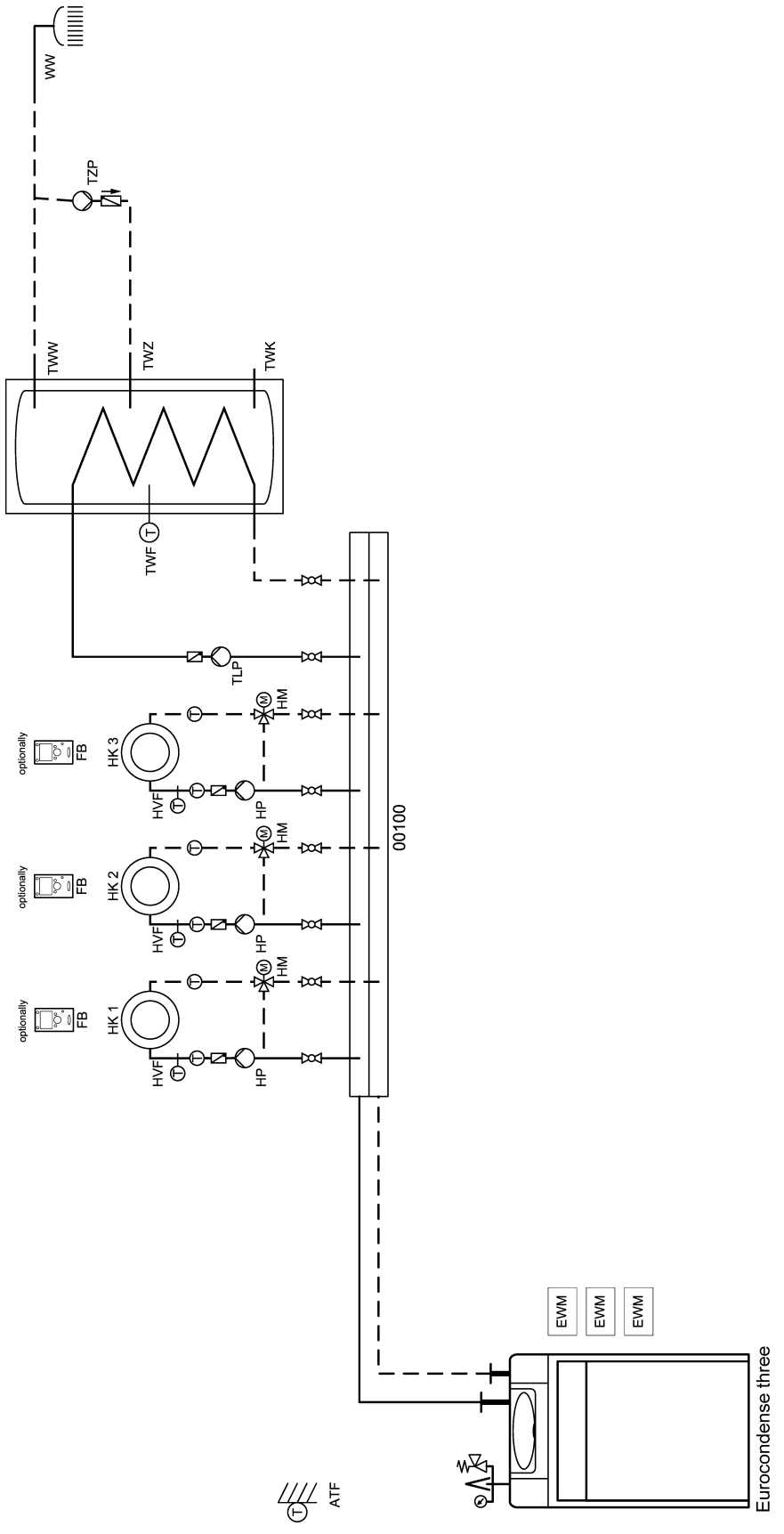


Wiring plan

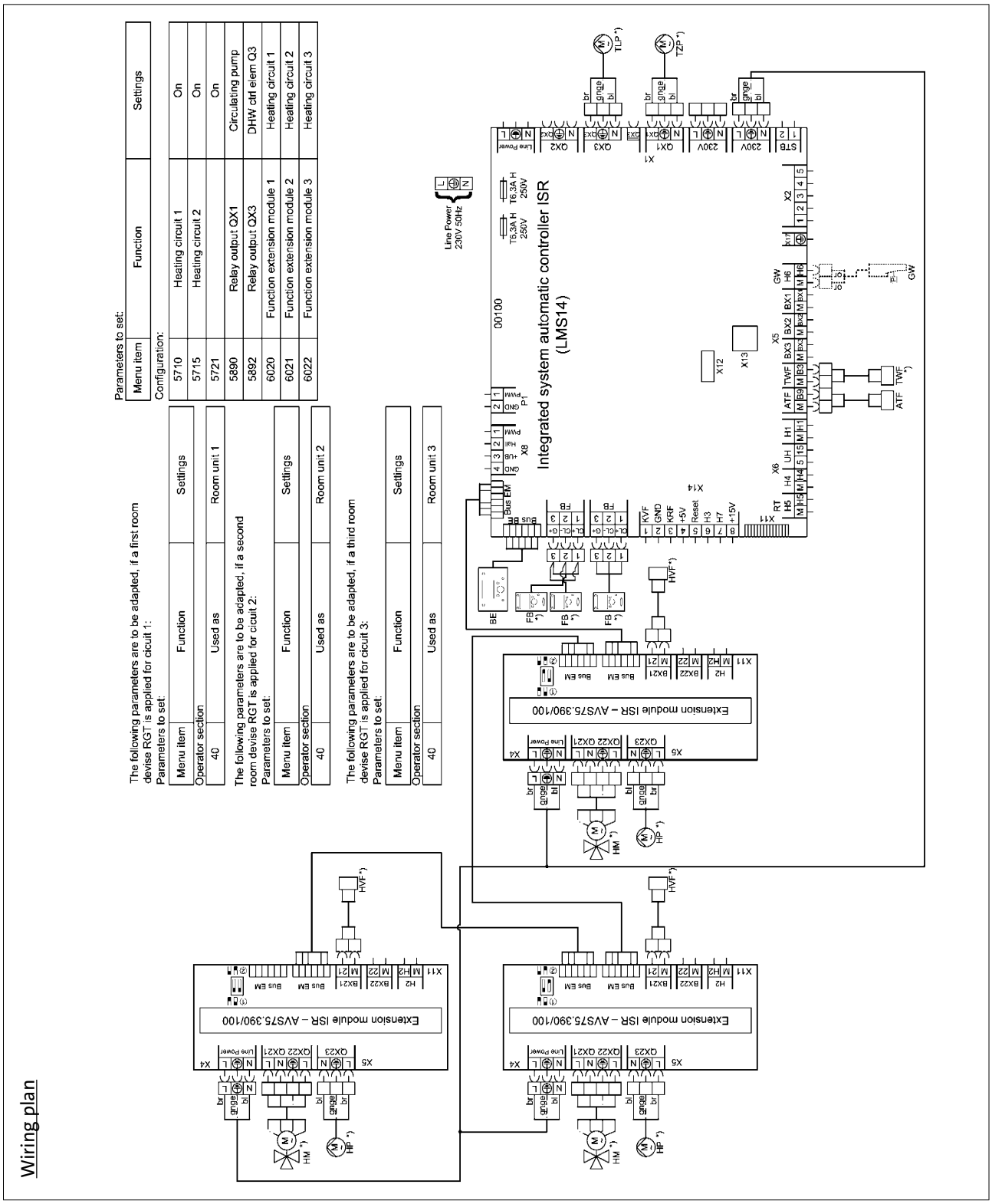

Integrated system automatic controller ISR
(LMS14)
00092
Line Power
230V 50Hz
T6,3A H
250V
Extension module ISR – AVS75.390/100
Bus EM
Bus BE
FB
BE
FB *)
HVF *)
HM *)
HP *)
TLP *)
TZP *)
TWF *)
ATF
GW
STB
230V
QX1
QX2
QX3
QX21
QX22
QX23
X1
X2
X4
X5
X6
X8
X11
X12
X13
X14
P1
Parameters to set:
Menu item | Function | Settings
Configuration:
5890 | Relay output QX1 | Circulating pump
5892 | Relay output QX3 | DHW ctrl elem Q3
6020 | Function extension module 1 | Heating circuit 1

Application example 3: EC three with three mixed circuits and DHW preparation

Hydraulic plan

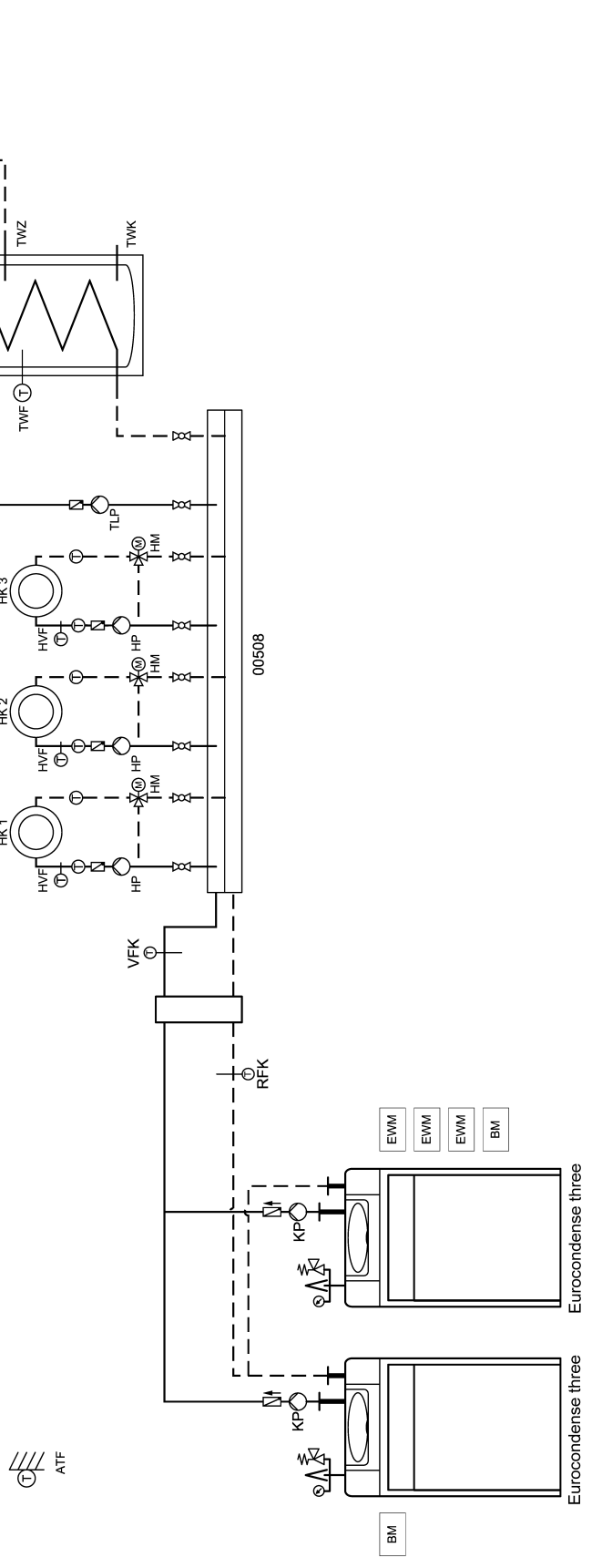


Wiring plan

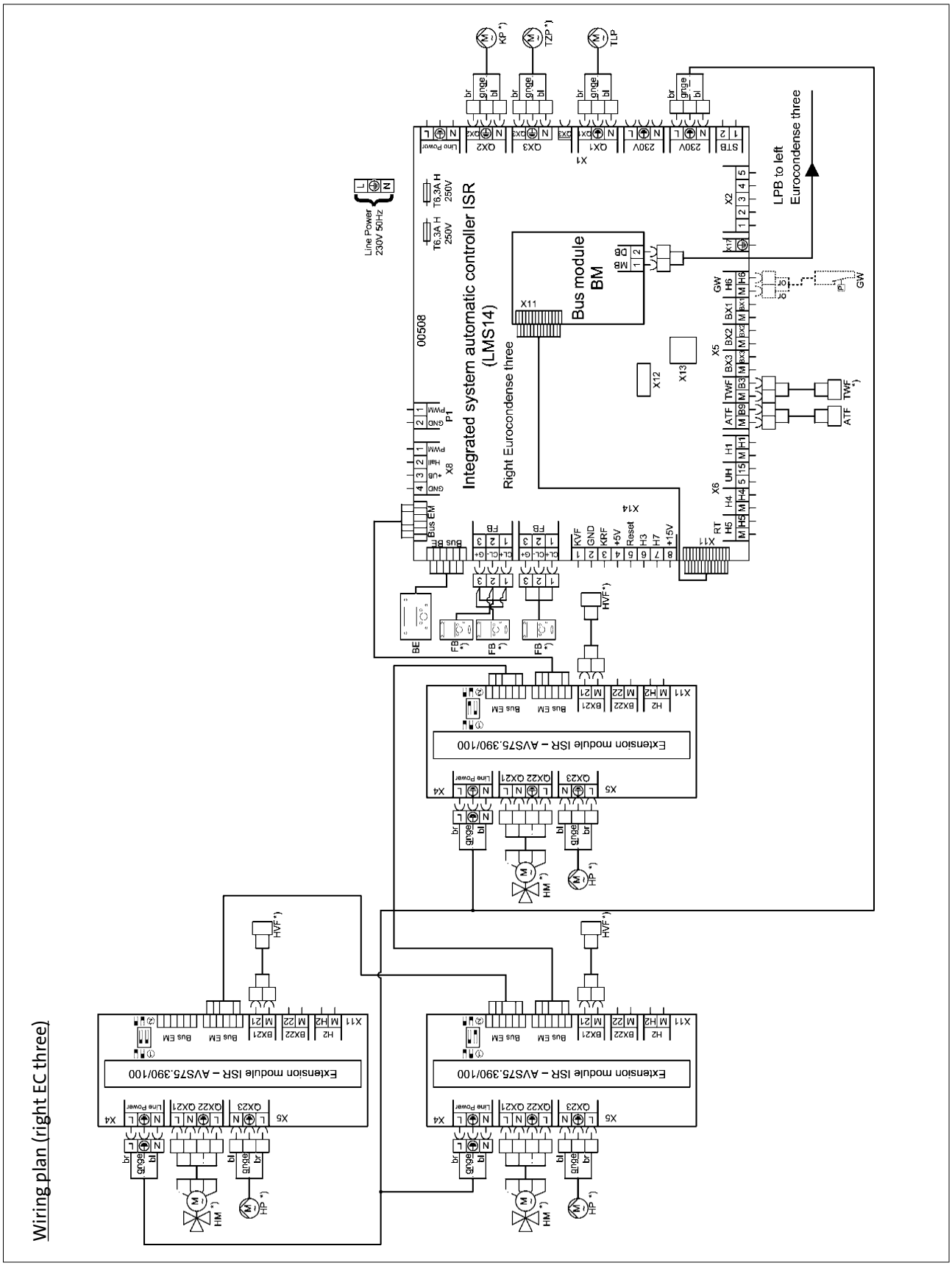

Parameters to set:
Menu item | Function | Settings
Configuration:
5710 | Heating circuit 1 | On
5715 | Heating circuit 2 | On
5721 | | On
5890 | Relay output QX1 | Circulating pump
5892 | Relay output QX3 | DHW ctrl elem Q3
6020 | Function extension module 1 | Heating circuit 1
6021 | Function extension module 2 | Heating circuit 2
6022 | Function extension module 3 | Heating circuit 3
The following parameters are to be adapted, if a first room devise RGT is applied for circuit 1:
Parameters to set:
Menu item | Function | Settings
Operator section
40 | Used as | Room unit 1
The following parameters are to be adapted, if a second room devise RGT is applied for circuit 2:
Parameters to set:
Menu item | Function | Settings
Operator section
40 | Used as | Room unit 2
The following parameters are to be adapted, if a third room devise RGT is applied for circuit 3:
Parameters to set:
Menu item | Function | Settings
Operator section
40 | Used as | Room unit 3
Integrated system automatic controller ISR
(LMS14)
00100
Line Power
230V 50Hz
Extension module ISR – AVS75.390/100
Extension module ISR – AVS75.390/100

Application example 4: Cascade with two EC three, three mixed circuits, hydraulic bypass and DHW preparation

Hydraulic plan



Wiring plan (right EC three)



Wiring plan (left EC three)

Parameters to set:

Menu item	Function	Settings
Configuration:		
5890	Relay output QX1	DHW ctrl elem Q3
5891	Relay output QX2	Boiler pump Q1
5892	Relay output QX3	Circulating pump
6020	Function extension module 1	Heating circuit 1
6021	Function extension module 2	Heating circuit 2
6022	Function extension module 3	Heating circuit 3
LPB system:		
6600	Device address	2
3) Adressing of the extension module on adress 2 (dip switch)		
4) Adressing of the third extension module on adress 3 (dip switch)		

The following parameters are to be adapted, if a second room devise RGT is applied for cicuit 2:

Parameters to set:

Menu item	Function	Settings
Operator section		
40	Used as	Room unit 2

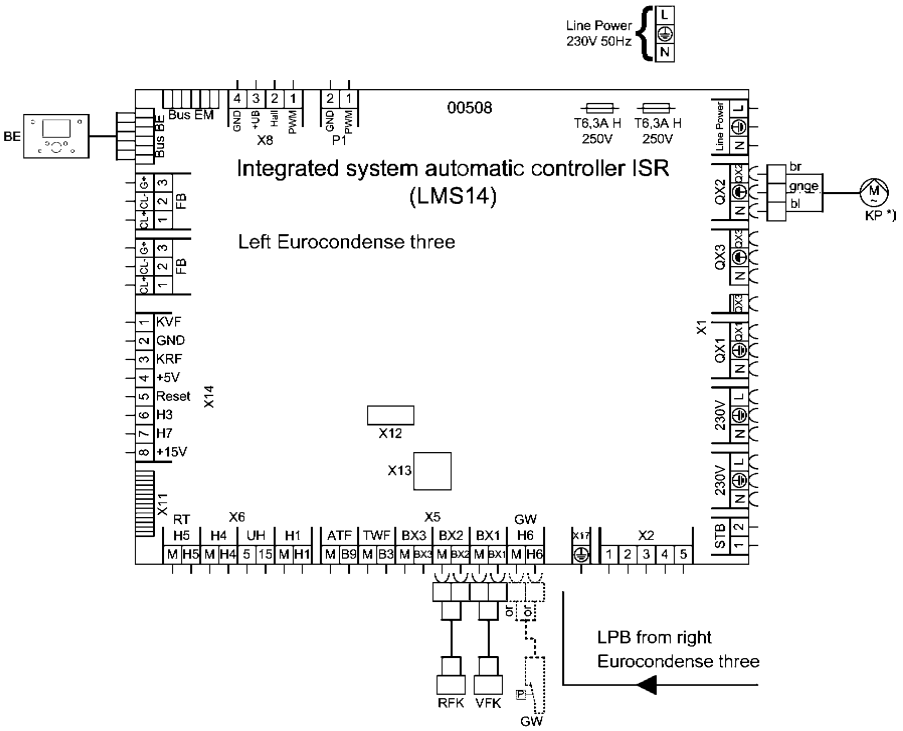
The following parameters are to be adapted, if a third room devise RGT is applied for cicuit 3:

Parameters to set:

Menu item	Function	Settings
Operator section		
40	Used as	Room unit 3

Parameters to set:

Menu item	Function	Settings
Configuration:		
5710	Heating circuit 1	Off
5891	Relay output QX2	Boiler pump Q1
5930	Sensor input BX1	Common flow sensor B10
5931	Sensor input BX2	Cascade return sensor B70
LPB system:		
6600	Device address	1



4.9 Legend

Sensor designations:

Title in the hydraulic	Title in the regulation	Function / Declaration	Type
ATF	Outdoor temp. sensor B9	Measuring the outdoor-temperature	QAC34
HVF	Flow sensor B1/B12/B16	Sensor of mixing circuit	D 36
KRF	Boiler return sensor B7	Measuring return temperature, e.g. for elevation of return temperature	Z 36
RTF	Return sensor B73	Measuring return temperature of installation, e.g. for elevation of return temp. (Solar)	Z 36
VFK	Flow sensor B10	Measuring flow temperature of installation, e.g. for low loss header	Z 36
RFK	Return sensor B70	Measuring return temperature of cascade	Z 36
TWF	Tank sensor B3	Measuring of upper DHW tank temperature	Z 36
TWF2	Tank sensor B31	Measuring of lower DHW tank temperature / storage tank	Z 36
TLF	DHW charging sensor B36	Measuring of charging temperature of charging system LSR	D 36
SKF	Collector sensor B6	Measuring temperature of solar collector	Z 36
SKF2	Collector sensor B61	Measuring temperature of solar collector (secondary field)	Z 36
SVF	Solar flow sensor B63	Measuring of flow temperature solar circuit	Z 36
SRF	Solar return sensor B64	Measuring of return temperature solar circuit	Z 36
PSF1	Upper storage tank sensor B4	Measuring of upper storage tank temperature	Z 36
PSF2	Lower storage tank sensor B41	Measuring of lower storage tank temperature	Z 36
PSF3	Middle storage tank sensor B42	Measuring of storage tank temperature / mid - tank	Z 36
FSF	Solid fuel boiler sensor B22	Measuring of temperature of woood boiler	Z 36
SBF	Swimming pool sensor B13	Measuring of pool temperature	Z 36
KVF	Boiler flow sensor B2	Measuring of boiler temperatur	Z 36

Type D is a dockable sensor, Type Z is a diving sensor, the collector sensor has a black silicon cable, the sensor of the SOR S/M are Pt 1000 Fühler.

Pumps:

Title in the hydraulic	Title in the regulation	Function / Declaration
TLP	DHW pump Q3	DHW charging pump
TZP	Circulating pump Q4	DHW circulating pump
SDP	DHW mixing pump Q35	Thorough mixing of DHW tank during legionella function
SUP	St tank transfer pump Q11	Shuffles DHW from storage to DHW tank
ZKP	DHW interm circ pump Q33	DHW pump in secondary circuit of tank charging system (e.g. LSR)
HP	Heating circuit pump Q2; Q6	Pump of a heating circuit
HKP	Heating circuit pump HCP Q20	Pump for circuit HKP
SKP	Collector pump Q5	Pump of solar circuit
SKP2	Collector pump Q16	Pump of 2nd solar circuit
FSP	Solid fuel boiler pump Q10	Boiler pump for wood boiler
ZUP	System pump Q14	Additionel pump for supply of distant circuit
SBP	Pump Hx Q15, Q18, Q19	Pump for swimmingpool
H1	H1 pump Q15	Pump for high temperature circuit e.g. ventilation
H2	H2 pump Q18	Pump for high temperature circuit e.g. ventilation
H3	H3 pump Q19	Pump for high temperature circuit e.g. ventilation
BYP	Bypass pump Q12	Pump for return temperature elevation
SET	Solar pump ext. exch. K9	Pump for secondary circuit of solar heat exchanger
KP	Boiler pump Q1	Boiler pump, in parallel to boiler operation

Valves:

Title in the hydraulic	Title in the regulation	Function / Declaration
DWV		Three way valve general
DWVP	Solar ctrl elem buffer K8	Switches solar circuit to storage tank
DWVS	Solar ctrl elem swi pool K18	Switches solar circuit to swimming pool
DWVE	Heat gen shutoff valve Y4	Separates boiler from circuits hydraulically
DWVR	Buffer return valve Y15	Switches return to elevation of return temperature (utilsation of solar energy)
HM	Heat circ mix valve Y1/2; Y3/4	Mixing circuit
USTV		Overflow valve (optionel extra)

General:

Shortcut	Function / Declaration
BE	Display of boiler or wall mounted control
Bus BE	Bus connection for display
Bus EM	Bus connection to extension module
FB	Connection distance control RGT; RGTF; RGTK
BXx	Input multifunctional (Sensor entrance)
QXx	Output multifunctional
H1; H2; H3	Input multifunctional (potential free)

Shortcut	Function / Declaration
TWW	DHW hot
TWK	DHW cold
TWZ	DHW circulation
S1	Boiler switch
F1	Fuse
FB	Connection distance control RGT; RGTF; RGTK
*)	Accessory to be orderd separately

Stand 03.02.2010

5. Installation

5.1 Connect heating circuit

Note: It is recommended that a filter be fitted in the heating return. In the case of old plants, the whole heating plant should be thorougly flushed before instrallation.

Safety valve
In case of open heating plants, connect the safety header and return pipeline; in case of closed heating plants install the expansion vessel and safety valve.

Caution! The connecting pipe between boiler and safety valve must not be blockable. Fitting of pumps and fittings or pipe reducer pieces is not permissible. The blow-off line of the safety valve must be so designed, that the pressure does not increase as one approaches the safety valve. It must not be led into free space, the opening must be clear and observable. Heating water that may possibly escape should be safely drained off.

5.2 Condensated water connection

A direct run-off of the condensate into the domestic drainage system is only allowed, if the system only comprises corrosion resistant materials (e.g. PP-pipe, stoneware or similar materials). If this is not the case, a suitable neutralisation plant must be installed.
The condensate must be able to flow freely into a tundish. A siphon trap must be installed between the tundish and drainage system. The condensate hose of the EuroCondense three must be inserted through the opening in the rear or side wall. If there is no drain underneath the condensate discharge, the use of a suitable neutralisation plant and pump is necessary.

5.3 Sealing and filling of the plant

- Filling the heating plant
- Check tightness (max.water test pressure 6 bar).

5.4 Flue system

The Flue system must provide satisfactory control of condensation, in accordance with Part J of the Building Regulations:
- Use components that are impervious to condensates and suitably resistant to corrosion (i.e. stainless steel grade 316 etc.)
- Make provision for draining, avoid ledges, crevices etc (e.g. most flexible liners are not suitable)
- Make provision for disposal of condensate to suitable drain point (e.g. PP pipe or stainless steel condensate drain with water seal siphon trap. Copper should not be used)

Owing to low flue gas temperatures only single skinned flue pipe is necessary in areas where personal protection is required (maximum temperature of 90°C.) The number of bends used should be kept to a minimum and bends used should be of the swept type. 90° tees should **not** be used. If an existing chimney is being reused, this must lined with a correct liner suitable for condensing operation. Termination of flue must be to current standards both for height and distance from adjacent objects i.e. other terminals, opening windows or doors and walls.

Flue lengths
Permissible Flue Lengths for Room Air Dependent Operation:

Modell	Flue Size	Maximum Flue Length incl. one 87° elbow
EC three 125	Ø 160 mm	60 m
EC three 170	Ø 160 mm	50 m
EC three 215	Ø 200 mm	60 m
EC three 260	Ø 200 mm	60 m
EC three 300	Ø 200 mm	60 m

These lengths only apply to single boilers. For more elbows the following deductions should be made:
1 x elbow 87°: 5 m
1 x elbow 45°: 2 m

For installation of multiple boilers, a flue specialist should be instructed to assist.

Standards
Flue systems should meet the applicable sections of:

- BS6644.
- CIBSE Applications Manual AM14 Non-Domestic Hot Water Heating Systems
- Clean Air Act 1993
- the current Building Regulations must also be strictly observed

The boiler should be installed in accordance with BS6644 with respect to protecting the boiler from damage, air for combustion and ventilation, discharge of products of combustion, clearances for service and access, temperatures, noise levels, the disposal of boiler water and the effects of flooding of the boiler house or seepage from roof top boiler house.

5.5 Gas connection

The gas side connection must only be carried out by an approved heating specialist. For the gas side installation and setting, the factory setting data of the equipment and optional label should be compared with the local supply conditions. Residues in pipes and pipe joints should be removed.

5.6 Check tightness

Danger! Danger of life from gas!
The entire gas inlet pipe, particularly the joints must be checked for leakages before commissioning.
The gas burner valve on the gas burner must be pressure- tested at maximum of **150 mbar**.

De-airing gas line

The gas line has to be purged before commissioning. For this, open the measuring nozzle for the connecting pressure and purge by observing the safety precautions. Check for tightness of the connection after de-airing!

5.7 Factory settings

- Gas type LL (natural gas L with Wobbe index W_{oN} = 12.4 kWh/m³ *or*
- Gas type E (natural gas E with Wobbe index W_{oN} = 15.0 kWh/m³

The set gas type can be seen on the affixed label on the burner. The data, set by the manufacturer, has to be checked with the local supply conditions before installation of the EuroCondense three. The gas pressure controller of the gas valve has been sealed.

Liquid gas design

Note: The cause may be lack of gas in case of the fault message "133" (see fault code table); therefore, the liquid gas tank must be checked for content.

5.8 CO2 -Content

The CO_2content in the exhaust gas must be checked during commissioning and during regular maintenance of the boiler, as well as, after reconstruction work on the boiler or on the exhaust gas system.
CO_2-content during operation see section *Technical data.*

Caution! Risk of damage of the burner!
Too *high* CO_2 -values can lead to incomplete combustion (high CO-values) and damage to the burner.
Too *low* CO_2 -values can lead to ignition problems.

The CO_2 -value is set at the gas valve by adjusting the gas pressure (see *Fig. 7*).
In case of employment of the EuroCondense three in areas with fluctuating natural gas composition, the CO_2-content should be adjusted in accordance with the Wobbe Index at any given time (ask the gas supply company).
The CO_2-content to be set can be decided as follows:
- CO_2-content = 9,3 - (W_{oN} - $W_{ocurrent}$) * 0,5

The air quantity set in the factory must not be changed.

5.9 Changing over from LPG to natural gas and vice versa

Danger**! Danger of injury by explosion!**
The gas type of the EuroCondense three must only be modified by an approved heating specialist.
To change to other type of gas only the CO_2- content must be reset by adjusting the jet pressure on the gas valve (see *Fig. 7*).

