POTTERTON
COMMERCIAL

Installation manual

Gas condensing boiler

Paramount four

30 – 115 kW

Dear Customer,

Thank you very much for buying this appliance.

Please read through the manual carefully before using the product, and keep it in a safe place for later reference. In order to ensure continued safe and efficient operation we recommend that the product is serviced regularly. Our service and customer service organisation can assist with this.

We hope you enjoy years of problem-free operation with the product.

Contents

1 Safety

1.1 General safety instructions

⚠ **Danger**
If you smell gas:
1. Do not use a naked flame, do not smoke, do not operate electrical contacts or switches (doorbell, light, motor, lift, etc.).
2. Shut off the gas supply.
3. Open the windows.
4. Trace possible leaks and seal them immediately.
5. If the gas leak is before the gas meter, contact the gas supplier.

⚠ **Danger**
Danger to life.
Observe the warnings affixed to the gas condensing boiler. Incorrect operation of the gas condensing boiler can lead to considerable damage.

⚠ **Danger**
Danger to life.
Commissioning, settings, maintenance and cleaning of gas condensing boilers may only be carried out by a qualified installer.

⚡ **Danger of electric shock**
Danger to life due to improper work.
All electrical work in connection with the installation may only be carried out by a trained electrician.

⚠ **Danger**
Risk of poisoning.
Never use water from the heating system as drinking water. It is contaminated by deposits.

⚠ **Caution**
Danger of freezing!
If there is a danger of freezing do not shut down the heating system; continue to operate it at least in economy mode with radiator valves open. You should only shut down the heating system and drain the boiler, domestic water storage tank and radiators if it is not possible to heat in frost mode.

⚠ **Caution**
Secure against unintentional switch-on!
When the heating system is empty, ensure that the boiler cannot be switched on unintentionally.

⚠ **Danger**
This appliance can be used by children aged 8 years and above and by 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. Children must not be allowed to play with the appliance. Cleaning and user maintenance must not be carried out by children without supervision.

⚠ **Danger**
The heating system must not continue to be operated if damaged.

⚠ **Danger**
Danger! Danger to life through modifications to the appliance.
Unauthorised conversions and modifications to the gas appliance are not permitted, as this can endanger persons and cause damage to the appliance. The appliance approval will become void if these instructions are not observed.

⚠ **Caution**
Replacement of damaged parts may only be performed by a qualified installer.

⚠ **Caution**
Connections sealed with thread sealant must never be opened or modified by a non-specialist. The seals serve as proof that essential connections for safe, trouble-free operation have not been tampered with. The guarantee becomes void if the seals are damaged.

⚠ **Warning**
Risk of damage.
The gas condensing boiler may only be installed in rooms with clean combustion air. Foreign matter such as pollen must never filter through the inlet apertures to reach the inside of the appliance. The boiler must not be started up if there is heavy dust development e.g. during construction work. There could be damage to the boiler.

⚠ **Caution**
Keep the inflow area clear.
Never block or close off ventilation apertures. The inflow area for combustion air must be kept clear.

> ⚠ **Danger**
> **Danger to life due to explosion/fire.**
> Do not store any explosive or easily flammable materials close to the appliance.

> ⚠ **Caution**
> **Risk of burns!**
> For safety reasons, the discharge pipe from the safety valve must always be open so that water can escape during heating operation. The operating state of the safety valve must be checked from time to time.

1.2 Intended use

The gas condensing boilers of the Paramount four series are intended to be used according to DIN EN 12828 as heat generators in domestic water heating systems.

They conform to DIN EN 483 and 677.

1.3 Specific safety instructions

1.3.1 Liquid gas below ground level

The Paramount four complies with DIN EN 126 and DIN EN 298 and, therefore does not need an additional disconnector valve for operation with liquid gas below ground level.

1.4 Liabilities

1.4.1 Manufacturer's liability

Our products are manufactured in compliance with the requirements of the various Directives applicable. They are therefore delivered with the CE marking and any documents necessary. In the interests of the quality of our products, we strive constantly to improve them. We therefore reserve the right to modify the specifications given in this document.

