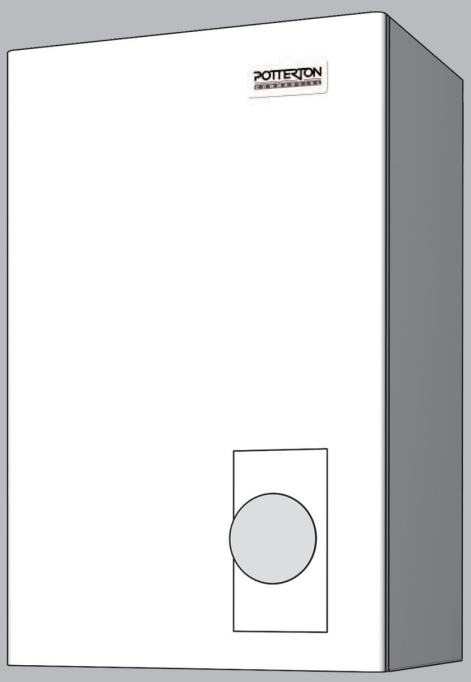
POTTERTON
COMMERCIAL



Installation manual

Gas condensing boiler

Paramount three 30-115 kW

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Table of contents

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1. About this manual

Read this instruction thoroughly before operating the device!
These instructions are from the original German document.

1.1 Manual contents

This manual contains the instructions for the installation of gas-fired boilers of the series Paramount for standard application with 1 pump heating circuit and 1 DHW storage tank.
If an EWM extension module is installed, an application with one or two mixed heating circuits is possible.
Here, an overview of the further documents belonging to this heating system. Retain all documents at the installation location of the gas boiler.

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, Heating specialist
Installation Handbook	- 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 - Operation - 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 database	- Anwendungsbeispiele für registrierte Benutzer auf der Internetseite *www.broetje.de*	Planner, 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	Heating specialist
Accessories	- Installation - Operation	Heating specialist, customer

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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.

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2. Safety

Danger! Observe the following safety information! Otherwise you are endangering yourself and others.

2.1 Usage according to purpose

The gas fired devices of the series Paramount are intended to be used according to BS 5440, BS 6644 and DIN EN 12828 as heat generators in water-heating plants. They conform to DIN EN 483 and 677.

- Installation type B_{23},B_{23P}, B_{33}, C_{13x}, C_{33x}, C_{43x}, C_{53}, C_{63x}, C_{83} and C_{93x}
- 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!

Risk 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 unit can be used by children aged 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge when they have been given supervision or instruction concerning the safe use of the device and understand the resulting risks. Do not let children play with the appliance. Cleaning and user maintenance must not be carried out by children without supervision.

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.

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2.3 Regulations and standards

Beside the general technical rules, the relevant standards, regulations, ordinances and guidelines should be followed:

- DIN 4109; Noise protection in construction engineering
- DIN EN 12828; Heating plants in buildings
- EnEV - Energy saving regulation
- Federal Immission Control Ordinance 3. BImSchV
- DVGW-TRGI 1986 (DVGW-worksheet G 600); Technical Rules for gas installation
- TRF; Technical Rules LPG
- DVGW-Data sheet G 613 Gas appliances- Installation, maintenance and operating instructions
- DIN 18380; Heating plants and central hot water plants (VOB)
- DIN EN 12831; Heating plants in buildings
- DIN 4753; Hot water plants for drinking and water supply
- DIN 1988; Technical Rules for drinking water installations (TRWI)
- VDE 0700-102, DIN EN 60335-2-102: Safety of electrical appliances for household use and similar purposes: Special requirements for gas-, oil- und solid fuel appliances with electrical connections
- Fuel Ordinance, State Ordinances
- Regulations of the local Electricity Board
- Obligation to register (possibly. Group Exemption Regulation)
- ATV-Code-of-practrice M251 of the waste water technology association
- Regulations of the Public Authorities for the run-off of condensate.

2.4 Liquid gas under ground

The Paramount 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-fired fuel value devices meet the requirements of the gas devices guideline 2009/142/EG, the low voltage guideline 2006/95/EG, as well as, the guideline 2004/108/EG (electro-magnetic compatibility, EMV) of the Commission to balance the legal regulations of the member states.
Meeting the protection requirements according to guideline 2004/108/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/EG as condensing boiler.
When natural gas is used, the gas condensing-boiler emit less than 60 $^{mg}/_{kWh}$ NO_X corresponding to the requirements as per §6 of the Ordinance regarding small firing places dated 26.01.2010 (1. BImSchV).

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2.6 Conformity declaration

Declaration of conformity

Product	Condensing gas boiler
Trade mark	Paramount
Product ID number	CE-0085 CL 0072
Type, Model	Paramount three 30, 40, 60, 80, 95, 115
EU directives	2006/95/EEC, 2004/108/EEC, 2009/142/EEC, 1992/42/EEC
Standards	DIN VDE 0722 DIN EN 50081-1, DIN EN 50082-2 DIN EN 60335-1, DIN EN 483 DIN EN 677, DIN EN 625
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. U. Patzke
Leiter Versuch/Labor und
Dokumentationsbevollmächtigter

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3. Technical Data Paramount Three 30-115

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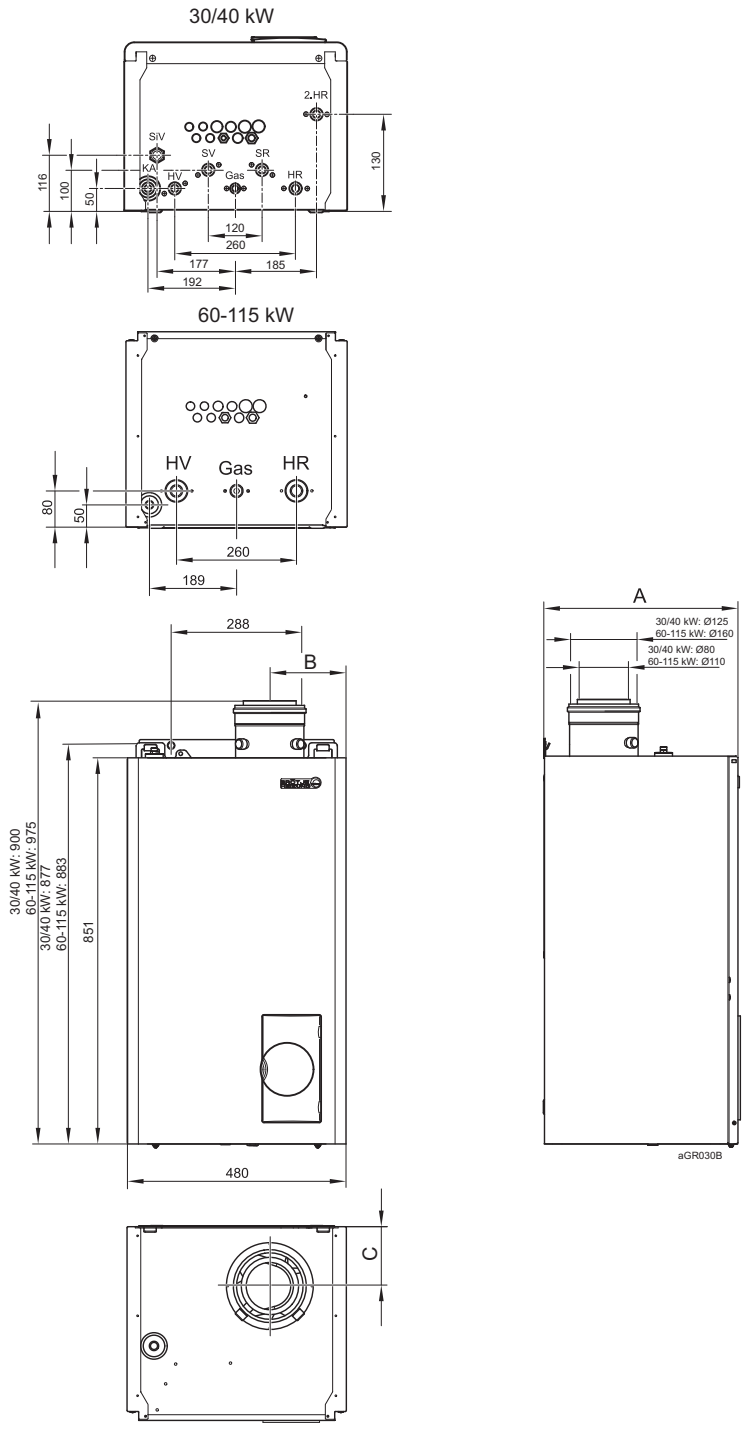
3.1 Dimensions and connections

Fig. 1: Dimensions and connections



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Technical Data Paramount Three 30-115

Tab. 1: Dimensions and connections

Model		Paramount three 30/40	Paramount three 60	Paramount three 80	Paramount three 95	Paramount three 115
HV	- Heating flow	G 1"	G 1 1/2“			
HR	- Heating return	G 1"	G 1 1/2“			
Gas	- Gas connection	G 1“				
SiV	- Safety valve	G 3/4“				
KA	- Condensated water connection	Ø 25 mm				
Dimension A	[mm]	407	447	542	585	
Dimension B	[mm]	240	168		163	
Dimension C	[mm]	130	132		152	

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3.2 Specification

Tab. 2: Specification

Model	Paramount three			30	40	60	80	95	115
Product-ID-No.				CE-0085BL0514					
VDE-Reg.-No.				VDE-mark					
International protection				IPx4D					
Gas category				II_{2H3+}					
Device categories				B_{23}, B_{33}, C_{13x}, C_{33x}, C_{43x}, C_{53}, C_{63x}, C_{83}					
Nominal heat input range	Natural Gas	Heating mode	kW	5,6-30,0	9,0-38,0	14,0-58,0	21,0-77,0	20,0-95,0	25,0-115,0
Nominal heat output range	Natural Gas	80/60°C	kW	5,4-29,2	8,7-36,8	13,4-56,3	20,3-74,7	19,4-92,2	24,3-111,7
		50/30°C	kW	6,0-31,3	9,6-39,0	14,9-60,1	22,6-79,7	21,4-98,1	26,7-118,6
Standard efficiency (DIN 4702)		75/60°C		106,0	106,0	106,0	106,0	106,0	106,0
		40/30°C		109,0	109,0	109,0	109,0	109,0	109,0
pH-value condensate			-	4-5	4-5	4-5	4-5	4-5	4-5
Volume condensate		40/30°C	l/h	0,83-3,00	1,19-2,84	1,78-4,71	2,53-6,46	2,75-8,42	3,85-9,61
NO_X-Standard emission factor			mg/kWh	17	20	20	20	25	25
CO-Standard emission factor			mg/kWh	5	10	10	10	20	20
Data for design of the chimney to EN 13384 (room sealed operation)									
Exhaust gas temperature (full load)	Full load	80/60°C	°C	66	75	71	73	73	77
	Low load		°C	53	56	59	59	59	60
	Full load	50/30°C	°C	46	53	54	54	51	56
	Low load		°C	33	35	34	35	32	33
Exhaust gas mass flow	Natural Gas	80/60°C	g/s	2,8-14,8	4,4-18,7	6,9-28,5	10,3-37,9	9,8-46,7	12,3-56,6
		50/30°C	g/s	2,5-14,1	4,1-18,0	6,4-27,4	9,7-36,4	9,1-44,8	11,3-54,4
Exhaust gas mass flow	Propane	80/60°C	g/s	2,6-14,1	4,2-17,8	6,6-27,2	9,8-36,1	14,1-44,6	16,4-53,9
		50/30°C	g/s	2,4-13,4	3,9-17,1	6,1-26,1	9,2-34,6	13,3-42,6	15,4-51,7
CO2-content natural gas	Natural Gas		%	8,3 - 8,8					
CO2-content LPG	Propane		%	10,3 - 10,7					
Draft requirement			mbar	0					
Max. delivery pressure at exhaust gas outlet			mbar	1,1	1,1	1,1	1,1	1,5	1.8
Exhaust gas/air supply connection			mm	80/125		110/160			
Exhaust gas value group to DVGW G636			-	G6					

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Technical Data Paramount Three 30-115

Model	Paramount three		30	40	60	80	95	115
Heating water								
Adjustment range heating water temperatur		°C	20 - 85					
Max. temp		°C	100					
Operating pressure	min.	bar	1,0					
		MPa	0,1					
	max.	bar	3,0		4,0			
		MPa	0,3		0,4			
Hydraulic resistance								
Flow rate @20K		kg/h	1254	1583	2150	3311	4085	4945
Hydraulic resistance @20K		kPa	10,4	14,7	6,8	8,5	12,5	17,8
Flow rate @11K		kg/h	2280	2879	4535	6020	7427	8991
Hydraulic resistance @11K		kPa	26,1	37,0	26,9	25,9	38,6	55,9
Gas-connected loads								
Supply pressure for natural gas		mbar	min. 18 - max. 25					
Connected loads	Natural gas [H_{UB} 9,45 kWh/m³]	m³/h	0,59-3,20	0,95-4,00	1,48-6,10	2,22-8,10	2,12-10,10	2,65-12,20
Supply pressure for propane		mbar	min. 42,5 - max. 57,5					
	Propane [H_U 12,87 kWh/kg]	kg/h	0,44-2,33	0,70-2,95	1,09-4,51	1,63-5,98	2,33-7,38	2,72-8,94
	Propane [H_U 24,64 kWh/m³]	m³/h	0,23-1,22	0,37-1,54	0,57-2,35	0,85-3,13	1,22-3,86	1,42-4,67
Electrical power consumption								
Electrical connection		V/Hz	230 V / 50 Hz					
max. electr. power consumption		W	55	70	100	108	170	200
Heating mode	protective mode	W	3	3	3	3	3	3
Dimensions								
Boiler weight		kg	53	53	61	72	84	84
Boiler water content		l	3,6	3,6	4,7	5.8	7,8	7,8
Height		mm	852					
Width		mm	480					
Depth		mm	407	407	447	542	570	570
Connections								
Gas connection			3/4"		1"			
Heating flow			1"		1 1/2"			
Heating return			1"		1 1/2"			

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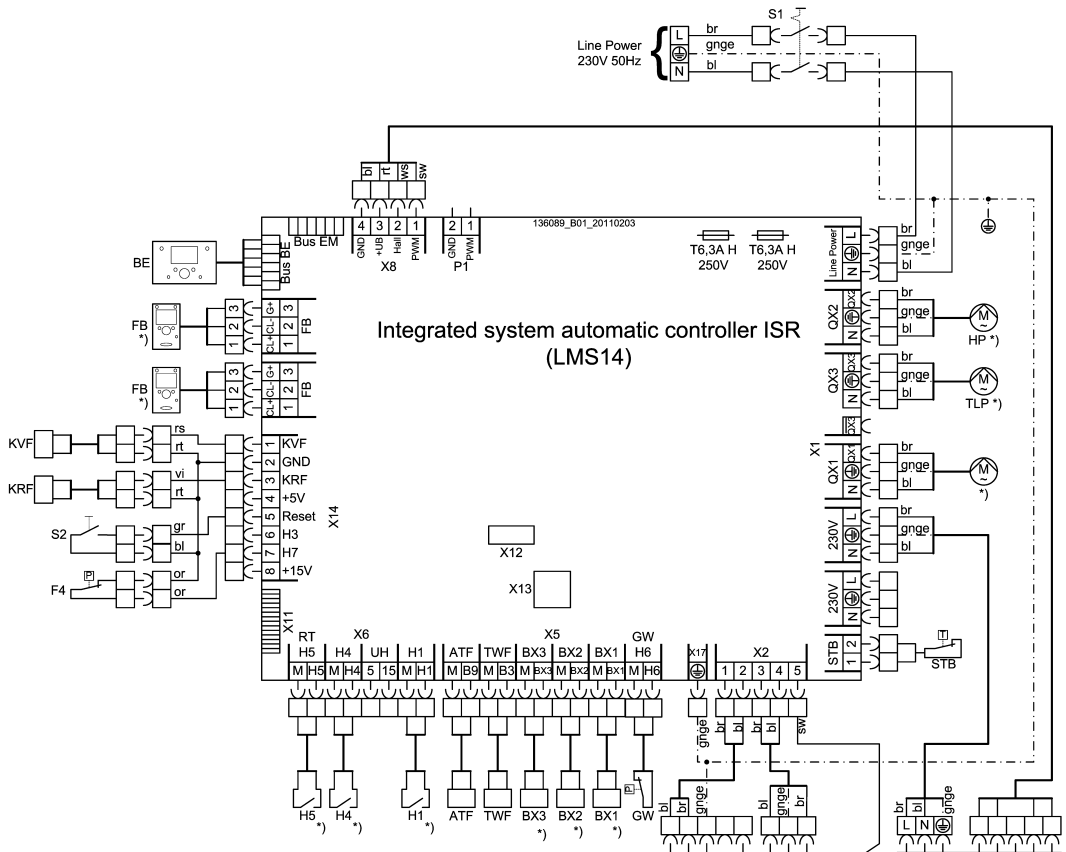
3.3 Wiring diagram

Fig. 2: Wiring diagram Paramount three 30 & 40



Legend:

ATF	Outdoor temp. sensor QAC 34	M4	Fan
B1	Ionization electrode	P1	PWM-Output
BE	Control unit	QX1..3	Multi functional output
Bus BE	Bus connection for control unit	S1	Operation switch
		S2	Reset button
Bus EM	Bus connextion for extension module	STB	Limit Thermostat
BX1..3	Function sensor input	T1	Ignation transformer
F4	Water pressure monitor	TLP	Hot water pump *)
FB	Room Unit *)	TWF	Tank sensor QAZ 36
GW	Gas pressure monitor	X11	Interface busmodule
H1,4,5	Multi - functional Input *)	X12,13	Service interface
H6	Gas pressure monitor input	Y2	Gas solenoid valve
HP	Ct - pump		
KRF	Boiler return sensor QAL 36	*)	Accessories
KVF	Boiler flow sensor QAK 36.670		

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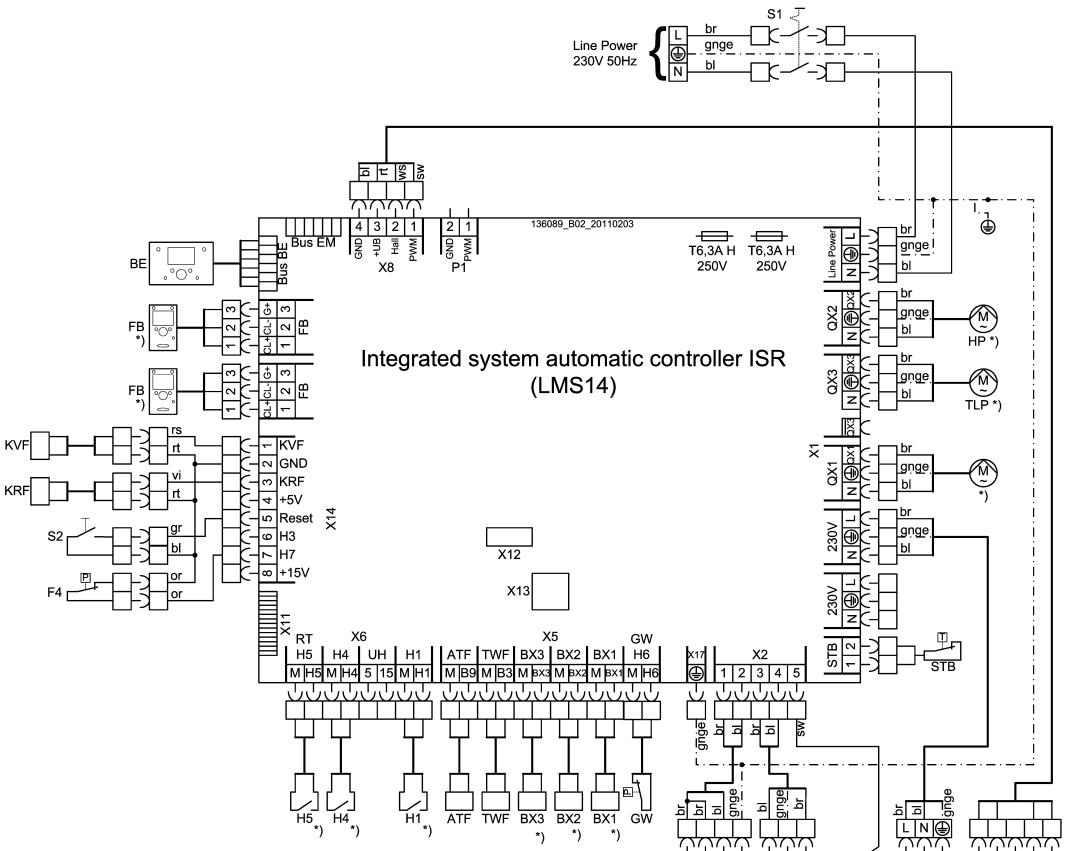
Fig. 3: Wiring diagram Paramount three 60-115



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BX1..3	Function sensor input	T1	Ignation transformer
F4	Water pressure monitor	TLP	Hot water pump *)
FB	Room Unit *)	TWF	Tank sensor QAZ 36
GW	Gas pressure monitor	X11	Interface busmodule
H1,4,5	Multi - functional Input *)	X12,13	Service interface
H6	Gas pressure monitor input	Y2	Gas solenoid valve
HP	Ct - pump		
KRF	Boiler return sensor QAL 36	*)	Accessories
KVF	Boiler flow sensor QAK 36.670		

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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

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4. Prior to installation

4.1 Air Supply Openings

In case of ventilation based operation of the Paramount an adequately sized opening for combustion air must be present in the place of installation. It should be pointed out to the customer that this opening must never be closed or blocked and that the connecting piece for combustion air on the upper side of the Paramount must be kept free.