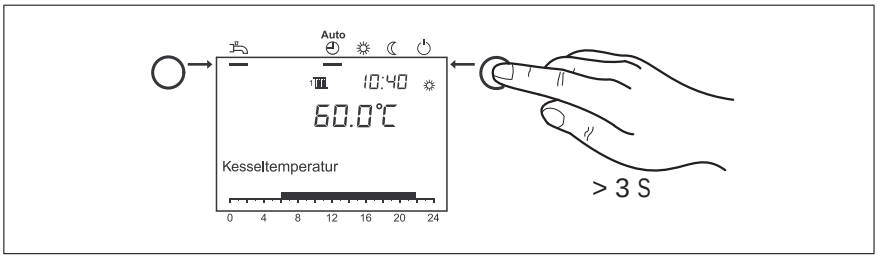
Moreover, the following parametres of the LMS control have to be adapted - see the values of the following tables:

Function	Prog. no.	Setting level	EC three 125		EC three 170		EC three 215	
			Natural gas	LPG	Natural gas	LPG	Natural gas	LPG
Boiler								
Output basic stage	2331	F	20	35	28	35	35	48
Burner control								
Nominal output prepurging	9504	F	59,3	66,3	75,5	86,8	77,1	89,3
Nominal output ignition	9512	F	59,3	66,3	75,5	86,8	77,1	89,3
Nominal output partial load	9524	F	20,0	35,0	28,0	35,0	35,0	48,0
Conversion fan output/speed increase	9626	F	37,1	33,9	27,6	24,1	26,4	23,0
Conversion fan output/speed Y section	9627	F	501,1	453,9	517,2	507,4	464,4	446,3
CO_2content (± 0,2)			9,3	11,0	9,3	11,0	9,3	11,0

Function	Prog. no.	Setting level	EC three 260		EC three 300	
			Natural gas	LPG	Natural gas	LPG
Boiler						
LOutput basic stage	2331	F	42	58	48	58
Burner control						
Nominal output prepurging	9504	F	97,7	110,3	103,9	115,5
Nominal output ignition	9512	F	97,7	110,3	103,9	115,5
Nominal output partial load	9524	F	42,0	58,0	48,0	58,0
Conversion fan output/speed increase	9626	F	21,5	19,9	19,9	19,0
Conversion fan output/speed Y section	9627	F	398,4	305,7	431,7	306,1
CO_2content (± 0,2)			9,3	11,0	9,3	11,0

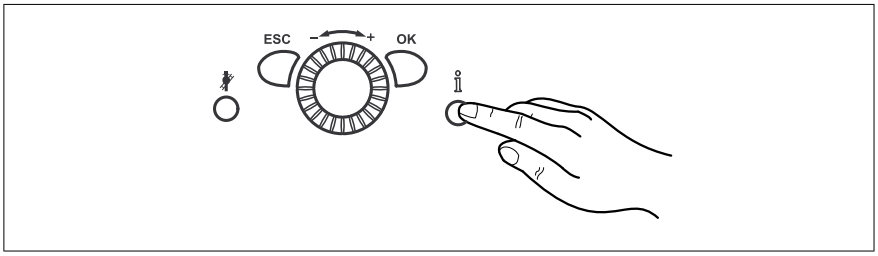
5.10 Controller Stop Mode (Manual Adjustment of Burner Load)

For setting and controlling the CO_2 values the EuroCondense three in operated in the **control stop function**.

1. 

   Press operation mode button Heating Operation for **approximately 3 seconds**
   => the message *Controller Stop Function ON* is displayed.

2. Wait, until the display has reached the basic display again.

3. 

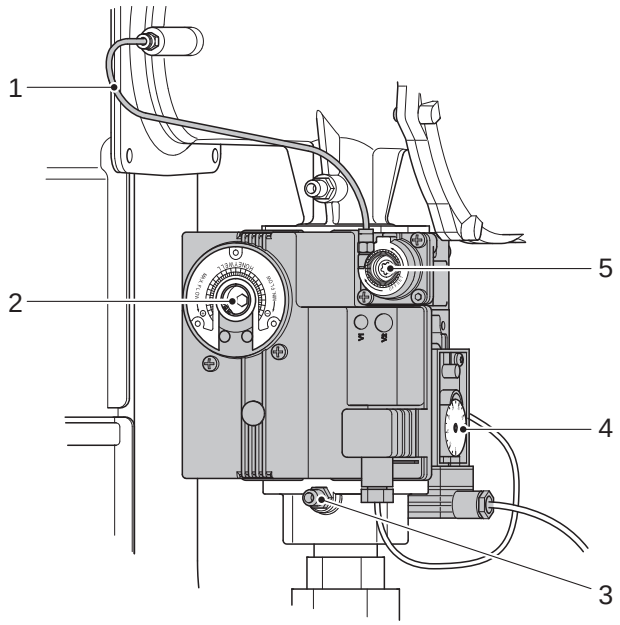
   Press information button
   => The message *Controller stop setpoint adjust* appears in the display. The actual modulation degree will be displayed on the display.

4. Press OK button
   = > The nominal value can now be changed.
5. Press OK button
   => The displayed nominal value is accepted by the control.

Note: The regulator stop function is stopped by pressing the *operating mode button Heating Operation* for approximately 3 seconds, reaching the maximum boiler temperature or a time limit.

5.11 Check and adjust CO2 content

Fig. 7: Gas valve



1 Compensation line
2 Adjustment screw for full load (Allen key 3 mm)
3 Measuring nozzle for inlet pressure
4 Gas pressure monitor
5 Adjustment screw for low load (Torx TX 40)

Set **CO_2-content at max. output**

1. EuroCondense three in the controller stop mode (refer to previous section) operated at mfull load
2. Remove safety cap from the adjustment screw for full load (2)
3. Set CO_2 content on the adjustment screw for full load (2) according to *Technical Data* section with a 3 mm Allen key
   - Clockwise: CO_2 content is decreased
   - Counter-clockwise: CO_2 content is increased
4. Replace safety cap on the adjusting screw for full load (2)

Set **CO_2-content at min. output**

1. EuroCondense threein the controller stop mode (refer to previous section) operated at low load
2. Remove safety cap from the adjustment screw for small load (5)
3. Set CO_2 content on the adjustment screw for small load (5) according to *Technical Data* section with a Torx key TX 40
   - Clockwise: CO_2-content is increased
   - Counter-clockwise: CO_2 is reduced
4. Replace safety cap on the adjusting screw for low load (5)

Note: After successful adjustment of the gas valve, the CO_2 content must again be controlled at maximum and minimum output and corrected if necessary

5.12 Electrical connection (general)

Danger of electric shock!
All electrical work in connection with the installation must only be carried out by a trained electrician!

- Mains Voltage AC 230 V +6% -10%, 50 Hz

In Germany the VDE and local regulations and in all other countries, the pertinent regulations should be followed during installation.
The electrical connection has to be carried out unmistakably regarding terminal and terminal direction. In Germany, the connection can be carried out with an accessible, unmistakable plug-in connection or as a fixed connection. In all other countries, a fixed connection has to be carried out.
It is recommended , to install a main switch before the EuroCondense three. This should switch off all poles and have a contact opening width of at least 3 mm.
All connected components must comply to VDE. Connecting lines have to be installed strain relieved.

Cable lengths

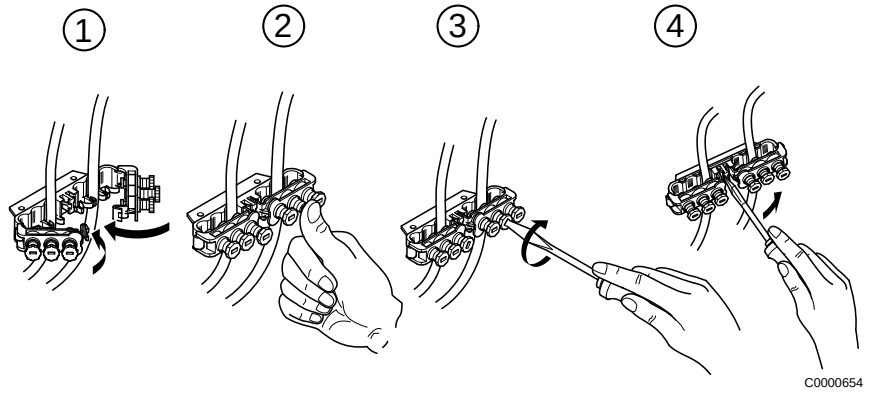
Bus / sensor cables do not carry mains voltage, but protective low voltage. They must not be routed in **parallel to the mains cables** (interference signals). Otherwise screen cables should be used.

Permissible cable lengths for all sensors:
- Cu-cable up to 20m: 0.8 mm^2
- Cu-cable up to 80m: 1 mm^2
- Cu-cable up to 120m: 1.5 mm^2

Strain reliefs

All electrical cables have to be installed from the boiler rear wall to the boiler switch panel. Here, the lines have to be fixed into the strain relief of the switching panel and to be connected according to the wiring diagram (*Fig. 8*).

Fig. 8: Strain relief



Circulating pumps

The permissible current load per pump connection is $I_{N\,max}$ = 1 Amp.

Fuses

Fuses in the Control Unit ISR:
- Mains fuse: T 6,3A H 250V

Connection sensor / components

Danger of electric shock! Danger of life, if handled inappropriately!
The wiring diagram must be followed! Optional accessories must be fitted and connected according to the instructions provided. Connect to the mains. Check earthing.

Outdoor temperature sensor (included in delivery)
The outdoor temperature sensor is located in the accessory bag. For connection see wiring plan.

Replacing cables

All connecting cables apart from the mains cable must be replaced when necessary with BRÖTJE-special cables. When replacing the mains cable only cables complying with BS6500 must be used.

Contact protection and international protection IPx4D

After opening the EuroCondense three, the cladding parts to be screwed on should be screwed back on with the appropriate screws for ensuring protection against contact.

6. Commissioning

Danger**!** The Commissioning must only be carried out by an approved heating specialist! The heating specialist checks the tightnesss of connections, the correct functioning of all regulating, control and safety installations and measures the combustion values. In case of incorrect performance possible danger of considerable damage to persons, environment and property!

Caution! In dusty environment, e.g. during contruction work, the boiler shall not be commissioned. The boiler could be damaged!

6.1 Check water pressure

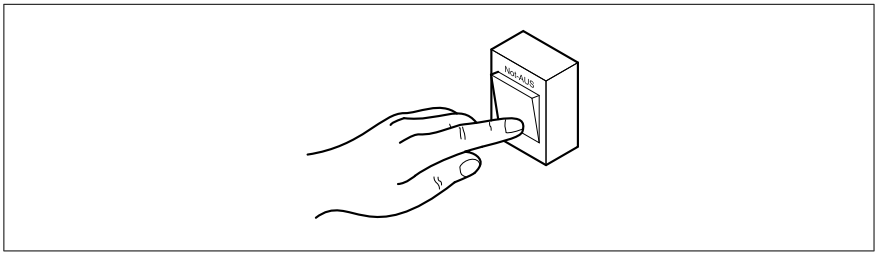
Caution! Check before switching-on, if the manometers show sufficient water pressure The value has to be between 1,0 and 2,5 bar.

- Less than 0,5 bar: Top up water .
  Caution! The maximum admissable installation pressure has to be considered!
- Over 6,0 bar: Do not start gas-condensing boiler. drain water.
  Caution! The maximum admissable installation pressure has to be considered!
- Check, if a collecting container is placed under the blow-down pipeline of the safety valve. In case of overpressure it collects running out heating circuit water.

6.2 Switching-on

Danger**! Danger of scalding!** Hot water may exit from the blow pipe of the safety valve.

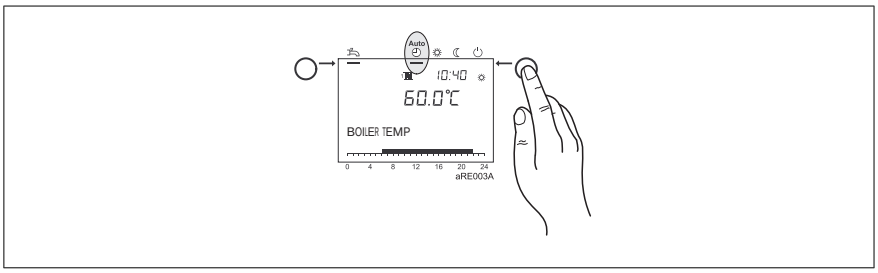
1.



Switch on heating isolator switch

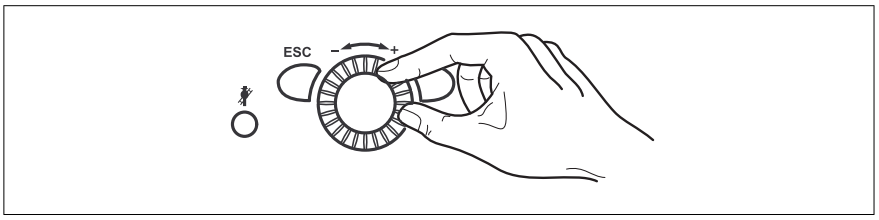
2. Open gas shut-off installation
3. Open front panel cover and switch on operating switch on the front panel of the boiler

4.



Select the operation mode **automatic operation**with the operation mode button on the control unit Auto

5.



Set the required room temperature on the rotating knob of the control unit

6.3 Temperatures for heating and drinking water

The information in the section *Programming* for setting the temperatures for heating and domestic hot water.

Note: The times for DHW will be set in time programme 4/ TWW. **For reasons of comfort, the start of DHW heating should be approximately 1 hour before start of heating!**

6.4 Individual time programme

The gas condensing boiler can be commissioned having its standard values.
For setting e.g. an individual time programme, please observe section *Programming (tab. 5)*.

6.5 Instruction for the customer

Instruction
The customer should be instructed in the operation of the boiler and the function of the safety devices. The following should be pointed out:

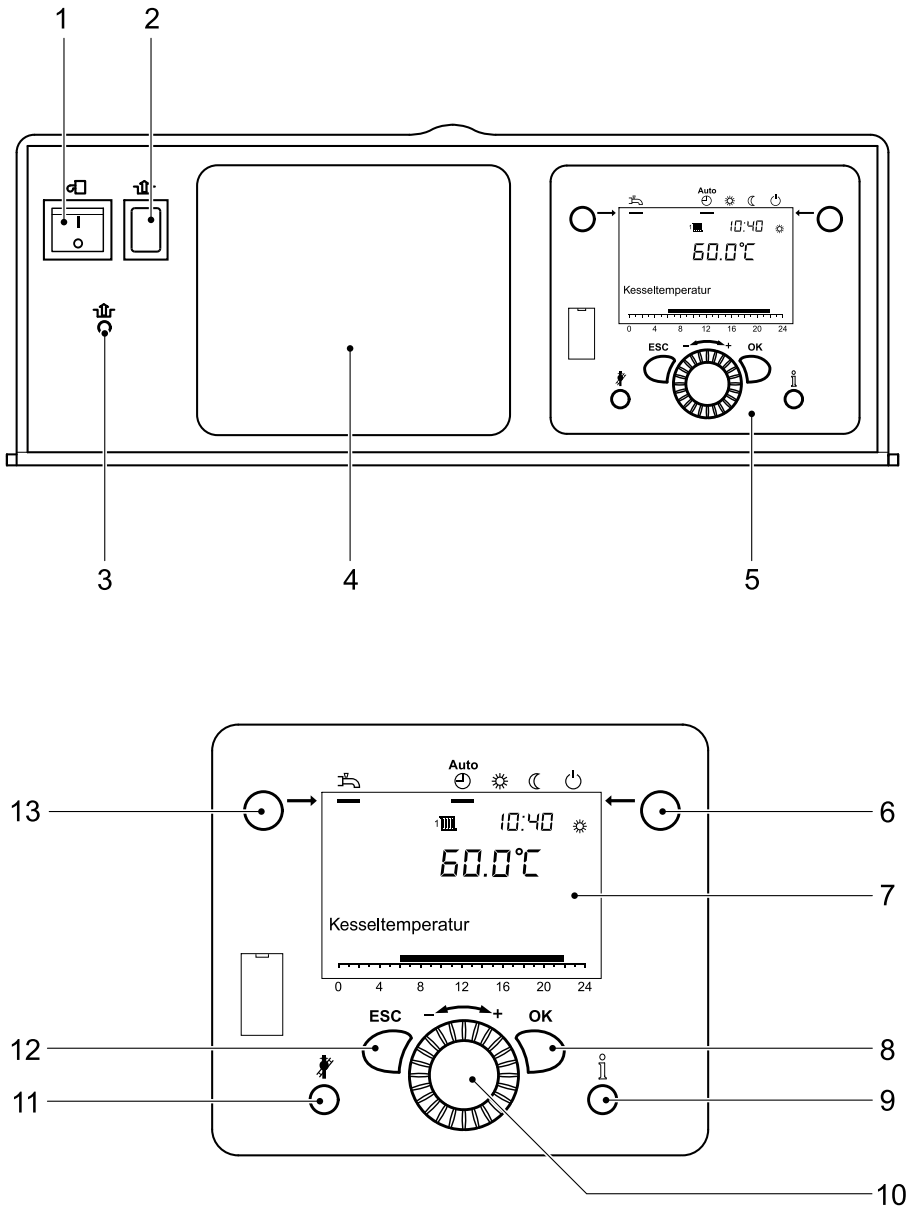
- the air inlet must not be restricted;
- flammable materials and liquids must not be stored in the vicinity of the gas boiler;
- the customer has to carry out the following control checks himself:
  - pressure check on the manometer;
  - check the discharge from the safety valve;
- only approved gas installers may carry out the inspection and maintenance.

Documents
- The documents, belonging to the boiler, have to be handed over with the instructions they have to be kept in the installation room of the boiler.
- Copy the commissioning sheet with confirmation and legally binding signature to the customer. All components have been installed according to the instruction of the manufacturer. The whole plant complies with the relevant British Standards and current Building Regulations.

7. Operation

7.1 Operating elements

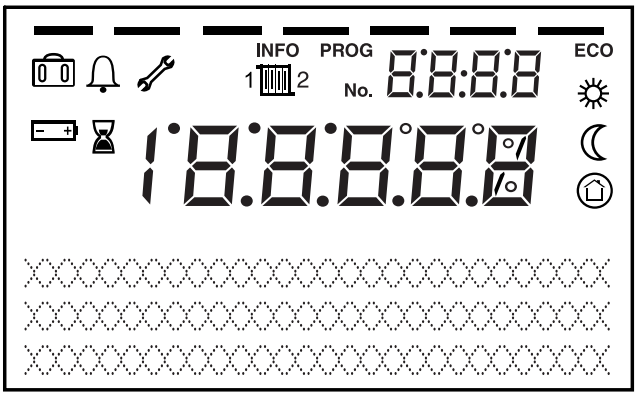
Fig. 9: Operating elements



1 Operating switch
2 Reset button
3 Reset safety temperature limiter (STB)
4 Blanking plate
5 Operator section (ISR)
6 Operating mode button heating operation
7 Display
8 OK-button (acknowledgment)
9 Information button
10 Rotating knob
11 Chimney-sweep button
12 ESC-button
13 Operation mode button DHW operation

7.2 Displays

Fig. 10: Symbols in the display



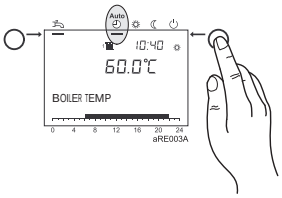
sRE081A

Meaning of the displayed symbols

- Heating at comfort nominal value
- Heating at reduced nominal value
- Heating at frost protection setpoint
- Current process
- Holiday function activated
- 1 2 Reference to heating circuit 1 or 2
- Servicing message
- Fault message
- **Info** Information level activated
- **PROG** Setting level activated
- **ECO** Heating switched off (Automatic sommer/ winter switch over activated)

7.3 Setting up heating operation

Change-over between operating modes for heating operation will be carried out with the operating button "Heating operation". The selected setting will be marked with a bar underneath the operating mode symbol.



Automatic operation Auto :

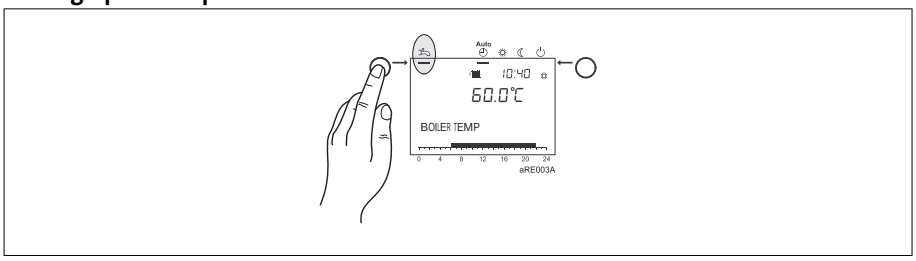
- Heating operation according to time programme
- Nominal temperature values comfort or reduced according to time programme
- Protection functions (plant frost protection, overheating protection) activated
- Automatic summer/winter switch-over (automatic switching over between heating and summer operation from a certain outside temperature on)
- Automatic day heating limit (automatic change-over between heating and summer operation, if outside temperature exceeds the nominal room value)

Continuous Operation ☼ comfort or ☾ reduced:
- Heating operation without time programme
- Protection functions activated
- Automatic summer/winter switch-over is not activated
- Automatic day heating limit is not activated

Protection operation ⏻:
- No heating operation
- Temperature according to frost protection setpoint
- Protection functions activated
- Automatic summer/winter switch-over is not activated
- Automatic day heating limit is not activated
- DHW operation according to status

7.4 Setting up DHW operation

Setting up DHW operation

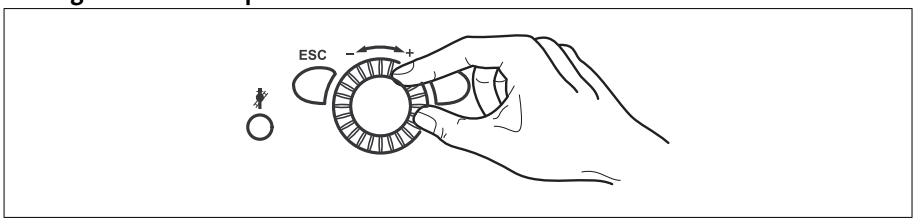


- *Switched on*: DHW will be prepared according to the selected switching programme.
- *Switched off*: DHW preparation has been de-activated.

Note: Legionella function
Each Sunday during the first charge of the DHW tank, the legionella function is activated; this means DHW ist heated up to 65 °C for reduction of legionella.

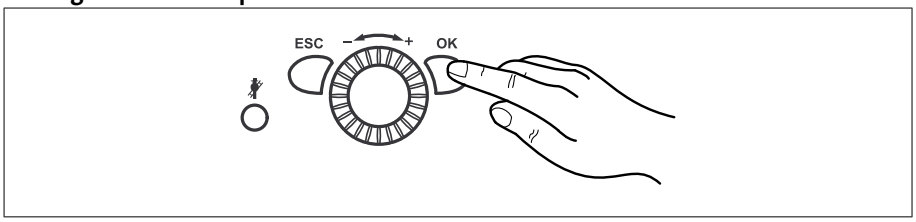
7.5 Setting room setpoint

Setting ☼ comfort setpoint:



1. Set comfort setpoint with the control knob
   => The value will automatically be take over

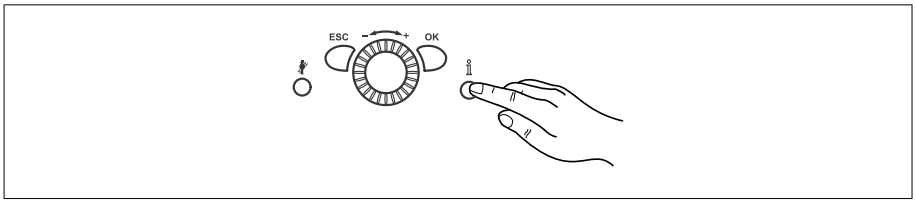
Setting ☾ reduced setpoint:



1. Press OK button
2. Select heating circuit.
3. Press OK button
4. Select parameter *Reduced setpoint*
5. Press OK button
6. Set reduced setpoint with the control knob
7. Press OK button
8. Leave programming level by pressing the operation mode button heating operation

7.6 Display information

Various temperatures and messages can be called up by pushing the information button.

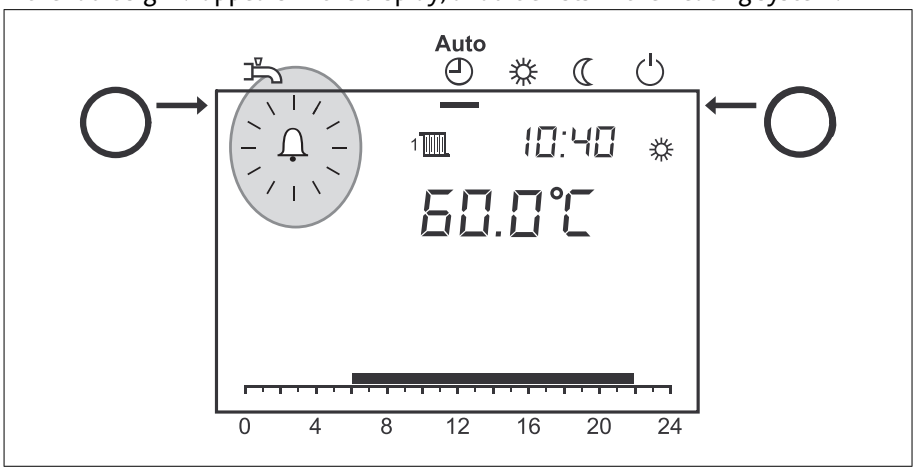


Including:
- Room and outside temperature (if sensor fitted)
- Fault or service messages

Note: When no faults occur and no service messages exist, this information is not displayed.

7.7 Error message

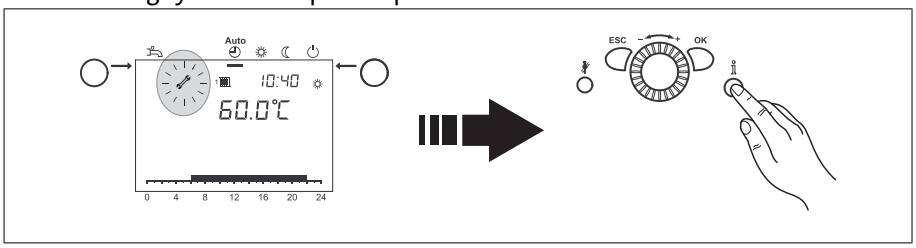
If the fault sign 🔔 appears in the display, a fault exists in the heating system.



- Press information button (i)
- further information can be called up (see *Fault code table*).

7.8 Servicing message

If the maintenance sign appears in the display, a maintenance message exists or the heating system is in special operation.



- Press information button (i)
- further information can be called up (see section *9.13 Maintenance code- table*).

Note: The maintenance message has not been activated by the setting in the factory.

7.9 Emergency mode (Manual control)

Activation of manual control. If the manual control function is activated the boiler will be controlled to the Setpoint manual control. All pumps will be activated. Additional request will be ignored!

1. Press OK button
2. Select menu point *Maintenance/service*
3. Press OK button
4. Select parameters *Manual control* (prog.-no. 7140)
5. Press OK button
6. Select parameter"On"
7. Press OK button
8. Leave programming level by pressing the operation mode button heating operation

7.10 Restore standard values

The standard values will be restored as described below:

- select level *engineer* and prog.no. 31
- Change to *Yes* and wait until value is switching back to No
- Leave menu by pressing *ESC*

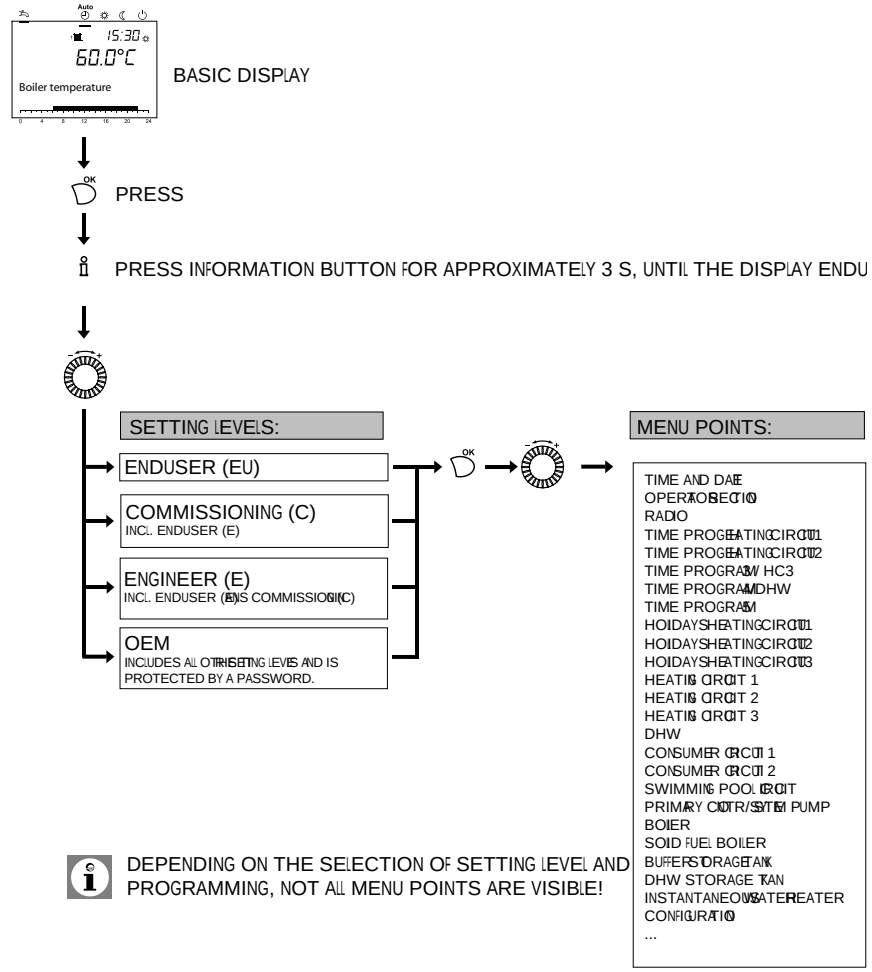
You can find more information for adjusting parameters in the section *programming*.

8. Programming

8.1 Programming procedure

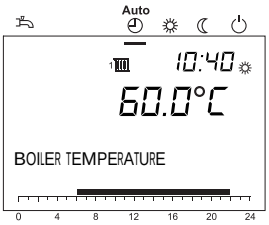
The selection of the setting levels and menu points for end users and heating specialists is carried out by means of the following diagram:

Fig. 11: Selection of setting levels and menu points



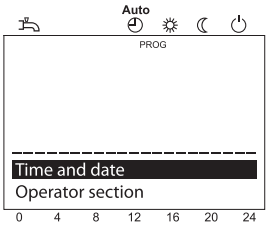
8.2 Modification of parameters

Settings, which are not directly modified via the front panel, have to be carried out in the setting level.
The basic programming processs is depicted in the following by the setting of time and date.



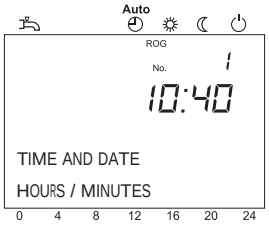
Basic display:

OK Press



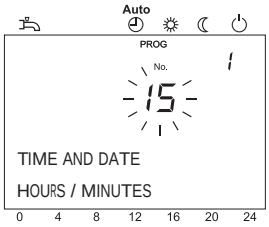
Select with the menu point **time and date**.