Our liability as manufacturer may not be invoked in the following cases:
- Failure to abide by the instructions on installing the appliance.
- Failure to abide by the instructions on using the appliance.
- Faulty or insufficient maintenance of the appliance.

1.4.2 Manufacturer's Declaration

Meeting the protection requirements according to guideline 2004/108/EC for electromagnetic compatibility (EMC) is only guaranteed when the boiler is operated according to purpose.

The ambient conditions according EN 55014 must be met.

Operation is only allowed with the casing fitted correctly.

Correct electric earthing must be ensured by regular checks (e.g. annual inspection) of the boiler.

When appliance parts need replacing, only original parts as specified by the manufacturer may be used.

The gas condensing-boilers fulfil the basic requirements of the Efficiency Guideline 92/42/EC as condensing boiler.

1.4.3 Installer's liability

The installer is responsible for the installation and initial commissioning of the appliance. The installer must abide by the following instructions:
• Read and follow the instructions given in the manuals provided with the appliance.
• Install the appliance in compliance with prevailing legislation and standards.
• Carry out initial commissioning and any checks necessary.
• Explain the installation to the user.
• If maintenance is necessary, warn the user of the obligation to check the appliance and keep it in good working order.
• Give all the instruction manuals to the user.

1.4.4 User's liability

To guarantee optimum operation of the system, you must abide by the following instructions:
• Read and follow the instructions given in the manuals provided with the appliance.
• Call on a qualified professional to carry out installation and initial commissioning.
• Get your installer to explain your installation to you.
• Have the required inspections and maintenance carried out by a qualified installer.
• Keep the instruction manuals in good condition close to the appliance.

2 About this manual

2.1 General

This manual is intended for installers of Paramount four boilers.

2.2 Additional documentation

2.2.1 Additional documentation

Here is an overview of the further documents belonging to this heating system.

Tab.1   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, installer, customer
Installation manual – Extended information	• Intended use • Technical data/circuit diagram • Regulations, standards, CE • Notes for installation location • Application example, Standard application • Commissioning, operation and programming • Maintenance	Installer
User manual	• Commissioning • Operation • User settings/programming • Fault table • Cleaning/maintenance • Energy-saving tips	Customer
Asset ledger	• Commissioning report • Check list for commissioning • Maintenance	Installer
Abridged instructions	• Operation in brief	Customer
Accessories	• Installation • Operation	Installer, customer

2.3 Symbols used

2.3.1 Symbols used in the manual

This manual uses various danger levels to draw attention to special instructions. We do this to improve user safety, to prevent problems and to guarantee correct operation of the appliance.

⚠	**Danger** Risk of dangerous situations that may result in serious personal injury.

⚡	**Danger of electric shock** Risk of electric shock.

⚠	**Warning** Risk of dangerous situations that may result in minor personal injury.

⚠	**Caution** Risk of material damage.

i	**Note** Please note: important information.

📖	**See** Reference to other manuals or pages in this manual.

3   Technical specifications

3.1   Homologations

3.1.1   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 systems in buildings
- Federal Immission Control Ordinance 3. BImSchV
- DVGW-TRGI 2008 (DVGW worksheet G 600); Technical rules for gas installation
- TRF; Technical rules LPG
- DVGW code of practice 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 4753-6: Domestic hot water calorifiers Domestic hot water heating system and storage tanks for heated water
- DIN 1988; Technical Rules for drinking water installations (TRWI)
- 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-practice M251 of the waste water technology association
- Regulations of the public authorities for the run-off of condensate.