Concentric Flue Applications
The air supplied for the boiler space ventilation shall be such that the maximum temperatures shall not exceed 25°C at floor level or 100 mm above, 32°C at mid level (1.5 m above floor level) and 40°C at ceiling level or 100 mm below ceiling level.
Refer to BS5440 2000 for boiler installations up 70 kW net and BS6644 2005 for boilers above 70 kW net for further details.
The following tables give the total free area of the vents required for single boiler installations in room sealed and open flue applications.

4.1.1 Clean combustion air!

Caution! Danger of damaging the device!
The Paramount must only be installed in rooms with clean combustion air. By no means should pollen or similar particles be able to get into the equipment through the suction holes!

4.2 Corrosion protection

Caution: Danger of damaging the device!
The combustion air must be free from corrosive elements - especially fluorine and chlorine containing vapours which are found, for example, in solvents and cleaning agents, propellant gases etc.

When connecting heat generators to under-floor heating systems, employing plastic pipe work which is not impervious to oxygen in accordance to DIN 4726, heat exchangers must be used for separation purposes.

Note: Prevention of damage in hot water heating systems caused by corrosion on the water side or scaling.

4.3 Requirements for heating circuit water

4.3.1 Further information on the heating water

- The water must not have any foreign matter, such as sweat beads, rust particles, scale or sludge. During filling, flush the system until only clean water runs out. When flushing the system,ensure that the water does not flow through the heat exchanger in the boiler, that the thermostatic radiator valves are removed and the valve inserts are set to the maximum flow rate.
- If additives are used it is important to follow the instructions of the manufacturer.
  If, in a special case, it is necessary to use additives in a mixture (e.g. hardness stabiliser, frost protection 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.
- For buffer cylinders in conjunction with solar thermal systems or solid fuel boilers, take the buffer capacity into consideration when determining the fill water volume.

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4.4 Treating and preparing the heating water

4.4.1 Determining the system volume

The total water volume in the heating system is composed of the system volume (= fill water volume) plus the top-up water volume. In the POTTERTON boiler-specific diagrams, only the system volume is given to make them easier to use. Over the entire service life of the boiler, a maximum top-up volume of twice the system volume is assumed.

4.4.2 Additives

The following products are currently approved by BRÖTJE:
- „Full heating protection“ from Fernox (www.fernox.com)
- „Sentinel X100“ from Guanako (www.sentinel-solutions.net)
- „Jenaqua 100 and 110“ from Guanako (www.jenaqua.de)
- „Vollschutz Genosafe A“ from Grünbeck
- "Care Sentinel X100" from Conel (www.conel-gmbh.de)

Complete softening

As a general rule, fully desalinated water can always be used, although a pH value stabiliser is also required. The following products for producing fully desalinated water have been tested and approved:
- „Complete softening (VE) GENODEST Vario GDE 2000" from Grünbeck (www.gruenbeck.de)
- "Complete softening cartridge SureFill" from Sentinel (www.sentinel-solutions.net)
- more devices on request

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Partial softening
The following products are currently approved by BRÖTJE:
- Sodium ion exchanger "Fillsoft" from Reflex (www.reflex.de)
- "Heifisoft" from Judo (www.judo-online.de)
- "Heating water softening 3200“ from Syr (www.syr.de)
- "AQA therm" and "HBA 100" from BWT Wassertechnik (www.bwt.de)
- "SoluTECH" from Firma Cillit (www.gc-gruppe.de)

It must be ensured with an automatic blending device that the min. hardness does not go under 6°dH .

The specifications of the manufacturer must be followed.

Further products are currently undergoing testing. Please ask BRÖTJE for more information.

Caution! If non-approved products are used, the guarantee becomes void.

4.4.3 Antifreeze

Using antifreeze with Potterton gas condensing boilers with aluminium heat exchangers

The heat transfer medium (Lasacor® LS 1) offered for solar thermal systems is also used in heating systems (e.g. holiday houses) as an antifreeze. In the mixture supplied in the canisters (42 % Lasacor® LS 1, 58 % water) the freezing point ("crystal formation point") is -28 °C. Due to the thermal capacity, which is lower than that of pure water, and the higher viscosity, boiling noises may occur in some systems. For most heating systems, frost protection down to -28 °C is not required; -15 °C is usually sufficient. To set this operating point, the heat transfer medium should be diluted with water in a ratio of 2:1. This mixing ratio has been test by Potterton in relation to its practical suitability for use with gas condensing boilers.

Note: The heat transfer medium Lasacor® LS 1 up to a mixing ratio of 2,5:1 is approved as an antifreeze down to -15 °C for use with Potterton gas condensing boilers.

Caution! Keep the installation room free of frost.
If antifreeze is used, pipework, radiators and gas condensing boilers are protected against frost damage. For the gas condensing boiler to be ready for operation at any time, suitable measures must also be taken to keep the installation room free of frost. If applicable, please also note special measures for any installed DHW heaters.

The table shows the relevant amounts of heat transfer medium and water, that need to be mixed together for varying volumes of water. If other frost protection temperatures are required in exceptional cases, individual calculations can be made.

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Water content of the plant [l]	Amount Lasacor® LS 1 [l]	Water in the mixture *) [l]	Antifreeze to [°C]
50	36	14	-15
100	71	29	-15
150	107	43	-15
200	143	57	-15
250	178	72	-15
300	214	86	-15
500	357	143	-15
1000	714	286	-15

*) The water for the mixture must be neutral (potable water quality with no more than 100 mg/kg chlorine) or demineralised. Please also follow the manufacturer instructions.

4.4.4 Maintenance instruction

The water hardness of the heating water has to be checked within the scope of the recommended maintenance of the boiler and, possibly, the respective amount of additive has to be added.

4.5 Practical information for heating contractors

1. With reference to the specific system volume (e. g. when using heating water buffer cylinders), determine which requirements apply regarding total hardness of the fill and top-up water to VDI Directive 2035 and the the following table.
   If partial softening to 6 °dH is insufficient according to the project-specific water hardness diagram, use either an additive or use only fully desalinated water (with pH stabiliser).
   If a boiler is replaced in an existing system, we recommend installing a dirt trap or filter in the system return, upstream of the boiler. Flush the system thoroughly.
2. Depending on the materials used, determine whether the addition of inhibitors, partial softening or full desalination is the best method.
3. Record the filling process (use the BRÖTJE system log. If an additive is used, note this on the boiler). To prevent gas pockets and bubbles, it is essential to fully vent the system at maximum operating temperature.
4. After 8 to 12 weeks, check and record the pH value. Offer and conclude a maintenance contract.
5. Once a year, check the system is operating correctly with regard to pressure maintenance, pH value and the volume of top-up water used.

Tab. 5: Table to VDI 2035 Sheet 1

Total heating output in kW	Total hardness in °dH subject to the specific system volume		
	< 20 l/kW	≥ 20 l/kW and < 50l/kW	≥ 50 l/kW
< 50 *)	≤ 16.8	≤ 11.2	< 0.11
50 - 200	≤ 11.2	≤ 8.4	< 0.11
200 - 600	≤ 8.4	≤ 0.11	< 0.11
> 600	≤ 0.11	< 0.11	< 0.11

*) for system boilers (< 0.3 l/kW) and systems with electric heating elements

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4.6 Operation in wet rooms

In the supplied status, the Paramount conforms in case of room air-independent operation to international protection type IPx4D ().

In the case of installation in wet rooms, the following conditions must be met:
- Room air-independent operation
- to maintain protection type IPx4D:
  - Operation of the room device or thermostat not in wet rooms!
  - All outgoing or incoming electrical lines must be installed through tension release screw fittings and fixed. The screw firttings have to be tightened, so that no water can enter the inside of the housing!

4.7 Notes for installation location

Caution! Danger of damage from water!
The following has to be observed for the installation of the Paramount:
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.

4.7.1 Installation room

The installation room must be dry, the room temperature must be between 0 and 40°C.
The installation location has to be selected, especially, with respect to ducting of the exhaust gas flues. When installing the boiler, the specified wall clearances have to be maintained.
Along with the general rules of the technology, the regulations of the country, such as fire and construction regulations 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 or heavy dust accumulation is not allowed.
Operation of Paramount boilers in rooms in which solvents, chorine containing cleaning agents, paint, glues or similar substances are worked with or in which such substances are stored is not 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.).

Caution! Danger of damaging the device!
Furthermore it is to be observed that under aggressive atmospheres even the boiler external installation can be attacked. To this are also included especially aluminium, brass and copper installations.

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

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4.8 Application example

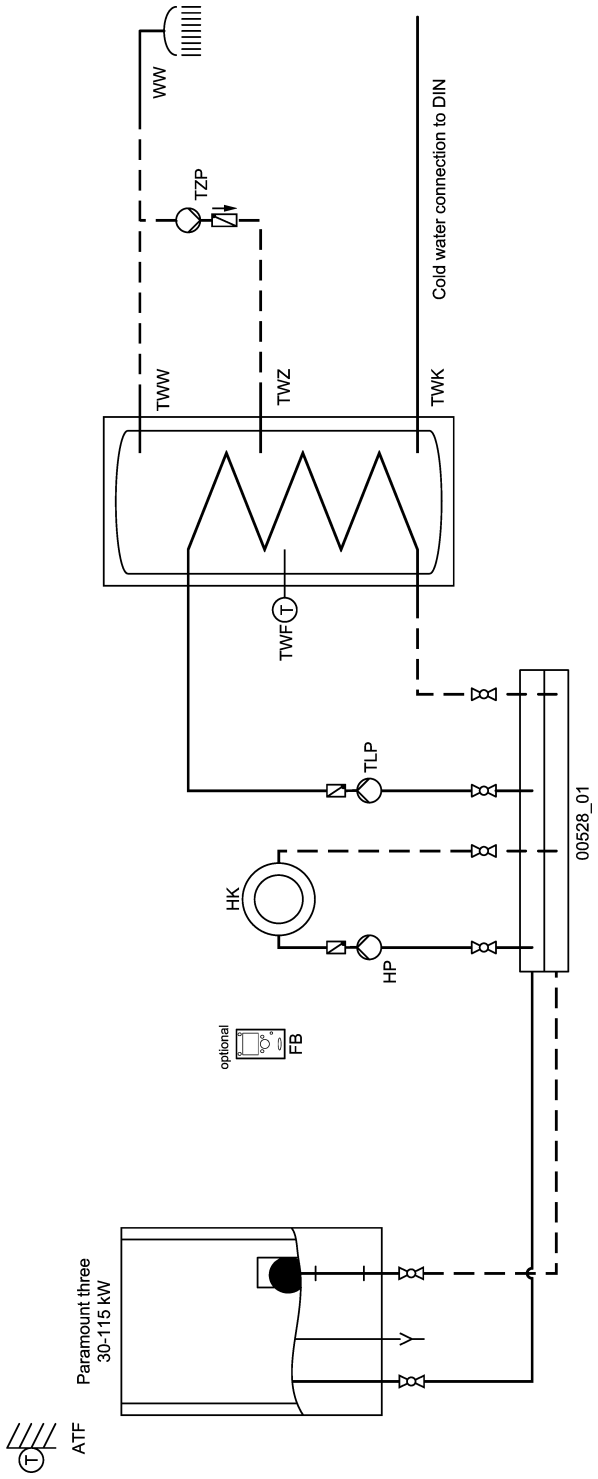

Fig. 4: Application example: A pump heating circuit with room device, including storage temperature control

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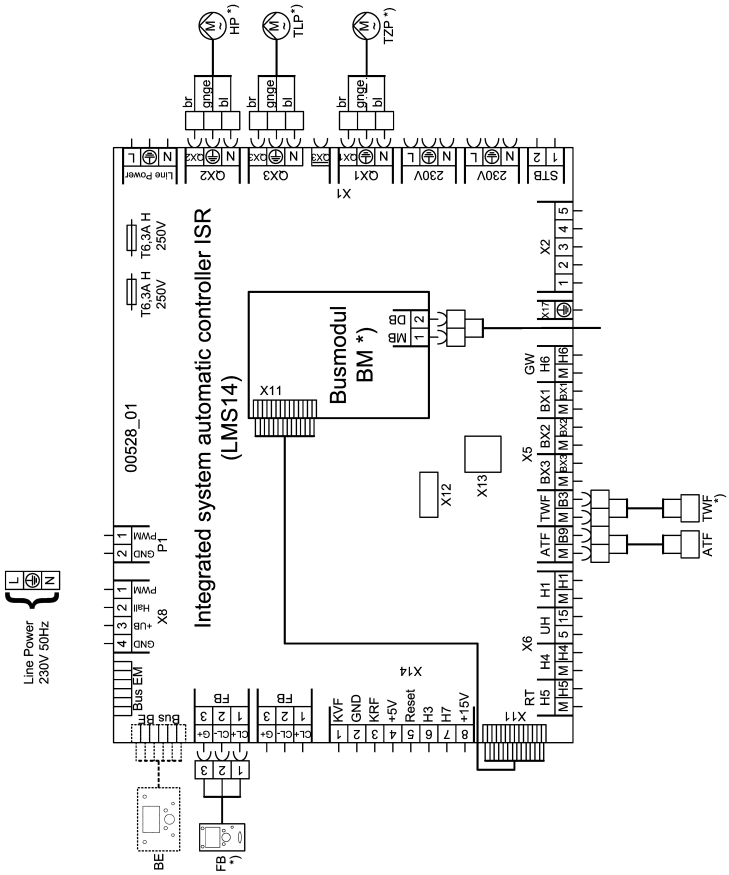

Fig. 5: Connection plan

In the case of use of a circulating pump additionally:

Menu item	Function	Settings
5890	Relay output QX1	Circulating pump
5891	Relay output QX2	Heat circuit pump HC1 Q2
6085	Function output P1	None

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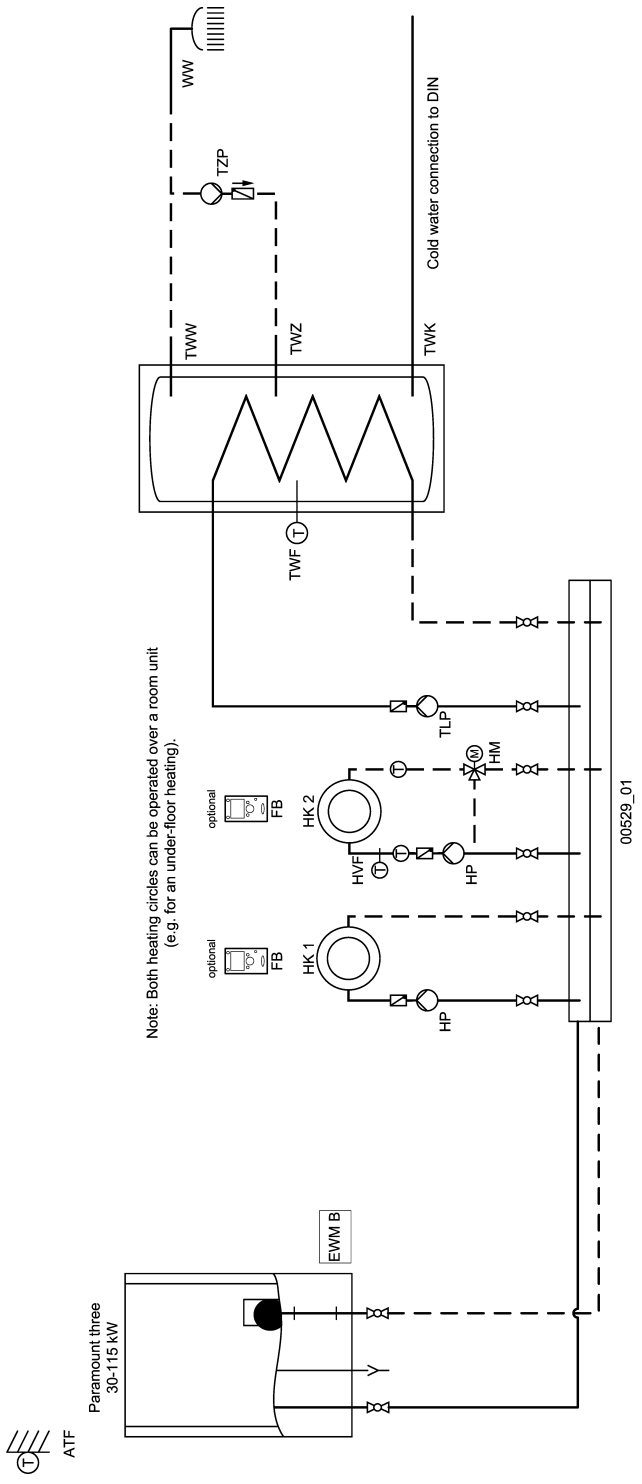

Fig. 6: Application example: One pump and one mixing heating circuit with storage temperature control, including storage temperature control

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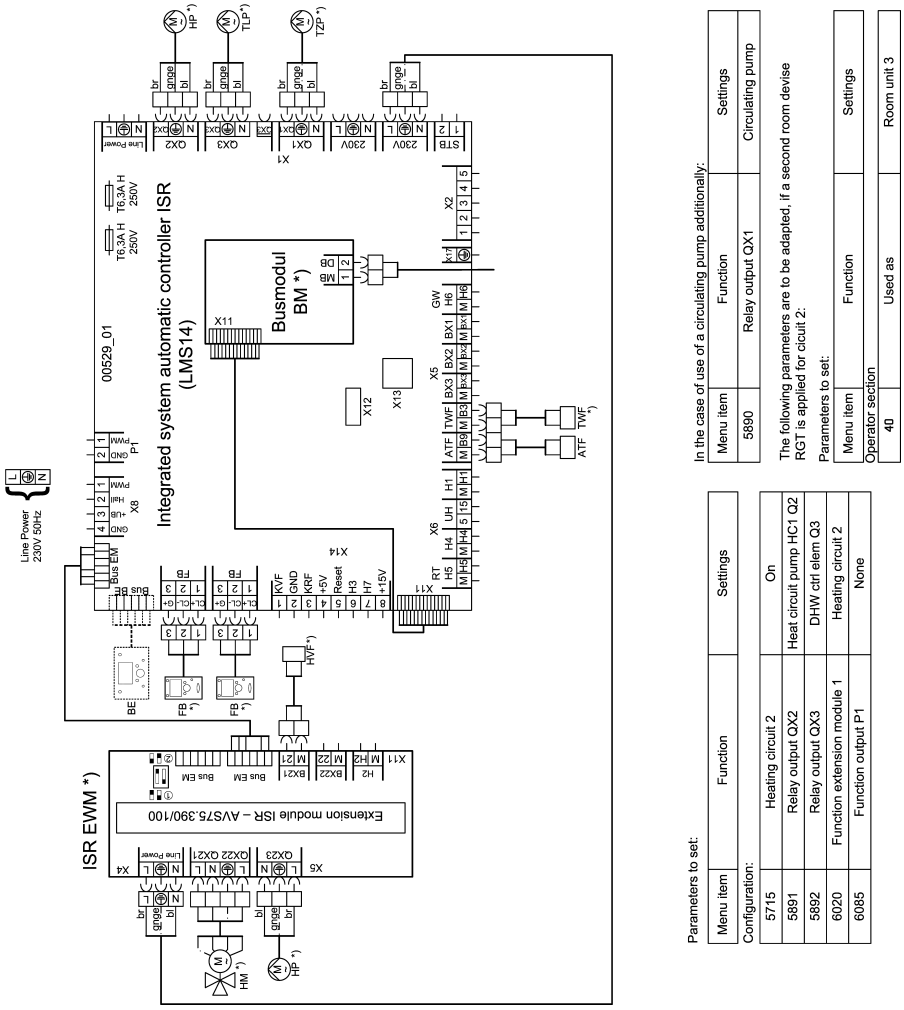

Fig. 7: Connection plan

Further application examples (mixing circuits, solar connection, etc.) may be found in the Programming and hydraulic system manual

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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	Kesselpumpe 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

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5. Installation

5.1 Connect heating circuit

Connect heating circuit with flat seal screw connections to boiler header and boiler return.
Shut-off valves have to be installed into the flow and return. To facilitate the assembly, shut-off sets ADH [1)] may be used.

Tip: Installing filter.
It is recommended that a filter be fitted in the heating return. In the case of old plants, the whole heating plant should be thoroughly flushed before installation.

5.2 Safety valve

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

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.

Caution!
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.

5.3 Condensate

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, Neutralisation Plant must be installed.
The condensate must be able to flow freely into a tundish. The condensate hose of the Paramount must be inserted through the opening in the floor. If there is no run-off facility underneath the condensate discharge, the use of a neutralisation and syphoning system is recommended.

Caution! Danger of damaging the device!
Fill the condensate discharge in the Paramount with water before commissioning. For this, fill 0.25 l water in the flue outlet before assembly of the flue gas pipe.

5.4 Sealing and filling of the plant

- Fill the heating plant via the return of the Paramount (see Technical Data)!
- Check tightness (max.water test pressure 3 bar).

5.5 Flue gas connection

For the operation of the Paramount as gas condensing boiler, the flue gas pipe should be designed with flue gas temperature under 120°(flue gas pipe type B). A flue specialist should be contacted for this.