Acknowledge selection with OK



Select with the menu point **hours/minutes**.

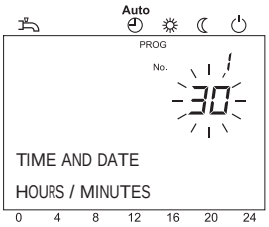
Acknowledge selection with OK



Select with set the hours (e.g. 15 hours).

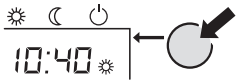
Acknowledge selection with OK

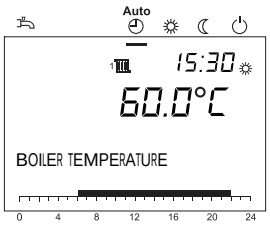
Select with  set the minutes (e.g. 30 minutes).



Acknowledge selection with 

Press heating circuit operation mode button to return to the basic display.





The previous menu point will be called-up by pressing the ESC-button without taking over previously modified values. If no settings are carried out for approximately 8 minutes, the basic display is called-up without taking over previously modified values.

8.3 Setting table

- Not all parameters displayed in the display are listed in the setting table.
- Depending on the plant configuration, not all parameters listed in the setting table are displayed in the display.
- In order to get to the setting levels: Enduser (E), Commissioning (I) and Specialist (F), press OK button; after this, press and hold the information (i) button for 3 seconds, select the required level with the handwheel and acknowledge with the OK button.

Tab. 5: Setting the parameters

Function	Prog. no.	Level [1)]	Standard value
Time of day and date			
Hours/minutes	1	Eu	00:00 (h:min)
Day/month	2	Eu	01.01 (day. month)
Year	3	Eu	2004 (year)
Start of summertime	5	E	25.03 (day.month)
End of summertime	6	E	25.10 (day, month)
Operator section This parameter is only visible in the room device!			
Language	20	Eu	English
Info Temporarily | Permanently	22	E	Temporarily
Display of errors Code | Code and text	23	E	Code and text
Contrast of display	25	Eu	87
Operation lock Off | On	26	E	Off
Programming lock Off | On	27	E	Off
Save basic settings No | Yes This parameter is only visible in the room device!	30	E	No
Activate basic settings No | Yes	31	E	No
Used as Room unit 1 | Room unit 2 | Room unit P | Operator unit | Service unit This parameter is only visible in the room device!	40	C	Room unit 1
Assignment device 1 Heating circuit 1 | Heating circuits 1and 2 This parameter is only visible in the room device, as the operating unit in the boiler is fixed programmed for the operating device!	42	C	Heating circuit 1
Operation HC2 Commonly with HC1 | Independently	44	C	Commonly with HC1
Operation HC3 Commonly with HC1 | Independently	46	C	Commonly with HC1

Function	Prog. no.	Level [1)]	Standard value
Action occupancy button None | Heating circuit 1 | Heating circuit 2 | Commonly ⓘ This parameter is only visible in the room device!	48	C	None
Readjustment room sensor ⓘ This parameter is only visible in the room device!	54	E	0.0°C
Software version	70	E	
Radio ⓘ Parameter only visible, if wireless room device exists!			
Room unit 1 Missing | Ready | No reception | Change battery | Delete device	130	C	missing
Room device 2 Missing | Ready | No reception | Change battery | Delete device	131	C	missing
Room unit 3 Missing | Ready | No reception | Change battery | Delete device	132	C	missing
Outside sensor Missing | Ready | No reception | Change battery | Delete device	133	C	missing
Repeater Missing | Ready | No reception | Change battery | Delete device	134	C	missing
Operator unit 1 Missing | Ready | No reception | Change battery | Delete device	135	C	missing
Operator unit 2 Missing | Ready | No reception | Change battery | Delete device	136	C	missing
Operator unit 3 Missing | Ready | No reception | Change battery | Delete device	137	C	missing
Service unit Missing | Ready | No reception | Change battery | Delete device	138	C	missing
Delete all devices No | Yes	140	C	No
Time prog heating circuit 1			
Pre-selection Mo-Su Mo-Su | Mo-Fr | Sa-Su | Mo |Tu |We | Th | Fr | Sa | Su	500	Eu	Mo - Su
1st phase on	501	Eu	06:00 (h/min)
1st phase off	502	Eu	22:00 (h/min)
2nd phase on	503	Eu	--:-- (h/min)
2nd phase off	504	Eu	--:-- (h/min)
3rd phase on	505	Eu	--:-- (h/min)
3rd phase off	506	Eu	--:-- (h/min)
Default values No | Yes	516	Eu	No
Time prog heating circuit 2 ⓘ Parameter only visible, if heating circuit 2 exists!			
Pre-selection Mo-Su Mo-Su | Mo-Fr | Sa-Su | Mo |Tu |We | Th | Fr | Sa | Su	520	Eu	Mo - Su
1st phase on	521	Eu	06:00 (h/min)

Function	Prog. no.	Level [1)]	Standard value
1st phase off	522	Eu	22:00 (h/min)
2nd phase on	523	Eu	--:-- (h/min)
2nd phase off	524	Eu	--:-- (h/min)
3rd phase on	525	Eu	--:-- (h/min)
3rd phase off	526	Eu	--:-- (h/min)
Default values No | Yes	536	Eu	No
Time program 3 / HC3			
Pre-selection Mo-Su Mo-Su | Mo-Fr | Sa-Su | Mo |Tu |We | Th | Fr | Sa | Su	540	Eu	Mo - Su
1st phase on	541	Eu	06:00 (h/min)
1st phase off	542	Eu	22:00 (h/min)
2nd phase on	543	Eu	--:-- (h/min)
2nd phase off	544	Eu	--:-- (h/min)
3rd phase on	545	Eu	--:-- (h/min)
3rd phase off	546	Eu	--:-- (h/min)
Default values No | Yes	556	Eu	No
Time program 4/DHW			
Pre-selection Mo-Su Mo-Su | Mo-Fr | Sa-Su | Mo |Tu |We | Th | Fr | Sa | Su	560	Eu	Mo - Su
1st phase on	561	Eu	05:00 (h/min)
1st phase off	562	Eu	22:00 (h/min)
2nd phase on	563	Eu	--:-- (h/min)
2nd phase off	564	Eu	--:-- (h/min)
3rd phase on	565	Eu	--:-- (h/min)
3rd phase off	566	Eu	--:-- (h/min)
Default values No | Yes	576	Eu	No
Time program 5			
Pre-selection Mo-Su Mo-Su | Mo-Fr | Sa-Su | Mo |Tu |We | Th | Fr | Sa | Su	600	Eu	Mo - Su
1st phase on	601	Eu	06:00 (h/min)
1st phase off	602	Eu	22:00 (h/min)
2nd phase on	603	Eu	--:-- (h/min)
2nd phase off	604	Eu	--:-- (h/min)
3rd phase on	605	Eu	--:-- (h/min)
3rd phase off	606	Eu	--:-- (h/min)
Default values No | Yes	616	Eu	No
Holidays heating circuit 1			
Preselection Period 1 ... 8	641	Eu	Period 1
Start	642	Eu	--.-- (day. month)

Function	Prog. no.	Level [1)]	Standard value
End	643	Eu	--.-- (day. month)
Operating level Frost protection | Reduced	648	Eu	Frost Protection
Holidays heating circuit 2			
Parameter only visible, if heating circuit 2 exists!			
Preselection Period 1 ... 8	651	Eu	Period 1
Start	652	Eu	--.-- (day. month)
End	653	Eu	--.-- (day. month)
Operating level Frost protection | Reduced	658	Eu	Frost Protection
Holidays heating circuit 3			
Parameter only visible, if heating circuit 3 exists!			
Preselection Period 1 ... 8	661	Eu	Period 1
Start	662	Eu	--.-- (day. month)
End	663	Eu	--.-- (day. month)
Operating level Frost protection | Reduced	668	Eu	Frost Protection
Heating circuit 1			
Operating mode Heating circuit 1 Protection | Automatic | Reduced | Comfort	700	E	Automatic
Comfort setpoint	710	E	20.0°C
Reduced setpoint	712	E	16.0°C
Frost protection setpoint	714	E	10.0°C
Heating curve slope	720	E	1.50
Heating curve displacement	721	F	0.0°C
Heating curve adaption Off | On	726	F	Off
Summer/winter heating limit	730	E	18°C
24-hour heating limit	732	F	- 3°C
Flow temp setpoint min	740	F	8°C
Flow temp setpoint max	741	F	80°C
Flow temp setpoint room stat	742	F	65°C
Room influence	750	C	- - - %
Room temp limitation	760	F	1°C
Boost heating	770	F	5°C
Quick setback Off | Down to reduced setpoint | Down to frost prot setpoint	780	F	Down to reduced set-point
Optimum start control max	790	F	0 min
Optimum stop control max	791	F	0 min
Reduced setp increase start	800	F	- - -°C
Reduced setp increase end	801	F	15°C

Function	Prog. no.	Level [1)]	Standard value
Continuous pump operation No | Yes	809	F	No
Overtemp prot pump circuit Off | On	820	F	ON
Mixing valve boost	830	F	5°C
Actuator running time	834	F	120 s
Floor curing function Off | Functional heating | Curing heating | Functional/curing heating | Curing/Functional heating | Manually	850	C	Off
Floor curing setp manually	851	F	25°C
Floor curing setp current	855	F	0°C
Floor curing day current	856	F	0°C
Excess heat draw Off | Heating mode | Always	861	F	Always
With buffer storage tank Off | Heating mode | Always	870	F	Yes
With prim contr/system pump No | Yes	872	F	Yes
Pump speed reduction Operating level | Characteristic	880	F	Characteristic
Pump speed min	882	C	0 %
Pump speed max	883	C	100 %
Curve readj at 50% speed	888	F	33 %
Flow setp readj speed ctrl No | Yes	890	F	Yes
Operating level changeover Frost protection | Reduced | Comfort	898	F	Reduced
Optg mode changeover None | Protection | Reduced | Comfort | Automatic	900	F	Protection
Heating circuit 2 Parameter only visible, if heating circuit 2 exists!			
Operating mode Heating circuit 2 Protection | Automatic | Reduced | Comfort	1000	E	Automatic
Comfort setpoint	1010	E	20.0°C
Reduced setpoint	1012	E	16.0°C
Frost protection setpoint	1014	E	10.0°C
Heating curve slope	1020	E	1.50
Heating curve displacement	1021	F	0.0°C
Heating curve adaption Off | On	1026	F	Off
Summer/winter heating limit	1030	E	18°C
24-hour heating limit	1032	F	-3°C
Flow temp setpoint min	1040	F	8°C
Flow temp setpoint max	1041	F	80°C
Flow temp setpoint room stat	1042	F	65°C

Function	Prog. no.	Level [1)]	Standard value
Room influence	1050	C	20 %
Room temp limitation	1060	F	1°C
Boost heating	1070	F	5°C
Quick setback Off | Down to reduced setpoint | Down to frost prot setpoint	1080	F	Down to reduced set-point
Optimum start control max	1090	F	0 min
Optimum stop control max	1091	F	0 min
Reduced setp increase start	1100	F	- - -°C
Reduced setp increase end	1101	F	-15°C
Continuous pump operation No | Yes	1109	F	No
Overtemp prot pump circuit Off | On	1120	F	ON
Mixing valve boost	1130	F	5°C
Actuator running time	1134	F	120 s
Floor curing function Off | Functional heating | Curing heating | Functional/curing heating | Curing/Functional heating | Manually	1150	F	Off
Floor curing setp manually	1151	F	25°C
Floor curing setp current	1155	F	0
Floor curing day current	1156	F	0
Excess heat draw Off | Heating mode | Always	1161	F	Always
With buffer storage tank No | Yes	1170	F	Yes
With prim contr/system pump No | Yes	1172	F	Yes
Pump speed reduction Operating level | Characteristic	1180	F	Characteristic
Pump speed min	1182	C	0 %
Pump speed max	1183	C	100 %
Curve readj at 50% speed	1188	F	33 %
Flow setp readj speed ctrl No | Yes	1190	F	Yes
Operating level changeover Frost protection | Reduced | Comfort	1198	F	Reduced
Optg mode changeover None | Protection | Reduced | Comfort | Automatic	1200	F	Protection
Heating circuit 3 Parameter only visible, if heating circuit 3 exists!			
Operating mode Heating circuit 3 Protection | Automatic | Reduced | Comfort	1300	E	Automatic
Comfort setpoint	1310	E	20.0°C
Reduced setpoint	1312	E	16.0°C
Frost protection setpoint	1314	E	10.0°C

Function	Prog. no.	Level [1)]	Standard value
Heating curve slope	1320	E	1.50
Heating curve displacement	1321	F	0.0°C
Heating curve adaption Off | On	1326	F	Off
Summer/winter heating limit	1330	E	18°C
24-hour heating limit	1332	F	-3°C
Flow temp setpoint min	1340	F	8°C
Flow temp setpoint max	1341	F	80°C
Flow temp setpoint room stat	1342	F	65°C
Room influence	1350	C	20 %
Room temp limitation	1360	F	1°C
Boost heating	1370	F	5°C
Quick setback Off | Down to reduced setpoint | Down to frost prot setpoint	1380	F	Down to reduced set-point
Optimum start control max	1390	F	0 min
Optimum stop control max	1391	F	0 min
Reduced setp increase start	1400	F	- - -°C
Reduced setp increase end	1401	F	-15°C
Continuous pump operation No | Yes	1409	F	No
Overtemp prot pump circuit Off | On	1420	F	ON
Mixing valve boost	1430	F	5°C
Actuator running time	1434	F	120 s
Floor curing function Off | Functional heating | Curing heating | Functional/curing heating | Curing/Functional heating | Manually	1450	F	Off
Floor curing setp manually	1451	F	25°C
Floor curing setp current	1455	F	0°C
Floor curing day current	1456	F	0
Excess heat draw Off | Heating mode | Always	1461	F	Always
With buffer storage tank No | Yes	1470	F	Yes
With prim contr/system pump No | Yes	1472	F	Yes
Pump speed reduction Operating level | Characteristic	1480	F	Characteristic
Pump speed min	1482	C	0 %
Pump speed max	1483	C	100 %
Curve readj at 50% speed	1488	F	33 %
Flow setp readj speed ctrl No | Yes	1490	F	Yes
Operating level changeover Frost protection | Reduced | Comfort	1498	F	Reduced

Function	Prog. no.	Level [1)]	Standard value
Optg mode changeover None | Protection | Reduced | Comfort | Automatic	1500	F	Protection
DHW			
DHW-Operating mode Off | On | Eco	1600	E	ON
Nominal setpoint	1610	E	55°C
Reduced setpoint	1612	F	40°C
Release 24h/day | Time programs HCs | Time program 4/DHW | Low tariff | Time program 4/DHW or LT	1620	E	Time programmes HCs
Charging priority Absolute | Shifting | None | MC shifting, PC absolute	1630	F	MC shifting, PC absolute
Legionella function Off | Periodically | Fixed weekday	1640	F	Fixed weekday
Legionella funct periodically	1641	F	3
Legionella funct weekday Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday	1642	F	Monday
Legionella funct time	1644	F	- - -
Legionella funct setpoint	1645	F	65°C
Legionella funct duration	1646	F	30 min
Legionella function circ pump Off | On	1647	F	ON
Circulating pump release Time programme 3 / HCP | DHW release | Time programme 4/DHW | Time program 5	1660	C	DHW release
Circulating pump cycling Off | On	1661	C	ON
Circulation setpoint	1663	F	45°C
Optg mode changeover None | Off | On	1680	F	Off
Consumer circuit 1			
Flow temp setp cons request	1859	C	70°C
DHW charging priority - No | Yes	1874	F	Yes
Excess heat draw - Off | On	1875	F	ON
With buffer storage tank - No | Yes	1878	F	Yes
With prim contr/system pump - No | Yes	1880	F	Yes
Consumer circuit 2			
Flow temp setp cons request	1909	C	70°C
DHW charging priority No | Yes	1924	F	Yes
Excess heat draw Off | On	1925	F	ON

Function	Prog. no.	Level [1)]	Standard value
With buffer storage tank No | Yes	1928	F	Yes
With prim contr/system pump No | Yes	1930	F	Yes
Consumer circuit 3			
Flow temp setp cons request	1959	C	70°C
DHW charging priority No | Yes	1974	F	Yes
Excess heat draw Off | On	1975	F	ON
With buffer storage tank No | Yes	1978	F	Yes
With prim contr/system pump No | Yes	1980	F	Yes
Swimming pool			
Setpoint solar heating	2055	Eu	26°C
Setpoint source heating	2056	Eu	22°C
Charging priority solar No | Yes	2065	E	No
Swimming pool temp max	2070	E	32°C
With solar integration No | Yes	2080	E	Yes
Primary contr/system pump			
Flow temp setpoint min	2110	F	8°C
Flow temp setpoint max	2111	F	80°C
Syst pump on heat gen lock Off | On	2121	F	Off
Mixing valve boost	2130	F	10°C
Actuator running time	2134	F	120 s
Primary contr/system pump Before buffer | After buffer	2150	F	After buffer
Boiler			
Setpoint min	2210	F	40°C
Setpoint max	2212	F	80°C
Setpoint manual control	2214	E	60°C
Burner running time min	2241	F	0 min
Burner running time min	2243	F	0 min
SD burner off time	2245	F	15°C
Pump overrun time	2250	F	5 min
Pump overr time after DHW	2253	F	1 min
Boiler pump on heat gen lock Off | On	2301	F	Off
Impact heat generation lock Heating mode only | Heating and DHW mode	2305	F	Heating mode only
Temp differential max	2316	C	20°C

Function	Prog. no.	Level [1)]	Standard value
Temp differential nominal	2317	C	10°C
Pump modulation None | Demand | Boiler setpoint | Temp differential nominal | Burner output	2320	F	Demand
Pump speed min	2322	F	0 %
Pump speed max	2323	F	100 %
Output nominal	2330	F	50 kW
Output basic stage	2331	F	30 kW
Output at pump speed min	2334	F	0 %
Output at pump speed max	2335	F	100 %
Max fan output heating operation	2441	F	0 kW
Max fan output heating full charging	2442	F	0 kW
Fan output DHW max.	2444	F	0 kW
Fan shutdown heating mode Off | On	2445	F	Off
Fan shutdown delay	2446	F	3 s
Controller delay Off | Heating mode only | DHW mode only | Heating and DHW mode	2450	F	Heating mode only
Fan output controller delay	2452	F	0 kW
Control delay duration	2453	F	10 s
Switching diff on HCs	2454	F	4°C
Switching diff off min HCs	2455	F	5°C
Switching diff off max HCs	2456	F	7°C
Switching diff on DHW	2460	F	5°C
Switching diff off min DHW	2461	F	6°C
Switching diff off max DHW	2462	F	8°C
Pressure switch shutdown Start prevention | Lockout position	2500	F	Lockout position
Cascade			
Lead strategy Late on, early off | Late on, late off | Early on, late off	3510	F	Late on, late off
Release integral source seq	3530	F	50°C*min
Reset integral source seq	3531	F	20°C*min
Restart lock	3532	F	300 s
Switch on delay	3533	F	5 min
Auto source seq ch'over	3540	F	500 h
Auto source seq exclusion None | First | Last | First and last	3541	F	None
Leading source Source 1 | Source 2 | Source 3 | Source 4 | Source 5 | Source 6 | Source 7 | Source 8 | Source 9 | Source 10 | Source 11 | Source 12 | Source 13 | Source 14 | Source 15 | Source 16	3544	F	Source 1
Return setpoint min	3560	F	8°C
Temp differential min	3590	F	- - -°C
Solar			

Function	Prog. no.	Level [1)]	Standard value
Temp diff on	3810	C	8°C
Temp diff off	3811	C	4°C
Charg temp min DHW st tank	3812	F	- - - °C
Temp diff on buffer	3813	F	- - - °C
Temp diff off buffer	3814	F	- - - °C
Charging temp min buffer	3815	F	- - - °C
Temp diff on swi pool	3816	F	- - - °C
Temp diff off swi pool	3817	F	- - - °C
Charging temp min swi pool	3818	F	- - - °C
Charging prio storage tank None | DHW storage tank | Buffer storage tank	3822	F	DHW storage tank
Charging time relative prio	3825	F	- - - min
Waiting time relative prio	3826	F	5 min
Waiting time parallel op	3827	F	- - - min
Delay secondary pump	3828	F	60 s
Collector start function	3830	F	- - -
Min run time collector pump	3831	F	20 s
Collector start function On	3832	F	07:00 (h:min)
Collector start function Off	3833	F	19:00 (h:min)
Collector start funct grad	3834	F	- - - min/°C
Collector frost protection	3840	F	- - - °C
Collector overtemp prot	3850	F	- - - °C
Evaporation heat carrier	3860	F	- - -
Antifreeze None | Ethylene glycol | Propylene glycol | Ethyl and propyl glycol	3880	F	Propylene glycol
Antifreeze concentration	3881	F	30%
Pump capacity	3884	F	200 l/h
Pulse valency	3887	F	10 l
Solid fuel boiler			
Locks other heat sources Off | On	4102	F	ON
Setpoint min	4110	F	40°C
Temp diff on	4130	F	8°C
Temp diff off	4131	F	4°C
Comparative temp DHW sensor B3 | DHW sensor B31 | Buffer sensor B4 | Buffer sensor B41 | Flow temp setpoint | Setpoint min	4133	F	Setpoint min
Pump overrun time	4140	F	20 min
Buffer storage tank			
Auto heat gen lock None | With B4 | With B4 and B42/B41	4720	E	With B4
Auto heat gen lock SD	4721	E	5°C
Temp diff buffer/HC	4722	E	-3°C
Min st tank temp heat mode	4724	E	- - - °C

Function	Prog. no.	Level [1)]	Standard value
Charging temp max	4750	E	80°C
Recooling temp	4755	E	60°C
Recooling DHW/HCs Off | On	4756	E	Off
Recooling collector Off | Summer | Always	4757	E	Off
With solar integration No | Yes	4783	E	Yes
Temp diff on return div	4790	E	8°C
Temp diff off return div	4791	E	4°C
Compar temp return div With B4 | With B41 | With B42	4795	E	With B4
Optg action return diversion Temp decrease | Temp increase	4796	E	Temp increase
Full charging Off | Heating mode | Always	4810	E	Off
Full charging temp min	4811	E	8°C
Full charging sensor With B4 | with B42/41	4813	E	With B42/41
DHW storage tank Parameter depends on hydraulic system!			
Charge push forward time	5011	E	01:00 min
Flow setpoint boost	5020	E	18°C
Transfer boost	5021	E	10°C
Type of charging Recharging | Full charging | Full charging legio | Full charg 1st time day | Full charg 1st time legio	5022	E	Full charging
Switching diff	5024	E	4°C
Charging time limitation	5030	E	120 min
Discharging protection Off | Always | Automatically	5040	E	Automatic
Charging temp max	5050	E	65°C
Recooling temp	5055	E	80°C
Recooling collector Off | Summer | Always	5057	E	Off
El imm heater optg mode Substitute | Summer | Always	5060	E	Substitute
El immersion heater release 24h/day | DHW release | Time program 4/DHW	5061	E	DHW release
El immersion heater control External thermostat | DHW sensor	5062	E	DHW sensor
Automatic push Off | On	5070	E	ON
Excess heat draw Off | On	5085	E	ON

Function	Prog. no.	Level [1)]	Standard value
With buffer No | Yes	5090	E	Yes
With prim contr/system pump No | Yes	5092	E	Yes
With solar integration No | Yes	5093	E	Yes
Pump speed min	5101	E	0%
Pump speed max	5102	E	100%
Speed Xp	5103	E	35°C
Speed Tn	5104	E	120 s
Speed Tv	5105	E	45 s
Transfer strategy Always | DHW release	5130	E	Always
Interm circ boost recharging	5139	E	5°C
Intermediate circuit boost	5140	E	3°C
Excess interm circ temp max	5141	E	2°C
Flow setp compensation delay	5142	E	30 s
Flow setp compensation Xp	5143	E	60°C
Flow setp compensation Tn	5144	E	30 s
Flow setp compensation Tv	5145	E	30 s
Full charging with B36 No | Yes	5146	E	Yes
Min start temp diff Q33	5148	E	-3°C
Excess interm circ temp del	5151	E	30 s
Configuration			
Heating circuit 1 Off | On	5710	C	ON
Heating circuit 2 Off | On	5715	C	Off
Heating circuit 3 Off | On	5721	C	Off
DHW sensor DHW sensor B3 | Thermostat	5730	F	DHW sensor B3
DHW controlling element Q3 No charging request | Charging pump | Diverting valve	5731	F	Charging pump
Basic pos DHW div valve Last request | Heating circuit | DHW	5734	F	Last request
DHW separate circuit Off | On	5736	F	Off
Optg action DHW div valve Position on DHW | Position on heating circuit	5737	F	Position on DHW
Ctrl boiler pump/DHW valve All requests | Request HC1/DHW only	5774	F	All requests
Solar controlling element Charging pump | Diverting valve	5840	F	Charging pump

Function	Prog. no.	Level [1)]	Standard value
External solar exchanger Jointly | DHW storage tank | Buffer storage tank	5841	F	Jointly
Combi storage tank No | Yes	5870	F	No
Relay output QX1 None | Circulating pump Q4 | El imm heater DHW K6 | Collector pump Q5 | Cons circuit pump VK1 Q15 | Boiler pump Q1 | Alarm output K10 | Heat circuit pump HC3 Q20 | Cons circuit pump VK2 Q18 | System pump Q14 | Heat gen shutoff valve Y4 | Solid fuel boiler pump Q10 | Time program 5 K13 | Buffer return valve Y15 | Solar pump ext exch K9 | Solar ctrl elem buffer K8 | Solar ctrl elem swi pool K18 | Cons circuit pump VK3 Q19 | Cascade pump Q25 | St tank transfer pump Q11 | DHW mixing pump Q35 | DHW interm circ pump Q33 | Heat request K27 | Heat circuit pump HC1 Q2 | Heat circuit pump HC2 Q6 | DHW ctrl elem Q3 | Status output K35 | Status information K36 | Flue gas damper K37 | Flue gas damper K37	5890	C	Boiler pump Q1
Relay output QX2 Parameters see Relay output QX1 (prog.-no. 5890)!	5891	C	Heat circuit pump HC1 Q2
Relay output QX3 Parameters see Relay output QX1 (prog.-no. 5890)!	5892	C	DHW controlling element Q3
Sensor input BX1 None | DHW sensor B31 | Collector sensor B6 | DHW circulation sensor B39 | Buffer sensor B4 | Buffer sensor B41 | Common flow sensor B10 | Solid fuel boiler sensor B22 | DHW charging sensor B36 | Buffer sensor B42 | Common return sensor B73 | Cascade return sensor B70 | Swimming pool sensor B13 | Solar flow sensor B63 | Solar return sensor B64	5930	C	None
Sensor input BX2 Parameters see Sensor input BX1 (prog.-no. 5930)!	5931	C	None
Sensor input BX3 Parameters see Sensor input BX1 (prog.-no. 5930)!	5932	C	None
Function input H1 None | Optg mode change HCs+DHW | Optg mode changeover DHW | Optg mode changeover HCs | Optg mode changeover HC1 | Optg mode changeover HC2 | Optg mode changeover HC3 | Heat generation lock | Error/alarm message | Consumer request VK1 | Consumer request VK2 | Consumer request VK3 | Excess heat discharge | Release swi pool solar | Operating level DHW | Operating level HC1 | Operating level HC2 | Operating level HC3 | Room thermostat HC1 | Room thermostat HC2 | Room thermostat HC3 | DHW thermostat | Pulse count | Checkb sign flue gas damper | Start prevention | Consumer request VK1 10V | Consumer request VK2 10V | Consumer request VK3 10V | Preselected output 10V	5950	C	None
Contact type H1 NC | NO	5951	C	NO
Voltage value 1 H1	5953	F	0 V
Function value 1 H1	5954	F	0
Voltage value 2 H1	5955	F	0 V
Function value 2 H1	5956	F	0

Function	Prog. no.	Level [1)]	Standard value
Function input H4 None | Optg mode change HCs+DHW | Optg mode changeover DHW | Optg mode changeover HCs | Optg mode changeover HC1 | Optg mode changeover HC2 | Optg mode changeover HC3 | Heat generation lock | Error/alarm message | Consumer request VK1 | Consumer request VK2 | Consumer request VK3 | Excess heat discharge | Release swi pool solar | Operating level DHW | Operating level HC1 | Operating level HC2 | Operating level HC3 | Room thermostat HC1 | Room thermostat HC2 | Room thermostat HC3 | DHW thermostat | Pulse count | Checkb sign flue gas damper | Start prevention | Flow measurement Hz	5970	C	None
Contact type H4 NC | NO	5971	C	NO
Frequency value 1 H4	5973	F	0
Function value 1 H4	5974	F	0
Frequency value 2 H4	5975	F	0
Function value 2 H4	5976	F	0
Function input H5 None | Optg mode change HCs+DHW | Optg mode changeover DHW | Optg mode changeover HCs | Optg mode changeover HC1 | Optg mode changeover HC2 | Optg mode changeover HC3 | Heat generation lock | Error/alarm message | Consumer request VK1 | Consumer request VK2 | Consumer request VK3 | Excess heat discharge | Release swi pool solar | Operating level DHW | Operating level HC1 | Operating level HC2 | Operating level HC3 | Room thermostat HC1 | Room thermostat HC2 | Room thermostat HC3 | DHW thermostat | Pulse count | Checkb sign flue gas damper | Start prevention	5977	C	Room thermostat HC1
Contact type H5 NC | NO	5978	C	NO
Function extension module 1 None | Multifunctional | Heating circuit 1 | Heating circuit 2 | Heating circuit 3 | Solar DHW | Primary contr/system pump	6020	C	None
Function extension module 2 Parameters see extension module 1 (prog.-no. 6020)!	6021	C	None
Function extension module 3 Parameters see extension module 1 (prog.-no. 6020)!	6022	C	None
Relay output QX21 module 1 Parameters see Relay output QX1 (prog.-no. 5890)!	6030	C	None
Relay output QX22 module 1 Parameters see Relay output QX1 (prog.-no. 5890)!	6031	C	None
Relay output QX23 module 1 Parameters see Relay output QX1 (prog.-no. 5890)!	6032	C	None
Relay output QX21 module 2 Parameters see Relay output QX1 (prog.-no. 5890)!	6033	C	None
Relay output QX22 module 2 Parameters see Relay output QX1 (prog.-no. 5890)!	6034	C	None
Relay output QX23 module 2 Parameters see Relay output QX1 (prog.-no. 5890)!	6035	C	None
Relay output QX21 module 3 Parameters see Relay output QX1 (prog.-no. 5890)!	6036	C	None