3.2   Technical data

3.2.1   Technical data – Boiler space heaters

Tab.2   Technical parameters for boiler space heaters

Model			Paramount four 30	Paramount four 40
Condensing boiler			Yes	Yes
Low-temperature boiler[1]			No	No
B1 boiler			No	No
Cogeneration space heater			No	No
Combination heater			No	No
Rated heat output	$Prated$	kW	29	37
Useful heat output at rated heat output and high temperature mode[2]	P_4	kW	29.2	36.8
Useful heat output at 30 % of rated heat output and low temperature mode[1]	P_1	kW	9.8	12.3
Seasonal space heating energy efficiency	η_s	%	93	93
Useful efficiency at rated heat output and high temperature mode[2][2]	η_4	%	87.6	87.7
Useful heat output at 30 % of rated heat output and low temperature mode[1]	η_1	%	97.9	97,8
Auxiliary power consumption				
At full load	$elmax$	kW	0.055	0.070
At part load	$elmin$	kW	0.021	0.025

Model			Paramount four 30	Paramount four 40
In standby mode	P_{SB}	kW	0.003	0.003
Other data				
Standby heat loss	P_{stby}	kW	0.055	0.055
Ignition burner power consumption	P_{ign}	kW	0.0	0.0
Annual energy consumption	Q_{HE}	GJ	90	114
Sound power level, indoors	L_{WA}	dB	50	53
Emissions of nitrogen oxides	NO_X	mg/kWh	23	23

(1) Low temperature means for condensing boilers 30°C, for low temperature boilers 37°C and for other heaters 50°C return temperature (at heater inlet).
(2) High temperature mode means 60°C return temperature at heater inlet and 80°C feed temperature at heater outlet.

📖 **See**
Contact details on the back cover.

3.2.2 Technical data – Boiler space heaters

Tab.3   Technical parameters for boiler space heaters

Model			Paramount four 50	Paramount four 60	Paramount four 80	Paramount four 95	Paramount four 115
Condensing boiler			Yes	Yes	Yes	Yes	Yes
Low-temperature boiler[1]			No	No	No	No	No
B1 boiler			No	No	No	No	No
Cogeneration space heater			No	No	No	No	No
Combination heater			No	No	No	No	No
Rated heat output	P_{rated}	kW	49	56	75	93	112
Useful heat output at rated heat output and high temperature mode[2]	P_4	kW	48.7	56.4	74.9	92.5	111.7
Useful heat output at 30% of rated heat output and low temperature mode[1]	P_1	kW	16.3	18.9	25.1	31.0	37.4
Seasonal space heating energy efficiency	η_s	%	93	93	–	–	–
Useful efficiency at rated heat output and high temperature mode[2]	η_4	%	87.7	87.7	87.7	87.8	87.6
Useful heat output at 30% of rated heat output and low temperature mode[1]	η_1	%	97.9	97,8	97,8	98,0	97,8
Auxiliary power consumption							
At full load	$elmax$	kW	0.088	0.100	0.112	0.170	0.200
At part load	$elmin$	kW	0,028	0,029	0.030	0,029	0.030
In standby mode	P_{SB}	kW	0.003	0.003	0.003	0.003	0.003
Other data							
Standby heat loss	P_{stby}	kW	0.060	0.060	0.065	0.070	0.070
Ignition burner power consumption	P_{ign}	kW	0.0	0.0	0.0	0.0	0.0
Annual energy consumption	Q_{HE}	GJ	151	175	–	–	–
Sound power level, indoors	L_{WA}	dB	56	55	55	58	60

Model			Paramount four 50	Paramount four 60	Paramount four 80	Paramount four 95	Paramount four 115
Emissions of nitrogen oxides	NO_X	mg/kWh	18	21	23	25	30

(1) Low temperature means for condensing boilers 30°C, for low temperature boilers 37°C and for other heaters 50°C return temperature (at heater inlet).
(2) High temperature mode means 60°C return temperature at heater inlet and 80°C feed temperature at heater outlet.

See
Contact details on the back cover.