Note: This system has been type-approved and certified as a system by Paramount DVGW. The enclosed assembly instruction for the exhaust gas pipeline system has to be observed.

1) accessory

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5.6 Exhaust gas system

	Paramount three 30/40			Paramount three 60			Paramount three 80			Paramount three 95			Paramount three 115		
Flue Type	Flue Size	Max. Flue Length*	Max No. of bends (87 °)	Flue Size	Max. Flue Length*	Max No. of bends (87 °)	Flue Size	Max. Flue Length*	Max No. of bends (87 °)	Flue Size	Max. Flue Length*	Max No. of bends (87 °)	Flue Size	Max. Flue Length*	Max No. of bends (87 °)
C13	(Horizontal Concentric)														
	80 / 125	10	2	100 / 150	5	2	100 / 150	5	2	100 / 150	5	2	100 / 150	5	2
C33(1)	(Concentric Vertical)														
	80 / 125	13	0	100 / 150	22	0	100 / 150	13	0	100 / 150	10	0	100 / 150	10	0
C33(2)	(Concentric Vertical)														
	80 / 125	15(3)	2	100 / 150	24(3)	2	100 / 150	15(3)	2	100 / 150	18(3)	2	100 / 150	20(3)	2
C33(3)	(Concentric Vertical)														
	80 / 125	13(3)	2	100 / 150	13(2)	2	100 / 150	9(3)	2	100 / 150	9(2)	2	100 / 150	8(2)	2
B23	(Conventional Flue)														
	80	20(3)	3	110	25(3)	3	110	16(3)	3	110	20(3)	2	110	20(3)	2

5.7.1 Contaminated chimneys

Combustion of solid and liquid fuels generates deposits and pollution in the pertinent flue gas tract. Cleaning and user maintenance must not be carried out by children without supervision. Such flue gas tracts are not suitable for combustion air supply of heat generators without pretreatment. Contaminated combustion air is one of the main causes of corrosion damage and malfuctions on fuel-burning installations. If the combustion air has to be drawn via an already existing chimney, this flue gas tract should be inspected by the competent district chimney sweep officer and if necessary cleaned. Should structural deficiencies (e. g. old, broken chimney structures) conflict with its use as combustion air supply duct, suitable measures such as shake-out of the fireplace should be taken. It must be ensured that there is no contamination of the combustion air with foreign matter.
In case an appropriate clean up of the existing flue gas tract is not possible, the heat generator can be operated on a concentric flue gas pipe independent of ventilation. The concentric exhaust gas pipe must run straight in the duct.

5.7.2 Lightning protection

Danger of electric shock! Danger of life by lightning!
The chimney head cover must be integrated in a possibly existing lightning protection system and house-side potential equalisation.
This work should be carried out by a approved concern specializing in lightning protection and electrical work.

5.7.3 Duct requirements

Inside buildings, exhaust gas system should be laid in suitable ventilated ducts.
The ducts must be made of non-combustible, dimensionally stable materials.
Fire resistance duration of the shaft: 90 min.
Fire resistance duration of the shaft in case of buildings of lower building height: 30 min.

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5.7 Assembly of the exhaust gas system

5.7.1 Assembly with downward slope

The exhaust gas duct must be installed with a slope towards the Paramount , so that the condensed water can drain from the exhaust gas duct to the central condensed water collector of the Paramount.

The min. downward slopes are:

- Horizontal exhaust gas duct: min. 3° (min. 5.5 cm per one metre)
- Outer wall feed-through: min. 1° (min. 2.0 cm per one metre)

5.7.2 Working gloves

Caution! Danger of injury by missing working gloves!
Wearing working gloves is recommended during the assembly work, particularly while cutting the pipes.

5.7.3 Shortening of the pipes

All pipes and all concentric pipes may be shortened. After cutting off, the ends of the pipes have to be thouroghly de-burred. When shortening a concentric pipe, a piece of pipe of a length of 6 cm must be cut off the outer pipe. The spring washer for centring the inner pipe becomes obsolete.

5.8 Working with the exhaust gas system KAS

Additional direction changes
Reduction of the total length of the exhaust gas pipe by:

- per 87° elbow = 2.50 m
- per 45° elbow = 1.00 m
- per 30° elbow = 0.50 m
- per 15° elbow = 0.50 m
- per revision T-piece = 2,50 m

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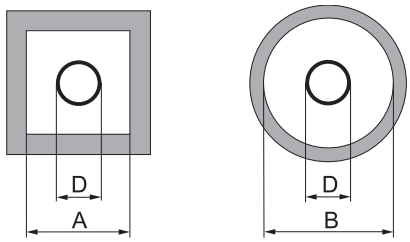
5.8.1 Minimum dimensions of the shaft

Fig. 8: Minimum dimensions of the shaft



System	Outer Ø coupling	Min. shaft inner dimension	
	D [mm]	short side A [mm]	round B [mm]
KAS 80 (DN 80) single wall	94	135	155
KAS 80 (DN 125) concentric	132	173	190
KAS 80/3 (DN 110) single wall	124	165	180
KAS 110	128	170	190
KAS 80 FLEX C (with connection- or inspection piece)	103	140	160
KAS 80 FLEX C (without connection- or inspection piece)	103	125	145

5.9 Cleaning and inspection openings

Caution: Clean exhaust gas pipelines!
It should be possible to clean the flue gas pipes and inspect their free cross-section and leakproofness.

At least one cleaning and inspection opening must be installed in the installation room of the Paramount.
Exhaust gas pipes in buildings, which cannot be cleaned or inspected from their mouth side must have an additional cleaning port in the upper part of the exhaust system or above the roof.
The exhaust gas pipelines at the outer wall must have at least one cleaning opening in the lower part of the exhaust gas facility. For exhaust gas facilities with building heights of < 15,00 m, in the vertical section, a pipeline length of < 2,00 m in the horizontal section and a maximum pipeline diameter of 150 mm with a maximum deflection (except for deflection directly at the boiler and in the shaft) one cleaning and inspection opening in the installation room of the Paramount is sufficient.
The ducts for exhaust gas facilities must have no openings other than the necessary cleaning and inspection ports as well as openings for back ventilation of the exhaust gas pipe.

5.10 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.
An approved thermally activated shut-off device has to be installed.
In case of regionally existing old gas pipes, the installation of a gas filter is recommended.

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Residues in pipes and pipe joints should be removed.

5.11 Check tightness

Danger! Danger of life from gas!
The entire gas inlet pipe, particularly the joints must be checked for leakages before commissioning.

5.11.1 Purging the 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 purging!

5.12 Factory settings

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 Paramount. The gas pressure controller of the gas valve has been sealed.

5.13 Supply pressure

The supply pressure must lie between the following values:
- for natural gas: 18 mbar - 25 mbar
- for liquid gas: nominal 37mbar

The connecting pressure is measured as pressure in the gas flow at the measuring nozzle of the gas valve (*Fig. 9*).

Danger! Danger of life by gas!
The Paramount must not be started up when the supply pressures are outside the said range!
The gas supply company should be informed.

5.14 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 has to be set by modifying the gas pressure at the gas valve (see *Fig. 9*).
The air quantity set in the factory must not be changed.

5.15 Changing over from LPG to natural gas and vice versa

Danger! Danger of life by gas!
The gas type of the Paramount must only be modified by an approved heating specialist. Use the BRÖTJE conversion set for LPG (accessory). The instructions of the conversion kit must be observed!

The CO_2-content has to be set by adjusting the nozzle pressure at the gas valve (see section *Guide line for nozzle pressure)*
The CO_2-content must be between the values according to section *Technical Data* at full load as well as low load.

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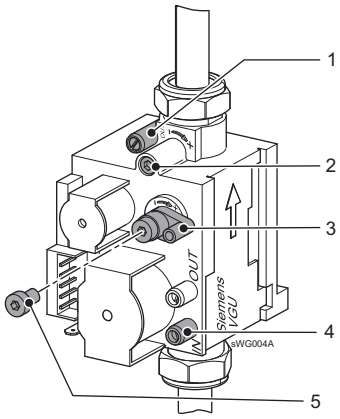
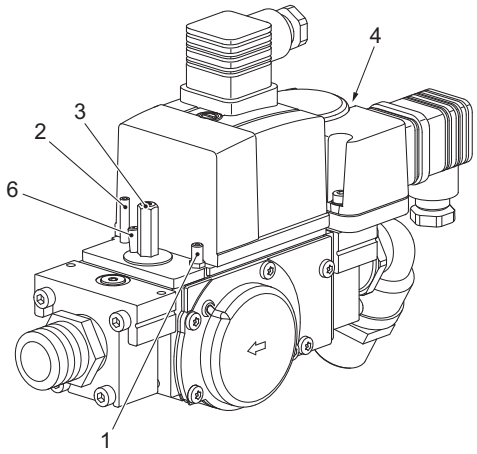
5.16 Gas valve

Fig. 9: Gas valve

Paramount Three 60 (Fa. Siemens VGU)
(setting of jet pressures with Torx T15)



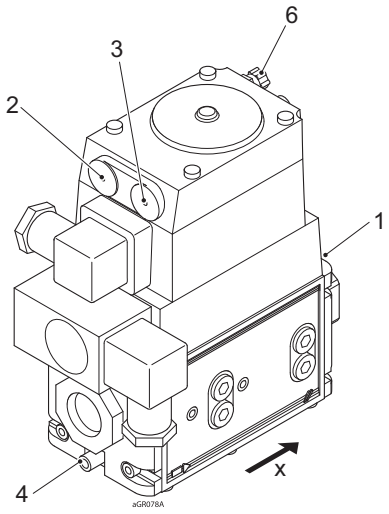
Paramount Three 80 (Fa. Dungs MBC 120)



2: Full load

3: Low load

Paramount Three 95/115 (Fa. Kromschröder CG 20)
(setting of jet pressures with Torx T15)



1 Measuring nozzle for jet pressure
2 Setting for full load
3 Setting for low load (remove protective plug in advance (**5**))
X Flow direction

Note: The Torx-key is located in the accessory bag.

4 Measuring nozzle for connecting pressure
5 Protective plug
6 Fan pressure

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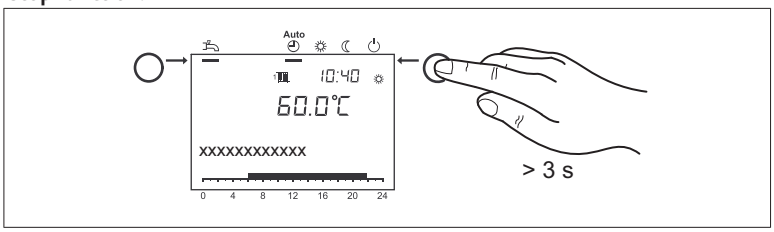
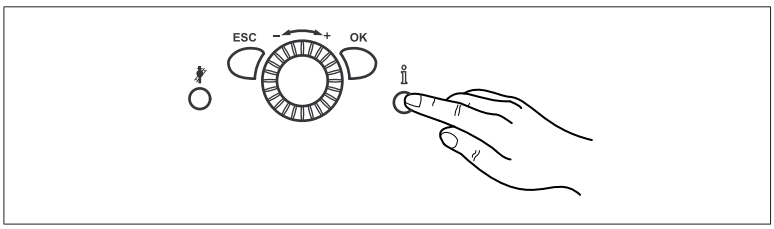
5.17 Controller Stop Mode (Manual Adjustment of Burner Load)

For setting and controlling the CO_2 values the Paramount 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 taken over 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.
If a heat demand from a cylinder with internal indirect coil is present, this demand will continue to be met while the controller stop function is running.

5.18 Guide Values for Injector Pressure

Guide values for gas flow, jet presure and CO_2-content
The values given in *Tab. 6 (Page 36)* are guide values. It is important that the gas quantity is set via the injector pressure in such a way that the CO_2-value is within the specified values (see *Tab. 2 (Page 13)*).

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Tab. 6: Guide Values for injector pressure (full load)

Model			Paramount Three 60	Paramount Three 80	Paramount Three 95	Paramount Three 115
Nominal heat load	Heating	kW	12,0-50,0	17,0-70,0	20,0-90,0	25,0-110,0
Nominal heat output	80/60°C	kW	11,5-48,5	16,4-67,9	19,4-87,3	24,3-106,8
	50/30°C	kW	12,8-51,9	18,3-72,5	21,4-93,1	26,7-113,5
Injector diameter for						
Natural Gas LL (G25)		mm	7,80	9,30	9,30	11,40
Natural Gas E (G20)		mm	7,20	8.50	8.50	10.30
LPG (propane)		mm	5,80	7,00	6,50	7,40
			Guide values for injector pressure *			
Natural Gas LL (12,4) **		mbar	6,3-7,3	8,3-8,9	12,5-13,5	12.0-13.0
Natural Gas E (15,0)**		mbar	6,3-7,3	8,0-8,6	12,5-13,5	12.0-13.0
Propane		mbar	6,3-7,3	7,9-8,5	14,5-15,5	14,5-15,5
the CO_2-content should be			- between 8.3% and 8.8% for natural gas - for liquid gas be between 10,3% and 10,8%			

* at pressure at end of boiler 0 mbar, 1013 hPa, 15 °C
** values in brackets = Wobbe Index W_{oN} in kWh/m³

Tab. 7: Guide Values for the gas flow rate for natural gas

Model			Paramount Three 60	Paramount Three 80	Paramount Three 95	Paramount Three 115
Nominal heat load	(full load)	kW	50,0	70,0	90,0	110,0
			Gas Flow Rate in l/min			
		7	119	167	214	262
		7.5	111	156	200	244
		8,0	104	146	188	229
Operating heating value		8.5	98	137	176	216
H_{uB} in kWh/m³		9,0	93	130	167	204
		9,5	88	123	158	193
		10	83	117	150	183
		10,5	79	111	143	175
		11	76	106	136	167
		11,5	72	101	130	159

5.19 Electrical connection (general)

Risk of electric shock! All electrical work in connection with the installation must only be carried out by a qualified electrician!
- Mains supply AC 230 V +6% -10%, 50 Hz

The boiler must be installed on an uninterrupted supply with the correct polarity. For the power supply, use the power cable attached to the boiler or cable types F 3 x 1 mm² or 3 x 1.5 mm².
We recommend the installation of a mains isolator upstream of the Paramount. This should isolate all poles and provide contact separation of at least 3 mm.

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5.19.1 Cable lengths

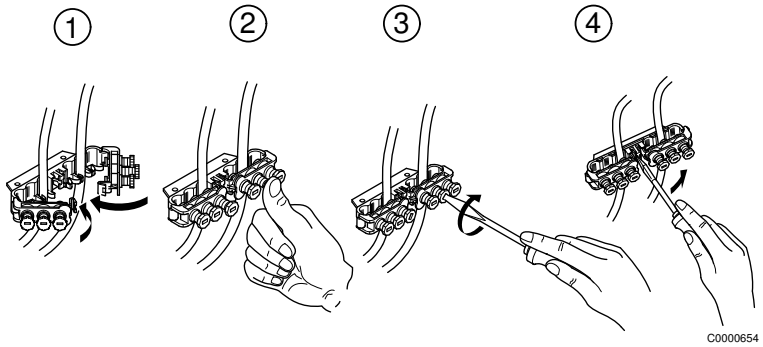
Bus/sensor lines do not have mains voltage, but small protective voltage. They must not be installed **in parallel with mains lines** (induced signals). Shielded cables have to be installed if this is unavoidable.

Permissible cable lengths for all bus 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

5.19.2 Strain relief fittings

All cables must be routed through the cable entries supplied and inserted through the holes in the boiler base and then secured. Also secure cables by means of the strain relief fittings on the control panel and then connect in accordance with the wiring diagram (*Fig. 10*).

Fig. 10: Strain relief



5.19.3 IP rating IPx4D

Tighten the cable entries to comply with the IPx4D rating and to safeguard the specified air-tight sealing of the air chamber, so that the grommets tighten around the cables.

5.19.4 Circulating pumps

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

5.19.5 Fuses

Device fuse in the control unit:
- F1 - T 6,3 H 250 ; mains

5.19.6 Connection sensor / components

Danger of electric shock!
The wiring diagram must be followed! Optional accessories must be fitted and connected according to the instructions provided. Ensure earthing is correct.

Outdoor temperature sensor (included in delivery)
The outdoor temperature sensor is located in the accessory box. Follow pictorials on box for installation instructions.

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5.19.7 Replacing cables

All connecting cables, except for the mains connection cable, have to be replaced by Potterton-special cables in case of replacement. When replacing the mains connection cable, only cables of the types 3 x 1 mm^2 or 3 x 1,5 mm^2 should be used.

5.19.8 Contact protection and international protection IPx4D

To ensure contact protection and internal protection IPx4d, the covering parts to be screwed, have to be fastened again with the respective screws after opening the Paramount.

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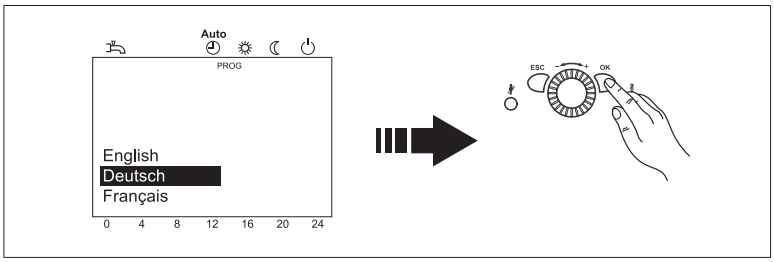
6. Commissioning

Danger! Danger of life by improperly performed work!
Commissioning must only be carried out by an GasSafe heating engineer! The heating specialist checks the tightnesss of pipelines, the correct functioning of all regulating, control and safety installations and measures the combustion values. In case of incorrect operations exists the danger of considerable damage to persons, environment and property!

6.1 Menu-Commissioning

During first commissioning, the menu Commissioning is showing up one-time.

1. 

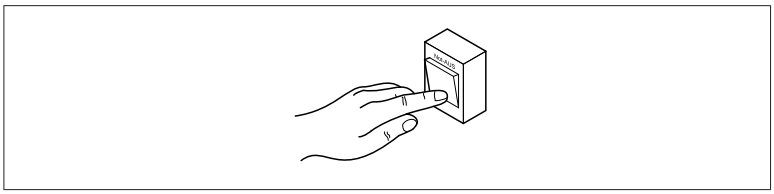
Select *Language* and confirm by pressing OK

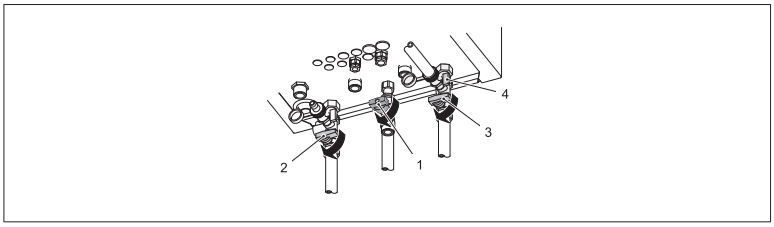
2. Select *Year* and confirm
3. Set *Date a*nd confirm
4. Set *Time* and confirm
5. Finalize by pressing OK

Note: If the menu commissioning is interrupted by pressing ESC, the menu is showing up again during the next switch-on of the device.

6.2 Switching on

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

1. 
Switch on boiler electrical isolation

2. 

Open gas shut-off device (**1**) and the water shut off valves (**2** and **3**)

3. Open front panel cover and switch on operating switch on the front panel of the boiler

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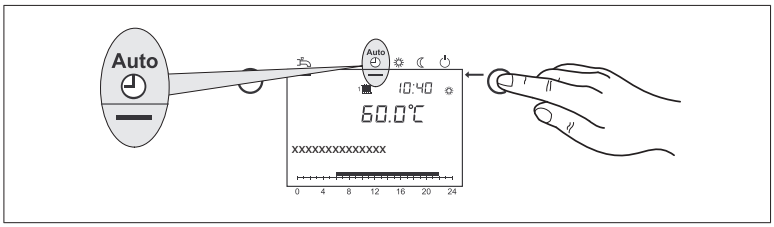
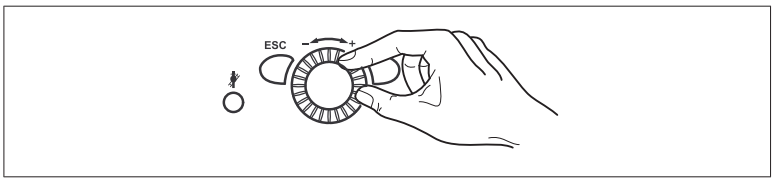
4.



Select the operation mode **automatic operation** with the operation mode button on the Auto (top right of ISR Plus).

5.



Set the required nominal 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 drinking water.
For DHW heating a setting between 50 and 60°C is recommended.

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 boiler can be commissioned having its standard time values.
For setting e.g. an individual time programme, please observe section *Time program* in *Programming*.

6.5 Programming of necessary parameters

Normaly, the parameters of the control do not need to be modified (Application example). Only date/time and possibly time programmes need to be set.

Note: Setting of the parameters is described in the section *programming*.

6.6 Emergency operation (Manual operation)

6.6.1 Set emergency operation

- Press OK button
- Select menu point maintenance/service
- Set function manual operation (prog. no. 7140) to "ON"
  Heating circuit pumps have been switched on and mixer is set to manual opration

6.6.2 Adjusting setpoint manual control

Using the operation mode "manual operation" you can choose a nominal temperature value for it:

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- Press button "info"
- Acknowledge selection with OK
- Adjust nominal value by using rotating knob
- Acknowledge setting with OK.
  See alsosection Explanations for setting table.