Function	Prog. no.	Level [1)]	Standard value
Relay output QX22 module 3 Parameters see Relay output QX1 (prog.-no. 5890)!	6037	C	None
Relay output QX23 module 3 Parameters see Relay output QX1 (prog.-no. 5890)!	6038	C	None
Sensor input BX21 module 1 Parameters see Sensor input BX1 (prog.-no. 5930)!	6040	C	None
Sensor input BX22 module 1 Parameters see Sensor input BX1 (prog.-no. 5930)!	6041	C	None
Sensor input BX21 module 2 Parameters see Sensor input BX1 (prog.-no. 5930)!	6042	C	None
Sensor input BX22 module 2 Parameters see Sensor input BX1 (prog.-no. 5930)!	6043	C	None
Sensor input BX21 module 3 Parameters see Sensor input BX1 (prog.-no. 5930)!	6044	C	None
Sensor input BX22 module 3 Parameters see Sensor input BX1 (prog.-no. 5930)!	6045	C	None
Function input H2 module 1 None | Optg mode change HCs+DHW | Optg mode changeover DHW | Optg mode changeover HCs | Optg mode changeover HC1 | Optg mode changeover HC2 | Optg mode changeover HC3 | Heat generation lock | Error/alarm message | Consumer request VK1 | Consumer request VK2 | Consumer request VK3 | Excess heat discharge | Release swi pool solar | | Operating level DHW | Operating level HC1 | Operating level HC2 | Operating level HC3 | Room thermostat HC1 | Room thermostat HC2 | Room thermostat HC3 | Limit thermostat HC | Start prevention | Consumer request VK1 10V | Consumer request VK2 10V | Consumer request VK3 10V | Preselected output 10V	6046	C	None
Contact type H2 module 1 NC | NO	6047	C	NO
Voltage value 1 H2 module 1	6049	F	0 Volt
Funct value 1 H2 module 1	6050	F	0
Voltage value 2 H2 module 1	6051	F	0 Volt
Funct value 2 H2 module 1	6052	F	0
Function input H2 module 2 Parameters see Function input H2 module 1 (prog.-no. 6046)!	6054	C	None
Contact type H2 module 2 NC | NO	6055	C	NO
Voltage value 1 H2 module 2	6057	F	0 Volt
Funct value 1 H2 module 2	6058	F	0
Voltage value 2 H2 module 2	6059	F	0 Volt
Funct value 2 H2 module 2	6060	F	0
Function input H2 module 3 Parameters see Function input H2 module 1 (prog.-no. 6046)!	6062	C	None
Contact type H2 module 3 NC | NO	6063	F	NO
Voltage value 1 H2 module 3	6065	F	0 Volt
Funct value 1 H2 module 3	6066	F	0
Voltage value 2 H2 module 3	6067	F	0 Volt

Function	Prog. no.	Level [1)]	Standard value
Funct value 2 H2 module 3	6068	F	0
PWM-output P1 None | Boiler pump Q1 | DHW pump Q3 | DHW interm circ pump Q33 | Heat circuit pump HC1 Q2 | Heat circuit pump HC2 Q6 Heat circuit pump HC3 Q20 | Collector pump Q5 | Solar pump ext exch K9 | Solar pump buffer K8 | Solar pump swi pool K18	6085	F	None
Sensor type collector NTC | PT 1000	6097	F	NTC
Readjustm collector sensor	6098	F	0°C
Readjustm outside sensor	6100	F	0°C
Time constant building	6110	C	15 h
Central setp compensation	6117	F	20°C
Frost protection plant Off | On	6120	F	Off
Saving sensors No | Yes	6200	C	No
Check no heat source 1	6212	F	-
Check no heat source 2	6213	F	-
Check no storage tank	6215	F	-
Check no. heating circuits	6217	F	-
Software version	6220	F	
LPB-system			
Device address	6600	C	0
Bus power supply function Off | Automatic	6604	F	Automatic
Bus power supply state Off | On	6605	F	
Display system messages No | Yes	6610	F	Yes
Alarm delay	6612	F	- - - min
Action changeover functions Segment | System	6620	F	System
Summer changeover Locally | Centrally	6621	F	Locally
Optg mode changeover Locally | Centrally	6623	F	Centrally
Manual source lock Locally | Segment	6624	F	Locally
DHW assignment Local HCs | All HCs in segment | All HCs in system	6625	F	All HCs in system
Clock mode Autonomously | Slave without remote setting | Slave with remote setting | Master	6640	C	Autonomously
Outside temp source	6650	F	0
Fault			
Fault message	6700	E	0

Function	Prog. no.	Level [1)]	Standard value
SW diagnostic code	6705	E	0
Burn ctrl phase lockout pos	6706	E	0
Reset alarm relay No | Yes	6710	C	No
Flow temp 1 alarm	6740	F	- - - min
Flow temp 2 alarm	6741	F	- - - min
Flow temp 3 alarm	6742	F	- - - min
Boiler temp alarm	6743	F	- - - min
DHW charging alarm	6745	F	- - - min
History 1 - Date / Time - Error code 1	6800	F	
SW diagnostic code 1 - Burner control phase 1	6805	F	
History 2 - Date / Time - Error code 2	6810	F	
SW diagnostic code 2 - Burner control phase 2	6815	F	
History 3 - Date / Time - Error code	6820	F	
SW diagnostic code 3 - Burner control phase 3	6825	F	
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
History 20 - Date / Time - Error code 20	6990	F	
SW diagnostic code 20 - Burner control phase 20	6995	F	
Service / special operation			
Burner hours interval	7040	F	--- h
Burn hrs since maintenance	7041	F	0 h
Burner start interval	7042	F	---
Burn starts since maint	7043	F	0
Maintenance interval	7044	F	--- months
Time since maintenance	7045	F	0 months
Fan speed ionization current	7050	F	0 rpm
Message ionization current No | Yes	7051	F	No
Chimney-sweep function Off | On	7130	E	Off

Function	Prog. no.	Level [1)]	Standard value
Manual control Off | On	7140	E	Off
Controller stop function Off | On	7143	F	Off
Controller stop setpoint	7145	F	50 %
Telephone customer service	7170	C	---
PStick storage pos	7250	F	0
PStick Reg data set	7251	F	0
PStick command No operation | Reading from stick | Writing on stick	7252	F	No operation
PStick progress	7253	F	0 %
State PStick No stick | Stick ready| Writing on stick | Reading from stick | EMC test active | Writing error | Reading error| Incompatible data set | Wrong stick type | Stick format error | Check data set | Data set disabled | Reading disabled	7254	F	0
Input/output test			
Relay test No test | Everything off | Relay output QX1 | Relay output QX2 | Relay output QX3 | Relay output QX21 module 1 | Relay output QX22 module 1 | Relay output QX23 module 1 | Relay output QX21 module 2 | Relay output QX22 module 2 | Relay output QX23 module 2 | Relay output QX21 module 3 | Relay output QX22 module 3 | Relay output QX23 module 3	7700	C	No test
Output test P1	7713	C	
PWM-output P1	7714	C	
Outside temp B9	7730	C	
DHW temp B3/B38	7750	C	
Boiler temp B2	7760	C	
Sensor temp BX1	7820	C	
Sensor temp BX2	7821	C	
Sensor temp BX3	7822	C	
Sensor temp BX21 module 1	7830	C	
Sensor temp BX22 module 1	7831	C	
Sensor temp BX21 module 2	7832	C	
Sensor temp BX22 module 2	7833	C	
Sensor temp BX21 module 3	7834		
Sensor temp BX22 module 3	7835		
Voltage signal H1	7840	C	
Contact state H1 Open | Closed	7841	C	
Voltage signal H2 module 1	7845	C	
Contact state H2 module 1 Open | Closed	7846	C	
Voltage signal H2 module 2	7848	C	

Function	Prog. no.	Level [1)]	Standard value
Contact state H2 module 2 Open | Closed	7849	C	
Voltage signal H2 module 3	7851	C	
Contact state H2 module 3 Open | Closed	7852	C	
Contact state H4 Open | Closed	7860	C	
Frequency H4	7862	C	
Contact state H5 Open | Closed	7865	C	
Contact state H6 Open | Closed	7872	C	
State			
State heating circuit 1	8000	C	
State heating circuit 2	8001	C	
State heating circuit 3	8002	C	
State DHW	8003	C	
State boiler	8005	C	
State solar	8007	C	
State solid fuel boiler	8008	C	
State burner	8009	C	
State buffer storage tank	8010	C	
State swimming pool	8011	C	
Diagnostics cascade			
Priority/state source 1 Missing | Faulty | Manual control active | Heat generation lock active | Chimney sweep funct active | Temporarily unavailable | Outside temp limit active | Not released | Released	8100	C	
Priority/state source 2 Parameters see Priority/state source 1 (prog.-no. 8100)!	8102	C	
Priority/state source 3 Parameters see Priority/state source 1 (prog.-no. 8100)!	8104	C	
Priority/state source 4 Parameters see Priority/state source 1 (prog.-no. 8100)!	8106	C	
Priority/state source 5 Parameters see Priority/state source 1 (prog.-no. 8100)!	8108	C	
Priority/state source 6 Parameters see Priority/state source 1 (prog.-no. 8100)!	8110	C	
Priority/state source 7 Parameters see Priority/state source 1 (prog.-no. 8100)!	8112	C	
Priority/state source 8 Parameters see Priority/state source 1 (prog.-no. 8100)!	8114	C	

Function	Prog. no.	Level [1)]	Standard value
Priority/state source 9 Parameters see Priority/state source 1 (prog.-no. 8100)!	8116	C	
Priority/state source 10 Parameters see Priority/state source 1 (prog.-no. 8100)!	8118	C	
Priority/state source 11 Parameters see Priority/state source 1 (prog.-no. 8100)!	8120	C	
Priority/state source 12 Parameters see Priority/state source 1 (prog.-no. 8100)!	8122	C	
Priority/state source 13 Parameters see Priority/state source 1 (prog.-no. 8100)!	8124	C	
Priority/state source 14 Parameters see Priority/state source 1 (prog.-no. 8100)!	8126	C	
Priority/state source 15 Parameters see Priority/state source 1 (prog.-no. 8100)!	8128	C	
Priority/state source 16 Parameters see Priority/state source 1 (prog.-no. 8100)!	8130	C	
Cascade flow temp	8138	C	
Cascade flow temp setp	8139	C	
Cascade return temp	8140	C	
Cascade return temp setp	8141	C	
Source seq ch'over current	8150	C	
Diagnostics heat generation			
Boiler pump Q1	8304	F	
Boiler pump speed	8308	F	
Boiler temp	8310	C	
Boiler temperature setpoint	8311	C	
Boiler switching point	8312	C	
Boiler return temp	8314	C	
Fan speed	8323	C	
Set point fan	8324	C	
Current fan control	8325	C	
Burner modulation	8326	C	
Ionization current	8329	C	
Hours run 1st stage	8330	E	
Start counter 1st stage	8331	C	
Hours run heating mode	8338	E	
Hours run DHW	8339	E	
Current phase number	8390	F	
Collector pump 1	8499	C	
Solar ctrl elem buffer	8501	F	

Function	Prog. no.	Level [1)]	Standard value
Solar ctrl elem swi pool	8502	F	
Collector temp 1	8510	C	
Collector temp 1 max	8511	C	
Collector temp 1 min	8512	C	
dt collector 1/DHW	8513	C	
dt collector 1/buffer	8514	C	
dt collector 1/swimming pool	8515	C	
Solar flow temp	8519	F	
Solar return temp	8520	F	
24-hour yield solar energy	8526	E	
Total yield solar energy	8527	E	
Hours run solar yield	8530	E	
Hours run collect overtemp	8531	F	
Hours run Collector pump	8532	E	
Solid fuel boiler temp	8560	C	
Hours run solid fuel boiler	8570	C	
Diagnostics consumers			
Outside temperature	8700	E	
Outside temperature minimum	8701	E	
Outside temperature maximum	8702	E	
Outside temp attenuated	8703	F	
Outside temp composite	8704	F	
Heating circuit pump 1 Off | On	8730	C	
Heat circ mix valve 1 open Off | On	8731	C	
Heat circ mix valve 1 close Off | On	8732	C	
Speed heating circuit pump 1	8735	C	
Room temp 1	8740	C	
Room setpoint 1	8741	C	
Flow temp 1	8743	C	
Flow temp setpoint 1	8744	C	
Room thermostat 1 No demand | Demand	8749	C	
Heating circuit pump 2 Off | On	8760	C	
Heat circ mix valve 2 open Off | On	8761	C	
Heat circ mix valve 2 close Off | On	8762	C	
Speed heating circuit pump 2	8765	C	
Room temp 2	8770	C	
Room setpoint 2	8771	C	

Function	Prog. no.	Level [1)]	Standard value
Flow temp 2	8773	C	
Flow temp setpoint 2	8774	C	
Room thermostat 2 No demand | Demand	8779	C	
Heating circuit pump 3 Off | On	8790	C	
Heat circ mix valve 3 open Off | On	8791	C	
Heat circ mix valve 3 close Off | On	8792	C	
Speed heating circuit pump 3	8795	C	
Room temp 3	8800	C	
Room setpoint 3	8801	C	
Flow temp setpoint 3	8803	C	
Flow temp 3	8804	C	
Room thermostat 3 No demand | Demand	8809	C	
DHW pump Off | On	8820	C	
Speed DHW pump	8825	F	
Speed DHW interm circ pump	8826	F	
DHW temp 1	8830	C	
DHW temp setpoint	8831	C	
DHW temp-actual value bottom (B31)	8832	C	
DHW circulation temp	8835	F	
DHW charging temp	8836	F	
Flow temp-setpoint Consumer circuit1	8875	C	
Flow temp-setpoint Consumer circuit 2	8885	C	
Flow temp-setpoint Consumer circuit 3	8895	C	
Swimming pool temp	8900	C	
Swimming pool setpoint	8901	C	
Primary controller temp	8930	F	
Primary controller setpoint	8931	F	
Common flow temperature	8950	F	
Common flow temp setpoint	8951	F	
Common return temp	8952	F	
Common output setpoint	8962	F	
Buffer temp 1	8980	C	
Buffer setpoint	8981	C	
Buffer temp 2	8982	C	
Buffer temp 3	8983	C	
Relay output QX1 Off | On	9031	C	

Function	Prog. no.	Level [1)]	Standard value
Relay output QX2 Off | On	9032	C	
Relay output QX3 Off | On	9033	C	
Relay output QX21 module 1 Off | On	9050	C	
Relay output QX22 module 1 Off | On	9051	C	
Relay output QX23 module 1 Off | On	9052	C	
Relay output QX21 module 2 Off | On	9053	C	
Relay output QX22 module 2 Off | On	9054	C	
Relay output QX23 module 2 Off | On	9055	C	
Relay output QX21 module 3 Off | On	9056	C	
Relay output QX22 module 3 Off | On	9057	C	
Relay output QX23 module 3 Off | On	9058	C	
Burner control			
Prepurge time	9500	F	10 s
Nominal output prepurging	9504	F	0 kW
Nominal output ignition load	9512	F	0 kW
Nominal output Partial load	9524	F	0 kW
Nominal output full load	9529	F	0 kW
Postpurge time	9540	F	5 s
Conversion fan output/speed increase	9626	F	0
Conversion fan output speed Y-section	9627	F	0
Info Option The display of the information values depends on the operation status!			
Fault message			
Servicing message			
Setpoint manual control			
Controller stop setpoint			
Boiler temp			
State heating circuit 1			
State heating circuit 2			
State heating circuit 3			
State DHW			
State boiler			
State solar			

Function	Prog. no.	Level [1)]	Standard value
State solid fuel boiler			
State buffer storage tank			
State swimming pool			
Year			
Date			
Time			
Telephone customer service			
[1)] Eu = End user; C = Commissioning; E = Engineer			

Note: Parameters with the program numbers 1- 54 are individual parameters of the operating unit and the room unit and may, therefore, be set differently on both devices. All paramteres from programme number 500 onwards are stored on the controller and, therefore, identical. The value changed last is the valid value.

8.4 Explanations for setting table

Time and date

Time of day and date (1 -3)

The control has a year clock with setting possibilities for time, day/month and year. Time and date must be correctly set, so that the heating programs can operate to previously carried out programming.

Summertime (5 - 6)

The start of the summertime can be set under program number 5; the end of summer time will be set under program number 6. The time changing will be carried out on the Sunday following the set date.

Operator section

Language (20)

The language of the menu guidance can be modified under programme number 20.

Info (22)

Temporary:The information display returns to the basic display after 8 minutes.
Permanently:The information display remains permanently displayed after call-up with the information button.

Contrast of display (25)

Under prog. No. 25 the contrast of the display can be adjusted.

Operation lock (26)

If this function is activated the following operating elements are locked:
- Operating mode buttons for heating and drinking water mode
- Control knob (comfort-setpoint room temperature)
- Presence button (only room device)

Programming lock (27)

In case of switched on lock, the parameters can be displayed, but not changed.
- Temporary unlocking:
  Press the OK- and the ESC-button simultaneously for at least 3 sec. The lock will be re-activated after leaving the setting level.
- Permanent unlocking:
  At first temporary unlocking, then prog. no. 27 to "Off".

Operator section save basic settings
(30)

The data of the control will be written into the room unit (only available for room unit).

Caution! The data of the room unit will be overwritten! With this, the individual programming of the control in the room unit can be ensured.

Operator section activate basic settings
(31)

The data of the operating unit or room unit will be written into the control.

Caution! The data of the control will be overwritten! The factory settings are stored in the operating unit.

- Activation of the prog. no. 31 at the *operating unit*:
  The control will be reset to the **factory settings.**
- Activation of the prog. no. 31 at the *room device*:
  The individual programming of the room unit will be written into the control.

Use as
(40)

- *room device 1/2*: this setting establishes which heating circuit the room unit on which this setting is made should be used. When selecting **room unit 1** the room device can be assigned to more heating circuits using prog. no. 42, while with the selection of **room unit 2** only heating circuit 2 can be controlled.
- *Operator unit*: this setting is provided for the pure operation without room functions and is not needed in connection with this controller.
- *service unit*: this setting is used, for example, to secure or save control settings.

Attribution room device 1
(42)

If the setting **room unit 1** (prog. no. 40) is selected on the room unit, it must be specified on prog. no. 42 whether the room unit of heating circuit 1 or both heating circuits will be assigned.

Operation HC2/HC3/P
(44, 46)

When selecting **room device 1** or **operating unit** (prog.no. 40), it must be set under program number 44 or 46, if the heating circuits HC2 and HC3/P have to be operated together with heating circuit 1 or independent from heating circuit 1 by the operator unit.

Effect of presence button
(48)

The effect of the presence button on the heating circuits has to be set under program number 48.

Readjustment room sensor
(54)

The temperature display of the value, transmitted by the room sensor, can be corrected under programme no. 54.

Software version
(70)

Display of the current software version.

Radio

Detailed descriptions are in the assembly and setting manual of the room device RGTF.

Device lists
(130 to 138)

The state of the respective device will be displayed under programme numbers 130 to 138.

Delete all devices (140)

The radio connections to all devices will be cancelled under programme number 140.

Time programmes

Note: The time programme 1 and 2 are always assigned to the respective heating circuits (1 - 3) and only displayed if these heating circuits are present and also turned on in the menu **Configuration** (prog.-no. 5710 and 5715).

Time program 3 can be used for the Heating circuit 3, for the DHW and for the circulation pump, depending on the setting, and is always displayed.
Time program 4 can be used for the DHW and for the circulation pump, depending on the setting, and is always displayed.
Time program 5 is not assigned a function and can be freely used for any application using an output QX.

Preselection (500, 520, 540, 560, 600)

Selection of weekdays or week blocks. The week blocks (Mo-Su, Mo-Fr and Sa-Su) are used as a setting aid. The times set there are only copied on the individual weekdays and can be again changed in the individual weekdays as required.
The times of the individual weekdays are always critical for the heating programme.

Note: When the set time of a day group is changed, this will automatically be taken over for all 3 on/off phases in this day group.

Heating phases (501 to 506, 521 to 526, 541 to 546, 561 to 566, 601 to 606)

Up to three heating phases may be set per heating circuit, which will be activated on the days, set under the **preselection**(prog.-no. 500, 520, 540, 560, 600). In the heating phases, it will be heated at the set comfort setpoint. Outside the heating phases, it will be heated at the reduced setpoint.

Note: The time programmes are only activated in the operation mode “Automatic“.

Default values (516, 536, 556, 576, 616)

Setting of the default values given in the setting table

Notice for time programme 4 / TWW: For comfort reasons, it is necessary that 2 heating phases will be set with a pause of at least 10 minutes! The first phase must be before the first heating phase of the heating, BRÖTJE recommends a first heating of the storage of 1 hour.

Holiday programmes

The heating circuits may be set to a selectable operation level with the holiday programme during a certain holiday period.

The heating circuits may be set to a selectable operation level with the holiday program during a certain holiday period.

Preselection (641, 651, 661)

8 vacation periods can be selected with this preselection.

Start of holiday (642, 652, 662)

Entering the holiday start

End of holiday
(643, 653, 663)

Input of holiday end

Operation level
(648, 658, 668)

Selection of the operation level (reduced setpoint or frost protection) for the holiday programme

Note: A holiday period ends each time on the last day at 12:00 AM (00:00). The holiday programmes are only activated in the operation mode " Automatic ".

Heating circuits

Comfort setpoint
(710, 1010, 1310)

Setting the maximum comfort setpoint in the heating phases. Without room sensor or with the room influence (prog.no. 750, 1050, 1350), this value is used for calculation of the flow temperature, to theoretically reach the set room temperature.

Reduced setpoint
(712, 1012, 1312)

Setting of the desired room temperature during the reduced heating phase. Without room sensor or with the room influence (prog.no. 750, 1050, 1350), this value is used for calculation of the flow temperature, to theoretically reach the set room temperature.

Frost protection setpoint
(714, 1014, 1314)

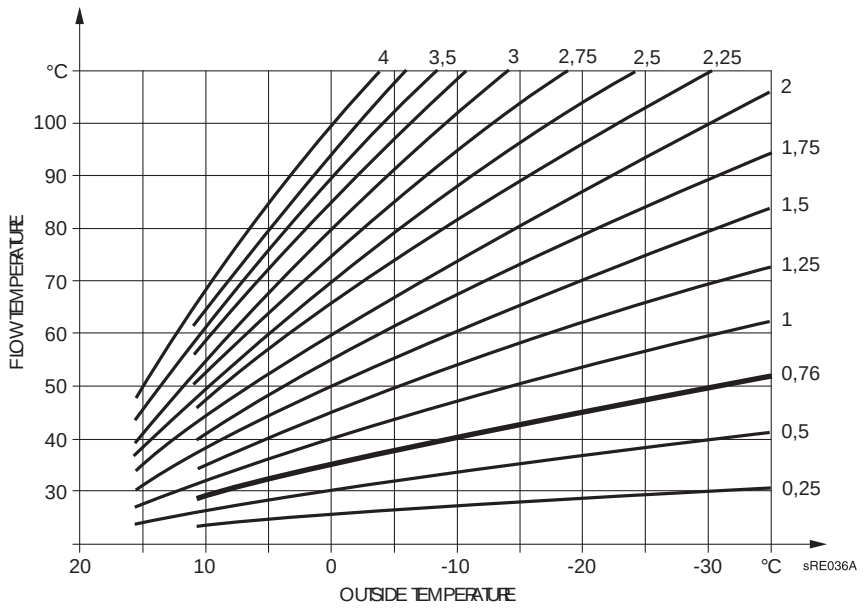
Setting of the desired room temperature during the frost protection operation. Without room sensor or with the room influence (prog.no. 750, 1050, 1350), this value is used for calculation of the flow temperature, to theoretically reach the set room temperature. The heating circuit remains turned off until the flow temperature drops so far that the room temperature falls below the frost protection temperature.

Nominal line gradient
(720, 1020, 1320)

Using the heating curve, the flow temperature setpoint is formed, which is used for control of the heating circuit, based on the outside temperature. The slope of the curve indicates by how much the flow temperature changes with changing outside temperature.

Determination of the heating curve slope
Determination of the heating curve slope: identify lowest the outside temperature for the heating zone (nominally 0°C), find this on the horizontal axis in *Fig. 12*,
then find the desired flow temperature of the heating circuit (e.g. 80°C) on the vertical axis. T
he intersecting point gives the value for the heating curve slope (e.g. 3.0) which needs to be entered into prog. no. 720, 1020 and 1320 of hte boiler as required.

Fig. 12: Heating curve diagram



Heating curve displacement (721, 1021,1321)

Correction of the heating curve by parallel shifting in case of generally too high or too low room temperature.

Heating curve adaption (726, 1026, 1326)

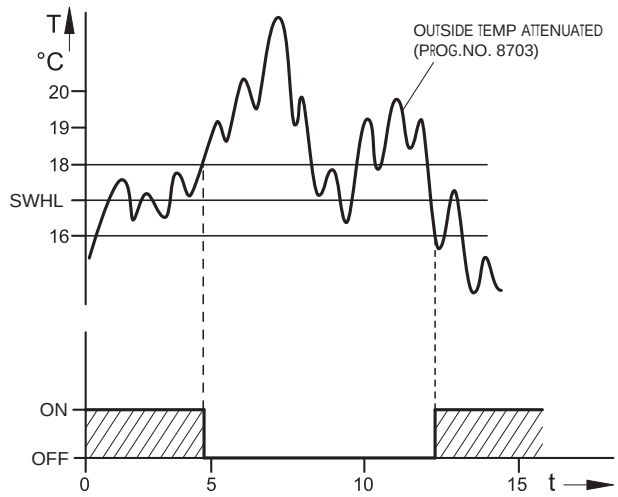
Automatic adaptation of the heating nominal line to the actual circumstances, due to which a correction of the heating nominal line gradient becomes obsolete.

For automatic adaptation of the heating curve a room sensor must be connected. The value for room influence (see prog. no. 750, 1050, 1350) must be set between 1% and 99%. Should there be radiator valves in the leading room (assembly location of the room sensor), these have to be fully opened.

Summer/winter heating limit (730, 1030, 1330)

As soon as the average of the outside temperatures of the last 24 hours rises 1°C over the value set here, the heating circuit switches into summer mode. As soon as the average of the outside temperatures of the last 24 hours drops 1°C below the value set here, the heating circuit switches back into winter mode.

Fig. 13: Summer/winter heating limit



SWHL	Summer/winter heating limit
T	Temperature
t	Time

24-hour heating limit
(732, 1032, 1332)

The 24-hour heating limit shuts off the heating circuit if the current outside temperature increases up to the difference set here of the current operating level (reduced or comfort set point). The heating cuts on again if the current outside temperature again falls under the set difference minus 1°C.

In the operation modes **continuous comfort temperature** and **continuous reduced temperature** this function is not activated.

Flow temp setpoint limitations
Minimum
(740, 1040, 1340)
Maximum
(741, 1041, 1341)

With this function, a range can be defined for the flow setpoint. When the required flow temperature setpoint of the heating circuit reaches the respective limit value, this remains constantly on maximum or minimum value during continuously increasing or decreasing heat requirement.

Flow temp setpoint room stat
(742, 1042, 1342)

For room thermostat mode the flow setpoint set here applies. If the control ist adjusted to **- - -°C** the flow temperature setpoint results from the outside temperature and the heating curve.

Room influence
(750, 1050, 1350)

The flow temperature is calculated using the heating curve as a factor of the outside temperature. This type of control assumes that the heating curve is set correctly, since the control does not take any room temperature into consideration in this setting.

Note: However, if there is a RGT/RGTF or RGB room unit is connected and the setting "room influence" is set between 1 and 99%, the deviation of the room temperature compared to the set point is recorded and taken into consideration in the temperature control. In this way existing external heat can be considered and a constant room temperature is possible. The influence of the deviation can be set in percentage. The better the leading room is (correct room temperature, correct installation location, etc.), the higher the value can be set and the room temperature is taken into consideration even more.

Caution! Open radiator valves!
Should there be radiator valves in the leading room (assembly location of the room sensor), these have to be fully opened.

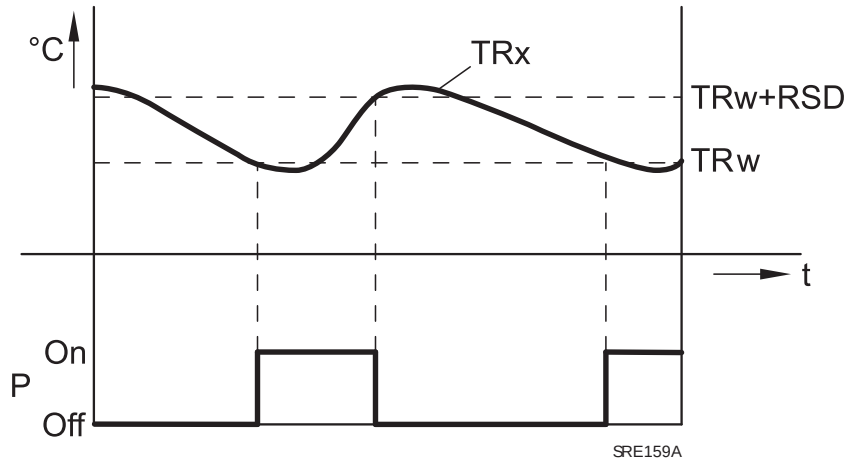
- Setting for weather compensation with room influence: 1% - 99%
- Setting for pure weather compensation: - - - %
- Setting for pure room compensation: 100%

Room temp limitation
(760, 1060, 1360)

The heating circuit pump will be switched on or off, depending on the room temperature due to the switching difference set here. The switch-off point of the pump is set as difference to the set room set point. The switch-on point is located at the set room set point. This function is only possible with the RGT/ RGTF or RGB room unit and active room influence.

A room sensor must be connected.

Fig. 14: Room temp limitation

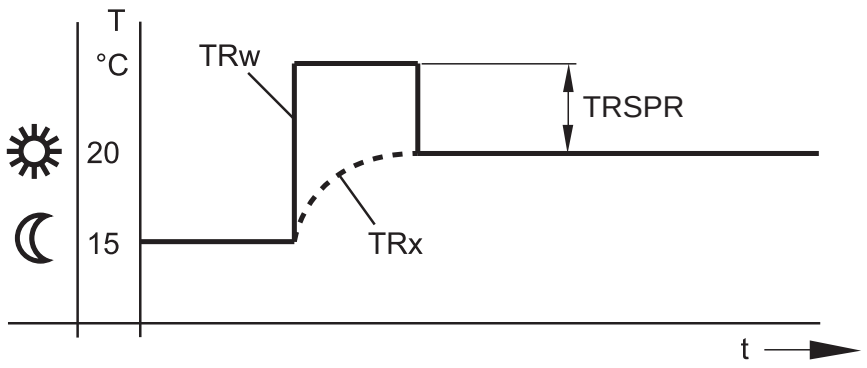


TRx	Room temperature actual value
TRw	Room temperature setpoint
RSD	Room switching difference
B	Pump
t	Time

Boost heating
(770, 1070, 1370)

The boost heating is active if the room set point is switched from protection mode or reduced mode to comfort mode. During the boost heating the the room set point is increased to the value set here. This causes the actual room temperature to increase to the new set point within a short period of time. The boost heating is ended if the room temperature measured with a RGT/RGTF or RGB (accessories) room unit increases to 0.25 °C below the comfort set point.
Without room sensor or without room influence the boost heating is carried out based on an internal calculation. Due to the room set point acting as a basis, the effect of the duration of the boost heating and that of the flow temperature works differently for each outside temperature.