3.2.3   Technical data

Tab.4   Technical data

Model				Paramount four 30	Paramount four 40	Paramount four 50	Paramount four 60	Paramount four 80	Paramount four 95	Paramount four 115
Product ID no.				CE-0085BL0514						
IP rating				IPx4D						
Gas category				II_{2H3+}						
Appliance category				B_{23}, B_{23P}, B_{33}, C_{13X}, C_{33X}, C_{43X}, C_{53}, C_{53X}, C_{63X}, C_{83}, C_{93X}						
Software version				V 4.2						
Nominal heat input range	Natural gas E, LL	Heating mode	kW	5,6 - 30,0	9,0 - 38,0	10,0 - 50,0	14,0 - 58,0	21,0 - 77,0	20,0 - 95,0	25,0 - 115,0
Effective rated output range	Natural gas E, LL	80/60°C	kW	5,4 - 29,2	8,7 - 37,0	9,7 - 48,7	13,6 - 56,4	20,3 - 74,9	19,4 - 92,5	24,3 - 111,7
		50/30°C	kW	6,0 - 31,2	9,7 - 39,6	10,8 - 52,1	15,1 - 60,4	22,6 - 80,2	21,4 - 98,6	26,7 - 119,3
Standard operating efficiency		75/60°C		106						
pH value condensate			–	4 - 5	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	1,60 - 4,68	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	20	25	30
CO standard emission factor			mg/kWh	5	10	10	10	10	20	20
Data for design of the chimney to DIN EN 13384 (room air-dependant operation)										
Flue gas temperature	Part load/full load	80/60°C	°C	53/66	56/75	58/69	59/71	59/73	59/73	60/77
	Part load/full load	50/30°C	°C	33/46	35/53	33/50	34/54	35/54	32/51	33/57
Flue gas mass flow rate	Natural gas E, LL	80/60°C	g/s	2,8 - 14,8	4,4 - 18,7	4,9 - 24,6	6,9 - 28,5	10,3 - 37,9	9,8 - 46,7	12,3 - 56,6
With natural gas		50/30°C	g/s	2,5 - 14,1	4,1 - 18,0	4,5 - 23,5	6,4 - 27,4	9,7 - 36,4	9,1 - 44,8	11,3 - 54,4
Flue gas mass flow rate	Propane	80/60°C	g/s	2,6 - 14,1	4,2 - 17,8	5,6 - 23,5	6.6 - 27.2	9,8 - 36,1	14,1 - 44,6	16,4 - 53,9
for LPG		50/30°C	g/s	2,4 - 13,4	3,9- 17,1	5,2 - 22,4	6,1 - 26,1	9,2 - 34,6	13,3 - 42,6	15,4 - 51,7
CO2 content natural gas	Natural gas E, LL		%	Paramount four 30 - Paramount four 60: 8,3 - 8,8 Paramount four 80 - 115: 8,5 - 9,0						
CO2 content LPG	Propane		%	10,3 - 10,8						
Draft requirement			mbar	0						

Model			Para-mount four 30	Para-mount four 40	Para-mount four 50	Para-mount four 60	Para-mount four 80	Para-mount four 95	Para-mount four 115
Max. delivery pressure at flue gas outlet		mbar	1,1	1,1	1,1	1,1	1,1	1,5	1,8
Flue gas/air supply duct		mm	110 / 160						
Flue gas value group to DVGW G636		–	G6						
Heating water									
Adjustment range heating water temperature		°C	20 - 85	20 - 85	20 - 85	20 - 85	20 - 85	20 - 85	20 - 85
Max. flow temperature		°C	100						
Water operating pressure	min.	bar	1,0	1,0	1,0	1,0	1,0	1,0	1,0
		MPa	0,1	0,1	0,1	0,1	0,1	0,1	0,1
	max.	bar	3.0	3,0	4,0	4,0	4,0	4,0	4,0
		MPa	0,3	0,4	0,4	0,4	0,4	0,4	0,4
Gas connected loads									
Supply pressure for natural gas		mbar	G20: min. 17 - max. 25						
Connection values	Natural gas E [H_{UB} 9,45 kWh/m³]	m³/h	0.59 - 3,2	0.95 - 4.0	1,06 - 5,30	1,48 - 6,10	2,22 - 8,10	2,12 - 10,10	2,65 - 12,20
	Natural gas LL [H_{UB} 8,13 kWh/m³]	m³/h	0,69 - 3,7	1,11 - 4,7	1,23 - 6,20	1,72 - 7,10	2,58 - 9,50	2,46 - 11,70	3,08 - 14,10
Connection pressure for propane		mbar	min. 25 - max. 45						
	Propane [H_U 12,87 kWh/kg]	kg/h	0,44 - 2,33	0,70 - 2,95	0,93 - 3,89	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	0,49 - 2,03	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	88	100	108	160	200
Heating mode	Protection	W	3	3	3	3	3	3	3
Dimensions									
Weight of boiler		kg	53	53	61	61	72	84	84
Boiler water content		l	3,6	3,6	4,7	4,7	5,8	7,8	7,8
Height		mm	852						
Width		mm	480						
Depth		mm	407	407	447	447	542	570	570
Connections									
Gas connection			3/4"		1"				
Heating flow			1"		1 $^1/_2$"				
Heating return			1"		1 $^1/_2$"				