6.7 Instruction of the customer

6.7.1 Instruction

The customer must be given full explanation of the heating plant operation and functioning of the protective installations. It has to be pointed out especially:

- that the air inlet must not be closed or restricted;
- that the connection nozzle for the combustion air at the top of the device must be accessible for the Maintenance engineer,
- 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 (pressure gauge - 1 bar minimum);
  - Check of the tundish under the blowpipe of the safety valve;
- Only approved heating engineer may carry out the inspection and cleaning work annually.

6.7.2 Documents

- Asset ledger with check list of commissioning with legally binding signature for the end user: Only components tested to the respective standard and marked have been used. All components have been installed according to the maufacturer's instruction. The whole system conforms to the relevant standard.

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6.8 Guide for commissioning

Tab. 8: Guide for commissioning

1.	System location			
2.	Customer			
3.	Boiler type/Designation			
4.	Serial number			
5.	Characteristic gas values	Gas Type		.....
6.		Natural Gas / LPG	kWh/m³	.....
7.	Have all pipelines and connections been checked for tightness?			□
8.	Exhaust gas system checked?			□
9.	Gas pipeline checked and purged?			□
10.	Static pressure measured at the gas valve inlet?		mbar	.....
11.	Free wheeling of pumps checked?			□
12.	Filling the heating plant			□
13.	Used water additives			.....
14.	Gas flow pressure measured at full load at the gas valve inlet?		mbar	.....
15.	Gas injector pressure measured at full load at the gas valve outlet?		mbar	.....
16.	CO_2-content at low load		%	.....
17.	CO-content at low load		ppm	.....
18.	CO_2-content at full load		%	.....
19.	CO-content at full load		ppm	.....
20.	Function test:	Heating mode		□
21.		DHW operation		□
22.	Programming:	Time /date		□
23.		Comfort setpoint heating circuit 1/2	°C	.....
24.		Setpoint DHW	°C	.....
25.		Automatic day time programme	Clock	.....
26.		Heating curve checked?		□
27.	Tightness of the flue system checked in operation (e.g. CO_2 test in annular gap)?			
28.	Customer instructed?			□
29.	Documents handed over?			□

Only components tested and marked according to he respective standard have been used.
To ensure the heat source operates reliably and economically for a long period,
we recommend annual maintenance for the heat source.

Date /signature
Company stamp

.....

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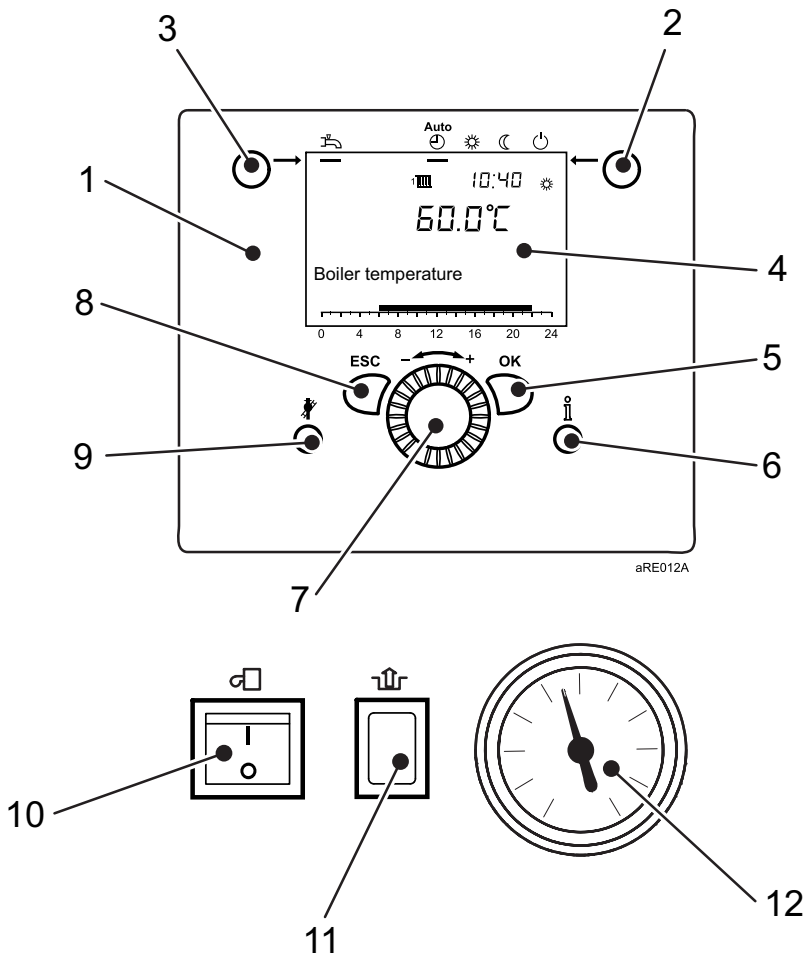
7. Operation

7.1 Operating elements

Fig. 11: Operating elements



1. Control operating unit ISR-Plus
2. Operating mode button heating operation
3. Operation mode button domestic hot water operation
4. Display
5. OK-button (acknowledgment)
6. Information button
7. Rotating knob
8. ESC-button (Interruption)
9. Chimney sweep (test)
10. Operating switch
11. Unlocking button reset
12. Manometer (pressure gauge)

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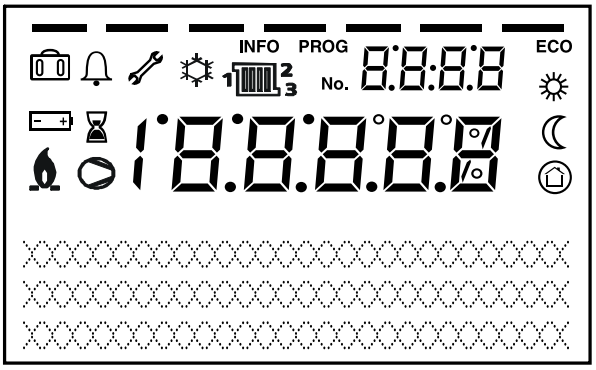
7.2 Display

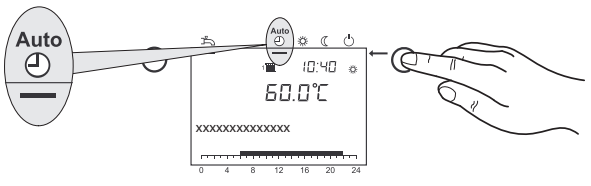
Fig. 12: Symbols on the display



Meaning of the displayed symbols			
☼	Heating to set comfort temperature	❄	Cooling active (heat pump only)
☾	Heating to set reduced temperature	⊖	Compressor in operation (heat pump only)
⌂	Heating to set frost protection temperature	🔧	Service message
⧗	Current process	🔔	Fault message
🧳	Holiday function active	**INFO**	Information level active
1 2 3	Reference to heating circuits	**PROG**	Setting level active
🔥	Burner in operation (boiler only)	**ECO**	Heating system shut down (automatic summer/winter changeover or automatic heating limit active)

7.3 Stop heating operation

Changeover 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.



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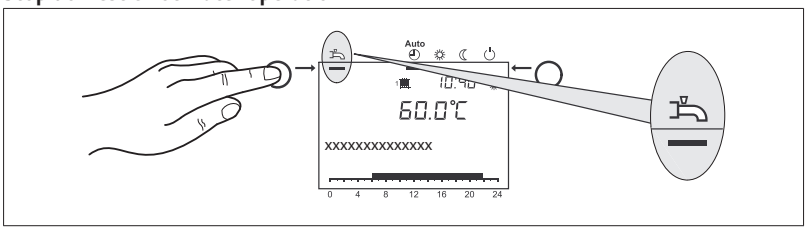
Automatic operation Auto :
- Heating operation according to time programme
- Nominal temperature values ☼ or ☾ according to time programme
- Protection functions (plant frost protection, overheating protection) activated
- Automatic summer/winter switch-over (automatic switching over between heating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

Continuous Operation ☼ or ☾ :
- 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 after frost protection setpoint
- Protection functions activated
- Automatic summer/winter switchover activated
- Automatic day heating limit activated

7.4 Stop domestic hot water operation

Stop domestic hot water operation

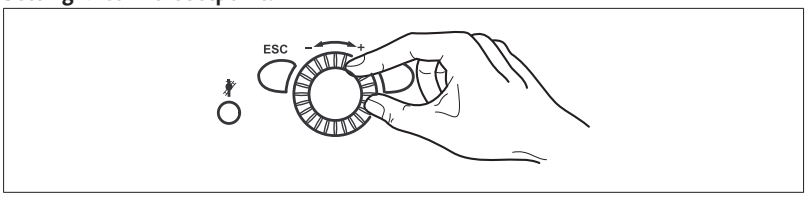


- *Switched on* domestic hot water will be prepared according to the selected switching programme.
- *Switched off* domestic hot water preparation has been de-activated.

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

7.5 Setting room setpoint

Setting ☼ comfort setpoint:



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

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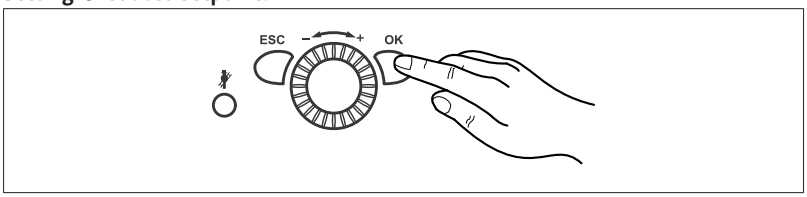
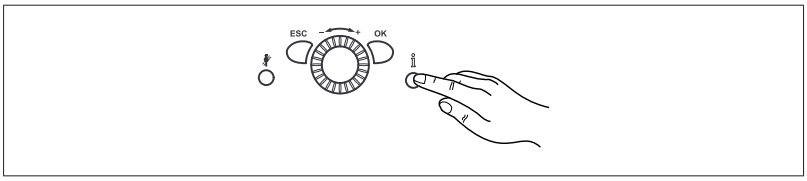
Setting ☾ reduced setpoint:



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.

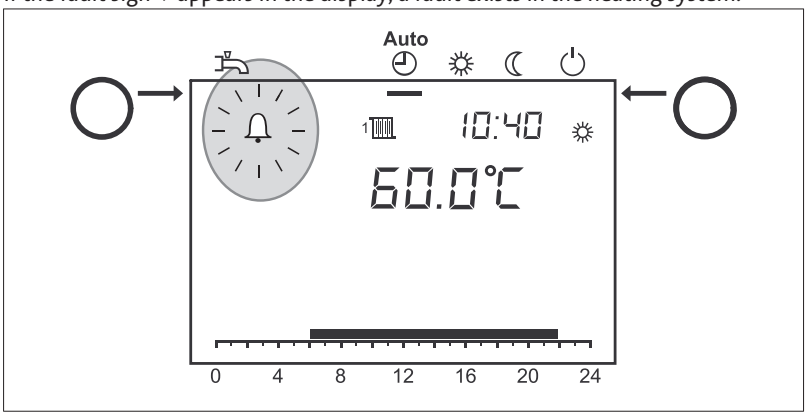


Including:
- Room and outside temperature (if sensor fitted)
- Fault or service messages

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*).

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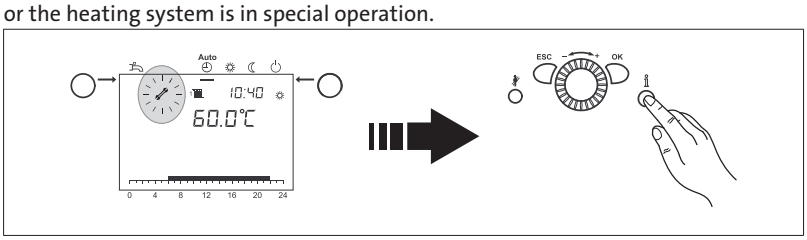
7.8 Servicing message

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



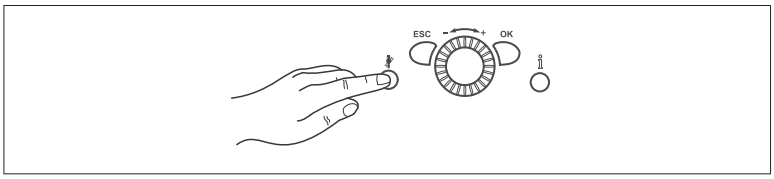
- Press information button (i)
- Further information can be called up (see section *Maintenance code- table*).

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

7.9 Chimney-sweep function

The chimney sweep function will be activated by the chimney sweep button.

1. **Activate chimney-sweep function**



Chimney-sweep button Press

=> The activated special function is displayed by the symbol in the display.

Note: If a heat demand from a cylinder with internal indirect coil is present, this demand will continue to be met while the emissions test function is running.

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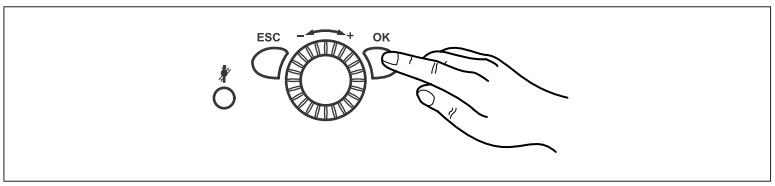
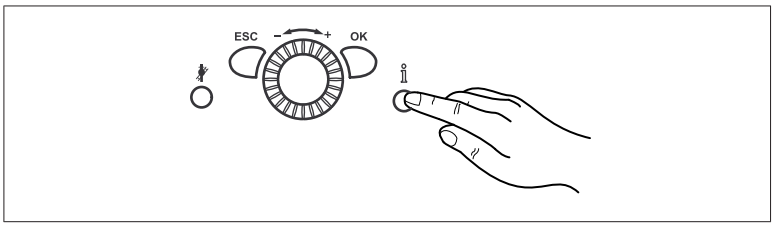
8. Programming

8.1 Programming procedure

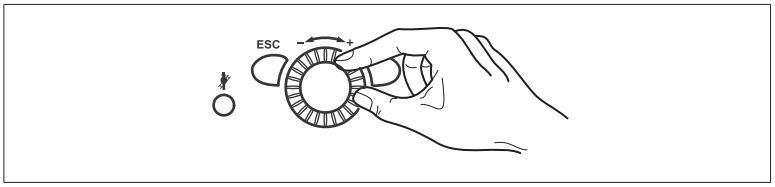
The selection of the setting levels and menu points are setting as follow:

1. 

Press OK button
=> It appears the display *Enduser*

2. 

Press the Info button **for approx. 3 s**
=> It appears the setting levels

3. 

Select the required setting level with the control knob.

Programming levels
- Enduser (Eu)
- Commissioning (C), incl. enduser (Eu)
- Engineer (E), incl. enduser (E) and commissioning (C)
- OEM, includes all other setting levels (password-protected)

4. Press OK button

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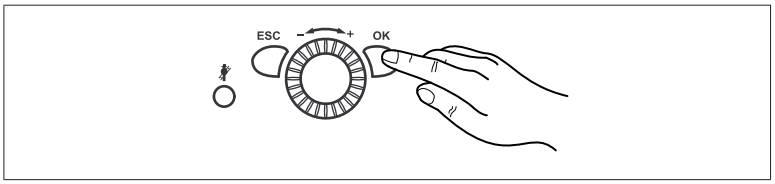
5. Select the required menu point with the control knob.

Menu point	Menu point
- Time and date	- Primary contr/system pump
- Operator section	- Boiler
- Wireless	
- Time prog heating circuit 1	- Cascade
- Time prog heating circuit 2	- Solar
- Time program 3/HC3	- Solid fuel boiler
- Time program 4 / DHW	- Buffer
- Time program 5	- DHW storage tank
- Holidays heating circuit 1	
- Holidays heating circuit 2	- Configuration
- Holidays heating circuit 3	- LPB-system
- Heating circuit 1	- Fault
- Heating circuit 2	- Service/special operation
- Heating circuit 3	- Input/output test
- DHW	- State
- Consumer circuit 1	- Diagnostics cascade
- Consumer circuit 2	- Diagnostics heat generation
- Swimming pool circuit	- Diagnostics consumers
- Swimming pool	- Burner control

Note: Not all menu points are visible, depending on the selection of setting level and programming!

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**.

1. 

Press OK button

Note: If parametres which are not mentioned in the level below are subject to change consider section *Programming procedure*!

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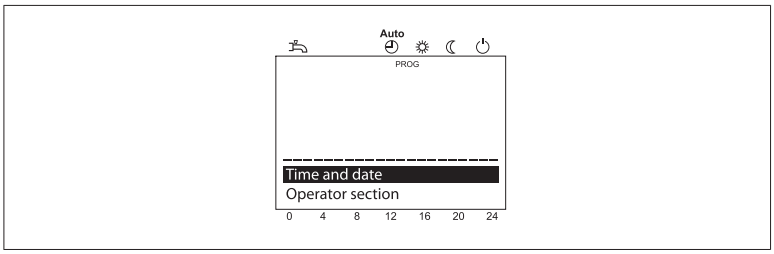
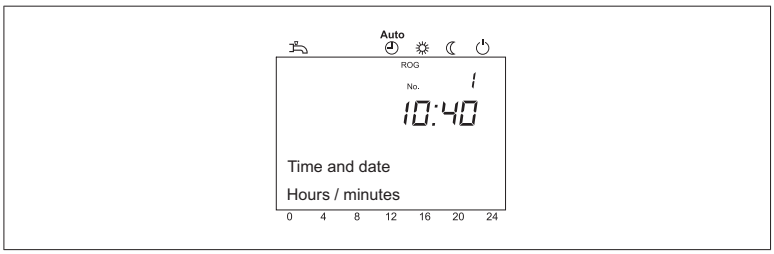
2. 

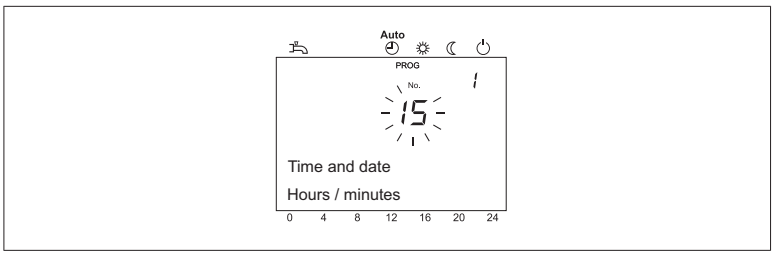
Select the menu point **Time and date** with the control knob

3. Press OK button

4. 

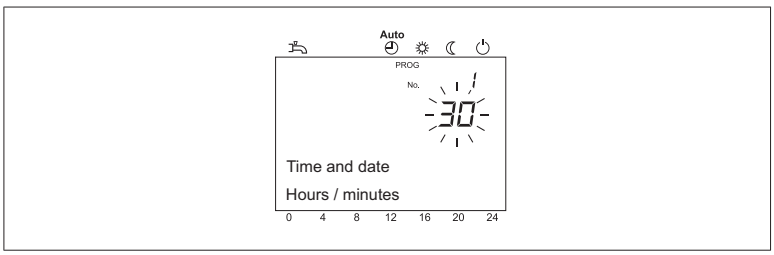
Select the menu point **hours/minutes** with the control knob

5. Press OK button

6. 

Carry out hour setting (e.g. 15 hours) with the control knob.

7. Press OK button

8. 

Carry out minute setting (e.g. 30 minutes) with the control knob.

9. Press OK button
10. Leave programming level by pressing the operation mode button heating operation

Tip: 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.

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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 (Eu), Commissioning (C) and Engineer (E), press OK button; after this, press and hold the information (i) button for 3 seconds, select the required level with the rotating knob and acknowledge with the OK button.