Fig. 15: Boost heating



TRw	Room temperature setpoint
TRx	Room temperature actual value
DTRSA	Room temperature set point-raised

Quick setback
(780, 1080, 1380)

The quick setback is active if the room setpoint is switched from comfort level to another operating level (selected between reduced mode or protection mode). During the quick setback the heating circuit pump is turned off and the mixing valve is also closed during mixing circuits. During the quick setback no heat requirement is sent to the heat generator.
The quick setback is possible with or without room sensor: with room sensor the heating circle function is switched off as long as the room temperature has dropped to the reduced setpoint or frost protection setpoint. If the room temperature has dropped to the reduced setpoint or the frost protection setpoint, the heating circuit pump is switched on again and the mixing valve is released. Without the room sensor the quick setback switched the heater off depending on the outside temperature and the building time constant (prog.no. 6110) as long as the temperature has theoretically dropped to the reduced target value or the frost protection value.

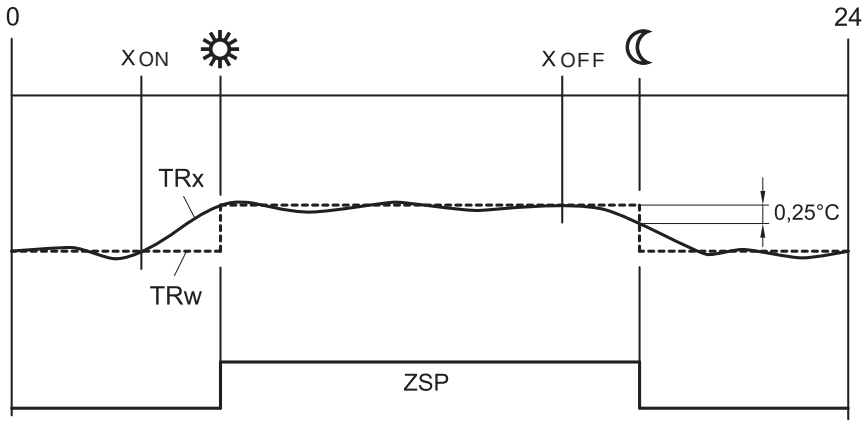
Duration of the quick setback for setback by **2**°C in h: (e.g. comfort sepoint = 20°C, reduced setpoint = 18°C)							
Outside temperature composite:	**Building time constant (configuration, programme number 6110)**						
	0 hrs	2 hrs	5 hrs	10 hrs	15 hrs	20 hrs	50 hrs
15°C	0	3,1	7,7	15,3	23		
10°C	0	1,3	3,3	6,7	10	13,4	
5°C	0	0,9	2,1	4,3	6,4	8,6	21,5
0°C	0	0,6	1,6	3,2	4,7	6,3	15,8
-5°C	0	0,5	1,3	2,5	3,8	5	12,5

-10°C	0	0,4	1	2,1	3,1	4,1	10,3
-15°C	0	0,4	0,9	1,8	2,6	3,5	8,8
-20°C	0	0,3	0,8	1,5	2,3	3,1	7,7
Duration of the quick setback for setback by **4**°C in h:							
Outside temperature composite:	**Building time constant (configuration, programme number 6110)**						
	0 hrs	2 hrs	5 hrs	10 hrs	15 hrs	20 hrs	50 hrs
15°C	0	9,7	24,1				
10°C	0	3,1	7,7	15,3	23		
5°C	0	1,9	4,7	9,3	14	18,6	
0°C	0	1,3	3,3	6,7	10	13,4	
-5°C	0	1	2,6	5,2	7,8	10,5	26,2
-10°C	0	0,9	2,1	4,3	6,4	8,6	21,5
-15°C	0	0,7	1,8	3,6	5,5	7,3	18,2
-20°C	0	0,6	1,6	3,2	4,7	6,3	15,8

Optimum start control max (790, 1090, 1390)
Optimum stop control max (791, 1091, 1391)

The optimization of the on/off switching time is a function of time and possible with or without the room unit. With a room unit the conversion of the operating level compared to the programmed time point is moved forward so that the building dynamics (heat up and cool down time) is considered. In this way the desired temperature level is reached exactly at the programmed time point. If this is not the case (too early or too late) a new switching time point is calculated which is used the next time.
Without room sensor an advance time point is calculated based on the outside temperature and the building time constant (prog. no. 6110). The optimization time (advance) is limited here to a maximum value. By setting the optimization time = 0, the function is switched off.

Fig. 16: Optimum start and stop control

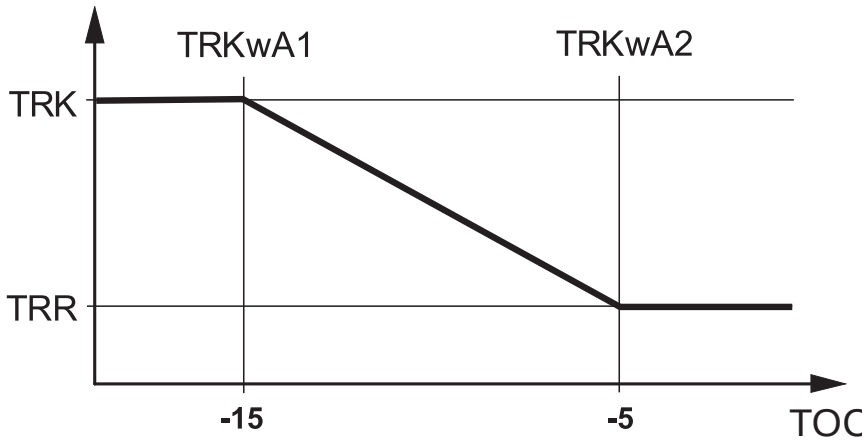


Xon	Start time set forward
Xoff	Stop time set forward
ZSP	Time switching program
TRw	Room temperature setpoint
TRx	Room temperature actual value

Reduced setpoint increase start
(800, 1100, 1400)
Red setpoint increase end
(801, 1101, 1401)

For a relatively small required heating output, the reduced room setpoint can be raised for cold outside temperatures. The increase is dependent upon the outside temperature. The lower the outside temperature is, the higher the reduced setpoint for the room temperature is raised. The start of of the increase and the end point can be set. Between these two points there is a linear increase of the "reduced setpoint" up to the "comfort setpoint".

Fig. 17: Reduced setpoint increase



TRwA1	Red setpoint increase start
TRwA1	Red setpoint increase end
TRK	Comfort nominal value
TRR	Room temperature reduced setpoint
TAgem	Outside temperature mixed

Continuous pump operation
(809, 1109, 1409)

Using the *continuous pump operation function* switching off the pump can be suppressed by the quick setback and when reaching the room set point (room thermostat, room sensor or room model)

- *No*: the heating circuit pump /boiler pump can be switched off by quick setback or reaching the room set point
- *Yes*: the heating circuit pump/boiler pump remains switched on even during the quick setback and after reaching the room set point

Overtemp prot pump circuit
(820, 1120, 1420)

This function prevents overheating of the pumped heating circuit by switching-on and switching-off the pump, if the flow temperature is higher than the flow temperature required according to the heating curve (e.g. in case of higher demands of other consumers).

Mixing valve boost
(830,1130, 1430)

The heat demand of the mixer heating circuit to the generator is superelevated above the set value here. This boost should be achieved so that the temperature fluctuations can be corrected with the mixer valve.

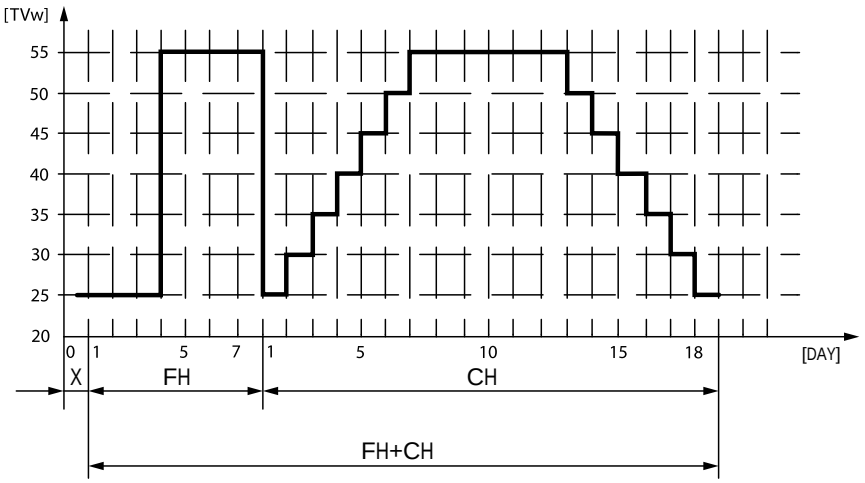
Actuator running time
(834, 941, 1134)

Einstellung der Antriebslaufzeit des verwendeten Mischerventils.
Bei Mischerkreisen wird im Anschluss an den Pumpenkick ein Kick des Mischerantriebes durchgeführt (Pumpe ist AUS). In this case, the mixer will be controlled in direction OPEN and CLOSED.
The time of activation in direction OPEN corresponds to the drive running time.

Floor curing function
(850, 1150)

The floor curing function serves controlled drying out of screed floors
- *Off*: the function is switched off.
- *Functional heating* (Fh): Part 1 of the temperature profile will be run through automatically.
- *Curing heating* (Bh): Part 2 of the temperature profile will be run through automatically.
- *Functional heating and curing heating*: The whole temperature profile will be run through automatically.
- *Manual*: Control to the floor curing setpoint manually.

Fig. 18: Temperature profile of the floor -curing function



X Starting day
Fh Functional heating
Ch Curing heating

Important! The respective regulations and standards of the screed manufacturer have to be observed.

A correct function is only possible with a correctly installed plant (hydraulic, electrical systems and settings).
Deviations can only lead to damage of the screed.
The floor curing function can be stopped prematurely by setting **0=OFF**.

Floor curing setp manually
(851, 1151, 1451)

Setting of temperature, up to which manual control is carried out at activated floor curing function (see prog. no. 850).

Screed nominal value actual
(1455)

Display of the current floor curing setpoint.

Screed day actual
(856, 1156, 1456)

Display of the current day of the floor curing function.

Excess heat draw
(861, 1161, 1461)

If the excess temperature draw is activated via input H1 to H5 or a maximum temperature is exceeded in the system, this excess heat energy can be released by a heat draw of the room heating.
- *Off*: the function is switched off.
- *Heating mode*: the function is limited to only a draw during the heating time.
- *Always*: the function is generally released.

With buffer storage tank
(870, 1170, 1470)

This parameter establishes whether the heating circuit can be supplied by a buffer or only from a heat generator. The function has the effect of whether with a heat demand the system pump goes into operation.
- *No*: the heating circuit is supplied from the boiler.
- *Yes*: the heating circuit can be supplied from the buffer.

With primary controller/system pump
(872, 1172, 1472, 5092)

This parameter establishes whether a zone system pump goes into operation with a heat demand of the heating circuit. This system pump is based on the segment, in which this controller is located (LPB bus system) and which is controlled with a primary control.

- *No*: the heating circuit will be fed without primary control unit/feed pump.
- *Yes*: the heating circuit is supplied after the primary control with the system pump.

Pump speed reduction
(880, 1180, 1480)

Speed reduction of the heating circuit pump can be done acc. to operating level or acc. to pump characteristic curve.
Operating level: With this option the speed of the heating circuit pump is calculated acc. to the operating level. The pump is controlled in operating level comfort (incl. optimization) or during active floor curing function with parameterized maximum speed. With reduced operating level the pump is controlled with the parameterized minimum speed.
Characteristic: The pump speed of the heating circuit pump is calculated based on the actually held flow temperature and the current flow set point. The common flow temp setpoint is used for the actual value If no common flow temperature sensor is available the boiler flow actual value is used. The temperature actual value is attenuated with a filter (time constant capable of parameterization)

Pump speed min
(882, 1182, 1482)

Using this function the minimum speed for the heating circuit pump can be specified.

Pump speed max
(883, 1183, 1483)

Using this function the maximum speed for the heating circuit pump can be specified.

Curve readj at 50% speed
(888, 1188, 1488)

Correction of the flow setpoint with reduction of the pump speed by 50%. The correction is calculated from the difference from the flow setpoint according to the heating curve and current room setpoint.

Flow setp readj speed ctrl
(890, 1190, 1490)

Here it can be specified whether the calculated flow setpoint correction is included in the temperature request or not.
- *No*: the temperature request remains unchanged. The calculated correction value was is not added.
- *Yes*: the temperature request includes the flow setpoint correction.

Operating level changeover (898, 1198, 1498)

Using an external timer above the entrances *Hx* it can be selected in which operating level the heating circuit is switched into.
- *Frost Protection*:
- *Reduced*:
- *Comfort*:

Optg mode changeover (900, 1200, 1500)

Bei externer Umschaltung der Betriebsart per Hx kann ausgewählt werden, ob bei Automatikbetrieb vom Komfortsollwert auf den Frostschutzsollwert oder Reduziertsollwert umgeschaltet wird.

DHW

Nominal value (1610)

Setting the drinking water nominal value

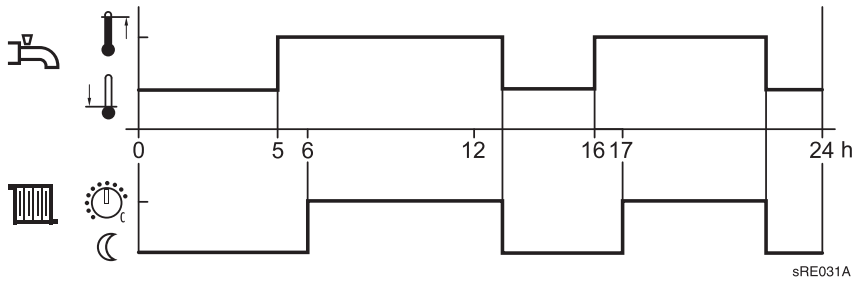
Reduced nominal value (1612)

The DHW reduced setpoint is set under programme number 1612.

Release (1620)

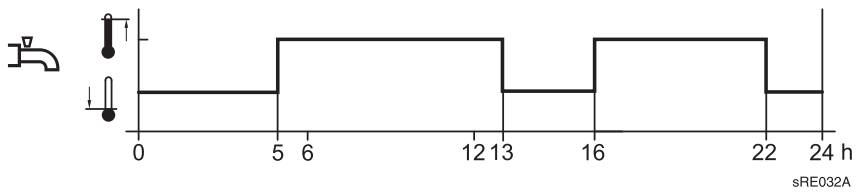
- *24h/day*: The DHW temperature will be continuously controlled to the nominal drinking water temperature value independent from the time switching programmes.
- *Time programs HCs*: The DHW temperature will be switched over between the nominal DHW temperature value and the reduced nominal DHW temperature value depending on the time switching programs. Every time, the switching-on time will be moved forward.
  - In case of several releases per day, it is moved forward by 1 hour (see *Fig. 19*).

Fig. 19: Release depending on the time switching programmes of the heating circuits (example#)



- *Time program 4*The DHW temperature will be switched over between the nominal setpoint and the reduced setpoint independent from the time switching programs of the heating circuits. In this case, the time switching programme 4 will be used (see *Fig. 20*).

Fig. 20: Release according to time switching programme 4 (example)



Charging priority (1630)

This function ensures that the boiler capacity is primarily made available for DHW in case of simultaneous capacity demand by room heatings and DHW.
- *Absolute priority*: Mixer and pumped heating circuits are blocked until the DHW has been heated up.
- *Sliding priority*: Should the boiler capacity not be sufficient to heat up DHW, mixer and pumped heating circuits will be restricted.
- *No priority*: Charging DHW is carried out in parallel with heating operation.
- *Mixer heating circuit sliding, pumped heating circuit absolute*: The pumped heating circuits are blocked until DHW has been heated up. Should the boiler capacity not be sufficient, also the mixer circuit will be restricted.

Legionella function (1640)

Function to kill legionella germs by heating up to the set legionella function setpoint (see programme number 1645).
- *Off*: Legionella function is switched off.
- *Periodisch*: Legionella function is repeated periodically, depending on the set value (prog. no. 1641).
- *Fixer Wochentag*: Legionella function will be activated on a certain weekday (prog. no. 1642).

Legionella funct periodically (1641)

Setting the interval for the **legionella function periodically** (recommended setting in case of additional drinking water heating by solar plant in connection with a st tankmixing pump).

Legionella funct weekday (1642)

Selection of the weekday for the legionella function **fixed weekday** (factory setting).

Legionella funct time (1644)

Setting the start time for the legionella function. The legionella function will be carried out at the first release of the DHW preparation with the setting "---".

Legionella funct setpoint (1645)

Setting the temperature setpoint for killing the germs.

Legionella function duration (1646)

With this function, the time will be set, during which the legionella function setpoint is activated to kill germs.

If the colder storage temperature rises above the **legionella function setpoint** by -1 K, the **legionella function setpoint** is assumed as met and the timer starts running. If the storage temperature drops by more than the switching difference +2 K below the required **legionella function setpoint**, the duration has to be met again. If no duration has been set, the legionella function has been met immediately on reaching the **legionella function setpoint**.

Legionella function circ pump
(1647)

- *On*: The circulation pump will be switched on in case of active legionella function.

Caution! There exists a hazard of scalding at the tapping locations in case of activated legionella function.

Circulating pump release
(1660)

- *Time programme 3*: The circulation pump is released, depending on the time programme 3 (see prog.no. 540 to 556).
- *Drinking water release*: The circulation pump will be released, when the drinking water preparation has been released.
- *Time programme 4*: The circulation pump will be released, depending on the time programme 4 of the local controller.

Circulation pump cycle operation
(1661)

The circulation pump will be switched on for 10 minutes and off for 20 minutes within the release time.

Zirkulationspumpe Sollwert
(1663)

Wird ein Fühler in der Trinkwasserverteilleitung platziert, überwacht der die Regelung dessen Ist-Wert während der Legionellenfunktion. Der eingestellte Sollwert muss am Fühler während der eingestellten Verweildauer (Prog.-Nr. 1646) eingehalten werden. Die Einstellung des Zirkulationssollwerts wird nach oben vom Nennsollwert begrenzt.

Optg mode changeover
(1680)

Using external switching above the entrances H1-H5 it can be selected into which operating mode is switched into.
- *None*: the function is switched off.

Consumercircuit

Flow temp setp cons request
(1859, 1909, 1959)

Setting of the flow setpoint is done with this function, which is effective during active request of the consumer circuit.

DHW charging priority
(1874, 1924, 1974)

Setting, if the connected consumerscircuit pump should be used with priority for domestic hot water charging.

Excess heat draw
(1875, 1925, 1975)

If an excess temperature discharge is activated, the excess energy can be discharged through a consumercircuit of the room heating. This can be separately set for each consumercircuit.

With buffer
(1878, 1928, 1978)

See prog no. 5090.

With prim contr/system pump
(1880, 1930, 1980)

See prog no. 5092.

Swimming pool

Setpoint solar heating
(2055)

When using solar energy, the swimming pool is heated to the setpoint set here.

Setpoint source heating (2056)

When using the generator heating, the swimming pool is heated to the setpoint set here.

Charging priority solar (2065)

Setting, of whether the swimming pool heating by solar charging has priority or not.

Swimming pool temp max (2070)

This parameter sets whether the swimming pool heating by solar charging has priority or not. If the swimming pool temp reaches the heating limit set here, the collector pump is switched off. It is again released if the swimming pool temp has dropped by 1 °C below the maximum heating limit temperature.

With solar integration (2080)

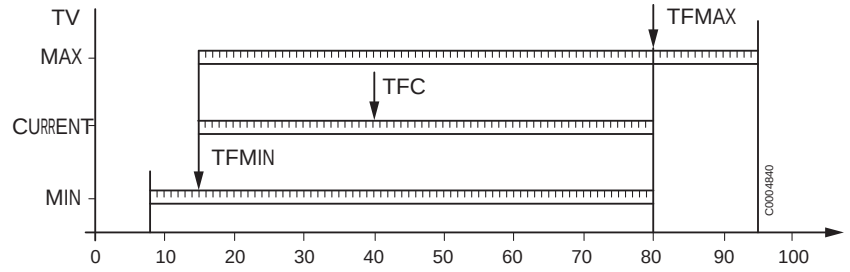
Setting, of whether the swimming pool heating can be done by solar energy or not.

Primary contr/system pump

Flow temp setpoint min (2110)
Flow temp setpoint max (2111)

With these boundaries a range for the flow setpoint during heating can be defined.

Fig. 21: Flow temp setpoint limitations



TVmax TVmax Flow temp setpoint max
TVmin TVmin Flow temp setpoint min
TVw TVw Current Flow temp setpoint

Syst pump on heat gen lock (2121)

This parameter can set whether during active heat generation lock the system pump will also be locked or not.
- *Off*: The system pump will not be locked.
- *On*: During active heat generation lock the system pump will also be locked.

Mixing valve boost (2130)

For the admixture the boiler flow temperature actual value must be higher as the requested setpoint of the mixer flow temperature, since these cannot otherwise be corrected. The controller from the boiler temperature setpoint from the boost set here and the current flow temperature setpoint.

Actuator running time (2134)

Setting the actuator running time of the used mixing valve.

Prim contr/system pump (2150)

- *Before buffer storage tank*: the primary controller/feed pump is arranged with existing buffer storage tank hydraulically before the buffer storage tank
- *After buffer storage tank*: the primary controller/feed pump is arranged with existing buffer storage tank hydraulically after the buffer storage tank

Boiler

Setpoint min (2210) Setpoint max (2212)	As a protection function the boiler temperature setpoint can be limited below by the minimum setpoint (prog.no. 2210) and above by the maximum setpoint (prog.no. 2212).
Setpoint manual control (2214)	Temperature, to which the boiler will be contolled in manual control mode (also see prog. no. 7140).
Burner running time min (2241)	Here the time span after start up of the burner is set in which the switch off difference is increased by 50 %. However, this setting does **not** guarantee that the burner always remains in operation for the set time span.
Burner off time min (2243)	The boiler minimum pause time only takes effect between heating requirements coming following in sequence. The boiler minimum pause time blocks the boiler for a set time.
SD burner off time (2245)	When exceeding this switching difference, the *burner pausing time minimum*(prog.-no. 2243) will be interrupted. The boiler starts despite pausing time.
Pump after-run time (2250) Pump after-run time after DHW mode (2253)	The delay times of the pumps are controlled according to heating mode or drinking water mode.
Boiler pump at heat generation lock (2301)	Stop of boiler pump in case of activated heat generation lock. - *Off*: Switching off not activated - *On*: Switching off activated
Impact heat generation lock (2305)	With these parameter it can be set whether the heat generation lock should be effective only for heating requests or also for DHW requests. - *Heating mode only*: Only the heating request is locked. DHW requests will continue to be operated. - *Heating and DHW mode*: All heating and DHW requests will be locked.
Temp differential max (2316)	The limit of the boiler stroke is only possible if a valid value of the boiler return temperature is available.  **Caution!** The limit of the boiler stroke is only performed if a modulating heat circuit pump is configured, i.e. if Prog. no. 6085 (PWM-output P1) is assigned to a heating circuit pump.
Temp differential nominal (2317)	The expansion between boiler flow temperature and boiler return temperature is called the temperature rise. For operation with a modulating pump, the temperature rise is limited with this parameter.

Pumpmodulation
(2320)

- *None*: the function is switched off.
- *Demand*: Actuation of the boiler pump occurs with the speed calculated for the DHW pump during DHW mode or with the highest calculated speed for the max. 3 heating circuit pumps during pure heating mode.
  The calculated pump speed for heating circuit 2 and 3 is only evaluated if these heating circuits are also dependent on the setting of the diverting valve (Parameter *boiler pump/DHW diverting valve control*).
- *Boiler temperature setpoint*: The boiler pump modulates its speed so that the current setpoint (DHW or buffer storage tank) is achieved on boiler flow. The speed of the boiler pump must be raised within the specified limits until the burner has reached its upper output limit.
- *Temp differential nominal*: The boiler output is controlled to the boiler setpoint. The control of the pump speed controls the speed of the boiler pump so that the nominal rise between the boiler return and boiler flow is held.
  If the actual rise is larger than the nominal rise, the pump speed is increased, otherwise the pump speed is reduced.
- *Burner output*: If the burner is operated with low output then the boiler pump should also run on low speed. During high boiler output the boiler pump should run on high speed.

Pump speed min
(2322)

For the modulating pump the working range can be defined in percent of output. The control translates the percent data internally into speeds.
The minimum value should be chosen so that the pump is reliably activated during actuation.

Pump speed max
(2323)

The power consumption can be limited via the maximum value.

Output nominal
(2330)
Output basic stage
(2331)

The settings under prog.no. 2330 and prog.no. 2331 are necessary when setting up boiler cascades with boilers of different power.

Output at pump speed min
(2334)
Output at pump speed max
(2335)

If under the prog. no. 2320 option burner load is selected, the boiler pump is operated up to the set burner load under prog. no line 2334 to minimum pump speed. from the set burner output set under prog. no. 2335 the boiler pump is operated on maximum pump speed. If the burner output lies between these two values, the pump speed for the boiler pump is given by linear conversion.

Max fan output heating operation
(2441)

With this parameter the maximum output can be limited in heating mode.

Max fan output heating full charging
(2442)

With this parameter the maximum output can be limited in full charging mode.

Fan output DHW max.
(2444)

With this parameter the maximum fan output for the DHW mode can be restricted.

Fan shutdown for heating mode
(2445)

This function is used for switching off the supply voltage for the fan. The supply voltage for the fad is released as soon as the fan PWM actuation is active or a DHW request exists. The switch off is done delayed to switch off of the PWM actuation or to discontinuation of the DHW request. The duration of the switch off delay can be set with the fan switch off delay function (prog.no. 2446). During a DHW request the voltage supply for the fan also remains then released if the PWM actuation is not active.

Fan shutdown delay
(2446)

If no heating requirement exists the voltage supply of the fan is switched off. The time is set here in which the fan gets voltage anyway.

Par controller delay
(2450)

The controller delay is used for a stabilisation of the combustion conditions, especially after a cold start. After release of the firing automation by the controller this remains on the set output for a specified time. Only after this time has elapsed is the modulation released.
Prog. no. 2450 is used to set at which operating mode the controller delay is active.

Speed controller delay
(2452)

Speed which is output during the duration of the control delay.

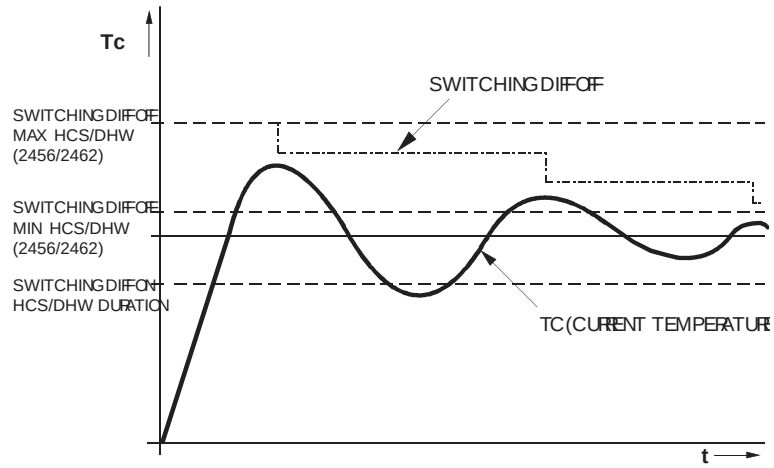
Controller delay duration
(2453)

Duration of the control delay. The time duration starts as soon as after ignition a positive flame detection is done.

Switching diff on HCs
(2454)
Switching diff off min HCs
(2455)
Switching diff off max HCs
(2456)
Switching diff on DHW duration
(2460)
Switching diff off min DHW
(2461)
Switching diff off max DHW
(2462)

To avoid unnecessary switch off during transient effects the switch off difference adapts dynamically depending on the temperature profile (see *Fig. 22*).

Fig. 22: Switching differential



Pressure switch shutdown (2500)

With this parameter the maximum fan output for the DHW mode can be restricted. This function checks the static water pressure with the aid of the connected water pressure switch. Depending on the set option (*start prevention* or *lockout position*) with shutdown either a start prevention or lockout position occurs with the corresponding diagnostics.
A closed water pressure switch releases the commissioning on the burner control and the actuation of the pumps. With open pressure switch only after the adjustable holding time is a start prevention or lockout position triggered.
The pump actuation is also locked for protection against dry running. If the water pressure increases again and the switch closes again , with a start prevention these are automatically again cancelled and the pump actuation is again released.

Cascade

Lead strategy (3510)

Considering the specified output range the heat generation is switched on and off acc. to the set lead strategy. To switch off the effect of the die output range, the limits must be set to 0% and 100% and the lead strategy to late on, late off.

- *Late on, early off*: additional boiler is switched on as late as possible (output range max) and back off as early as possible (output range max). I.e. boiler in operation as little as possible, or short running times for additional boiler.
- *Late on, late off*: additional boiler is switched on as late as possible (output range max) and back off as late as possible (output range min). I.e. as few as possible on and off processes as possible for the boiler.
- *Early on, late off*: additional boiler is switched on as early as possible (output range min) and back off as late as possible (output range min). I.e. boiler in operation as much as possible, or as long as possible running times for additional boiler.

Release integral source seq (3530)

A value generated from temperature and time. The following boiler will be switched on in case of exceeding the set limit. .

Reset integral source seq (3531)

The following boiler will be switched off in case of exceeding the setpoint

Restart lock (3532)

The restart lock prevents switching back on of a switched off boiler. Only after the set time period has elapsed is it again released. This prevents too frequent switching on and off of the boiler and achieves a stable operating condition of the system.

Switch-on delay (3533)

Too frequent forward and back switching (cycles) of the boiler are avoided by the switch-on delay and therefore a stable operating state is ensured.

Auto source seq ch'over (3540)

The sequence of lead boiler and following boiler is defined by the source sequence changeover and in this way, the utilisation of the boilers in a cascade is influenced. After the set time has elapsed, the boiler sequence will be changed. The boiler with next higher device address operates as lead boiler.