3.2.4 Tables of sensor values

Tab.5   Resistance values for outside temperature sensor ATF

Temperature [°C]	Resistance [Ω]
-20	8194
-15	6256

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

Tab.6   Resistance values for flow sensor KVF, drinking water sensor TWF, return sensor KRF, 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

3.2.5 Total dynamic head Paramount four

Fig.1 Total dynamic head Paramount four 30 - Paramount four 40
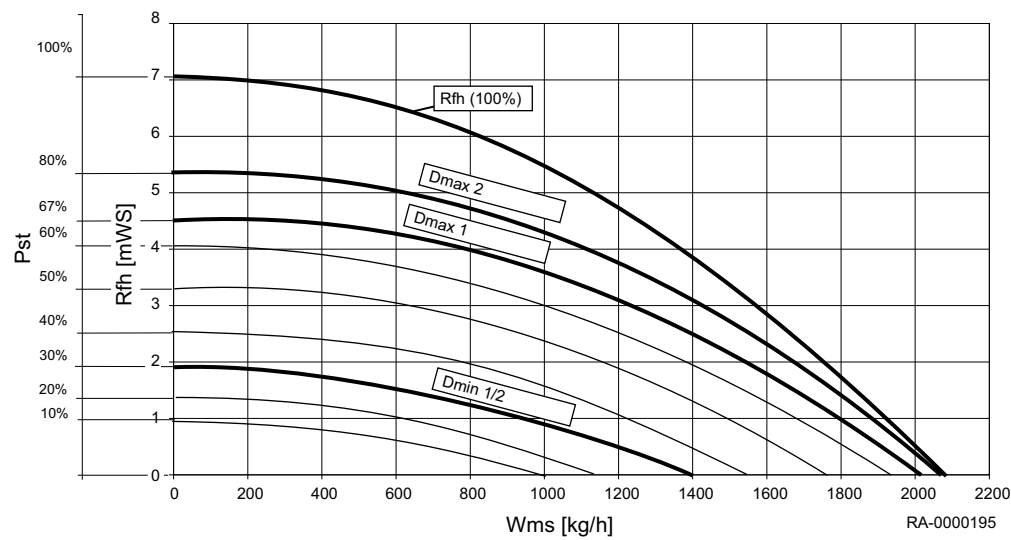
Key:	
Dmax 1	Paramount four 30 (max.)
Dmax 2	Paramount four 40 (max.)
Dmin 1/2	Paramount four 30 (min.) Paramount four 40 (min.)
Pst	Pumping stage
Rfh	Total dynamic head
Wms	Water mass flow

Note
The select min. and max. values are controlled via the program numbers for minimum pump speed and maximum pump speed.