Tab. 9: 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	2030 (year)
Start of summertime	5	E	25.03 (day.month)
End of summertime	6	E	25.10 (day, month)
Programming unit This parameter is only visible in the room device!			
Language	20	Eu	English
Info Temporarily | Permanently	22	E	Temporarily
Contrast of display	25	E	
Operation lock Off | On	26	E	Off
Programming lock Off | On	27	E	Off
Units °C, bar | °F, PSI	29	Eu	°C, bar
Save basic settings No | Yes This parameter is only visible in the room device!	30	E	No
Activate basic settings No | Yes This parameter is only visible if a suitable standard setting is available in the programming unit.	31	E	No
Use as Room unit 1 | Room unit 2 | Room unit 3/P | Operator unit 1 | Operator unit 2 | Operator unit 3 | Service unit This parameter is only visible in the room device!	40	C	Room controller 1
Room controller 1 assignment Heating circuit 1 | Heating circuits 1 and 2 | Heating circuits 1 and 3/P | All heating circuits 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

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Function	Prog. no.	Level [1]	Standard value
Operation HC2 Commonly with HC1 | Independently	44	C	Commonly with HC1
Operation HC3/P Commonly with HC1 | Independently	46	C	Commonly with HC1
Room temperature Unit 1 Only for Heating circuit 1 | For all assigned heating circuits This parameter is only visible in the room device!	47	C	For all assigned heating circuits
Presence key device 1 None | Only for Heating circuit 1 | For all assigned heating circuits This parameter is only visible in the room device!	48	C	For all assigned heating circuits
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			
Preselection Mo - Su Mo-Su | Mo-Fr | Sa-Su | Mo | Tu | We | Th | Fr | Sa | Su	500	Eu	Mo
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)
Copy?	515	Eu	

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Function	Prog. no.	Level [1]	Standard value
Default values No | Yes	516	Eu	No
Time program heating circuit 2 Parameter only visible if heating circuit 2 is installed.			
Preselection Mo - Su Mo-Su | Mo-Fr | Sa-Su | Mo | Tu | We | Th | Fr | Sa | Su	520	E	Mo
1st phase ON	521	E	06:00 (h/min)
1st phase OFF	522	E	22:00 (h/min)
2nd phase ON	523	E	--:-- (h/min)
2nd phase OFF	524	E	--:-- (h/min)
3rd phase ON	525	E	--:-- (h/min)
3rd phase OFF	526	E	--:-- (h/min)
Copy?	535	E	
Standard values No | Yes	536	E	No
Time program 3 / HC3			
Preselection Mo - Su Mo-Su | Mo-Fr | Sa-Su | Mo | Tu | We | Th | Fr | Sa | Su	540	Eu	Mo
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)
Copy?	555	Eu	
Default values No | Yes	556	Eu	No
Time program 4/DHW			
Preselection Mo-Su Mo-Su | Mo-Fr | Sa-Su | Mo |Tu |We | Th | Fr | Sa | Su	560	Eu	Mo
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)
3. phase on	565	Eu	- - : - - (h/min)
3. phase off	566	Eu	- - : - - (h/min)
Copy?	575	Eu	
Default values No |Yes	576	Eu	No
Time program 5			
Preselection Mo - Su Su | Mo-Fr | Sa-Su | Mo | Tu | We | Th | Fr | Sa | SuMo-	600	Eu	Mo
1st phase on	601	Eu	06:00 (h/min)
1st phase off	602	Eu	22:00 (h/min)

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Function	Prog. no.	Level [1)]	Standard value
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)
Copy?	615	Eu	
Default values No | Yes	616	Eu	No
Holidays heating circuit 1			
Preselection Period 1 ... 8	641	E	Period 1
Start	642	E	--.-- (day. month)
End	643	E	--.-- (day. month)
Operating level Frost protection | Reduced	648	E	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			
Comfort setpoint	710	Eu	20.0°C
Reduced setpoint	712	Eu	18.0°C
Frost protection setpoint	714	Eu	10.0°C
Heating curve slope	720	Eu	1.50
Heating curve displacement	721	E	0.0 °C
Heating curve adaption Off | On	726	E	Off
Summer/winter heating limit	730	Eu	18°C
24-hour heating limit	732	E	0 °C
Flow temp setpoint min	740	E	8°C
Flow temp setpoint max	741	E	80°C
Flow temp setpoint room stat	742	E	--- °C

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Function	Prog. no.	Level [1]	Standard value
Delayed heat request	746	E	0 s
Room influence	750	C	- - - %
Room temp limitation	760	E	0.5°C
Boost heating	770	E	--- °C
Quick setback Off | Down to reduced setpoint | Down to frost prot setpoint	780	E	Down to reduced set-point
Optimum start control max	790	E	0 min
Optimum stop control max	791	E	0 min
Reduced setp increase start	800	E	--- °C
Reduced setp increase end	801	E	- 15°C
Overtemp prot pump circuit Off | On	820	E	Off
Mixing valve boost	830	E	5°C
Actuator running time	834	E	120 s
Floor curing function Off | Functional heating | Curing heating | Functional/curing heating | Curing/Functional heating | Manually	850	E	Off
Floor curing setp manually	851	E	25°C
Floor curing setp current	855	E	--- °C
Floor curing day current	856	E	0
Excess heat draw Off | Heating mode | Always	861	E	Heating mode
With prim contr/system pump No | Yes	872	E	yes
Pump speed reduction Operating level | Characteristic	880	E	Characteristic
Pump speed min	882	C	30 %
Pump speed max	883	C	80 %
Curve readj at 50% speed	888	E	10 %
Flow setp readj speed ctrl No | Yes	890	E	No
Operating level changeover Frost protection | Reduced | Comfort	898	E	Reduced
Optg mode changeover None | Protection | Reduced | Comfort | Automatic	900	E	Protection
Heating circuit 2 Parameter only visible if heating circuit 2 is installed.			
Comfort setpoint	1010	Eu	20.0°C
Reduced setpoint	1012	Eu	18.0°C
Frost protection setpoint	1014	Eu	10.0°C
Heating curve slope	1020	Eu	1.50
Heating curve displacement	1021	E	0.0 °C
Heating curve adaption Off | On	1026	E	Off

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Function	Prog. no.	Level [1)]	Standard value
Summer/winter heating limit	1030	Eu	18°C
24-hour heating limit	1032	E	0 °C
Flow temp setpoint min	1040	E	8°C
Flow temp setpoint max	1041	E	80°C
Flow temp setpoint room stat	1042	E	--- °C
Delayed heat request	1046	E	0 s
Room influence	1050	C	- - - %
Room temp limitation	1060	E	0.5°C
Boost heating	1070	E	--- °C
Quick setback Off | Down to reduced setpoint | Down to frost prot setpoint	1080	E	Down to reduced set-point
Optimum start control max	1090	E	0 min
Optimum stop control max	1091	E	0 min
Reduced setp increase start	1100	E	--- °C
Reduced setp increase end	1101	E	-15°C
Overtemp prot pump circuit Off | On	1120	E	Off
Mixing valve boost	1130	E	5°C
Actuator running time	1134	E	120 s
Floor curing function Off | Functional heating | Curing heating | Functional/curing heating | Curing/Functional heating | Manually	1150	E	Off
Floor curing setp manually	1151	E	25°C
Floor curing setp current	1155	E	--- °C
Floor curing day current	1156	E	0
Excess heat draw Off | Heating mode | Always	1161	E	Heating mode
With prim contr/system pump No | Yes	1172	E	yes
Pump speed reduction Operating level | Characteristic	1180	E	Characteristic
Pump speed min	1182	C	30 %
Pump speed max	1183	C	80 %
Curve readj at 50% speed	1188	E	10 %
Flow setp readj speed ctrl No | Yes	1190	E	No
Operating level changeover Frost protection | Reduced | Comfort	1198	E	Reduced
Optg mode changeover None | Protection | Reduced | Comfort | Automatic	1200	E	Protection
Heating circuit 3 Parameter only visible, if heating circuit 3 exists!			
Comfort setpoint	1310	Eu	20.0°C
Reduced setpoint	1312	Eu	18.0°C

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Function	Prog. no.	Level [1)]	Standard value
Frost protection setpoint	1314	Eu	10.0°C
Heating curve slope	1320	Eu	1.50
Heating curve displacement	1321	E	0.0 °C
Heating curve adaption Off | On	1326	E	Off
Summer/winter heating limit	1330	Eu	18°C
24-hour heating limit	1332	E	0 °C
Flow temp setpoint min	1340	E	8°C
Flow temp setpoint max	1341	E	80°C
Flow temp setpoint room stat	1342	E	--- °C
Delayed heat request	1346	E	0 s
Room influence	1350	C	- - - %
Room temp limitation	1360	E	0.5°C
Boost heating	1370	E	--- °C
Quick setback Off | Down to reduced setpoint | Down to frost prot setpoint	1380	E	Down to reduced set-point
Optimum start control max	1390	E	0 min
Optimum stop control max	1391	E	0 min
Reduced setp increase start	1400	E	--- °C
Reduced setp increase end	1401	E	-15°C
Continuous pump operation No | Yes	1409	E	No
Overtemp prot pump circuit Off | On	1420	E	Off
Mixing valve boost	1430	E	5°C
Actuator running time	1434	E	120 s
Floor curing function Off | Functional heating | Curing heating | Functional/curing heating | Curing/Functional heating | Manually	1450	E	Off
Floor curing setp manually	1451	E	25°C
Floor curing setp current	1455	E	0 °C
Floor curing day current	1456	E	0
Excess heat draw Off | Heating mode | Always	1461	E	Heating mode
With prim contr/system pump No | Yes	1472	E	yes
Pump speed reduction Operating level | Characteristic	1480	E	Characteristic
Pump speed min	1482	C	30 %
Pump speed max	1483	C	80 %
Curve readj at 50% speed	1488	E	10 %
Flow setp readj speed ctrl No | Yes	1490	E	No
Operating level changeover Frost protection | Reduced | Comfort	1498	E	Reduced

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Function	Prog. no.	Level [1]	Standard value
Optg mode changeover None | Protection | Reduced | Comfort | Automatic	1500	E	Protection
DHW			
Nominal setpoint	1610	Eu	55°C
Reduced setpoint	1612	E	45°C
Release 24h/day | Time programs HCs | Time program 4/DHW	1620	Eu	Time program 4/DHW
Charging priority Absolute | Shifting | None | MC shifting, PC absolute	1630	E	MC shifting, PC absolute
Legionella function Off | Periodically | Fixed weekday	1640	E	Fixed weekday
Legionella funct periodically	1641	E	7
Legionella funct weekday Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday	1642	E	Sunday
Legionella funct time	1644	E	- - -
Legionella funct setpoint	1645	E	65°C
Legionella funct duration	1646	E	- - - min
Legionella function circ pump Off | On	1647	E	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	E	55°C
Optg mode changeover None | Off | On	1680	E	Off
Consumer circuit 1			
Flow temp setp cons request	1859	C	70°C
DHW charging priority - No | Yes	1874	E	Yes
Excess heat draw - Off | On	1875	E	ON
With buffer storage tank - No | Yes	1878	E	Yes
With prim contr/system pump - No | Yes	1880	E	Yes
Consumer circuit 2			
Flow temp setp cons request	1909	C	70°C
DHW charging priority No | Yes	1924	E	Yes
Excess heat draw Off | On	1925	E	ON
With buffer storage tank No | Yes	1928	E	Yes

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Function	Prog. no.	Level [1)]	Standard value
With prim contr/system pump No | Yes	1930	E	Yes
Swimming pool circuit			
Flow temp setp cons request	1959	C	70°C
DHW charging priority No |Yes	1974	E	Yes
Excess heat draw Off | On	1975	E	ON
With buffer No |Yes	1978	E	Yes
With prim contr/system pump No |Yes	1980	E	Yes
Swimming pool			
Setpoint solar heating	2055	Eu	26°C
Setpoint source heating	2056	Eu	22°C
Charging priority solar Priority 1 | Priority 2 | Priority 3	2065	E	Priority 3:
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	E	8°C
Flow temp setpoint max	2111	E	80°C
Syst pump on heat gen lock Off | On	2121	E	Off
Mixing valve boost	2130	E	0°C
Actuator running time	2134	E	120 s
Boiler			
Release below outside temp	2203	E	--- °C
Full charging buffer Off | On	2208	E	Off
Setpoint min	2210	E	20°C
Setpoint max	2212	E	88°C
Setpoint manual control	2214	Eu	60°C
Burner running time min	2241	E	1 min.
Burner off time min	2243	E	7 min.
SD burner off time	2245	E	20°C
Pump overrun time	2250	E	2 min.
Pump overr time after DHW	2253	E	1 min.
Frost prot plant boiler pump Off | On	2300	E	Off
Boiler pump on heat gen lock Off | On	2301	E	Off
Impact heat generation lock Heating mode only | Heating and DHW mode	2305	E	Heating mode only

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Function	Prog. no.	Level [1)]	Standard value
Temp differential max	2316	C	---
Temp differential nominal	2317	C	15°C
Pump modulation None | Demand | Boiler setpoint |Temp differential nominal | Burner output	2320	E	Demand
Pump speed min	2322	E	10%
Pump speed max	2323	E	100%
Output nominal	2330	E	Paramount Three 30: 28 kW Paramount Three 40: 38 kW Paramount Three 60: 50 kW Paramount Three 80: 70 kW Paramount Three 95: 90 kW Paramount Three 115: 110 kW
Output basic stage	2331	E	Paramount Three 30: 6 kW Paramount Three 40: 9 kW Paramount Three 60: 12 kW Paramount Three 80: 17 kW Paramount Three 95: 20 kW Paramount Three 115: 25 kW
Output at pump speed min	2334	E	0%
Output at pump speed max	2335	E	100%
Max fan output heating operation	2441	E	Paramount Three 30: 28 kW[*)] Paramount Three 40: 38 kW[*)] Paramount Three 60: 50 kW [*)] Paramount Three 80: 70 kW [*)] Paramount Three 95: 90 kW[*)] Paramount Three 115: 110 kW[*)]

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Function	Prog. no.	Level [1)]	Standard value
Max fan output heating full charging	2442	E	Paramount Three 30: 28 kW[*)] Paramount Three 40: 38 kW[*)] Paramount Three 60: 50 kW [*)] Paramount Three 80: 70 kW [*)] Paramount Three 95: 90 kW[*)] Paramount Three 115: 110 kW[*)]
Fan output DHW max.	2444	E	Paramount Three 30: 28 kW[*)] Paramount Three 40: 38 kW[*)] Paramount Three 60: 50 kW [*)] Paramount Three 80: 70 kW [*)] Paramount Three 95: 90 kW[*)] Paramount Three 115: 110 kW[*)]
Fan shutdown heating mode Off | On	2445	E	Off
Fan shutdown delay	2446	E	3 s
Controller delay Off | Heating mode only | DHW mode only | Heating and DHW mode	2450	E	Heating mode only
Fan output controller delay	2452	E	Paramount Three 30: 10,0 kW[*)] Paramount Three 40: 14,0 kW[*)] Paramount Three 60: 21 kW [*)] Paramount Three 80: 29 kW [*)] Paramount Three 95: 36 kW[*)] Paramount Three 115: 40 kW[*)]
Controller delay duration	2453	E	40 s
Switching diff on HCs	2454	E	4°C
Switching diff off min HCs	2455	E	5°C
Switching diff off max HCs	2456	E	10 °C
Switching diff on DHW	2460	E	5°C
Switching diff off min DHW	2461	E	6°C
Switching diff off max DHW	2462	E	8°C
Delay heat request special op	2470	E	0 s

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Function	Prog. no.	Level [1)]	Standard value
Pressure switch shutdown Start prevention | Lockout position	2500	E	Start prevention
[*)] kW-settings are approximate values. Exact values can for example are determined by the gas meter.			
Cascade			
Lead strategy Late on, early off | Late on, late off | Early on, late off	3510	E	Late on, late off
Release integral source seq	3530	E	50°C*min
Reset integral source seq	3531	E	20°C*min
Restart lock	3532	E	300 s
Switch on delay	3533	E	10 min
Auto source seq ch'over	3540	E	100 h
Auto source seq exclusion None | First | Last | First and last	3541	E	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	E	Source 1
Return setpoint min	3560	E	8°C
Temp differential min	3590	E	- - -°C
Solar			
Temp diff on	3810	C	8°C
Temp diff off	3811	C	4°C
Charg temp min DHW st tank	3812	I	- - - °C
Temp diff on buffer	3813	E	- - - °C
Temp diff off buffer	3814	E	- - - °C
Charging temp min buffer	3815	E	- - - °C
Temp diff on swi pool	3816	E	- - - °C
Temp diff off swi pool	3817	E	- - - °C
Charging temp min swi pool	3818	E	- - - °C
Charging prio storage tank None | DHW storage tank | Buffer storage tank	3822	E	DHW storage tank
Charging time relative prio	3825	E	- - - min
Waiting time relative prio	3826	E	5 min
Waiting time parallel op	3827	E	- - - min
Delay secondary pump	3828	E	60 s
Collector start function	3830	E	- - -
Min run time collector pump	3831	E	20 s
Collector start function On	3832	E	07:00 (h:min)
Collector start function Off	3833	E	19:00 (h:min)
Collector start funct grad	3834	E	- - - min/°C
Collector frost protection	3840	E	- - - °C
Collector overtemp prot	3850	E	- - - °C
Evaporation heat carrier	3860	E	130°C

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Function	Prog. no.	Level [1]	Standard value
Antifreeze None | Ethylene glycol | Propylene glycol | Ethyl and propyl glycol	3880	E	Propylene glycol
Antifreeze concentration	3881	E	50%
Pump capacity	3884	E	200 l/h
Pulse valency	3887	E	10 l
Solid fuel boiler			
Locks other heat sources Off | On	4102	E	Off
Setpoint min	4110	E	65°C
Temp diff on	4130	E	8°C
Temp diff off	4131	E	4°C
Comparative temp DHW sensor B3 | DHW sensor B31 | Buffer sensor B4 | Buffer sensor B41 | Flow temp setpoint | Setpoint min	4133	E	Buffer sensor B41
Pump overrun time	4140	E	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
Charging temp max	4750	E	80°C
Recooling temperature	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 Parameter subject to the respective system hydraulics.			
Charge push forward time	5011	E	60 min
Flow setpoint boost	5020	E	18°C
Transfer boost	5021	E	10°C

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Function	Prog. no.	Level [1]	Standard value
Type of charging Recharging | Full charging | Full charging legio | Full charg 1st. time day | Full charg 1st time legio. charging	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	69°C
Recooling temperature	5055	E	80°C
Recooling collector Off | Summer | Always	5057	E	Off
El imm heater optg mode Substitute | Summer | Always	5060	E	Substitute
Electrical 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
With buffer storage tank 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	2°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	no
Min start temp diff Q33	5148	E	-3°C
Excess interm circ temp del	5151	E	30 s
Configuration			

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Function	Prog. no.	Level [1]	Standard value
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	E	DHW sensor B3
DHW controlling element Q3 No charging request | Charging pump | Diverting valve	5731	E	Charging pump
Basic pos DHW div Last request | Heating circuit | DHW	5734	E	Heating circuit
DHW separate circuit Off | On	5736	E	Off
Contact type DHW div valve Position on DHW | Position on HC	5737	E	Position on DHW
Ctrl boiler pump/DHW valve All requests | Request HC1/DHW only	5774	E	All requests
Solar controlling element Charging pump | Diverting valve	5840	E	Charging pump
External solar exchanger Commonly | DHW storage tank | Buffer storage tank	5841	E	Commonly
Combi storage tank No | Yes	5870	E	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 | Swimming pool pump 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 | Fan shutdown K38	5890	C	None
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	Collector sensor B6
Sensor input BX2 Parameters see Sensor input BX1 (prog.-no. 5930)!	5931	C	DHW sensor B31
Sensor input BX3 Parameters see Sensor input BX1 (prog.-no. 5930)!	5932	C	Buffer st tank sensor B4

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Function	Prog. no.	Level [1)]	Standard value
Function input H1 None | Optg mode change HCs+DHW | Optg mode change 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 | Release swi pool source | 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 | Preselected output 10V	5950	C	None
Contact type H1 NC | NO	5951	C	NO
Voltage value 1 H1	5953	E	0,5
Function value 1 H1	5954	E	0
Voltage value 2 H1	5955	E	10
Function value 2 H1	5956	E	1000
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 VK21 | Release swi pool source | 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	E	0
Function value 1 H4	5974	E	0
Frequency value 2 H4	5975	E	0
Function value 2 H4	5976	E	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 VK21 | Release swi pool source | 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	None
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	Heating circuit 2

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Function	Prog. no.	Level [1)]	Standard value
Function extension module 2 Parameters see extension module 1 (prog.-no. 6020)!	6021	C	Heating circuit 3
Relay output QX21 module 1	6030	C	None
Relay output QX22 module 1	6031	C	None
Relay output QX23 module 1	6032	C	None
Relay output QX21 module 2	6033	C	None
Relay output QX22 module 2	6034	C	None
Relay output QX23 module 2	6035	C	None
Relay output BX21 module 1 Parameters see Sensor input BX1 (prog.-no. 5930)!	6040	C	None
Relay input BX22 module 1 Parameters see Sensor input BX1 (prog.-no. 5930)!	6041	C	None
Relay output BX21 module 2 Parameters see Sensor input BX1 (prog.-no. 5930)!	6042	C	None
Relay input BX22 module 2 Parameters see Sensor input BX1 (prog.-no. 5930)!	6043	C	None
Function input H2 EM1 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 | Release swi pool source | 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 | 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 EM1 NC | NO	6047	C	NO
Voltage value 1 H2 EM1	6049	E	0 volt
Voltage value 1 H2 EM1	6050	E	0
Voltage value 2 H2 EM1	6051	E	10 volt
Voltage value 2 H2 EM1	6052	E	1000
Function input H2 EM2 Parameter see function input H1 (prog.-no. 5950)!	6054	C	None
Contact type H2 EM2 NC | NO	6055	C	NO
Voltage value 1 H2 EM2	6057	E	0 volt
Function value 1 H2 EM2	6058	E	0
Voltage value 2 H2 EM2	6059	E	10 volt
Function value 2 H2 EM2	6060	E	1000
PWM-output P1 None | Boiler pump Q1 | DHW pump Q3 | Heating circuit pump HC1 Q2 | Heating circuit pump HC2 Q6 | Heating circuit pump HC3 Q20	6085	E	None
Sensor type collector NTC | PT 1000	6097	E	NTC
Readjustm collector sensor	6098	E	0 °C