Auto source seq exclusion (3541)

- *None*: After the set time has elapsed, the boiler sequence will be changed.
- *First*: the first boiler in the addressing works as the lead boiler; for all other boilers, the boiler sequence is changed after the time set in prog.no. 3540 has elapsed.
- *Last*: the last boiler in the addressing always remains as the last boiler; for all other boilers, the boiler sequence is changed after the time set in prog.no. 3540 has elapsed.

Leading source
(3544)

The setting of the leading source is only used in combination with the fixed sequence of the source sequence (prog. no. 3540). The boiler defined as the leading boiler is always put into operation first, and switched off last. The other boilers are switched on and off in the sequence of the device address.

Return setpoint min
(3560)

If the return temperature drops below the return setpoint set here, the return maintenance is active. The return maintenance enables influences on the consumers or use of a return controller.

Temp differential min
(3590)

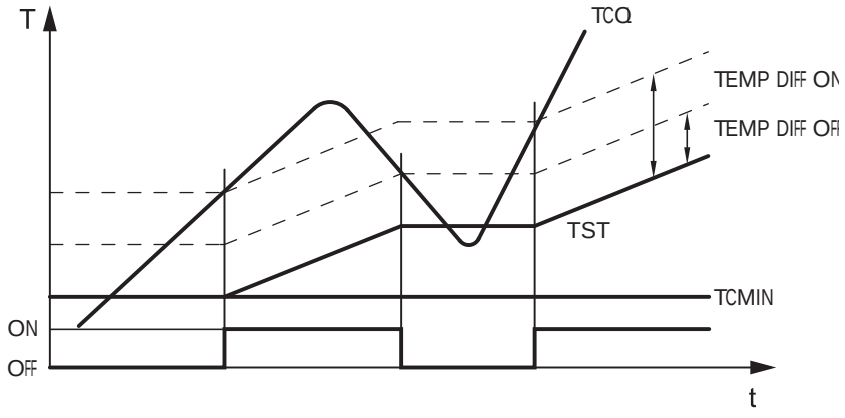
This function prevents too high cascade return temperatures and improves the switch off behaviour of the cascade. If the temperature difference between the flow and return sensor is smaller than the minimal temperature spread set here, a source is switched off as early as possible independently of the set lead strategy. If the temperature difference is again sufficient, the set lead strategy is again switched to.

Solar

Temp diff on
(3810)
Temp diff off
(3811)

The switching-on and switching-off point of the collector pump is set with these functions. Basis is the temperature difference between collector temperature and storage temperature.

Fig. 23: charging control /schematically)



ON / OFF	Collector pump
Tkol	Collector temp
TLmin	Charging temp min buffer / swimming pool
TSp	Storage temperature

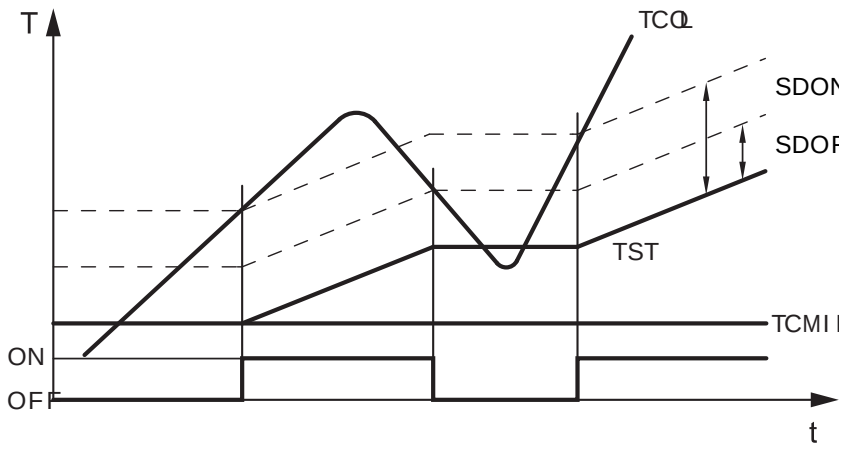
Charg temp min DHW st tank
(3812)

Zusätzlich zur Temperaturdifferenz ist das Erreichen einer bestimmten minimalen Kollektortemperatur für den Speicher-Ladevorgang notwendig.

Temp diff ON buffer storage tank
(3813)
Temp diff OFF buffer storage tank
(3814)
Charging temp min buffer storage tank
(3815)

For charging the storage tank via the heat exchanger a sufficiently large temperature difference between the collector and storage tank is necessary. In addition the collector must have reached the minimum charging temperature.

Fig. 24: Storage tank charging



Tcol	Collector temp
ON/OFF	Charging ON or OFF
SdON	Temp diff ON
SdOFF	Temp diff OFF
Tcmin	Charging temp min buffer storage tank

Temp diff ON swi pool
(3816)
Temp diff OFF swi pool
(3817)

For exceeding or not reaching the difference between solar collector temperature and swimming pool temperature, the solar pump is switched on and off.

Charging temp min swi pool
(3818)

Temperatures that the collector must have at the least in order to begin charging a swimming pool.

Charging prio storage tank
(3822)

For several combined exchangers in the system, the loading sequence for the combined storage tank can be defined by setting the loading priority.
None: each storage tank is loaded alternately for a temperature increase of 5°C, until each setpoint has reached level A, B or C (see *Tab. 6 (Page 96)*). If all setpoints are reached, the setpoint of the next level is approached.
DHW storage tank: The DHW storage tank is preferred during solar charging. It is charged in each level A, B or C (see below) with priority. Only afterward is the following consumer in the same level charged. As soon as all setpoints in one level are reached, the ones in the next level are approached, whereby the DHW storage tank again has priority.
*Buffer storage tank:*The buffer storage tank is preferred during soar charging. It is charged in each level A, B or C (see *Tab. 6 (Page 96)*) with priority. Only afterward is the consumer next to it in the same level charged. As soon as all setpoints in one level are reached, the ones in the next level are approached, whereby the buffer storage tank again has priority.

Tab. 6: Storage tank setpoints

Level	**DHW storage tank**	**Buffer storage** tank
A	1610 Nominal setpoint	Buffer setpoint (drag-pointer)
B	5050 DHW Charging temp max	4750 Buffer storage tank charging temp max
C	DHW storage tank temp max (set by factory: 90°C)	Buffer storage temperature max (set by factory: 90°C)

Charging time relative prio (3825)

If the preferred storage tank corresponding to the charging control not be charged, during the time set here the priority goes to the next storage tank or the swimming pool.

Waiting time relative prio (3826)

The transfer of the priority of the time set here is delayed.

Waiting time parallel op (3827)

With sufficient solar capacity, with use of solar charging pumps a parallel operation is possible. During this the next storage tank in the priority sequence can be loaded parallel to the current loaded storage tank. The storage tank switching on for parallel operation can be delayed and staged by the value set here.

Delay secondary pump (3828)

So that possible existing cold water can be first rinsed through the pump in the primary circuit, the operation of the secondary pump of the heat exchanger can be delayed.

Collector start function (3830)

If the temperature at the collector with the pump turned off not be measured correctly (e.g. with vacuum tubes), then a periodic switching on of the pump is possible.

The temperature on a certain collector cannot be measured correctly, if the pump is switched-off. For this reason, the pump must be activated from time to time.

Min run time collector pump (3831)

The collector pump is periodically switched on for the running time set here.

Collector start function ON (3832)
Collector start function OFF (3833)

The time that the collector start function starts or stops is set here.

Collector start funct grad (3834)

As soon as there is a temperature increase on the collector sensor, the collector pump switches on. The higher the value here is set, the larger the temperature increase must be.

Collector frost protection (3840)

In order to prevent freezing of the collector, the collector pump will be activated in case of frost danger.

Collector overtemp prot (3850)

In case of overheating danger, charging of the storage will be continued, to remove heat. When reaching the storage safety temperature, charging of the storage will be interrupted.

Evaporation heat carrier (3860)	Pump protecting function, to prevent overheating of the collector pump in case of evaporating danger of the heat carrying medium due to high collector temperature.
Antifreeze (3880)	Information of the antifreeze used.
Antifreeze concentration (3881)	Input of antifreeze concentration for usage measurement of solar energy.
Pump capacity (3884)	Input of the flow of the installed pump for calculation of the brought in volume for usage measurement.
Pulse valency (3887)	Defines the flow per pulse for the H4 inlet. The H4 inlet must be configured to pulse count for this.

Solid fuel boiler

Locks other heat sources (4102)

Locks other heat sources (4102)	If the solid fuel boilers are activated, other heat generators, e.g. oil./gas boilers, are blocked, as soon as an increase in the boiler temperature is discovered that points to the exceeding of the comparative temperature (prog. no. 4133).

Setpoint min (4110)

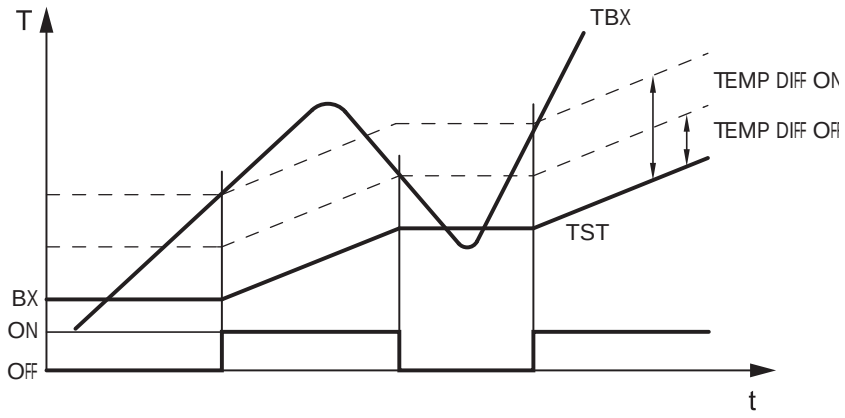
Setpoint min (4110)	The boiler pump is only put into operation if the boiler temperature has reached the minimum setpoint set here in addition to the necessary temperature difference.

Temperature difference (4130 - 4133)

Temp diff on/off (4130, 4131)
Comparative temp (4133)

A sufficiently large temperature difference is necessary between the boiler temperature and the comparative temperature for start-up of the pump.

Fig. 25: Storage tank charging



TBx	Boiler temp
Bx	Comparative actual temperature
ON/OFF	ON/OFF Boiler pump

To maintain the comparative temperature, the following settings are available under prog. no. 4133:
DHW sensor B3/B31: The comparative temperature is supplied by the DHW sensor B3/B31
Storage tank sensor B4/B41: The comparative temperature is supplied by the buffer storage tank sensor B3/B31
Flow temp setpoint: The flow temperature setpoint is used as comparative temperature.
Setpoint min The value set in prog.no. 4110 is used as comparative temperature.

Pump after-run time (4140)

Pump after-run time (4140)

Setting pump after-run time.

Buffer storage

Auto generation lock (4720)

The hydraulic separation of heat source and buffer storage tanks achieved by the automatic heat generation lock. The heating source will only be started if the buffer storage tank cannot cover the actual heat request. The following settings are possible:
- *None*: the automatic heat generation lock is de-activated.
- *with B4*: the automatic heat generation lock will be triggered by the buffer storage tank B4
- *with B4 and B42/B41*: the automatic heat generation lock will be triggered by the buffer storage tanks B4 and B41/B42.

Auto heat gen lock SD (4721)

The heat source will be locked if the temperature in the buffer storage tank is higher than the boiler setpoint+ auto heat generation lock SD.

Temp diff buffer/HC
(4722)

If the temperature difference between buffer storage and heating circuit temperature request is sufficiently large, the heat required by the heating circuit will be taken from the buffer storage. The heat generator is locked.

Min st tank temp heat mode
(4724)

If the storage tank temperature of the buffer storage tank drops below this value, the heating circuit is switched of if no generator is available.

Charging temp max
(4750)

The buffer storage tank is charged from solar energy up to the set charging temperature maximum.

The collector overheating protection function can put the collector pump back in operation until the maximum storage tank temperature is reached.

Recooling temperature
(4755)

The collector overheating protection function can put the collector pump back in operation until the maximum storage tank temperature is reached.

Recooling DHW/HCs
(4756)

For the recooling of the buffer storage tank to the recooling temperature there are two functions available.The energy can be discharged via a heat draw of the room heating or the DHW storage tank. This can be separately set for each heating circuit.

Recooling collector
(4757)

Recooling with a too high buffer storage tank temperature by transmission of energy to the environment via the collector area.
- *Off*: recooling is switched off.
- *Summer*: the recooling is only active in the summer.
- *Always*: recooling is always active.

With solar integration
(4783)

Setting of whether the buffer storage tank can be charged by solar energy.

Return diversion
(4790 - 4795)

At the appropriate temperature difference between the return sensor B73 and the selectable comparative temperature the return is re-routed to the lower buffer storage tank part. The function can either be used as return temperature increase or as return temperature decrease. The way this works is defined in prog. no.4796.
Using the definition of the temperature differences in prog. no. 4790 and 4791 the switch on and switch off point of the return redirection is established.
In prog.no. 4795 the buffer storage tank sensor is selected that delivers the value for the comparison with the return temperature, to switch on the return redirection with the aid of the set temperature differences.

Note: To activate the return redirection the relay outlet QX1, QX2, QX3 (prog. no. 5890-5892) for the buffer deflector valve and the sensor inlet BX1, BX2, BX3 (prog. no. 5930-5932) for the rail return sensor B73 must also be configured.

Optg action return diversion (4796)

The function can either be used as return temperature increase or as return temperature decrease.
Temp decrease: If the return temperature of the consumer is higher than the temperature on the selected sensor (prog. no. 4795), the lower part of the storage tank can be preheated with the return. The return temperature drops even lower with this, which, for example with a condensing boiler leads to a higher efficiency.
Temp increase: If the return temperature of the consumer is lower than the temperature on the selected sensor (prog. no. 4795), the return can be preheated by redirecting over the lower part of the storage tank. In this way, for example, a return reheating can be implemented.

Full charging (4810)

The function *full charging* makes it possible that the released heat source is first switched off, despite automatic heat source block if the buffer storage tank is fully charged. During active function the heat source parameterized for the fully charging function is first switched off, if the fully charging setpoint is reached or the boiler must be switched off because of burner control.
Off: the Full charging function is switched off.
Heating Mode: The full charging is active if the automatic heat source block blocks the heat source during valid heat request based on the buffer temperature. If the buffer storage tank reaches the requested temperature on the sensor parameterized for the full charging function, the function is ended.
Always: The full charging is active if the automatic heat source block blocks the heat source during valid heat request based on the buffer temperature or the heat request is invalid. If the buffer storage tank reaches the requested temperature on the sensor parameterized for the full charging function, the function is ended.

Full charging temp min (4811)

The buffer storage tank is charged minimally to the set value.

Full charging sensor (4813)

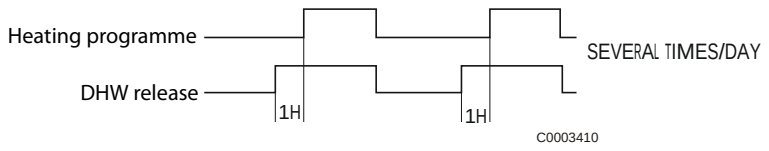
With B4 For the full charging function the buffer storage tank sensor B4 is considered.
With B42/B41: For the full charging function the buffer storage tank sensor B42, if not available buffer storage tank sensor B41, is considered.

DHW-storage

Charge push forward time (5011)

If the setting *several times/day* is selected under prog. no. 5010, the DHW release is pushed forward by the set charge push forward time compared to each heating circuit allocation and kept during the heating circuit allocation.

Fig. 26: Charge push forward time



Flow setpoint boost
(5020)

The boiler temperature setpoint for charging the DHW storage tank consists of the DHW temperature setpoint and the flow setpoint boost.

Transfer boost
(5021)

Through the transfer, energy can be moved from the buffer storage tank into the DHW storage tank. For this the current buffer storage tank temperature must be higher than the current temperature in the DHW storage tank. This temperature difference is set here.

Type of charging
(5022)

Charging a layer storage:
- Charging: The first charging of each day will heat-up the hot water tank completely.
- Re-charging : all the following re-charges afterwards will heat-up the water above the hot water sensor.

- *Re-charging*: In general, the demand of domestic hot water is controlled by the upper tank sensor TWF (B3).
- *Charging*: The demand of domestic hot water is controlled by the two tank sensors (B3) and TLF (B36).
- *Charging Legio*: Legionella function being active: both sensors control the demand of domestic hot water, otherwise the upper sensor TWF (B3) only.
- *Charging 1. Charge*: During the 1st charge of the day: both sensors control the demand of domestic hot water, otherwise the upper sensor TWF (B3) only.
- *Full charg 1st time legio. Charge*: During the 1st charge of the day: both sensors TWF (B3) and TLF (B36) control the demand of domestic hot water, otherwise the upper sensor TWF (B3) only.

Switching diff
(5024)

If the DHW temperature is lower than the current setpoint minus the switching difference set here, the DHW charging is started. The DHW charging is ended if the temperature of the current setpoint is reached.

At the first DHW release of the day, a forced charging is performed.
The DHW charging is also started if the DHW temperature is within the switching difference - as long as it is not less than 1 K under the setpoint.

Charging time limitation
(5030)

During the DHW charging, the room heater - depending on the selected charging priority (prog.no. 1630) and the hydraulic switch – has too little or no power. Often it is therefore practical to restrict the time of DHW charging.

Discharging prot
(5040)

The function ensures that the DHW pump (Q3) first switches on if the temperate in the heat generator is sufficiently high.
Application with sensor
The charging pump is first switched on if the heat source temperature is above the DHW temperature plus the half of the charging increase. If the boiler temperature drops again below the DHW temperature plus 1/8 of the charging excess during the charging, the charging pump is again switched off. If two DHW sensors for the DHW charging are parameterized, the lower temperature is considered for the discharge safety function (normally the DHW sensor B31).
Application with thermostat
The charging pump is first switched on if the boiler temperature is above the DHW nominal setpoint. If the boiler temperature drops below the DHW nominal setpoint minus the DHW switching difference, charging pump is again switched off.
Off: the function is switched off.
Always: the function always affects.
Automatic The function only takes effect if the heat generator cannot deliver heat or is not available (malfunction, heat source block).

Charging temp max
(5050)

With this setting, the maximum charging temperature for the connected storage of the solar system will be limited. If the DHW-charging value is exceeded, the collector pump switches off.

The collector pump can be re-activated by the collector overheating protecting function see prog.no. 3850) until the storage safety temperature has been reached.

Recooling temperature
(5055)

Setting the temperature for recooling the DHW-storage.

Recooling collector
(5057)

Recooling of the overheated collector through giving off of the energy to the surrounding of the collector.

El imm heater optg mode
(5060)

- *Replacement*: the DHW is only heated by electrical immersion heater if the boiler signals a malfunction or a boiler lock exists.
- *Summer*: the DHW is heated by an electrical immersion heater if all connecting heating circuits have switched to summer mode. As soon at least one heating circuit is switched to heating mode, the DHW preparation is again taken over by the boiler. The conditions listed for the electrical immersion heater under Replacement operating mode is also activated in the Summer operating mode.
- *Always*: the DHW preparation is only performed by the electrical immersion heater.

Electrical immersion heater release
(5061)

- *24h/day*: Permanent release of the electric insert
- *DHW release*: Release of the electric insert depending on DHW-release (see prog.no. 1620).
- *Time programme 4*: Release of the electric insert via the time switching programme 4 of the local controller.

Electric insert control
(5062)

- *External thermostat*: The storage temperature will be achieved with an external thermostat without setpoint control of the controller.
- *DHW sensor*: The storage temperature will be achieved with an external thermostat with setpoint control of the controller.

Automatic-Push
(5070)

The DHW-Push can activated by hand or automatically. It causes a one-time DHW charging to the nominal setpoint.

- *Off*: The DHW-Push can only activated by hand.
- *On*: If the DHW temperature drops by more than two switching differences (prog. no. 5024) below the reduced setpoint (prog. no. 1612), one -time it will be recharged to the DHW nominal setpoint (prog.no.1610).

The automatic push only works for set DHW operating mode.

Excess heat draw
(5085)

An excess heat draw can be actuated through the following functions: storage tank temperature maximum, automatic push, charging priority time push, excess heat draw, active inputs H1, H2, H3 or EX2, storage tank recooling, solid boiler excess heat draw. If an excess temperature discharge is activated, the excess energy can be discharged through a heat draw of the room heating. This can be separately set for each heating circuit.

With buffer storage tank (5090)	- *No*: The domestic hot water storage tank will be directly charged from the boiler. - *Yes*: The domestic hot water storage tank will be charged from the buffer storage tank.
With primary control/system pump (5092)	- *No*: the domestic hot water storage tank will be charged without primary controller/system pump. - *Yes*: the domestic hot water storage tank will be charged from the primary controller on/with the system pump.
With solar integration (5093)	This function sets whether the DHW storage tank should be filled.
Pump speed limitations (5101, 5102)	Setting of the minimum and maximum speed of the storage tank charging pump in percent.
Speed Xp (5103)	The P-band Xp defines the amplification of the controller A smaller Xp value leads to a higher actuation of the charging pump with equal control difference.
Speed Tn (5104)	The reset time Tn determines the reaction speed of the controller when compensating for remaining controller differences. A shorter reset time Tn leads to faster compensating.
Speed Tv (5105)	The preholding time Tv determines how long a spontaneous change of the control difference continues to have an effect. A short time only influences the control variable only for a short time.
Transfer strategy (5130)	The transfer is always allowed or to the set DHW release times.
Interm circ boost recharging (5139)	Setpoint boost for charging setpoint on charging sensor B36 with recharging.
Intermediate circuit boost (5140)	Setpoint boost for charging setpoint on charging sensor B36 with full charging.
Excess interm circ temp max (5141)	With this parameter the end criterion of a full charging during control is specified on the charging sensor B36. If the contents of the layer storage is charge to the bottom, the temperature increases on the charging sensor
Flow setp compensation delay (5142)	The filter time for the setpoint lead is set here.
Flow setp compensation Xp (5143)	The P-band Xp defines the amplification of the controller A smaller Xp value leads to higher actuation of the charging pump with equal control difference.
Flow setp compensation Tn (5144)	The reset time Tn determines the reaction speed of the controller when compensating for remaining controller differences. A shorter reset time Tn leads to faster compensating.

Flow setp compensation Tv (5145)

The preholding time Tv determines how long a spontaneous change of the control difference continues to have an effect. A short time only influences the control variable only for a short time.

Full charging with B36 (5146)

Here it can be set whether the end of the full charging is detected via the temperature on the charging sensor B36.
- *No*: the end of the full charging is detected via the temperature on the upper and lower storage sensor B3 and B31.
- *Yes*: the end of the full charging is detected via the temperature on the upper storage sensor B3.

Min start temp diff Q33 (5148)

This parameter determines switch on delay of the intermediate circuit pump depending on the boiler temperature. The intermediate circuit pump is switched on as soon as the boiler temperature has reached the boiler setpoint plus the value set here. The setting -5 °C has the effect that the intermediate circuit pump will be switched on as soon as the boiler temperature has reached the boiler setpoint up to 5 °C.

Excess interm circ temp del (5151)

Control of the burner output on the charging temperature is activated if the time set here has elapsed since switching on the intermediate circuit pump.

Configuration

Heating circuit 1,2 (5710, 5715)

The heating circuits can be switched on or off by this setting. The parameters for the heating circuits are hidden in the switched off state.

This adjustment directly affects the heating circuits and has no influence on the operating unit!

DHW sensor (5730)

- *None*: No DHW sensor available.
- *Sensor B3*: It exists a DHW storage tank sensor. The controller calculates the switching points with the corresponding switching difference from the DHW setpoint and the measured DHW storage tank temperature.
- *Thermostat*: Control of domestic hot water temperature as a function of the switching status of a thermostat connected to DHW sensor B3.

Note: When using a DHW thermostat no reduced mode is possible. This means if reduced mode is active, the DHW preparation is blocked with the thermostat.

Caution! No frost protection for DHW !
The domestic water frost protection cannot be guaranteed.

- *Sensor B38*: An instantaneous heater discharge sensor is present. The controller calculates the switching points with corresponding switching difference from the instantaneous heater setpoint and the measured DHW discharge temperature.

DHW control element Q3 (5731)

- *None*: DHW-charge de-activated via Q3.
- *Charge pump*: DHW-charging via the connection of a charge pump to Q3/Y3.
- *Deflecting valve*: DHW-charging via connection of a deflecting valve at Q3/Y3.

Basicposition DHW diverting valve
(5734)

The base position of the diverting valve is the position in which the diverting valve (DV) is in if no request is active.
- *Last request*: The diverting valve (DV) remains after the last request has ended in this last position.
- *Heating circuit*: The diverting valve (DV) goes into the heating circuit position after the last request has ended.
- *DHW*: The diverting valve (DV) goes into the DHW position after the last request has ended.

Separate circuit
(5736)

The DHW separate circuit can only be used in a boiler cascade.
- *Off*: The DHW separate circuit is switched off. Each available boiler can feed the DHW storage tank.
- *On*: The DHW separate circuit is switched on. The DHW charging is only done from the boiler defined for this.

For a DHW separate circuit, under prog. no. 5731, the DHW control element Q3 is set on "diverting valve“.

Optg action DHW div valve
(5737)

Using this parameter the diverting valve position is set, which applies during active output.
- *Position on DHW*: during active output the diverting valve is in the DHW position.
- *Position on heating circuit*: during active output the diverting valve is in the heating circuit position.

Ctrl boiler pump/DHW valve
(5774)

With this parameter it can be defined for special hydraulic systems that the boiler pump Q1 and the diverting valve Q3 only are responsible for DHW and heating circuit 1, however not for heating circuits 2 and 3 or for the external consumer circuit.
- *All requests*: the diverting valve is connected hydraulically for all requests and switches between DHW mode and the remaining requests. The boiler pump runs for all requests.
- *Request HC1/DHW only*: The diverting valve is connected hydraulically only for heating circuit 1 and DHW and switches between DHW mode and heat circuit 1 mode. All other requests are not connected hydraulically via the diverting valve (DV) and the boiler pump, but rather directly connected to the boiler.

Solar controlling element
(5840)

The solar heating system can also be operated with charging pumps instead of with a collector pump and diverting valves for the storage tank connection.
- *Charge pump*: When using with the charging pump all exchangers can be flowed through simultaneously. The parallel or alternative mode is possible.
- *Deflecting valve*: When using with a diverting valve always only one exchanger can be flowed through. Only the alternative mode is possible.

External solar exchanger
(5841)

For solar schemes with two storage connections it must be set whether the external heat exchanger is present and is used *together* for DHW and buffer storage or only *for one of the two*.

Combined storage
(5870)

Combined storage-specific functions will be activated with this setting. For instance, the buffer storage electric heater insert can be used for heating as well as for DHW.
- *No*: No combined storage exists.
- *Yes*: A combined storage exists.

Relay outputs QX1 - QX3 (5890 - 5892)

Relay outputs QX1/QX2/QX3 (5890 - 5892)

- *None*: Relay outputs deactivated.
- *Circulation pump Q4*: The connected pump serves as domestic hot water circulation pump (see prog. no. 1660).

- *El imm heater DHW K6*: With the connected electrical immersion heater, the DHW can be charged according to the operating side DHW storage operating lines electrical immersion heater.

Note: The Operating mode is set under programme number 5060.

- *Collector pump Q5*: Connection of a circulating pump in case of solar collector use.
- *Cons circuit pump VK1/2/3* : Connection of a pump at the input Q15/18/19 for an additional consumer, which is requested via an Hx-input.
- *Boiler pump Q1*: the connected pump is used for recirculation of the boiler water.
- *Alarm output K10*: An occurring fault will be signalled with the alarm relay. The contact will be closed with a delay time of 2 minutes. If no fault exists any more, the contact opens without delay.

Note: The alarm relay can be reset without having the fault remedied (see prog. no. 6710).

- *Heating circuit pump HC3 / Q20*: Activating the pump heating circuit HC3.
- *System pump Q14*: Connection of a system pump.
- *Heat gen shutoff valve Y4*: Connection of a changeover valve for hydraulic decoupling the heat generator from the rest of the heating system.
- *Solid fuel boiler pump Q10*: Connection of a circulating pump for the boiler circuit for connection to a solid fuel boiler.
- *Time program 5 K13*: The relay will be controlled by the time program 5 according to the settings.
- *Buffer return valve Y15*:This valve must be configured for return temperature increase/decrease or the buffer storage tank partial charging.
- *Solar pump ext exch K9*:here, the solar pump external exchanger K9 must have been set for the external heat exchange.
- *Solar ctrl elem buffer K8*: if several exchangers are connected, the buffer storage must be set at the respective relay output and the type of solar regulating unit must be defined under prog.no. 5840.
- *Solar ctrl elem buffer K8*: if several exchangers are connected, the swimming pool must be set at the respective relay output and the type of the solar regulating unit must be defined in prog.no. 5840.
- *Cascade pump Q25*: Boiler pump in common for all boilers in a cascade.
- *St tank transfer pump Q11*: The drinking water storage can be charged from the buffer storage, if is sufficiently hot. This transfer is carried out with the transfer pump Q11.
- *DHW mixing pump Q35*: Separate pump for storage circulation during active legionella function.
- *DHW interm circ pump Q33*: pump for domestic hot water storage with external heat exchanger.
-
- *Heat request K27*: As soon as a heat demand exists in the system, the output K27 will be activated.
- *Heating circuit pump HC1 /HC2*: The relay is used for actuating the heating circuit pump Q2/Q6.
- *DHW controlling element Q3*: Depending on the hydraulics a connected DHW charging pump or diverting valve.

- *Status output K35*: The status output will be operated when a command exists from the controller to the firing automation. If there is a disturbance, which prevents the firing automation to operate, the status output will be switched off.
- *Status information K36*: The output is set, when the burner operates.
- *Flue gas damper K37*: This function activates the flue gas damper control. If the flue gas damper control is activated the burner will only start operating, when the flue gas damper is open.
- *Fan shutdown K38*: This output serves to stop the fan. The output is activated, when the fan is needed; otherwise it is not activated. The fan should be switched off as often as possible, to minimize the total energy consumption of hte system.

Sensor inputs BX1/BX2/BX3 (5930 - 5932)

Functions in addition to the basic functions will be possible by configuring the sensor inputs.