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Function	Prog. no.	Level [1]	Standard value
Outside temperature sensor correction	6100	E	0.0 °C
Time constant building	6110	C	10 h
Central setp compensation	6117	E	20°C
System Frost Protection Off | On	6120	E	On
Save sensors No | Yes	6200	C	No
Reset to default parameters	6205	E	
Check no. heat source 1	6212	E	
Check no. heat source 2	6213	E	
Check no storage tank	6215	E	
Check no. heating circuits	6217	E	
Software version	6220	E	
Info 1 OEM	6230	E	
Info 2 OEM	6231	E	
LPB-system			
Device address	6600	C	1
Bus power supply function Off | Automatic	6604	E	Automatic
Bus power supply state Off | On	6605	E	
Display system messages No |Yes	6610	E	Yes
Alarm delay	6612	E	- - - min
Action changeover functions Segment | System	6620	E	System
Summer changeover Locally | Centrally	6621	E	Locally
Optg mode changeover Locally | Centrally	6623	E	Centrally
Manual source lock Locally | Segment	6624	E	Locally
DHW assignment Local HCs | All HCs in segment | All HCs in system	6625	E	All HCs in system
Note OT limit ext source No |Yes	6632	E	No
Clock mode Autonomously | Slave without remote setting | Slave with remote setting | Master	6640	C	Slave with remote setting
Outside temp source	6650	E	
Fault			
Fault message	6700	Eu	
SW diagnostic code	6705	Eu	
Burn ctrl phase lockout pos	6706	Eu	

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Function	Prog. no.	Level [1)]	Standard value
Reset alarm relay No |Yes	6710	C	No
Flow temp 1 alarm	6740	E	- - - min
Flow temp 2 alarm	6741	E	- - - min
Flow temp 3 alarm	6742	E	- - - min
Boiler temp alarm	6743	E	- - - min
DHW charging alarm	6745	E	--- h
History 1 - Date / Time - Error code 1	6800	E	
SW diagnostic code 1 - Burner control phase 1	6805	E	
History 2 - Date / Time - Error code 2	6810	E	
SW diagnostic code 2 - Burner control phase 2	6815	E	
History 3 - Date / Time - Error code	6820	E	
SW diagnostic code 3 - Burner control phase 3	6825	E	
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
History 20 - Date / Time - Error code 20	6990	E	
SW diagnostic code 20 - Burner control phase 20	6995	E	
Service / special operation			
Burner hours interval	7040	E	--- h
Burn hrs since maintenance	7041	E	0 h
Burner start interval	7042	E	---
Burn starts since maint	7043	E	0
Maintenance interval	7044	E	--- months
Time since maintenance	7045	E	0 months
Fan speed ionization current	7050	E	0 rpm
Message ionization current No |Yes	7051	E	No
Chimney-sweep function Off | On	7130	Eu	Off
Manual control Off | On	7140	Eu	Off

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Function	Prog. no.	Level [1]	Standard value
Controller stop function Off | On	7143	E	Off
Controller stop setpoint	7145	E	
Telephone customer service	7170	C	---
PStick storage pos	7250	E	0
PStick Reg data set	7251	E	
PStick command No operation | Reading from stick | Writing on stick	7252	E	No operation
PStick progress	7253	E	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	E	
Input/output test			
Relay test No test | Everything off | Relay output QX1 | Relay output QX2 | Relay output QX3 | Relay output QX4 | 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	7700	C	No test
Output test P1	7713	C	
PWM-output P1	7714	C	
Outside temperature B9	7730	C	
DHW temp B3/B38	7750	C	
Boiler temp B2	7760	C	
Sensor temperature BX1	7820	C	
Sensor temperature BX2	7821	C	
Sensor temperature 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	
Voltage signal H1	7840	C	
Contact state H1 NO | NC	7841	C	
Voltage signal H2 EM1	7845	C	
Contact state H2 EM1 NO | NC	7846	C	
Voltage signal H2 EM2	7848	C	
Contact state H2 EM2 NO | NC	7849	C	
Contact state H4 NO | NC	7860	C	
Frequency H4	7862	C	

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Function	Prog. no.	Level [1)]	Standard value
Contact state H5 NO | NC	7865	C	
Contact state H6 NO | NC	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	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	
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	

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Function	Prog. no.	Level [1]	Standard value
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	E	
Boiler pump speed	8308	E	
Boiler temp	8310	C	
Boiler setpoint			
Boiler switching point	8312	C	
Control sensor Boiler sensor B2 |DHW charging sensor B36 | DHW outlet sensor B38 | Cascade sensor B10/B70	8313	E	
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	Eu	
Start counter 1st stage	8331	C	
Operating hours heating operation	8338	Eu	
Operating hours TWW	8339	Eu	
Current phase number	8390	E	
Collector pump 1	8499	C	
Solar ctrl elem buffer	8501	E	
Solar ctrl elem swi pool	8502	E	
Collector temp 1	8510	C	
Collector temp 1 max	8511	C	
Collector temp 1 min	8512	C	
dt collector 1/DHW	8513	C	

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Function	Prog. no.	Level [1)]	Standard value
dt collector 1/buffer	8514	C	
dt collector 1/swimming pool	8515	C	
Solar flow temp	8519	E	
Solar return temp	8520	E	
24-hour yield solar energy	8526	Eu	
Total yield solar energy	8527	Eu	
Operating hours solar gains	8530	Eu	
Hours run collect overtemp	8531	E	
Hours run Collector pump	8532	Eu	
Solid fuel boiler temp	8560	C	
Hours run solid fuel boiler	8570	C	
Diagnostics consumers			
Outside temperature	8700	Eu	
Outside temperature minimum	8701	Eu	
Outside temperature maximum	8702	Eu	
Outside temp attenuated	8703	E	
Outside temp composite	8704	E	
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 temperature 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 temperature 2	8770	C	
Room setpoint 2	8771	C	
Flow temperature 2	8773	C	
Flow temp setpoint 2	8774	C	
Room thermostat 2 No demand | Demand	8779	C	

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Function	Prog. no.	Level [1)]	Standard value
Heating circuit pump 3 Off | On	8790	C	
Heating circuit pump 3 open Off | On	8791	C	
Heating circuit pump 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 temperature 3	8804	C	
Room thermostat 3 No demand | Demand	8809	C	
DHW pump Off | On	8820	C	
Speed DHW pump	8825	E	
Speed DHW interm circ pump	8826	E	
DHW temp 1	8830	C	
DHW temp setpoint	8831	C	
DHW temp-actual value bottom (B31)	8832	C	
DHW circulation temp	8835	E	
DHW charging temp	8836	E	
Flow temp setp VK1	8875	C	
Flow temp setp VK2	8885	C	
Flow temp setp VK3	8895	C	
Swimming pool temp	8900	C	
Swimming pool setpoint	8901	C	
Primary controller temp	8930	E	
Primary controller setpoint	8931	E	
Common flow temperature-act value	8950	E	
Common flow temperature-setpoint	8951	E	
Common return temp	8952	E	
Common output setpoint	8962	E	
Buffer temp-act value high (B4)	8980	C	
Buffer temp-setpoint	8981	C	
Buffer temp-act value low (B41)	8982	C	
Buffer temp-act value middle (B42)	8983	C	
Relay output QX1 Off | On	9031	C	
Relay output QX2 Off | On	9032	C	
Relay output QX3 Off | On	9033	C	

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Function	Prog. no.	Level [1)]	Standard value
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	
Burner control			
Pre-purge time	9500	E	15 s
Nominal output pre-purging	9504	E	Paramount 30: 14,5 kW*) Paramount 40: 19,5 kW*) Paramount 60: 32,0 kW *) Paramount 80: 44,6 kW*) Paramount 95: 52,0 kW*) Paramount 115: 57,0 kW*)
Nominal output ignition load	9512	E	Paramount 30: 14,5 kW*) Paramount 40: 19,5 kW*) Paramount 60: 32,0 kW Paramount 80: 44,6 kW*) Paramount 95: 52,0 kW*) Paramount 115: 57,0 kW*)
Nominal output Partial load	9524	E	Paramount 30: 5,6 kW*) Paramount 40: 9,0 kW*) Paramount 60: 12,0 kW Paramount 80: 17,0 kW*) Paramount 95: 20,0 kW*) Paramount 115: 25,0 kW*)
Nominal output full load	9529	E	Paramount 30: 28,0 kW*) Paramount 40: 38,0 kW*) Paramount 60: 50,0 kW Paramount 80: 77,0 kW*) Paramount 95: 80,0 kW*) Paramount 115: 110,0 kW*)
Post-purge time	9540	E	10 s
Fan output/speed increase	9626	E	Paramount 30: 214.3 Paramount 40: 150.0 Paramount 60: 106.6 Paramount 80: 76.1 Paramount 95: 65.0 Paramount 115: 60.0

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Function	Prog. no.	Level [1]	Standard value
Fan output/speed Y-section	9627	E	Paramount 30: 100.0 Paramount 40: 100.0 Paramount 60: 70.0 Paramount 80: 101.0 Paramount 95: 150.0 Paramount 115: 100.0
[*] kW-settings are approximate values. Exact values can for example are determined by the gas meter.			
Info Option The display of the information values depends on the operation status!			
Fault message			
Servicing message			
Setpoint manual control			
Controller stop setpoint			
Boiler temperature			
State heating circuit 1			
State heating circuit 2			
State heating circuit 3			
State domestic hot water			
State boiler			
State solar			
State solid fuel boiler			
State buffer			
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

In the following the individual parameters of the Paramount will be described.

8.5 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.

Summer time (5 - 6)

Under prog. no. 5 the start of summertime is set. under prog. no. 6 the end of summertime is set. The time changing will be carried out on the Sunday following the set date.

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8.6 Operator section

Language
(20)

The language of the menu guidance can be modified under prog. no. 20.

Info
(22)

Temporarily: 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 DHW 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".

Units
(29)

Prog. no. 29 enables you to select SI units (°C, bar) or US units (°F, PSI).

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 unit*:
  The individual programming of the room unit will be written into the control.

This parameter is only visible if a suitable standard setting is available in the programming unit.

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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.

Room controller 1 assignment
(42)

If setting **Room controller 1** (prog. no. 40) was selected at the room controller, determine the heating circuits to which room controller 1 is assigned under prog. no. 42.

Operation HC2/HC3/P
(44, 46)

When selecting **room unit 1** or **operator unit** (prog.no. 40), it must be set under prog. no. 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.

Room temperature Unit 1
(47)

Under prog. no. 47 you can select the assignment of room controller 1 to the heating circuits.
Heating circuit 1 only: The room temperature is sent exclusively to heating circuit 1.
For all assigned heating circuits: The room temperature is sent to the heating circuits assigned under prog. no. 42.

Occupancy button device 1
(48)

You can select the assignment of the occupancy button under prog. no. 48.
None: Pressing the presence key has no effect on the heating circuits.
Heating circuit 1 only: The presence key only affects heating circuit 1.
For all assigned HCs: The presence key affects the heating circuits assigned under prog. no. 42.

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.

8.7 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.

8.8 Time programs

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).

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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 weekday or day blocks. The day blocks (Mo-Su, Mo-Fr and Sa-Su) assist the adjustment. The set times are only copied to the individual weekdays and can be changed in the individual day settings, as required.
The times of the individual weekdays always determine the heating program.

Note: If a time in a group of days is changed, all 3 start/stop phases will be copied to the day group automatically.
To call up groups of days (Mo-Su, Mo-Fr or Sa-Su), turn the rotary selector anticlockwise; to call up individual days (Mo, Tu, We, Th, Fr, Sa, Su), turn the rotary selector clockwise.

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“.

Copy
(515, 535, 555, 575, 615)

The time switching program for one day can be copied and assigned to another or several other days.

Note: Day blocks cannot be copied.

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

Setting of the default values given in the setting table

8.9 Holiday programs

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

Operatin level
(648, 658, 668)

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

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

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8.10 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.

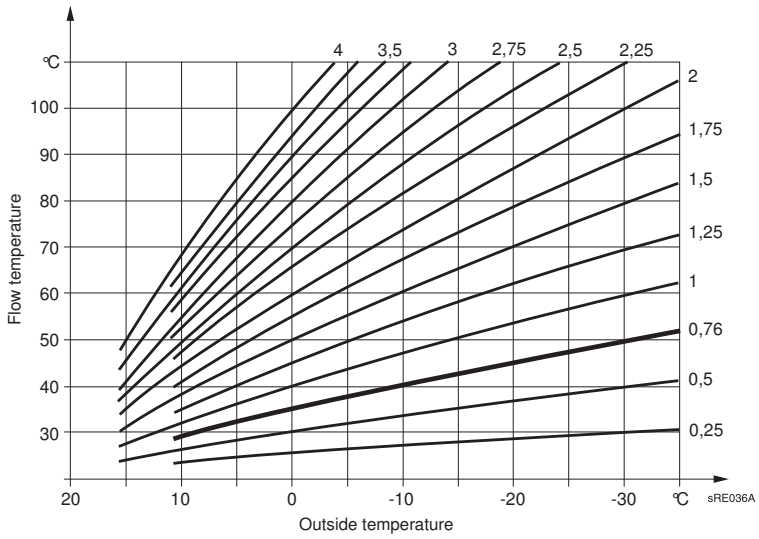
Heating curve slope (720, 1020, 1320)

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

Enter lowest calculated outside temperature according to climate zone (e.g. -1°C in London) into the diagram (see *Fig. 13*) (e.g. vertical line at -1°C). Enter the maximum flow temperature of the heating circuit, which is reached by calculating with -1°C outside temperature at 20°C room temperature e.g., horizontal line at 82°C). The intersecting point gives the value for the heating curve slope.

Fig. 13: 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.

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Heating curve adaptation (726, 1026, 1326)

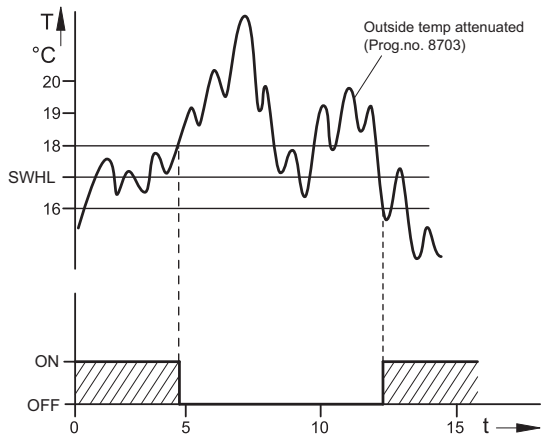
Automatic adaptation of the heating nominal line to the actual circumstances, due to which a correction of the heating nominal line gradient becomes obsolete.

For automatic adaptation of the heating curve a room sensor must be connected. The value for the room influence (see prog.no. 750, 1050, 1350) must be 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. 14: 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.

This function is not activated in operation mode **continuous operation comfort** ☼ or reduced ☾ .

Flow temp setpoint limitations min (740, 1040, 1340) max (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.
If there is a direct circuit in parallel with other heating demands, it may result in an elevated temperature in the direct circuit.

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

For room thermostat mode the flow setpoint set here applies.
In the setting *"--°C"*, the value calculated via the heating curve is used as the set flow temperature.

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Delay heat request
(746, 1046, 1346)

The boiler heat request is forwarded to the burner delayed by the time set here. In this way a slowly opening mixer can already start up before the burner goes into operation.

Note: If, uner Prog. no. 1630 the option *Absolute* is selected, the value "0" must be set under Prog.no. 746, 1046 and 1346. For special functions (e.g. chimney-sweep function) the delay does not have an effect (see Prog. no. 2470).

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 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 of the point is located 0.25°C below 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. This function only applies to pumped heating circuits.

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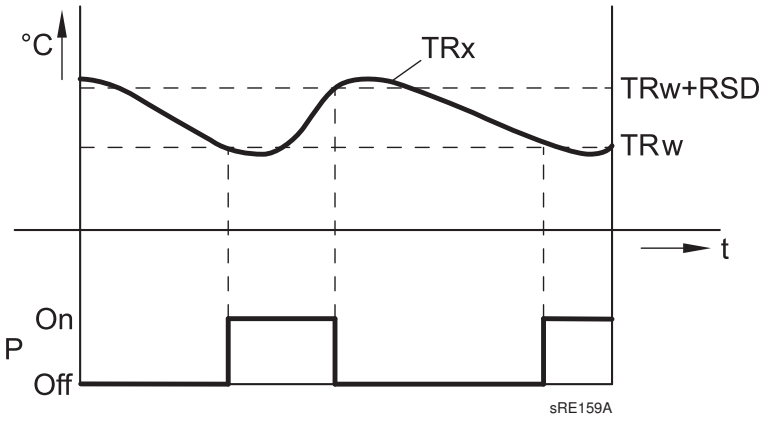
Fig. 15: Room temp limitation

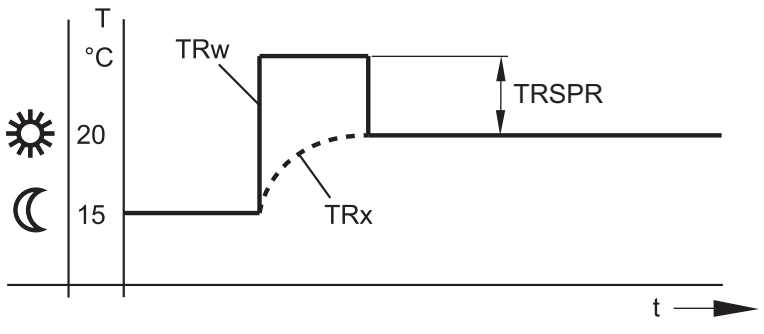


TRx	Room temperature actual value
TRw	Room temperature setpoint
SDR	Room switching difference
P	Pump
t	Time

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 [2)] 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. 16: Boost heating



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

2) accessories

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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 is above the reduced setpoint or frost protection setpoint. If the room temperature is above 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:							
Outside temperature mixed:	**Time constant building (Configuration, prog.no. 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 mixed:	**Time constant building (Configuration, prog.no. 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 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.

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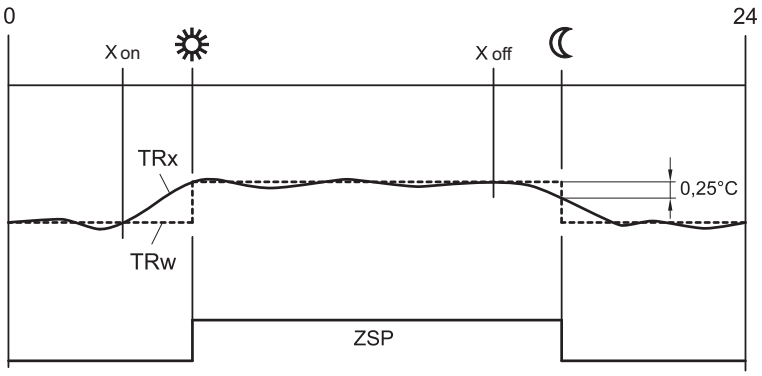
Fig. 17: Optimum start and stop control

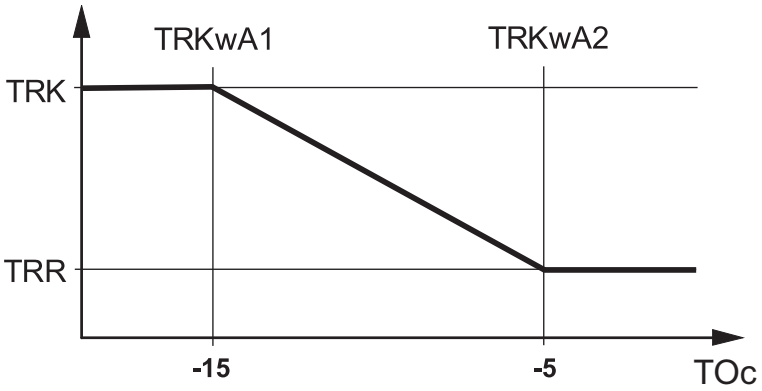


Xon	Start time set forward
Xoff	Stop time set forward
ZSP	Time switching program
TRw	Room temperature setpoint
TRx	Room temperature actual value

Reduced setp increase start (800, 1100, 1400)
Red setp 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 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. 18: Reduced setpoint increase



TRwA1	Red setpoint increase start
TRwA2	Red setpoint increase end
TRK	Comfort nominal value
TRR	Room temperature reduced setpoint
TOc	Outside temperature composite

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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.

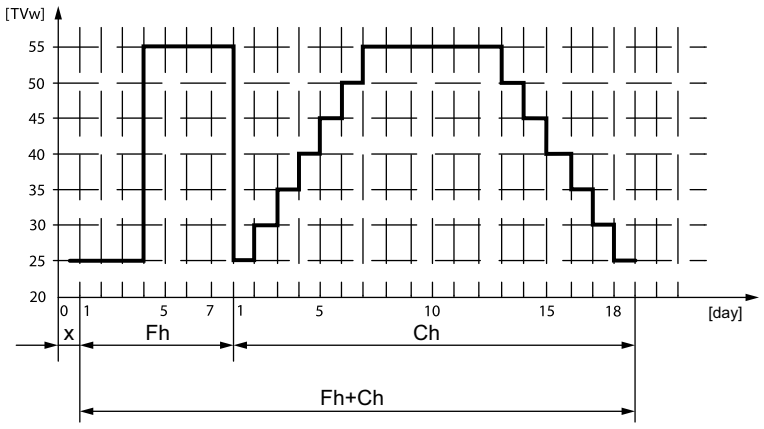
Actuator running time (834, 941, 1134)

For mixing circuits, a kick-start of the mixer drive is carried out after a pump kick-start (Pump is OFF). 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, 1450)

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

Fig. 19: Temperature profile during floor curing function



X Start day
Fh Functional heating
Ch Curing heating

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

A correct function is only possible with a correctly installed heating system (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).