- *None*: Sensor inputs deactivated.
- *DHW sensor B31*: second DHW sensor, which is used for through loading of the legionella function.
- *Collector sensor B6*: first solar collector sensor in a collector field.
- *DHW circulation sensor B39*: Sensor for return line of DHW circulation.
- *Buffer st tank sensor B4*: lower buffer storage tank sensor.
- *Buffer st tank sensor B41*: centre buffer sensor.
- *Flue gas temp sensor B8*: Flue gas temp sensor for the alarmfunction.
- *Common flow sensor B10*: common flow sensor for boiler cascades.
- *Solid fuel boiler sensor B22*: Sensor for the acquisition of the temperature of a solid fuel boiler.
- *DHW charging sensor B36*: DHW sensor for DHW charging system.
- *Buffer st tank sensor*: upper buffer storage tank sensor.
- *Common return sensor B73*: Return sensor for the function return diversion.
- *Cascade return sensor B70*: common return sensor for boiler cascades.
- *Swimming pool sensor B13*: Sensor for measurement of swimming pool temp.
- *Solar flow sensor B63*: this sensor is required for the solar usage measurement.
- *Solar return sensor B64*: this sensor is required for the solar usage measurement.

Function inputs H1/H4/H5/ H2 (5950, 5970, 5977)

- *None*: No function.
- *Optg mode change HCs+DHW*: Changeover of the operating modes of the heating circuits to reduced operation or protecting operation (program numbers 900, 1200, 1500) and locking of domestic hot water charging in case of closed contact at H1/H4/H5/H2.
- *Optg mode changeover HC1 to HC3*: Changeover of operating modes of the heating circuits to protective operation or reduced operation.

Locking of domestic hot water charging is only possible under the setting **Optg mode change HCs+DHW**.

- *Heat generation lock*: locking of the boiler in case of closed contact at H1/H4/H5/H2.
- *Error/alarm message*: Closing the inputs H1/H2 gives a control unit-internal fault message, which will also be signalled via a relay output, programmed as an alarm output or in the remote management system.
- *Consumer request VK1/VK2/VK3*: The set flow temperature setpoint is activated via the connecting terminals (e.g. a ventilation heater function for door curtain units).

Note: The setpoint is set under programme number 1859/1909/1959.

- *Excess heat discharge*: an active excess heat discharge enables, for example, an external source to force the consumer (heating circuit, DHW storage tank, pump Hx) to take up the excess heat. For each consumer it can be set by the parameter excess temperature discharge whether the forced signal is paid attention to and therefore should take part in the heat discharge or not.
- *Release swi pool solar*: This function enables the solar swimming pool heater to be released externally (e.g. via a manual switch or the solar charging priority to be specified as compared to the storage.
- *Operating level DHW/HC's*: The operating level can be set via the contact instead of via the internal time switching program (external time switching program)
- *Room thermostat HC's*: With the input a room thermostat request can be generated for the set heating circuit.
- *DHW thermostat*: Connection of the DHW thermostat.
- *Pulse count*: By querying the input the low frequency pulse, e.g. for flow measurement is recorded.
- *Checkb sign flue gas damper*: Checkback via input H1 in case of activated flue gas damper control.
- *Start prevention*: With this input a burner start can be prevented.
- *Consumer request VKx 10V*: The application nodes external load x receives a voltage signal (DC 0-10 V) as heat request. The linear curve is defined via two fix points (voltage value 1/function value 1 and voltage value 2/function value 2).
- *Preselected output:* The source receives a voltage signal (DC 0 - 10 V) as output request. The linear curve is defined via two fix points (voltage value 1 / function value 1 and voltage value 2 / function value 2).
- *Flow measurement*: Here a flow sensor can be connected which indicates the flow volume via a frequency.

Contact type H1/H4/H5/H2 (5951, 5971, 5978)

With this function, the contacts can be set as resting contact (contact closed, must be opened for activating the function) or as working contact (contact opened, must be closed for activating the function).

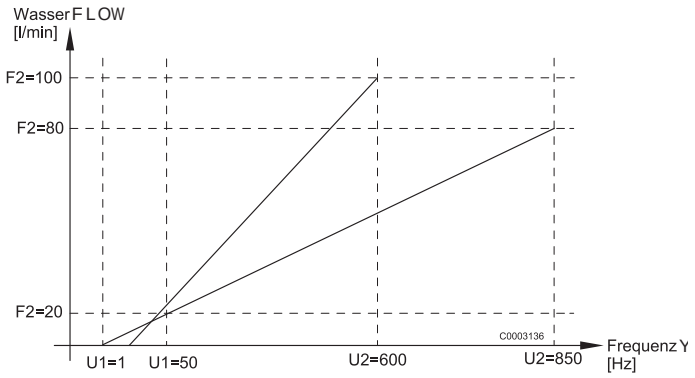
Voltage value 1 H1 (5953)

TECHEM-function: the following value has to be set: 9,5 V

Frequency values 1/2 H4
Function values 1/2 H4
(5973-5976)

The linear sensor curve is defined over two fixed points. The setting is done with two parameter pairs for *function value* and *frequency value* (F1 / U1 and F2 / U2).

Fig. 27: Example for two different sensor curves



Function extension module 1/2/3
(6020 - 6022)

Specification of the functions, which are controlled by the extension modules 1 2 and 3.
Multifunctional: For possible functions which can be assigned to the multifunctional inputs/outputs, see prog. no. 5890 or 5930.
Heating circuit 1 For this usage, the respective settings can be adjusted in the menu point Heating circuit 1.
Heating circuit 2 For this usage, the respective settings can be adjusted in the menu point Heating circuit 2.
Heating circuit 3 For this usage, the respective settings can be adjusted in the menu point Heating circuit 3.
Solar DHW: For this usage, the respective settings can be adjusted in the menu point Solar.
Primary contr/system pump For this usage, the respective settings can be adjusted in the menu point Primary contr/system pump.

Relay output QX21-QX23
(6030 - 6038)

Relay outputs for the moduls 1, 2 and 3.
Explanations see prog.-no. 5890.

Sensor input BX21/BX22
(6040 - 6045)

Sensor input for the moduls 1, 2 and 3.
Functions in addition to the basic functions will be possible by configuring the sensor inputs BX21 and BX22.
Explanations see prog.-no. 5930).

Function input H1/H4/H5/H2
(5950, 5970, 5977)

Explanations see prog.-no. 5950.

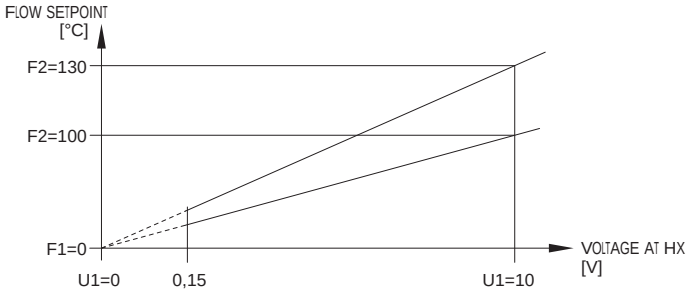
Contact type H2 EM 1/2/3
(6047, 6055, 6063)

Explanations see prog.-no. 5951.

Voltage values 1/2 H2 module 1-3
(6049, 6051, 6057, 6059, 6065, 6067)
Function values 1/2 H2 module 1-3
(6050, 6052, 6058, 6060, 6066, 6068)

The linear sensor curve is defined over two fixed points. The setting is done with two parameter pairs for *function value* and *voltage value* (F1 / U1 and F2 / U2).

Fig. 28: Example for Heat request 10 V and Refrigeration request 10 V



F1 Function value 1
F2 Function value 2
U1 Voltage value 1
U2 Voltage value 2

PWM-output P1
(6085)

With this parameter the function for the modulating pumps is specified. If because of the function no modulating signal can be calculated internally, then 0 % for **Off** or 100 % for **On** is output.
- *None*: No output P1 exists.
- *Boiler pump Q1*: the connected pump is used for recirculation of the boiler water.
- *DHW pump Q3*: Control element for drinking water storage.
- *DHW interm circ pump Q33*: Charge pump for domestic hot water storage with external heat exchanger.
- *Heat circuit pump HC1 Q2*: the heat circuit pump HC1 will be activated.
- *Heating circuit pump HC2 Q6*: the heat circuit pump HC2 will be activated.
- *Heating circuit pump HC3 Q20*:the heat circuit pump HC3 will be activated.
- *Collector pump Q5*: a circulation pump for the collector circuit is required for connection of a solar collector.
- *Solar pump ext exch K9*: if several exchangers are connected, the buffer storage must be set at the respective relay output. and the type of the solar regulating unit must be defined in prog.no. 5840.
- *Solar pump swi pool K18*: if several exchangers are connected, the the swimming pool must be set at the respective relay output. and the type of the solar regulating unit must be defined in prog.no. 5840.

.

Sensor type collector
(6097)

Selection of used sensor types for measurement of the collector temperature.

Readjustm coll sensor 1
(6098)

Setting a correction value for collector sensor 1.

Readjustm outside sensor
(6100)

Setting a correction value for outside sensor.

Time constant building (6110)

The value set here influences the reaction speed of the nominal flow value in case of fluctuating outside temperatures as a function of the building design.
Beispielwerte (siehe auch *Schnellabsenkung* Prog.-Nr. 780, ...):
- 40 for buildings with thick walls or outer insulation.
- 20 For buildings of normal building design.
- 10 For buildings of light building design.

Central setp compensation (6117)

The central setpoint lead monitors the heat generator setpoint to the required central flow temperature. With the setting the maximum corrector is restricted, even if a large adaptation is required.

System Frost Protection (6120)

The heating circuit pump will be activated by the outside temperature without heat request If the outside temperature reaches the lower setpoint of -4°C,the heating circuit pump will be activated. If the outside temperature is between -5°C and +1.5°C, the pump will be activated every 6 hours for 10 minutes. When reaching the upper limit of 1.5°C, the pump will be switched off.

Saving sensors (6200)

Sensor statuses can be stored under programme number 6200. This happens automatically; however, after changing the plant (removal of a sensor) the state at the sensor terminals must be stored new.

Control numbers generator 1/storage/heating circuit (6212, 6213, 6215, 6217)

The basic device generates a control number for identification of the plant scheme, which is composed of the numbers compiled in *Tab. 7 (Page 111)*

Tab. 7: Check no. heat source 1 (prog.-no. 6212)

Solar					
A collector field with sensor **B6** and collector pump **Q5**	Tank charging pump for buffer storage tank **K8**	Solar diverting valve for buffer storage tank **K8**	Solar charging pump for swimming pool **K18**	Solar diverting valve for swimming pool **K18**	External solar exchanger, Solar pump **K9** DHW=DHW storage tank P=Buffer storage tank
0	No solar				
1					*
3					DHW/B
5	X				
6		X			
8	X				DHW+B
9		X			DHW/B
10	X				DHW
11		X			DHW

Solar					
12	X				B
13		X			B
14			X		
15				X	
17			X		DHW/B
18				X	DHW/B
19	X		X		
20		X		X	
22	X				DHW+B
23		X		X	DHW/B
24	X		X		DHW
25		X		X	DHW
26	X		X		B
27		X		X	B

Tab. 8: Check no. storage tank (prog.-no. 6215)

Buffer storage		DHW storage tank	
0	No buffer	00	No DHW storage tank
1	Buffer storage	01	Electric immersion heater
2	Buffer, solar connection	02	Solar connection
4	Buffer, heat generation shutoff valve	04	Charging pump
5	Buffer, solar connection Heat gen shutoff valve	05	Charging pump, solar connection
		13	Diverting valve
		14	Diverting valve, solar connection
		16	Primary control, without exchanger
		17	Primary control, 1 exchanger
		19	Intermediate circuit, without exchanger
		20	Intermediate circuit, 1 exchanger
		22	Charging pump/intermediate circuit, without exchanger
		23	Charging pump, intermediate circuit, 1 exchanger
		25	Diverting valve, intermediate circuit, without exchanger
		26	Diverting valve, intermediate circuit, 1 exchanger
		28	Primary control, intermediate circuit, without exchanger
		29	Primary control, intermediate circuit, 1 exchanger

Tab. 9: Check no. heating circuit (prog.-no. 6217)

Heating circuit 3		Heating circuit 2		Heating circuit 1	
0	No heating circuit	00	No heating circuit	00	No heating circuit
1	Circulation via boiler pump	01	Circulation via boiler pump	01	Circulation via boiler pump
2	Heating circuit pump	02	Heating circuit pump	02	Heating circuit pump
3	Heating circuit pump, mixing valve	03	Heating circuit pump, mixing valve	03	Heating circuit pump, mixing valve

Software version
(6220)

Display of the actual software version.

LPB-system

Device address/Segment address
(6600/6601)

The two-part LPB address of the controller consists of the 2-digit segment number and the 2-digit device number.

Bus power supply function
(6604)

- *Off*: the power supply of the bus system does not take place through the controller.
- *Automatically*: the power supply of the bus system is switched on and off by the controller depending on the power requirement of the bus system..

Bus power supply state
(6605)

- *Off*: the power supply of the bus system through the controller is currently inactive.
- *On*: the power supply of the bus system through the controller is currently active.

Display systemmessages
(6610)

This setting allows system messages which are transmitted via LPB to be suppressed on connected operating elements.

Alarm delay
(6612)

Settling out of the alarm on the BM module can be delayed in the base device by an adjustable time. This allows the prevention of unnecessary messages to a service location from briefly occurring malfunctions (e.g. temperature monitor queried, communication errors). However, it must be realised that briefly occurring malfunctions which continue and quickly occur again, are also filtered out with this.

Display systemmessages
(6610)

If the setting Central is activated under progr. no. 6221 and 6223, the action for this setting can be set. The following settings are possible:
- *Segment*: the changeover is done for all controllers in the same segment.
- *System*: the changeover is done for all controllers in the entire system (that is in all segments). The controller must be located in segment 0!

Summer changeover
(6621)

- *Locally*: the local heating circuit is switched on and off depending on prog. no. 730, 1030 or 1330.
- *Centrally*: depending on the settings made in prog no. 6620 either the heating circuit in the segment or in the entire system is switched on and off.

Optg mode changeover
(6623)

- *Locally*: the local heating circuit is switched on and off.
- *Centrally*: depending on the settings made in prog no. 6620 either the heating circuit in the segment or in the entire system is switched on and off.

Manual source lock (6624)

- *Locally*: The local heating source is locked.
- *Segment*: All heating sources of the cascade are locked.

DHW assignment (6625)

This setting is only necessary if the control of the DHW charging is done by a heating circuit time program (see prog. no. 1620 and 5061)

- *Local HCs*: the DHW charging is done only for the local heating circuit.
- *All HCs in segment*: the DHW charging is done for all heating circuits in the segment.
- *All HCs in system*: the DHW charging is done for all heating circuits in the system.

For all settings the controller is also considered for the DHW charging, which are in vacation status.

Clock mode (6640)

With this setting the action of the system time is established on the time setting of the controller. The following settings are possible:

- *Autonomously*: the time of day can be modified at the control. The time of the controller is not adapted to the system time.
- *Slave without remote setting*: the time of day can not be modified at the control. The time of the controller is continually, automatically adapted to the system time.
- *Slave with remote setting*: The time of day can be modified at the control. Simultaneously the system time is adapted, since the change is done by the master. The time of the controller is then continually adapted to the system time.
- *Master*: The time of day can be modified at the control. The time of the controller is the default for the system. The system time is adapted.

Outside temp source (6650)

In the LPB system only one single outside temperature sensor is necessary. This delivers the signal via the LPB to the controller without sensor. In the display the segment number appears as first number and the device number is the second number.

Fault

Fault message (6700)

A current existing error in the system is displayed here in the form of an error code.

SW Diagnosis code (6705)

In case of a fault, the display fault is on permanently. In addition, the diagnosis code is displayed on the display.

Fault phase (6706)

Phase, in which the fault has occurred, which led to the failure.

Reset alarm relay (6710)

An output relay QX, programmed as an alarm relay can be reset via this setting.

Temperature-Alarms (6740-6745)

Setting the time, after which a error message will be triggered in case of persisting deviation from temperature nominal and actual values.

Error history/error codes (6800 - 6995)

The last 20 error messages with error code and time of error occurrence will be stored in the error storage.

Service / special operation

Burner hours interval (7040)	Setting of the interval for maintenance of the burner.
Burn hrs since maintenance (7041)	Burner hours since the last maintenance. *Note*: The burner hours are only counted, when the maintenance message has been activated.
Burner start interval (7042)	Setting of the interval for burner starts for maintenance.
Burn starts since maint (7043)	Burner starts since the last maintenance. *Note*: The burner starts are only counted, when the maintenance message has been activated.
Maintenance interval (7044)	Setting of maintenance interval in months.
Time since maintenance (7045)	Passed time since the last maintenance interval. *Note*: The time is only counted, when the maintenance message has been activated.
Fan speed ionization current (7050)	Speed limit from which the ionisation current service alarm should be set (prog. no. 7051), if the ionisation current monitoring and therefore a speed increase based on too low ionisation current active is.
Message ionization current (7051)	Function for display and reset of the burner ionisation current service alarm. The service alarm can only be reset if the reason for service is taken care of.
Chimney-sweep function (7130)	The chimney sweep function is switched on or off under this prog no.

Note:
The function is switched off by the setting "Off" or automatically if the maximum boiler temperature is reached.
It can also be directly activated via the chimney sweep button.

Manual control (7140)	Activation of manual control. If the manual control function is activated the boiler will be controlled to the Setpoint manual control. All pumps will be activated. Additional request will be ignored!
Controller stop function (7143)	If the controller stop function is activated, the burner output set in the setpoint controller stop is immediately requested by the device.
Controller stop setpoint (7145)	With activated controller stop function the output set here is requested by the device.
Telephone customer service (7170)	Here the desired telephone number of customer service can be entered.
PStick storage pos (7250)	Via the parameter *PStick Storage Pos* the data set (data set number on the stick) can be selected which should be written or read.

PStick Des data set (7251)

If a data set is selected under prog. no. 7250, under prog. no 7251 the data set name is displayed. For backup sticks the data set name is displayed in the format *BUYYMMDDHHMM* (BU for backup and date of backup: Year, Month, Day, Hour, Minute). As soon as a data set number is selected, the text is displayed for the data set description.

PStick command (7252)

- *No operation*: this is the base condition. As long as no operation is active on the stick, this command is displayed.
- *Reading from stick*: starts reading the data from the stick. This operation is only possible with READ or READ/WRITE sticks. The data of the set data set is copied in the LMS control. Beforehand is checked whether the data set may be brought in. If the data set is incompatible, it may not be brought in. The display resets to no operation, displays an error message. The text Read from stick remains until the operation is completed or an error occurs. As soon as the data transmission begins, the LMS control goes in a parameterization position. As soon as the parameter is transferred, the LMS control must be unlocked after ending the transmission. Error 183 parameterization is displayed.
- *Writing on stick*: Starts writing the data from the LMS control to the stick. This operation is only possible with WRITE or READ/WRITE sticks. The data is written in the previously set data set. Before writing of the data begins, it is checked whether the data fits on the stick and the respective customer number is correct. The text Writing to stick remains until the operation is completed or an error occurs.

PStick progress (7253)

The read or write progress is displayed as a percentage. If no operation is active or an error shows up, 0% is displayed.

State PStick (7254)

- *No stick*: The LMS control detected no stick (possibly the stick is not inserted).
- *Stick ready*: Basic condition, stick is detected, no action active, no error present.
- *Writing on stick*: Data is copied (backup) from he LMS control to the stick.
- *Reading from stick*: Data is transferred from the stick in the LMS control.
- *EMC test active*: Special function EMC tests in the lab. A special compiler switch must be set for this.
- *Writing error*: An error occurred when copying the data from the LMS control to the stick. The operation was aborted.
- *Reading error*: An error occurred when copying the data from the stick to the LMS control.. The operation was aborted. The control LMS is locked. Status change to read lock.
- *Incompatible data set*: Data set does not match LMS control. Compatibility conditions are not met. The data set can not be brought in.
- *Wrong stick type*: Stick type does not match selected action. E. B. read from write stick or write to read stick is not possible.
- *Stick format error*: incorrect customer number on the stick or data format on the stick is not recognised and cannot be evaluated by the LMS control.
- *Check data set*: during transmission of a data set from the stick to the LMS control a problem appeared, but it did not lead to an abort.
- *Data set disabled*: the data set may not be transferred into the LMS control (read protected).
- *Reading disabled*: the parameterization position is in the *ABORT* condition. Only limited actions are possible to remove the parameterization position.

Input/output test

Input/output tests (7700 - 7872)

Tests for checking the connected components for function.

State

State
(8000 - 8011)

With this function the state of the selected system can be requested.

The following messages are possible under **Heating circuit**:

End user (E)	**Commissioning, Technician (menu *state*)**
Monitor has tripped	Monitor has tripped
Manual control active	Manual control active
Floor curing function active	Floor curing function active
Heating mode restricted	Overtemp prot active Restricted, boiler protection Restricted, DHW priority Restricted, buffer
Forced draw	Forced draw DHW Forced draw source Overrun active
Comfort heating mode	Opt start ctrl+boost heating Optimum start control Boost heating Comfort heating mode
Reduced heating mode	Optimum stop control Reduced heating mode
Frost protection active	Frost prot room active Frost protection flow active Frost prot plant active
Summer operation	Summer operation
Off	24-hour Eco active Setback reduced Setback frost protection Room temp limitation Off

The following messages are possible under **DHW**:

End user (E)	**Commissioning, Technician (menu *state*)**
Monitor has tripped	Monitor has tripped
Manual control active	Manual control active
Consumption	Consumption
Holding mode On	Holding mode Active Holding mode On
Recooling active	Recooling via collector Recooling via heat gen Recooling via HCs
Charging lock active	Discharging prot active Charg time limitation active Charging locked
Forced charging active	Forced, max stor tank temp Forced, max charging temp Forced, legionella setp Forced, nominal setp
Charg el imm heater	El charging, legionella setp El charging, nominal setp El charging, reduced setp El charging, frost prot setp El imm heater released
Push active	Push, legionella setp Push, nominal setp
Charging active	Charging, legionella setp Charging, nominal setp Charging, reduced setp
Frost protection active	Frost protection active Frost protection Instantaneous water heater
Overrun active	Overrun active
Standby charging	Standby charging
Charged	Charged, max st tank temp
	Charged, max charging temp
	Charged, legionella temp
	Charged, nominal temp
	Charged, reduced temp
Off	Off
Ready	Ready

The following messages are possible under **boiler**:

End user (E)	**Commissioning, Technician (menu *state*)**
SLT has tripped	SLT has tripped
SLT test active	SLT test active
Fault	Fault
Flue gas temp too high	Flue gas temp, shutdown Flue gas temp, powerlimitation
Monitor has tripped	Monitor has tripped
Manual control active	Manual control active
Chimney sweep funct active	Chimney-sweep function, nominal load Chimney-sweep function, part load
Locked	Locked, manual Locked, solid fuel boiler Locked, automatic Locked, outside temp Locked, economy mode
Min limitation active	Min limitation Min limitation, part load Min limitation active
In operation	Protective start Protective start, part load Return limitation Return limitation, part load
Charging buffer	Charging buffer
In op for HC, DHW	In op for HC, DHW
In part load op for HC, DHW	In part load op for HC, DHW
Released for HC, DHW	Released for HC, DHW
In operation for DHW	In operation for DHW
In part load op for DHW	In part load op for DHW
Released for DHW	Released for DHW
In operation for HC	In operation for HC
In part load op for HC	In part load op for HC
Released for HC	Released for HC
Overrun active	Overrun active
Released	Released
Frost protection active	Frost prot plant active
Off	Off

The following messages are possible under **Solar**:

End user (E)	**Commissioning, Technician (menu *state*)**
Manual control active	Manual control active
Fault	Fault
Frost prot collector active	Frost prot collector active
Recooling active	Recooling active
Max st tank temp reached	Max st tank temp reached
Evaporation prot active	Evaporation prot active
Overtemp prot active	Overtemp prot active
Max charging temp reached	Max charging temp reached
Charging DHW+buffer+swi pool	Charging DHW+buffer+swi pool
Charging DHW+buffer	Charging DHW+buffer
Charging DHW+swi pool	Charging DHW+swi pool
Charging buffer+swi pool	Charging buffer+swi pool
Charging DHW	Charging DHW
Charging buffer	Charging buffer
Charging swimming pool	Charging swimming pool
Radiation insufficient	Min charg temp not reached Temp diff insufficient Radiation insufficient

The following messages are possible under **solid fuel boiler**:

End user (E)	**Commissioning, Technician (menu *state*)**
Manual control active	Manual control active
Fault	Fault
Overtemp prot active	Overtemp prot active
Released	Locked, manual Locked, automatic
Min limitation active	Min limitation Min limitation, part load Min limitation active
Antigelo caldaia attivo	Protective start Protective start, part load Return limitation Return limitation, part load 14 In operation for HC
In part load op for HC	In part load op for HC
In operation for DHW	In operation for DHW
In part load op for DHW	In part load op for DHW
In op for HC, DHW	In op for HC, DHW
In part load op for HC, DHW	In part load op for HC, DHW
Overrun active	Overrun active
In operation	In operation
Assisted firing active	Assisted firing active
Released	Released
Frost protection active	Frost prot plant active Boiler frost prot active
Off	Off

The following messages are possible under **burners**:

End user (E)	**Commissioning, Technician (menu *state*)**
Fault position	Fault position
Start prevention	Start prevention
In operation	In operation
Commissioning	Safety time Prepurge Commissioning
	Postpurge Shutdown 213 Home mode
Standby	Standby

The following messages are possible under **Buffer storage tank**:

End user (E)	Commissioning, Technician (menu *state*)
Warm	Warm
Frost protection active	Frost protection active
Charg el imm heater	El charg, emergency mode El charg, source protection Electric charging defrost Electric charging, forced Electric charging, substitute
Charging restricted	Charging locked Restricted, DHW priority
Charging active	Forced charging active Partial charging active
Recooling active	Recooling via collector Recooling DHW / HCs
Charged	Charged, max st tank temp Charged, min charging temp Charged, forced temp Charged, required temp Part charged, required temp Charged, min charging temp
Cold	Cold
No request	No request

The following messages are possible under **swimming pool**:

End user (E)	Commissioning, Technician (menu *State*)
Manual control active	Manual control active
Fault	Fault
Heating mode restricted	Heating mode source
Heated, max Swimming pool temp	Heated, max Swimming pool temp
Heated	Heated, Setpoint solar Geheizt, Setpoint source
Heating mode	Heating mode solar off Heating mode source off
Cold	Cold

Diagnostics cascade/heat generation/consumers

Diagnostics cascade/heat generation/consumers (8100 - 9058)

Displays of different nominal and actual values, relay switching statuses and counter statuses for diagnosis purposes.

Burner control

Prepurge time
(9500)

Pre-venting time.

Note: This parameter must only be changed by a heating specialist!

Nominal output prepurging
(9504)

Nominal output fan speed during preventing.

Nominal output ignition load
(9512)

Nominal output fan speed during ignition.

Nominal output Partial load
(9524)

Nominal output fan speed under boiler in LF.

Nominal output Full load
(9529)

Nominal output fan speed under boiler in HF

Prepurge time
(9500)

After-venting time.

Note: This parameter must only be changed by a heating specialist!

Conversion fan output/speed increase
(9626)
Conversion fan output/speed Y-section
(9627)

With this parameter the rotational speed of the fan can be adjusted (e.g. for complex exhaust systems or the conversion of gas condensing boilers for operating with liquid gas.
- Prog. no. 9626 equates to the incline of the fan characteristic curve
- Prog. no. 9627 equates to the shift of the fan characteristic curve in Y-direction

Info Option

Display of different information values which depend on the current operation state. Furthermore, informations about the different states are displayed (see section *State*).

9. Maintenance

9.1 Inspection and need dependent service

Note:
It is recommended to carry out maintenance of the EuroCondense three annually. Should during inspection the need for maintenance work be found, these should be carried out according to need.

Maintenance work includes among others:
- Clean EuroCondense three outside.
- The burner has to be checked for contamination and, possibly, to be cleaned and serviced.
- Clean burner areas and heating surfaces
- Replace wear parts (see *Spare parts list*)

Caution! Only original spare parts must be used.

- Check connection and seal locations of water filled parts.
- Check safety valves for correct function.
- Check operating pressure and, possibly, fill in water.
- De-aerate heating plant
- De-aerate heating plant and return gravity lock into operating position.
- End control and documentation of performed service work

Tip: Conclude a maintenance contract!
In order to guarantee an optimum operation, recommend to have a service contract.