Floor curing setp current
(855, 1155, 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
(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.

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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)	In case of external changeover of the operating mode per Hx it can be selected, if in automatic mode changeover will be carried out from nominal comfort value to the frost protection value or the reduced nominal value.

8.11 DHW

Nominal setpoint (1610)	Setting the DHW nominal setpoint.
Reduced setpoint (1612)	The DHW reduced setpoint is set under prog. no. 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. - Die Vorverlegung beträgt 1 Stunde (siehe *Fig. 20*).

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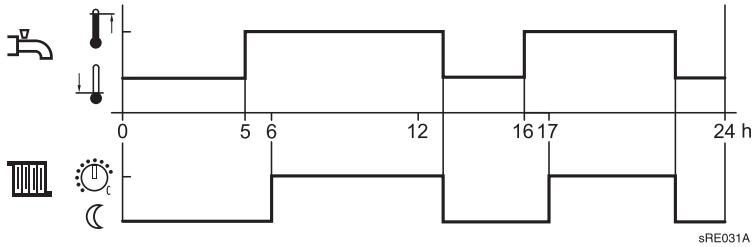
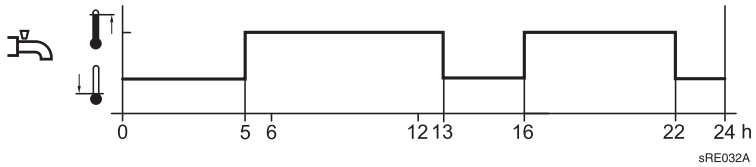
Fig. 20: Release depending on the time switching programmes of the heating circuits (example#)



- *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. 21*).

Fig. 21: 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.
- *Shifting priority*: Should the boiler capacity not be sufficient to heat up DHW, mixer and pumped heating circuits will be restricted.
- *None priority*: Charging DHW is carried out in parallel with heating operation.
- *MC shifting, PC absolute*: Pumped heating circuits are blocked until the 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.
- *Periodically*: Legionella function is repeated periodically, depending on the set value (prog. no. 1641).
- *Fixed weekday*: 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).

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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 funct 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 program 3* The DHW circulating pump is enabled subject to time program 3 (see prog. no. 540 to 556).
- *DHW release*: The DHW circulating pump will be enabled when DHW heating has been enabled.
- *Time program 4* The DHW circulating pump will be enabled subject to time program 4.

Circulating pump cycling (1661)

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

Circulation setpoint (1663)

In case of undercutting the circulation setpoint (Standard value: 45°C), the circulation pump will be switched on for 10 minutes within the release time. When reaching the circulation setpoint, but at the earliest 10 minutes later, the pump is switched off. For this function, the connection of a sensor in the circulation return is necessary (inputs BX, program no. 5930-5933).

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.

8.12 Consumer circuits/ Swimming pool circuit

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.

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

- *No*: the consumer circuit will be fed without primary control unit/feed pump
- *Yes*: the consumer circuit will be charged from the primary controller on/with the system pump.

8.13 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 which priority the swimming pool will be solar heated. The priority for the DHW and charging buffer is set under Prog. no. 3822.
- *Priority 1:* the swimming pool is heated, **before** the buffer is charged.
- *Priority 2:* the swimming pool is heated, **while** the buffer is charged.
- *Priority 3:* the swimming pool is heated, **after** the buffer is charged.

Swimming pool temp Maximum
(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.

8.14 Primary contr/system pump

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

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

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

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8.15 Boiler

Release below outside temp (2203)

The boiler is only put into operation if the mixed outside temperature is below the threshold set here. The switching difference is 0.5°C.

Full charging buffer (2208)

Under Prog. no. 4810 (full charge charging buffer) is selected, whether and when the charging buffer is fully charged despite automatic heat generation lock. Under Prog.no. 2203 it is set, whether the boiler takes part in the full charge or not.
- *Off:* the boiler does **not** take part in the full charging of the charging buffer.
- *On:* the boiler takes part in the full charging of the charging buffer.

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 overrun time (2250)
Pump overr time after DHW (2253)

The delay times of the pumps are controlled according to heating mode or DHW mode.

Boiler pump at heat generation lock (2301)

Stop of boiler pump in case of activated manual heat generation lock (e.g. via H1).
- *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.

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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.

Pump modulation
(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 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 value *"0%"* corresponds to the minimum pump speed.

Pump speed max
(2323)

The pump speed and with it, 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 boiler capacity can be limited in heating mode.

Note: These are calculated values. The actual output must be calculated using a gas meter, for example.

Max fan output heating full charging
(2442)

With this parameter the maximum boiler capacity can be limited in full charging mode at layer storage.

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Note: These are calculated values. The actual output must be calculated using a gas meter, for example.

Fan output DHW max. (2444)

With this parameter the maximum boiler capacity for the DHW mode can be restricted.

Note: These are calculated values. The actual output must be calculated using a gas meter, for example.

Fan shutdown 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.

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.

Controller delay fan output (2452)

Boiler capacity which is used during the duration of the control delay.

Note: The calculated value see prog-no. 2444.

Controller delay duration (2453)

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

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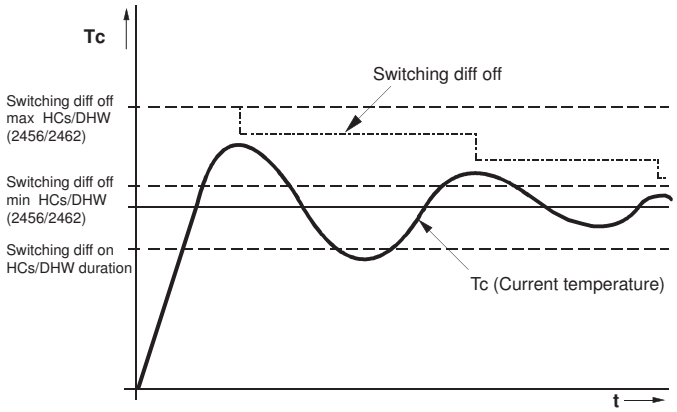
Switching diff on HCs (2454)
Switching diff off min HCs (2455)
Switching diff off max HCs (2456)
Switching diff on DHW (2460)
Switching diff off min DHW (2461)
Switching diff off max DHW (2462)

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



Delay heat request special op (2470)

The heat request during special operation (chimney-sweep function, controller stop, manual operation) is sent to the burner delayed by the time set here. In this way slowly opening mixers can already start up before the burner goes into operation. Thus a boiler temperature that is too high can be prevented.

Pressure switch shutdown (2500)

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 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.

8.16 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.

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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.
The operating hours transfer from the generator to the cascade master are decisive for calculating the hours run.

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 generator defined as the leading generator is always put into operation first, and switched off last. The other generators 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.

8.17 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.

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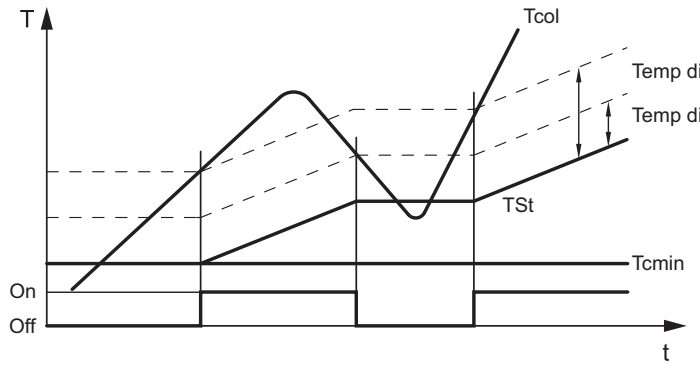
Fig. 23: charging control /schematically)

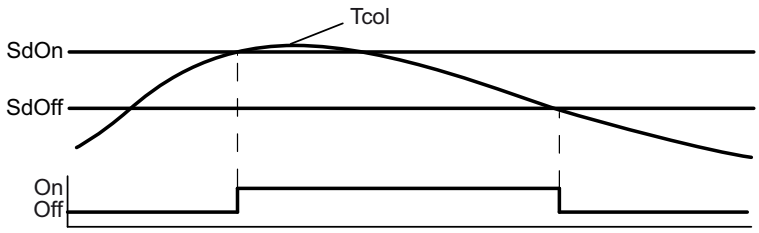


ON / OFF	Collector pump
Tkol	Collector temp
TLmin	Charging temp min buffer / swimming pool
TSp	Storage temperature

Charg temp min DHW st tank (3812)

In addition to the temperature difference, reaching a certain collector temperature is necessary for the storage charging process.

Fig. 24: Charging controller (dT)



Tcol	Collector temperature
On/Off	Charging ON / OFF
SdON	Temp diff ON
SdOFF	Temp diff OFF

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

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 of the buffer.
In addition to the temperature difference, reaching a certain minimum collector temperature is necessary for the buffer storage charging process.

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.

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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 (Tab. 1). If all setpoints are reached, the setpoint of the next level is approached.
- *Drinking water storage tank* : the drinking water storage tank is loaded during the solar charging in each level (A, B, or C) according to priority. First afterwards are more consumers loaded in the same level. If all the setpoints are reached, the setpoints of the next level are approached. Again the loading of the drinking water storage tank has priority.
- *Buffer storage tank* : the buffer storage tank is loaded during the solar charging in each level (A, B, or C) according to priority. First afterwards are more consumers loaded in the same level. If all the setpoints are reached, the setpoints of the next level are approached. Again the loading of the buffer water storage tank has priority.

Tab. 10: Storage tank setpoints

Level	**DHW-storage**	**Buffer storage** tank	**Swimming pool** [1)]
A	Nominal value (Prog.no. 1610)	Buffer setpoint (drag-pointer)	Setpoint solar heating (Prog.no. 2055)
B	Charging temp max (Prog.no. 5050)	Charging temp max (Prog.no. 4750)	Setpoint solar heating (Prog.no. 2055)
C	Storage tank temp max (Prog.no. 5051)	Storage tank temp max (Prog.no. 4751)	Swimming pool temp max (Prog.no. 2070)

[1)] With switched on charging priority of the swimming pool (prog. no. 2065), the charging of the swimming pool has priority over the charging of the storage tank

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 is 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.

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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 Hx inlet. The Hx inlet must be configured to pulse count for this.

8.18 Solid fuel boiler

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)	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.

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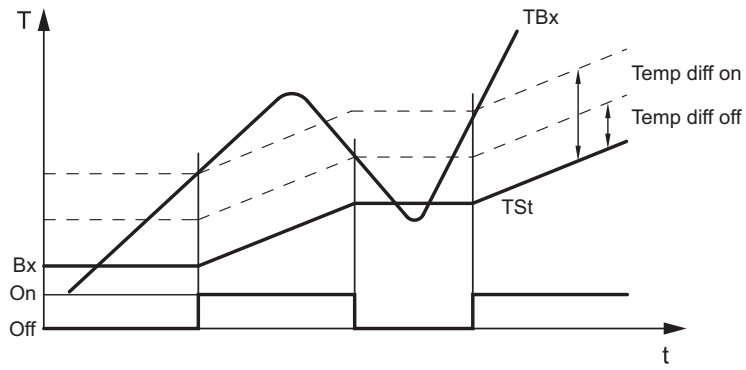
Temp diff ON/OFF (4130, 4131)
Comparative temp (44133)

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



TKx	Boiler temperature
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
Buffer 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)

Setting pump after-run time.

8.19 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.

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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 temp (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.

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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)

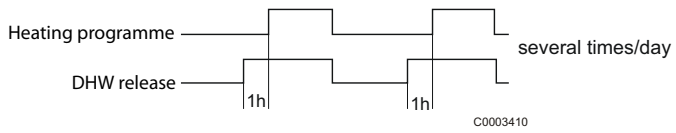
With B4 For the full charging function the buffer storage tank sensor B4 is considered.
With B42/B41: For the full charging function the buffer storage tank sensor B42, if not available buffer storage tank sensor B41, is considered.

8.20 DHW-storage

Charge push forward time (5011)

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.

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Type of charging
(5022)

Charging a layer storage (if exists):
- *Recharging*: The cylinder is only reheated at every DHW demand.
- *Full charging*: The cylinder is fully heated at every DHW demand.
- *Full charging legio*: The cylinder is fully heated if the pasteurisation function is enabled; otherwise it is only reheated.
- *Full charg 1st time day*: During the first charging of the day, the cylinder is fully heated; after this, it is reheated.
- *Full charg 1st time legio*: The cylinder is fully heated during the first charging of the day and if the pasteurisation function is enabled; otherwise, it is reheated

Explanations:
- Full charging: The stratification cylinder is fully heated. The heat demand is triggered by the top cylinder sensor TWF (B3), and ended by sensors TWF and TLF (B36) or TWF2 (B31). If only one B3 is installed, reheating takes place automatically.
- Recharging: The stratification cylinder is reheated; i.e. only the area up to the cylinder sensor TWF (B3) is heated. The heat demand is triggered and ended by the top cylinder sensor TWF (B3).

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 protection
(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.
Automatically: 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.

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Recooling temp
(5055)

Setting the temperature for recooling the DHW-storage.

Recooling collector
(5057)

Recooling of the overheated collector through giving off of the energie 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.

El 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 program 4/DHW*: Release of the electric insert via the time switching programme 4 of the local controller.

El inmmersion heater 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.

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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.

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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.

8.21 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.

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.

Basic pos DHW div 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.

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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“.

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/QX2
(5890/5891)

- *None*: Relay outputs deactivated.

- *Cons circuit pump VK1*: Connection of a pump at the input Q15/18 for an additional consumer, which is requested via an Hx-input.
- *Boiler pump Q1:* the connected pump is used for recirculating boiler water.
- *System pump Q14:* connection of a feed pump.
- *Heat gen shut-off valve Y4:* Connection of a changeover valve for hydraulic decoupling the heat generator from the rest of the heating system.
- *Time program 5 K13:* the relay will be controlled according to the settings of time program 5.
- *Cascade pump Q25*: common boiler pump for all boilers in a cascade.
- *DHW mixing pump Q35*: separate pump for cylinder content circulation whilst pasteurisation is active.
- *Heat request K27*: output K27 will be activated as soon as a heat demand exists in the system.

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- *Heating circuit pump HC1 /HC2*: The relay is used for actuating the heating circuit pump Q2/Q6.
- *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.
- *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 minimise the total energy consumption of the system.

Sensor inputs BX1/BX2/BX3 (5930 bis 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.
- *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 (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*: 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.

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- *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.

Note: The quick decrease should be switched off for the corresponding heating circuits.

- *DHW thermostat*: Connection of the DHW thermostat.
- *Pulse count*: By querying the input the low frequency pulse, e.g. for flow measurement is recorded.
- *Feedback flue gas damper*: Feedback 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 (only applies to H1).
- *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 (only applies to H1).
- *Flow measurement*: Here a flow sensor can be connected which indicates the flow volume via a frequency (only applies to H4).

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 1/2 H1 (5953, 5955)
Function value 1/2 H1 (5954, 5956)

The linear sensor curve is defined over two fixed points. The setting is made with two parameter pairs for *Function value* and *Voltage value* (F1 / U1 and F2 / U2). The function value is specified to a factor of 10, i.e. if you require 100 °C, you should select "1000".

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).

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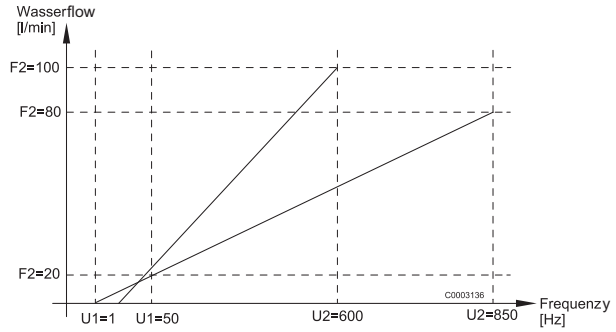
Fig. 27: Example for two different sensor curves



Function extension module 1/2
(6020/6021)

Determination of the functions, which will be controlled via the extension modules 1 and 2.

- *Multifunctional*: For possible functions which can be assigned to the multifunctional inputs/outputs, see prog. no. 6030 to 6055.
- *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.

Sensor input BX21/BX22
(6040 - 6043)

Sensor inputs for the modules 1 and 2.
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 H2 EM1/2
(6046, 6054)

Explanations see prog.-no. 5950.

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

Explanations see prog.-no. 5951.

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

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

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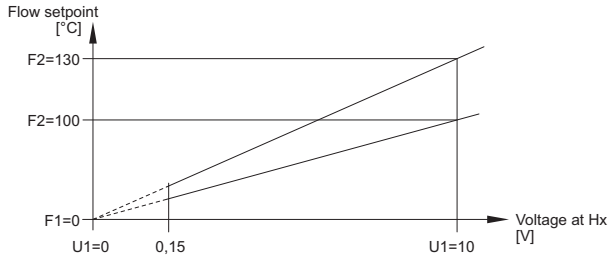
Fig. 28: Example for heat demand 10 V and cooling demand 10 V



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.
- *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.
possible values (see also *Quick setback* prog.-no. 780, ...):
- 40 for buildings with thick walls or outer insulation.
- 20 For buildings of normal building design.
- 10 For buildings of light building design.

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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.

Frost protection plant (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.

Reset to default parameters (6205)

The factory settings of the control unit will be written to the control unit.

Caution! The control parameters will be overwritten. The factory settings are stored in the control unit.

- Activation of the prog. no. 6205:
  The control will be reset to the **factory settings**.

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 listed in *Tab. 11 (Page 112)*

Tab. 11: 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 B=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

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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. 12: 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

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Tab. 13: 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.

8.22 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
(6620)

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.

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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.

8.23 Fault

Fault message (6700)

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

SW diagnostic 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.

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8.24 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.

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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 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 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.

8.25 Input/output test

Input/output tests (7700 - 7872)	Tests for checking the connected components for function.

8.26 State

State (8000 bis 8011)	With this function the state of the selected system can be requested.

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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

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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

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

End user (Eu)	**Commissioning, Engineer (menu *state*)**
SLT has tripped	SLT has tripped
Fault	Fault
Limitter has tripped	Limitter 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

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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

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

End user (Eu)	Commissioning, Engineer (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
In operation for HC	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 (Eu)	Commissioning, Engineer (menu *state*)
Fault position	Fault position
Start prevention	Start prevention
In operation	In operation
Commissioning	Safety time Prepurge Commissioning
	Postpurge Shutdown Home mode
Standby	Standby

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

End user (Eu)	Commissioning, Engineer (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 Heated, Setpoint source
Heating mode	Heating mode solar off Heating mode source off
Cold	Cold

8.27 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.

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8.28 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.

Note: If you change this value, please note that prog. no. 2452 is always set higher!

Nominal output Full load (9529)

Nominal output fan speed under boiler in HF

Postpurge time (9540)

After-venting time.

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

Fan output/speed slope (9626)
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

8.29 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*).

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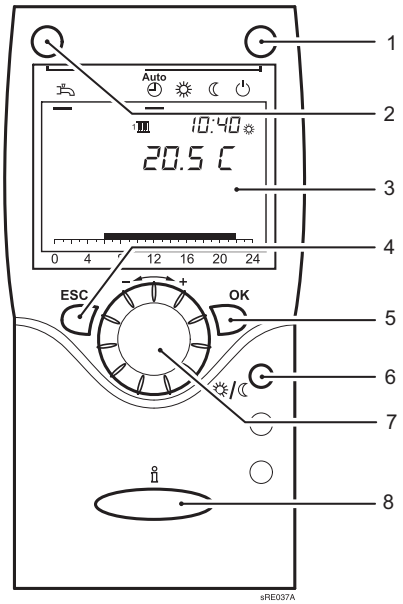
9. General

9.1 Room device RGT

Remote setting of all adjustable control functions of the basic device is possible when using the room device RGT [3)].

Fig. 29: Operating interface of the room devices RGT



1 Operating mode key, heating operation
2 Operating mode key DHW operation
3 Display
4 ESC key (cancel)
5 OK key (acknowledgement)
6 Occupancy button
7 Control knob
8 Information key

9.2 Occupancy button

Manual switching over between heating operation at comfort nominal value and heating operation at reduced nominal value is possible with the presence button< irrespective of the set time programmes. The value switched over to stays active until the next modification by the time programme.

3) accessories

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10. Maintenance

According to EU Directive 2002/91/EC (Energy Performance of Buildings), Article 8, boilers with a rated output from 20 to 100 kW should be regularly inspected.
In heating and air conditioning systems, a regular inspection and maintenance as required by qualified personnel contribute to correct operation according to the product specification, and therefore to ensuring high efficiency and low environmental pollution in the long term.

Risk of electric shock!Disconnect the boiler from the mains!
Before removing parts of the cover, the boiler has to be de-energised.
Work under voltage (removed cover) must only be carried out by an electrician!

Caution: Only the heating contractor should clean the burner.
Cleaning of heating surfaces and burner should be carried out by approved heating specialist. Before beginning the work, the gas shut-off device and the shut off valves of the hot water should be closed.

10.1 Inspection and need dependent service

Note:
It is recommended to carry out maintenance of the Paramount 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 Paramount 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*)

¡Atención! 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.
- 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.

10.2 Replace quick-de-aerator

A defective quick-de-aerator must only be replaced with an original spare part; this guarantees an optimum de-aering!

Caution! Drain off boiler water!
The boiler water has to be drained before disassembly of the quick-de-aerator, as otherwise water will leak out!