9.2 Boiler view

Fig. 29: Boiler view Eurocondense three 125-170

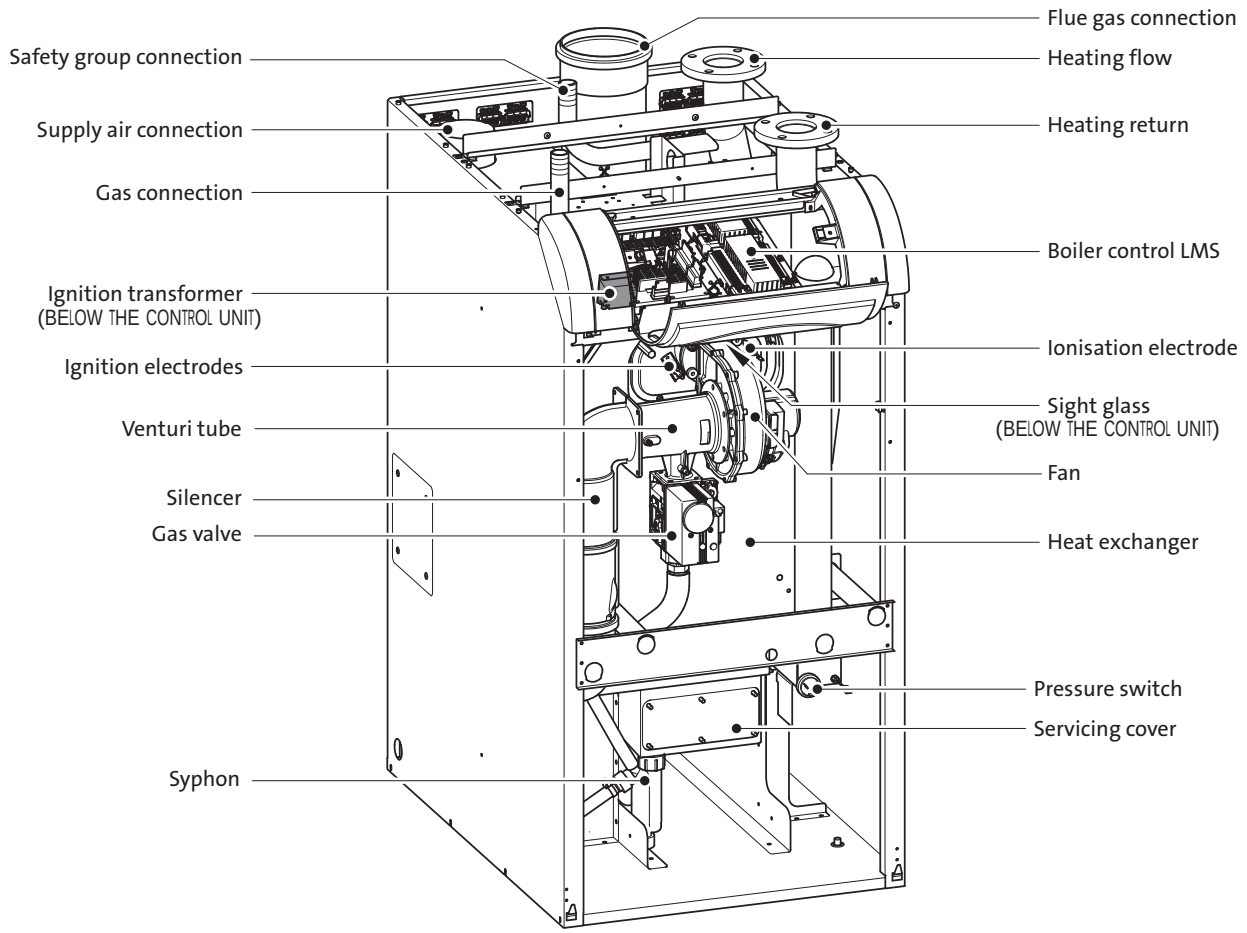
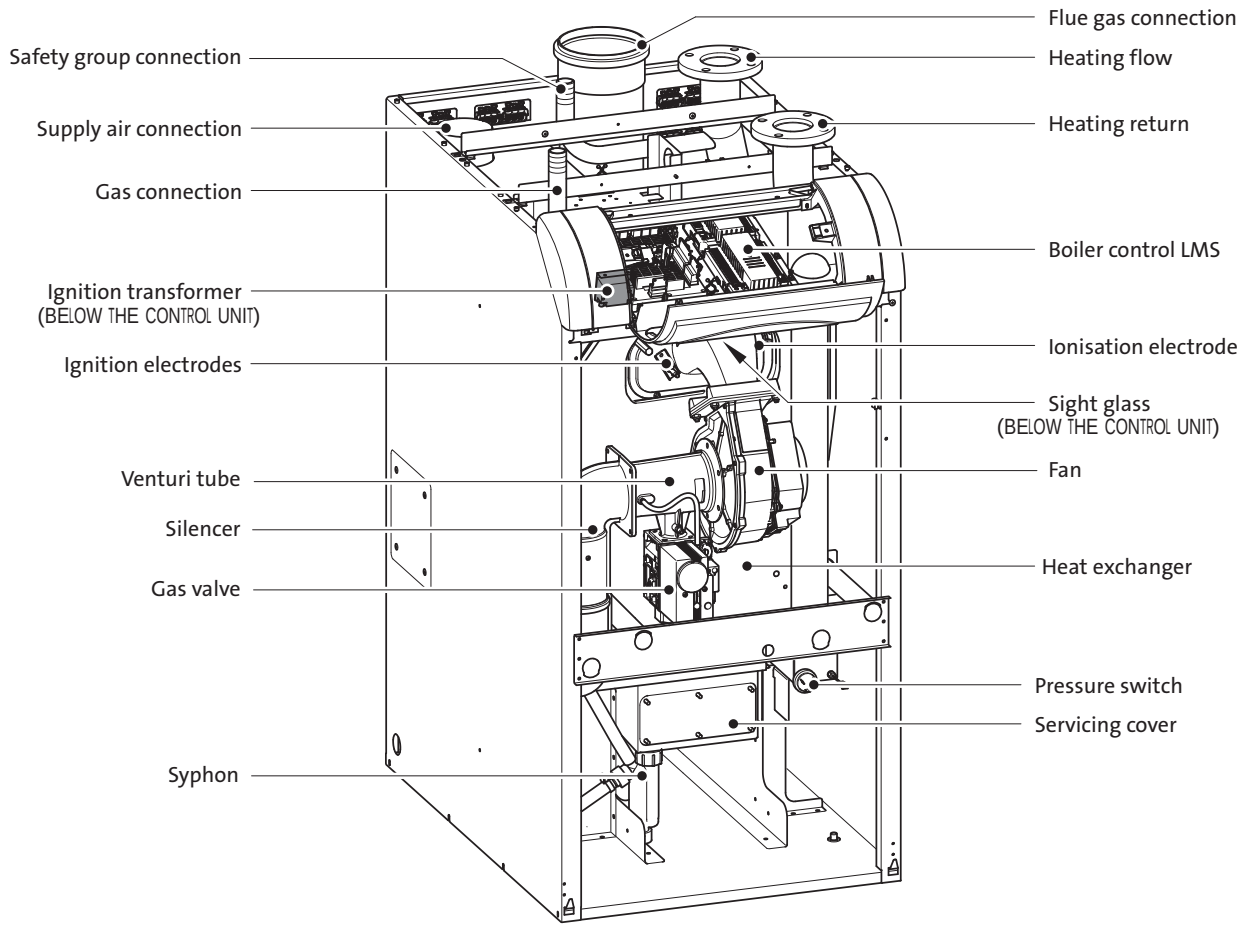


Fig. 30: Boiler view Eurocondense three 215-300



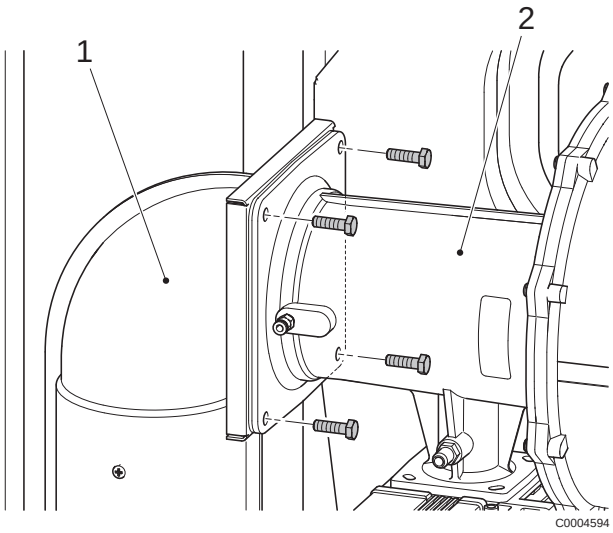
9.3 Disassembling and installing burner

Danger of electric shock! Before performing service work, power to the boiler must be shut off and it must be secured from accidentally being switched back on!

Disassembling burner

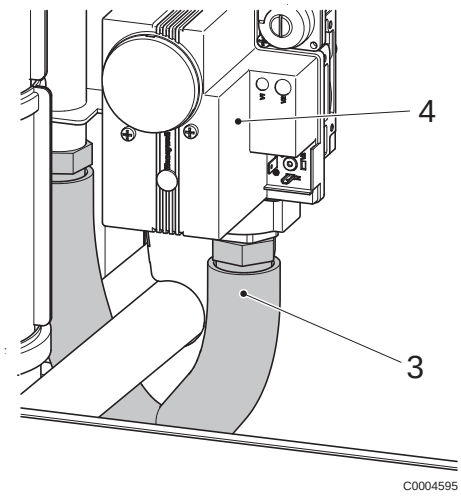
1. Close gas shut off device
2. Remove front panel of the EuroCondense three gas condensing boiler
3. Release ignition cable, ionisation line and earthing cable.
4. Disconnect connection lines from fan and gas valve

Fig. 31: Loosen screws on the exhaust silencer



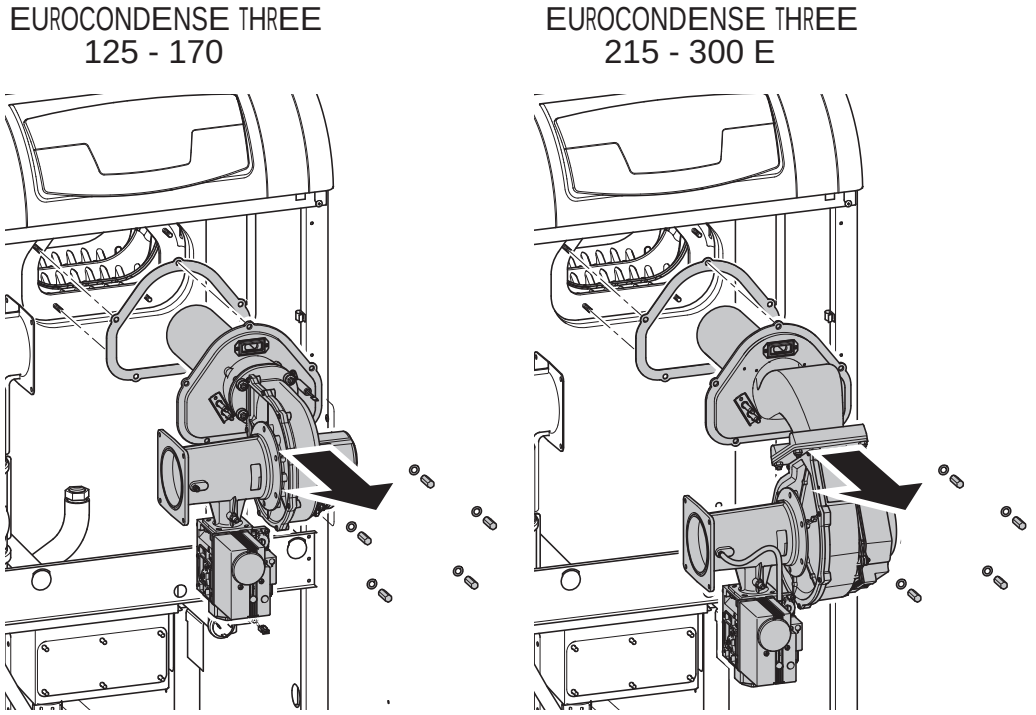
5. Remove screws on the flange of the venturi tube (2) and loosen the venturi tube with seal (in the flange) from the exhaust silencer (1).

Fig. 32: Release gas connection hose on the gas valve



6. Release the screwed connection of the gas connection hose (3) on the gas valve (4)

Fig. 33: Remove burner



7. Remove nuts and washers and pull out the entire burner (5) with burner seal (6) forwards

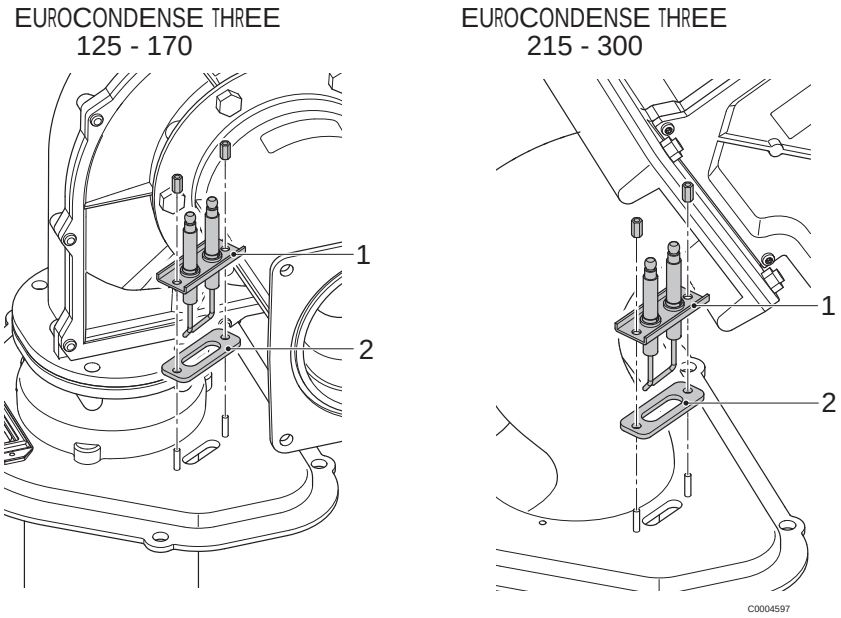
Installing burner
The installation of the burner is done in the opposite sequence
Note: Use new seals when installing the burner.

9.4 Check and replacing Ignition electrode

Note: To avoid an influence of the ionisation current by the ignition, the ignition electrode must only immerse into the edge of the flame.

Change ignition electrodes
Danger of electric shock! Before performing service work, power to the boiler must be shut off and it must be secured from accidentally being switched back on!

Fig. 34: Remove ignition electrode block



1. Loosen ignition cable
2. Remove nuts and pull out the ignition electrode block (1) with the seal (2)
3. Insert the new ignition electrode block with seal and fasten with nuts

Note: Installation position and electrode clearance has to be maintained according to *Fig. 36*.

4. Reconnect the ignition cable

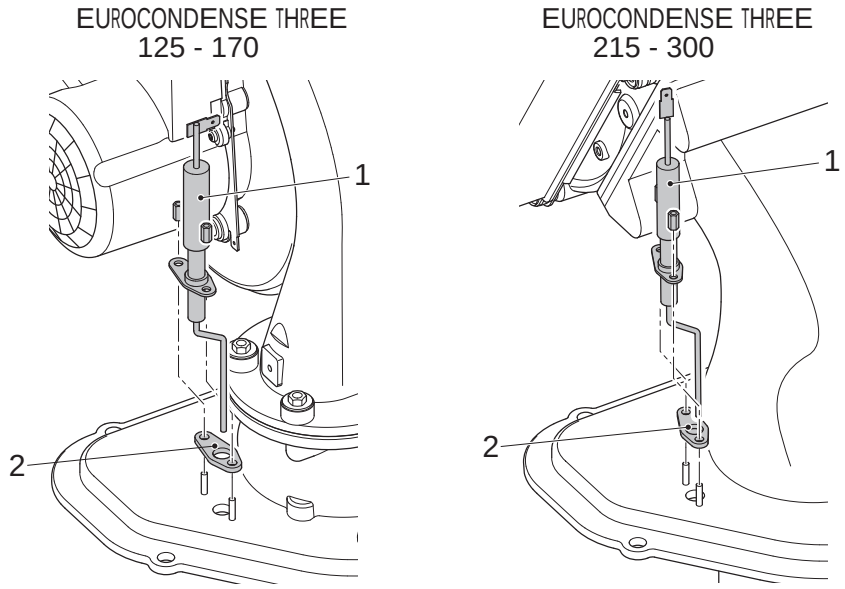
9.5 Check and replacing ionisation electrode

The ionisation electrode must always be in contact with the flame. During burner operation, the measured ionisation flow must following data display:
- At minimum power > 5 µA DC (switching threshold at 0.7 µA DC)
- At maximum power > 10 µA DC

Measurement ionization current
For measurement of the ionisation current, pull plug from the gas-firing automaton and connect amperemeter between plug and electrode.
Danger of electric shock! Do not touch plug contacts during the ignition process!

Changing the ionisation electrode
Danger of electric shock! Before performing service work, power to the boiler must be shut off and it must be secured from accidentally being switched back on!

Fig. 35: Removing ionisation electrode



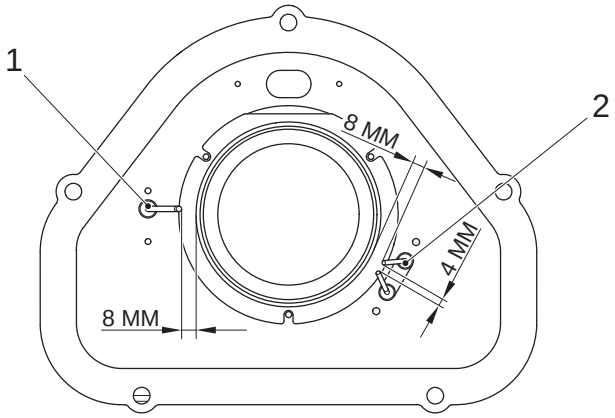
1. Release ionisation line
2. Remove nuts and pull out the ionisation electrode (1) with the seal (2)
3. Insert the new ionisation electrode with seal and fasten with nuts

Note: Installation position and electrode clearance has to be maintained according to *Fig. 36*

4. Reconnect the ionisation line

9.6 Electrode spacing and installation locations

Fig. 36: Electrode spacing and installation locations

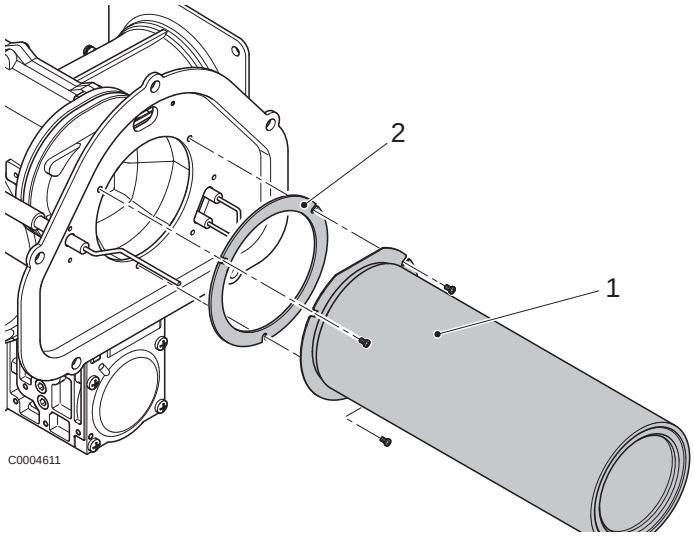


1 Ionisation electrode
2 Ignition electrode block

9.7 Clean burner pipe

1. Removing burner (see section *Installing and removing burner*)

Fig. 37: Dismantle burner pipe



2. Remove screws and remove burner pipe (1) with the burner pipe seal (2)
3. Clean the burner pipe with compressed air
4. Reinstall burner pipe with burner pipe seal

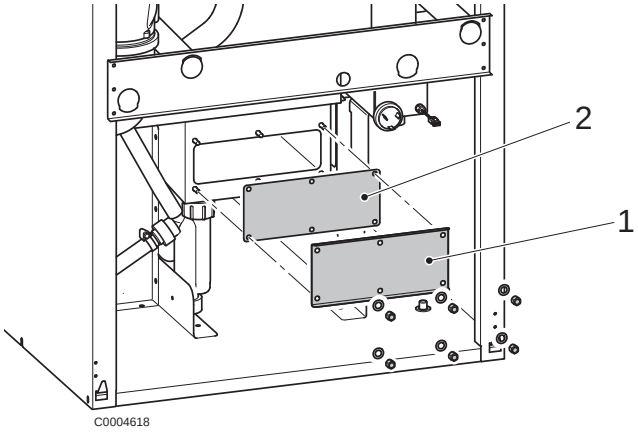
Note: Use a new burner pipe seal when installing the burner pipe.

5. Reinstall burner (see section *Installing and removing burner*)

9.8 Clean heat exchanger

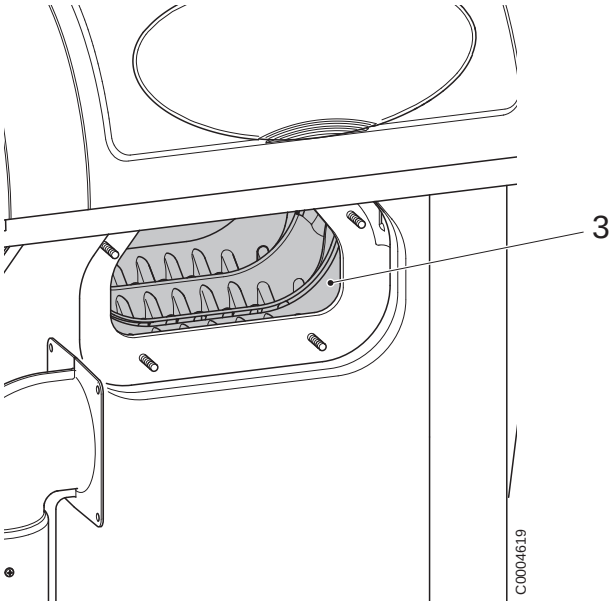
1. Remove burner (see section *Installing and removing burner*)

Fig. 38: Remove the cover of the exhaust collection pan



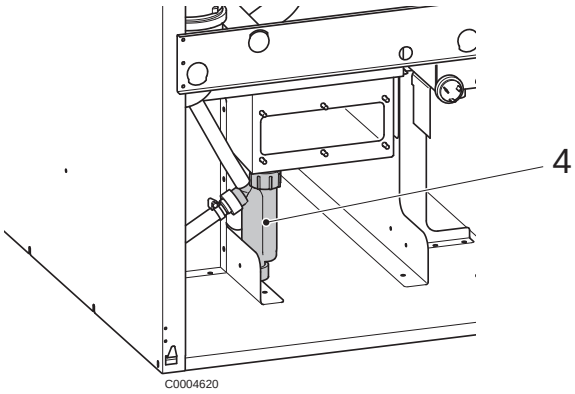
2. Remove screws and remove cover (1) of the exhaust collection pan with seal (2)

Fig. 39: Heat exchanger



3. Clean heat exchanger (3) with a brush or rinse with water
4. Remove deposits from the exhaust collection pan

Fig. 40: Siphon



5. Remove siphon (4) and clean
6. Clean siphon
7. Reinstall siphon
8. Replace the cover of the exhaust collection pan

Note: Use a new seal when installing the cover.

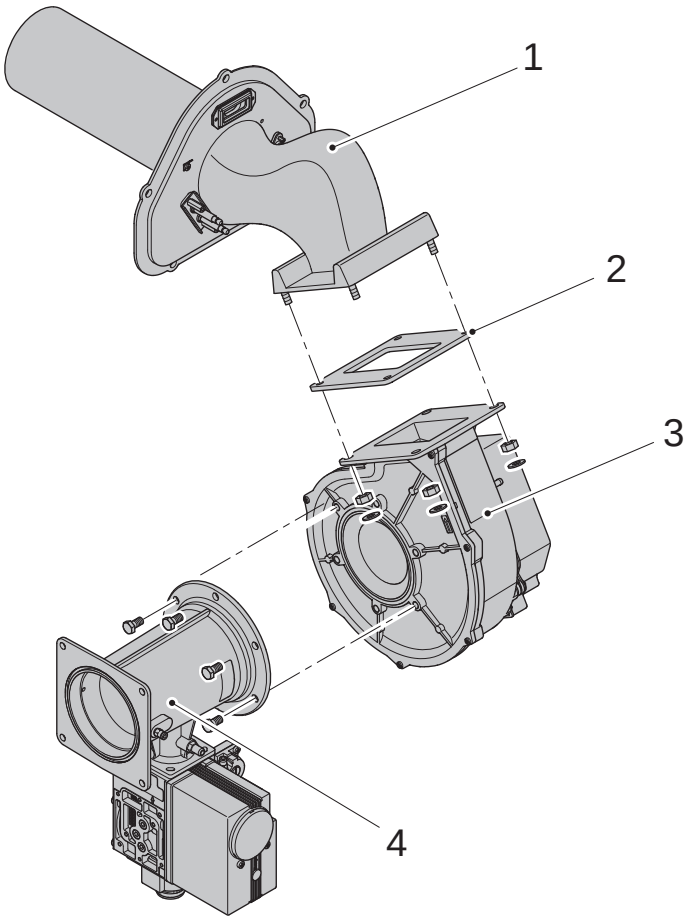
9. Reinstall burner (see section *Installing and removing burner*)

9.9 Clean fan

Dismounting the burner

1. Remove burner (see section *Installing and removing burner*)

Fig. 41: Remove fan



2. Remove nuts with washers and release the fan (3) with seal (2) from burner cover (1)
3. Remove screws and release venturi pipe, incl. gas valve (5) with seal (4) from fan
4. Clean fan with compressed air
5. Reassemble burner in the opposite sequence

Note: Use new seals when reassembling the burner.

6. Reinstall burner (see section *Installing and removing burner*)

9.10 Control and regulating centre LMS

Description of function

Control and monitoring of the burner with control and regulating centre LMS, with ionisation electrode.

Automatic start according to programme with monitoring of flame forming. The sequence itself may be varied via parameters.

9.11 Fault switch-off

Safety switch-off in case of flame failure during the operation.
After every safety stop, a new ingition attempt according to programme is carried out. If this does not lead to flame forming, shutoff is carried out.
In case of fault switch-off, the reset button on the control panel should be pressed.
In case of operation disturbances (bell symbol in thewdisplay), the digit in the display on the operating panel points out the cause of the disturbance (see section *9.12 Fault code table*).

Burner does not start:
- no voltage at the control and regulating centre
- no “Burner ON“ signal from the heating circuit control (see *fault code table*)

Burner goes into disturbance status:
Without flame formation:
- no ignition
- ionisation electrode has ground connection
- no gas

Despite flame forming, the burner changes to disturbance status after the safety period:
- ionisation electrode defective or contaminated
- ionisation electrode does not immerse into the flame

9.12 Fault code table

The following is an extraction of the fault code table. If further fault codes appear, please inform a heating specialist.

Fault	Fault description	Explanations/possible causes
0	No error	
10	Outside sensor short or interruption	Checking the connection or sensor, emergency operation
20	Boiler sensor 1 short or interruption	Checking the connection, informing of a specialist [1)]
30	Flow sensor 1 short or interruption	
32	Flow sensor 2 short or interruption	Checking the connection, informing of a specialist [1)]
40	Return sensor 1 short or interruption	Checking the connection, informing of a specialist [1)]
50	DHW sensor 1 short or interruption	Checking the connection, informing of a specialist, emergency operation [1)]
52	DHW sensor 2 short or interruption	Checking the connection, informing of a specialist [1)]
57	DHW circulation sensor short or interruption	
60	Room sensor 1 short or interruption	
65	Room sensor 2 short or interruption	
68	Room sensor 3 short or interruption	
73	Collector sensor 1 short or interruption	
82	Address collision on LPB bus	Checking the addressing of connected control devices
83	BSB short-circuit	Checking room devices
84	BSB address collision	Connection of room devices with same allocation (prog. no. 42)
85	BSB Radio communication fault	
91	Data loss in EEPROM	Internal fault LMS, changing LMS, informing of a specialist
98	Extension module 1 (common fault)	
99	Extension module 2 (common fault)	
100	2 clock time masters (LPB)	Checking clock time masters
105	Maintenance message	For detailed informations see maintenance codes (pressing information button once)
109	Boiler temperature supervision	
110	Lockout SLT	No heat dissipation, SLT short, possibly gas valve short [2)], internal fuse defective; cooling-down of the boiler and performing of a reset; if the fault appears again informing of a specialist [3)]
111	Shutdown limit thermostat	No heat dissipation; pump defective, radiator valve closed[1)]
119	Pressure switch fault	Checking of water pressure respectively re-filling of water[1)]
121	Flow temperature (heating circuit 1)	
122	Flow temperature (heating circuit 2)	
126	DHW charging temperature	
127	Legionella temperature not reached	
128	Loss of flame in operation	
129	Fan fault	
131	Burner lockout	

Fault	Fault description	Explanations/possible causes
132	Gas pressure sensor	Lack of gas, GW contact open, external temperature sensor
133	No flame during safety time	Performing of a reset; if the fault appears again informing of a specialist, lack of gas, checking of ignition electrodes and ionisation electrode[1) 3)]
146	Configuration fault (common fault)	
151	IInternal fault	Checking parameters (see setting table, engineer) , unlocking of LMS, cahnge of LMS, informing of a specialist[1) 3)]
160	Fan fault	Fan defective, speed threshold not adjusted correctly [3)]
171	Alarm contact H1 or H4 active	
172	Alarm kontact H2 (EM1, EM2 or EM3) or H5 aktive	
241	Solar flow sensor fault	
242	Solar return sensor fault	
320	DHW charging sensor fault	
324	BX same sensors	
325	BX / extension modules same sensors	
326	BX / mixer group same sensors	
327	Extension modules same function	
328	Mixer group same function	
329	Extension module/ mixer group same function	
330	BX1 no function	
331	BX2 no function	
332	BX3 no function	
333	BX4 no function	
334	BX5 no function	
335	BX21 no function(EM1, EM2 or EM3)	
336	BX22 no function(EM1, EM2 or EM3)	
337	B1 no function	
338	B12 no function	
339	Collector pump Q5 missing	
340	Collector pump Q16 missing	
341	Collector sensor B6 missing	
342	Solar DHW sensor B31 missing	
343	Solar integration missing	
351	Primary controller/system pump addressing fault	
352	Sensor pressureless header addressing fault	
353	Common flow sensor B10 missing	
371	Flow temperature (heating circuit 3)	
373	Extension module 3 fault (Sammelfehler)	
378	Repetition counter internal fault expired	
379	Repetition counter external light expired	
380	Repetition counter flame failure during operation expired	

Fault	Fault description	Explanations/possible causes
381	Repetition counter no flame during safety time expired	
382	Repetition counter fan fault expired	
383	No repitition allowed	
384	External light	
385	Netzunterspannung	
386	Fan speed has left valid range	
388	DHW sensor no function	
432	Function ground X17 not connected	

1) Shutdown, start prevention, restart after fault repair

2) Checking of parameters according to setting table (engineer) and programming to the standard values or recalling of internal SW diagnostic code and correction of parameters according to fault message!

3) Shutdown and start prevention, restart only possible after reset

9.13 Maintenance code table

Maintanance codes	Maintenance description
1	Burner operating hours exceeded
2	Burner starts exceeded
3	Maintenance interval exceeded

9.14 Operation phases of control and regulation centre LMS

After pressing the information button the operation phases will be displayed.

Display	Operating Status	Description of function
STY	Standby (no heat demands)	Burner on stand-by
THL1	Fan startup	Self-test for burner start and fan startup
THL1A		
TV	Pre-purging time	Pre-purging, fan deceleration time to starting load speed
TBRE	Waiting time	Internal safety tests
TW1		
TW2		
TVZ	Ignition phase	Ignition and start of safety period flame forming Ionisation current build-up
TSA1	Safety time constant	Flame monitoring with ignition
TSA2	Safety time variable	Flame monitoring without ignition
TI	Interval time	Flame stabilisation
MOD	Modulating operation	Burner in operation
THL2	Subsequent ventilation with last operating fan speed	Fan continues to run
THL2A	Subsequent ventilation with pre-purging fan speed	Fan continues to run
TNB	Reheating time	Permitted reheating time
TNN	Overrun time	Permitted overrun time of the fan
STV	Start prevention	No internal or external release (e.g. no water pressure, lack of gas)
SAF	Safety shutdown	
STOE	Fault position	The actual fault code is displayed, see *fault code table*

Index

P

Q

R

S

T

U

W

Space for notes

Space for notes

Publication Date: 0411

PART OF BDR THERMEA

Baxi Commercial Division
Wood Lane, Erdington,
Birmingham B24 9QP

Sales:
0845 070 1056

Technical:
0845 070 1057

Email: potterton.commercial@baxicommercialdivision.com
www.pottertoncommercial.co.uk

INVESTORS IN PEOPLE

POTTERTON COMMERCIAL

heating specialists