10.3 Siphon for condensate

The condensate siphon should be cleaned every one or two years. To do this loosen the upper screw connection on the siphon and pull the siphon away downwards. Remove the siphon completely from the gas-condensing boiler with hose from the boiler, dismantle and rinse thoroughly with clean water. Re-assemble the siphon in reverse order.

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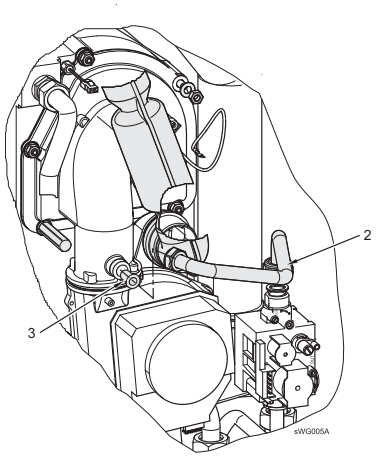
Note: At the same time, the exhaust gas collecting tray should be checked for soiling and if needed should be cleaned (rinsed).

10.4 Removing gas burner

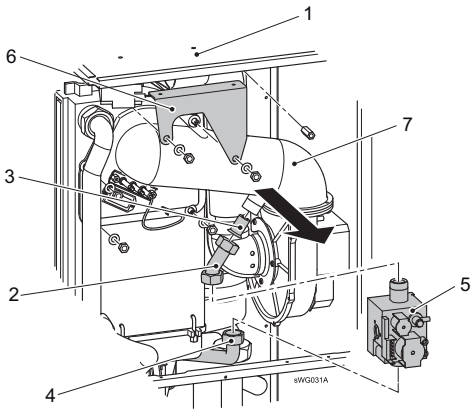
Remove the gas burner before cleaning the heating surfaces.

Fig. 30: Removing gas burner

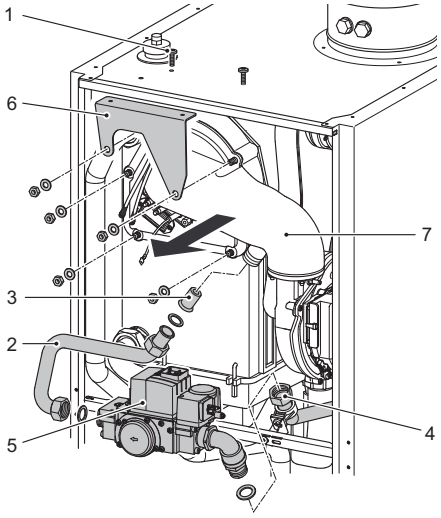
Paramount three 30/40



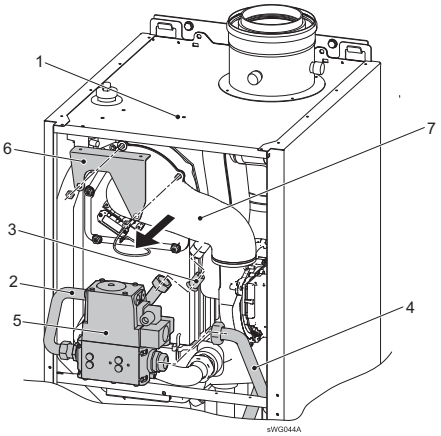
Paramount three 60



Paramount three 70



Paramount three 95/115



Removing gas burner (*Fig. 30*)

1. Disconnect the electrical connection cables to the fan at the coupler
2. Pull off air hose from the fan
3. Pull the connector from the electrodes
4. Undo fixing screw (**1**) in the inlet silencer at the top of the Paramount

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5. Loosen the screw connections of the gas connection pipe at the mixing channel and the gas valve
6. Remove the gas connection pipe (**2**) and the gas jet (**3**)
7. Loosen the gas connection pipe at the gas valve (**4**) and remove gas valve (**5**)
8. Loosen the 5 fastening screws at the mixing channel/heat exchanger
9. Remove (**6**) bracket
10. Remove intake muffler
11. Pull out the burner together with mixing channel and fan to the front (**7**)
12. Clean burner pipe with soft brush

Caution: Use new seals!
When re-fitting, new gaskets should be used, particularly for the the gas connecting pipe.

10.5 Protection against contact

Danger of electric shock! To ensure shock-proof protection, all parts of the device to be screwed on, have to be screwed on correctly; especially the cover parts!

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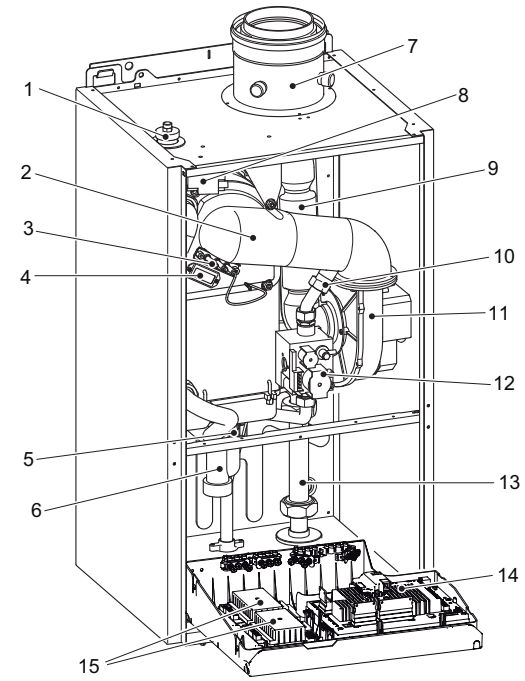
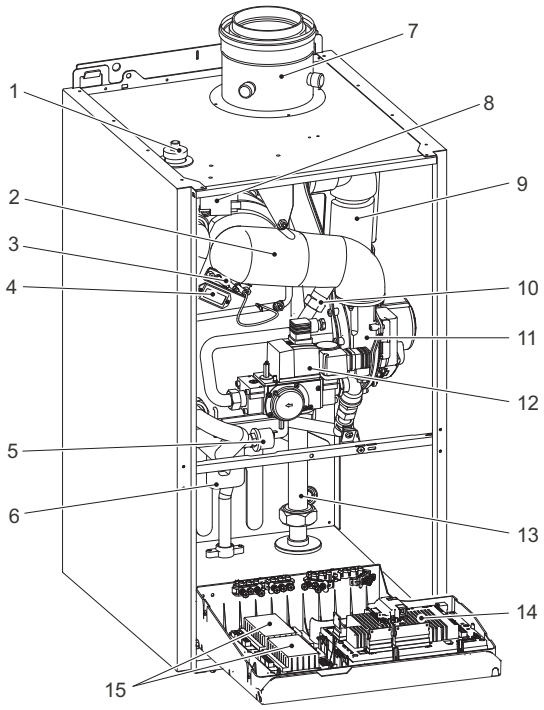
10.6 Boiler view Paramount

Fig. 31: Boiler views Paramount (depicted without front wall and control cover)

Paramount three 30-60



Paramount three 80



Legend

1 Auto-de-aerator
2 Mixing channel
3 Ignition and ionisation electrode
4 Viewing glass
5 Pressure controller
6 Siphon
7 Exhaust gas adapter with test openings
8 Ignition transformer (under the lid)
9 Intake muffler
10 Gas jet
11 Fan
12 Gas valve
13 Pump replacement pipe
14 Control LMS
15 EWM *)

*) Accessories

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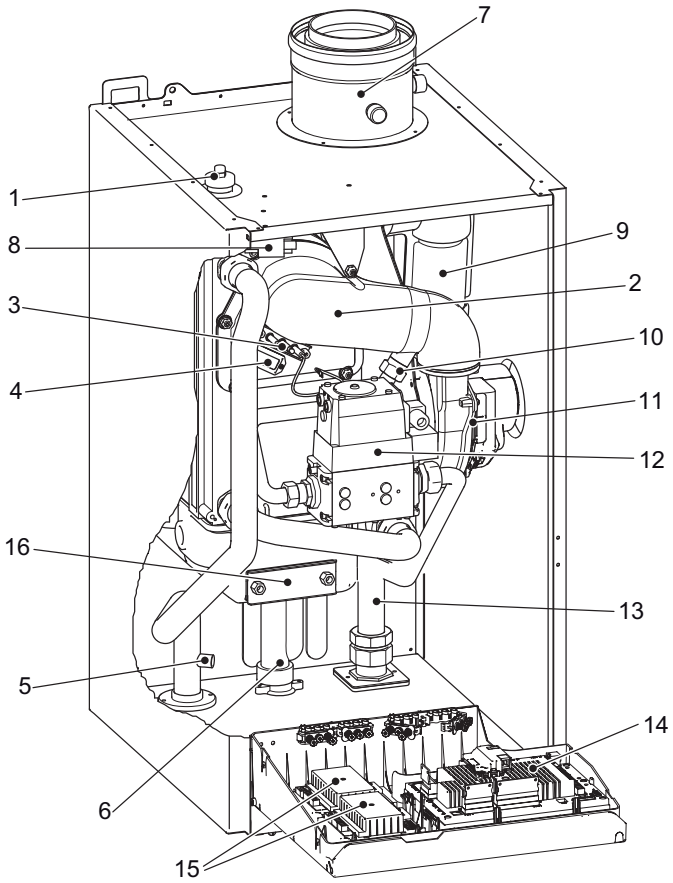
Fig. 32: Boiler views Paramount (depicted without front wall and control cover)

Paramount three 95/115



Legend

1 Auto-de-aerator
2 Mixing channel
3 Ignition and ionisation electrode
4 Viewing glass
5 Pressure controller
6 Siphon
7 Exhaust gas adapter with test openings
8 Ignition transformer (under the lid)
9 Intake muffler
10 Gas jet
11 Fan
12 Gas valve
13 Pump replacement pipe
14 Control LMS
15 EWM *)
16 cleaning cover

*) Accessories

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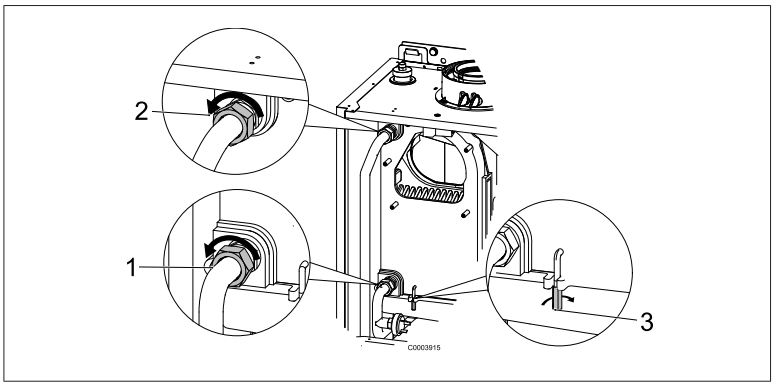
10.7 Disassembling heat exchanger

The following work has to be carried out, if the heat exchanger has to be fully disassembled:

Note:
The gas burner must be removed (see section *Removing the gas burner*).

1. Close shut-off valves of flow and return.
2. Drain off boiler water
3. Loosen plugs of boiler sensors (flow and return).
4. 

Loosen screw connectors of flow and return (**1** and **2**) at the heat exchanger (flat seal)
5. Remove auto-de-aerator.
6. Pull off cable from water pressure monitor.
7. Undo fitting at the pump replacement pipe and remove the pipe
8. Paramount three 60: Remove return pipe.
9. Paramount three 60: Pull off plug from gas valve, loosen and disassemble gas valve.
10. Paramount three 95/115: Remove the connection line between the heat exchanger and the collecting tray
11. Paramount three 95/115: Push the slide coupling on the flue pipe upwards
12. Loosen nuts at collecting tray, remove yoke and disassemble collecting tray.
13. Loosen nuts of holding sheet at the rear wall, lift heat exchanger from the rear wall and take out.
14. For cleaning the heat exchanger, rinse with soft water jet (without additives).

10.8 At the end of the maintenance work

- After finishing the cleaning work, re-install heat exchanger and burner.
- Check the nominal heat load and exhaust gas values.

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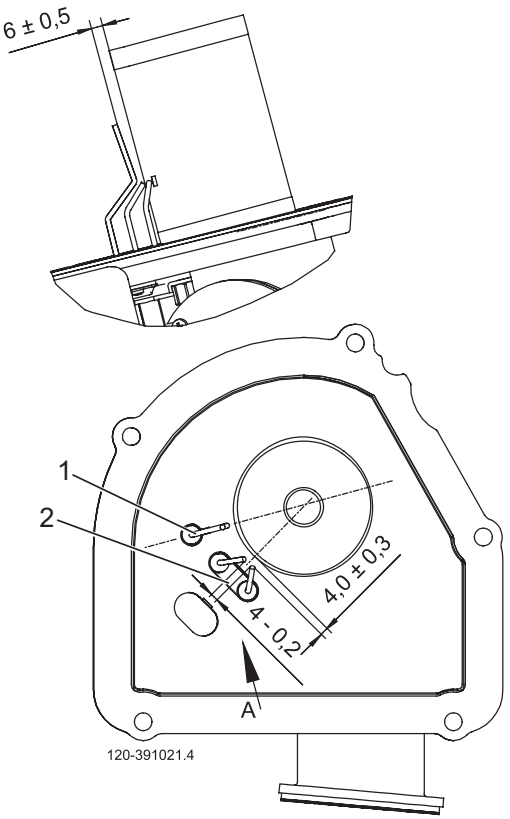
10.9 Check Electrodes

Fig. 33: Electrodes



Ionisation electrode (1)
The ionisation electrode must always be in contact with the flame.
- switching threshold at 1 µA DC
- max. achievable current 10 µA DC

The distance from the ionisation electrode to the blast tube must be maintained in accordance with *Fig. 33* . When replacing the ionisation electrode, check its distance to the burner and correct if required.

Risk of electric shock! Danger of life by high tension!
Please note Do not touch plug contacts during the ignition process!
For measurement of the ionisation current, pull plug from the gas-firing automaton and connect ammeter between plug and electrode.

Ignition electrodes (2)
To avoid an influence of the ionisation current by the ignition
- The ignition electrode must only immerse into the edge of the flame.
- The ignition spark must not spark-over to the ionisation electrode.

Installation position and electrode clearance has to be maintained according to *Fig. 33*

10.10 Fault switch-off

Safety switch-off in case of flame failure during the operation.

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After every safety switch-off a new ignition attempt is carried out as per program. If this does not result in flame formation a fault switch-off occurs.
In case of fault switch-off, the reset button on the control panel should be pressed.
In case of operation disturbances (bell symbol in thew display), the digit in the display on theoperating panel points out the cause of the disturbance (see 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

In spite of flame formation the burner goes on fault after expiration of the safety time:
- Ionisation electrode defective or soiled.
- Ionisation electrode does not penetrate the flame

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10.11 Fault code table

The following is the fault code table. In case of further displayed fault codes, please inform the heating specialist.

Fault code	Fault description	Explanations/causes
0	No error	
10	Outside temp sensor fault	Connection or AT-sensor, emergency operation
20	Boiler temperature 1 Sensor fault	Check connection, inform heating specialist [1)]
25	Boiler temperature solid fuel sensor fault	
26	Boiler temperature solid fuel sensor fault	
28	Boiler temperature solid fuel sensor fault	
30	Flow temperature 1 Sensor fault	
32	Flow temperature 2 Sensor fault	Check connection, inform heating specialist[1)]
38	Boiler temperature solid fuel sensor fault	
40	Return temperature 1 Sensor fault	Check connection, inform heating specialist[1)]
46	Boiler temperature solid fuel sensor fault	
47	Common return temp sensor fault	
50	DHW temperature 1 sensor fault	Check connection, inform heating specialist, emergency operation[1]
52	DHW temperature 2 sensor fault	Check connection, inform heating specialist[1)]
54	Flow temperature DHW sensor fault	
57	Drinking water circulation temperature sensor fault	
60	Room temperature 1 sensor fault	
65	Room temperature 2 sensor fault	
68	Room temperature 3 sensor fault	
70	Storage tank temp 1 (top) sensor fault	
71	Storage tank temp 2 (bottom) sensor fault	
72	Storage tank temp 3 (middle) sensor fault	
73	Collector temperature 1 sensor fault	
81	LPB short-circuit or no bus power supply	
82	LPB Address collision	Check addresses of connected control modules
83	BSB-wire short/circuit	Check connection of the room units
84	BSB Address collision	2 room devices have the same allocation (Prog.-Nr. 42)
85	BSB-radio communication fault	
91	EEPROM fault: information of locking mechanism	Internal fault LMS, process sensor, replace LMS, heating specialist
98	Expansion module 1 fault (collective fault)	
99	Expansion module 2 fault (collective fault)	
100	Two time masters (LPB)	Check time master
102	Clock time master without backup	
105	Servicing message	See maintenance code (press information button once) for detailed information
109	Boiler temperature monitoring	

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Fault code	Fault description	Explanations/causes
110	Safety temperature limiter lockout	No heat removal, STB/interruption, possibly short in gas valve [2], internal fuse defective; let device cool down and reset; if this fault occurs several times, inform heating specialist [3]
111	Temperature monitor switching off	No heat removal; pump defect,radiator valves closed [1]
119	Fault pressure switch	Check or refill water pressure[1]
121	Flow temperature 1 (Heating circuit 1) monitoring	
122	Flow temperature 2 (Heating circuit 2) monitoring	
126	DHW charging monitoring	
127	Legionnaire>'s setpoint temperature not reached	
128	Flame failure during operation	
132	Gas pressure monitor- or air pressure switch fault	Lack of gas, contact GW opened, external temperature monitor
133	No flame during the safety time	Reset, if the fault re-occurs several times, contact heating specialist, lack of gas, polarity of mains connection, safety period, check ignition electrode and ionisation current [1] [3]
146	Configuration fault Common message	
151	Internal fault	Check parameter (see Adjustment Table Heating Expert and/or Call-up Values), reset LMS, change LMS, heating expert [1] [3]
152	Parameterization fault	
160	Fan fault	Fan possible defective, speed threshold set wrongly [3]
162	Air pressure monitor doesn`t close.	
171	Alarm contact H1 or H4 activated.	
172	Alarm contact H2 (EM1, EM2 or EM3) or H5 activated	
178	Temperature monitor heating circuit 1	
179	Temperature monitor heating circuit 2	
183	The device is in Parameter setting mode	
217	Sensor fault	
218	Pressure supervision	
241	Flow sensor solar sensor fault	
242	Return sensor solar sensor fault	
243	Swimming pool sensor fault	
260	Flow temperature 3 Sensor fault	
270	Monitoring function	
317	Ned frequency outside of valid range	
320	DHW Charging temp sensor fault	
324	BX same sensors	
325	BX/e'module same sens	
326	BX/m'grp same sens	

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Fault code	Fault description	Explanations/causes
327	E'module same funct	
328	Mix group same funct	
329	E'mod/m'grp same funct	
330	Sensor BX1 no function	
331	Sensor BX2 no function	
332	Sensor BX3 no function	
335	Sensor BX21 no function (EM1, EM2 or EM3)	
336	Sensor BX22 no function (EM1, EM2 or EM3)	
339	Coll pump Q5 missing	
341	Coll sensor B6 missing	
342	Solar DHW sensor B31 missing	
343	Solar integration missing	
344	Solar ctrl elem buffer K8 missing	
345	Sol ctrl elem swi pool K18 missing	
346	Solid fuel boiler pump Q10 missing	
347	Solid fuel boil comp sens missing	
348	Solid fuel boil addr err	
349	Buff valve Y15 missing	
350	Buffer address error	
351	Prim/sys pump addr err	
352	Pr'less header addr err	
353	Common flow sensor B10 missing	
371	Flow temperature 3 (Heating circuit 3) monitoring	
372	Limit thermostat HC3	
373	Expansion module 3 fault (collective fault)	
378	Repetition counter internal fault expired	
382	Repetition counter fan fault expired	
384	Extran light	
385	Ned undervoltage	
386	Fan: revolutions per minute has left valid range	
387	Air pressure switch fault	
426	Checkb sign flue gas damper:	
427	Configuration flue gas damper	
432	Functional earth X17 not connected	

1) Switching off, start prevention, re-start after removal of fault

2) Check parameter according to table Setting Table Heating Specialist and program basic settings or call-up internal LMS SW-diagnosis code and correct respective parameter fault according to fault information!

3) Switching off and interlock; can only be unlocked by reset

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10.12 Maintenance code table

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

10.13 Operating phases of the Control Centre LMS

Press the information key to display the operating phases.

Phase no.		
Display	**Operating state**	**Description of function**
STY	Standby (no heat demands)	Burner on stand-by
THL1	Fan start-up	Self-test for burner start and fan start-up
THL1A		
TV	Pre-purging time	Pre-purging, fan deceleration time to starting load speed
TBRE	Waiting time	Internal safety tests
TW1		
TW2		
VDE	Ignition phase	Ignition and start of safety time for flame formation, ionisation current build-up
tsa1	Safety time constant	Flame monitoring with ignition
tsa2	Safety time variable	Flame monitoring without ignition
it	Interval time	Flame stabilisation
MOD	Modulating mode	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	Burner shut-off delay	Permitted burner run-on time
TNN	Overrun time	Permitted fan run-on time
STV	Start prevention	No internal or external release exists (e.g. no water pressure, lack of gas)
SAF	Safety switch-off	
STOE	Fault position	The actual fault code is displayed, see *fault code table*

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Index

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