3.3   Dimensions and connections

Fig.2   Dimensions and Connections Paramount four 30 / 40

1	HV – Heating flow	5	SiV – Safety valve
2	HR – Heating return	6	KA – Condensate connection
3	2. HR – Heating return, heating circuit 2	7	SV – Storage tank flow (accessory)
4	Gas – Gas connection	8	SR – Storage tank return (accessory)
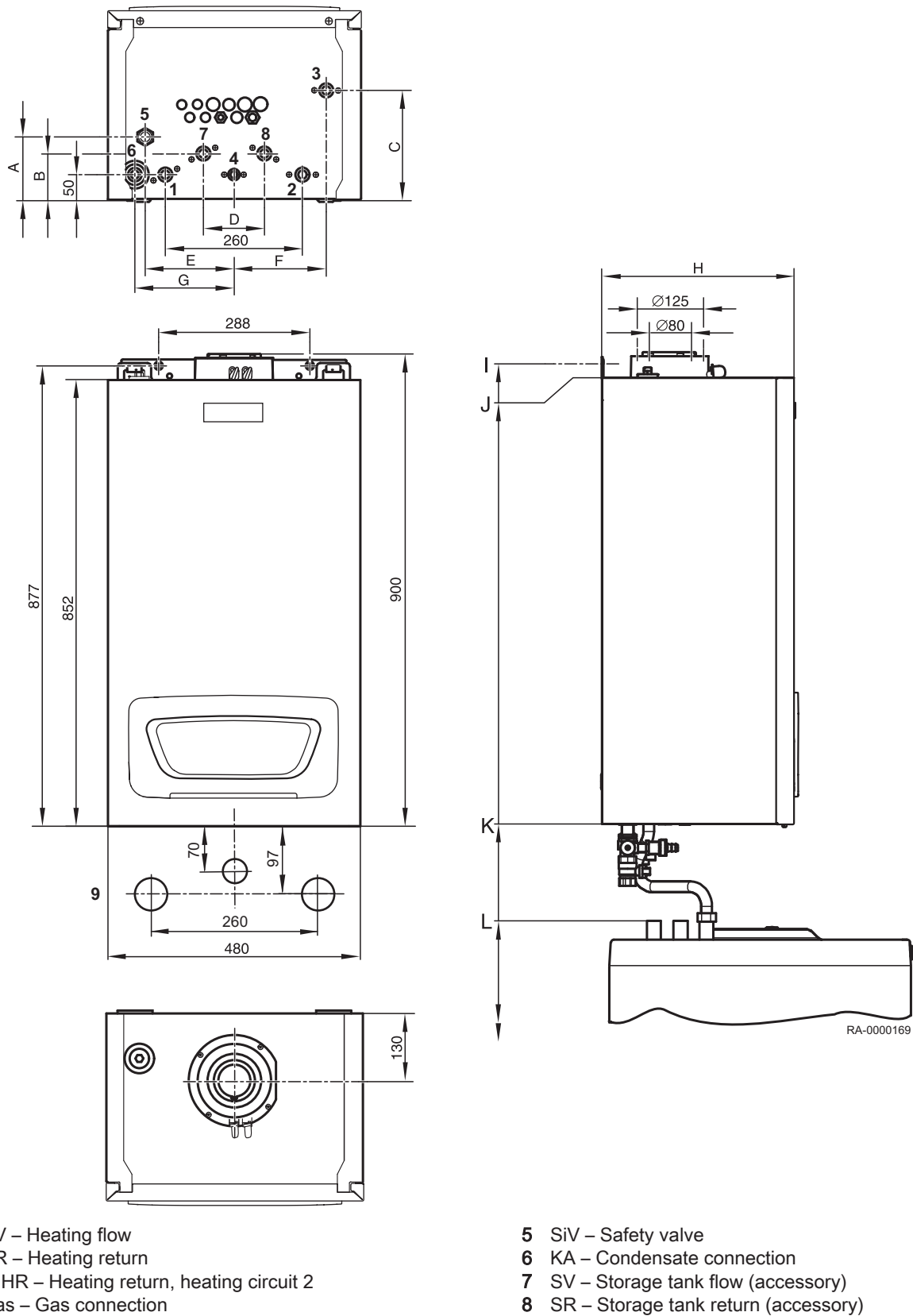
Tab.7   Dimensions and connections

Model		Paramount four 30/40
HV – Heating flow		G 1"

Model		Paramount four 30/40
HR – Heating return		G 1"
2nd HR – Heating return, heating circuit 2		G 1"
Gas – Gas connection		G 3/4"
SiV – Safety valve		G 3/4"
KA – Condensate connection		Ø 25 mm

Gravity lock	blocked (valve opened)	Operating position
Paramount four	Z ⊖ A	Z ⊖ A

> **For more information, see**
> Sealing and filling of the system, page 36

3.4   Dimensions and connections

Fig.3   Dimensions and Connections Paramount four 50 - 115

RA-0000310
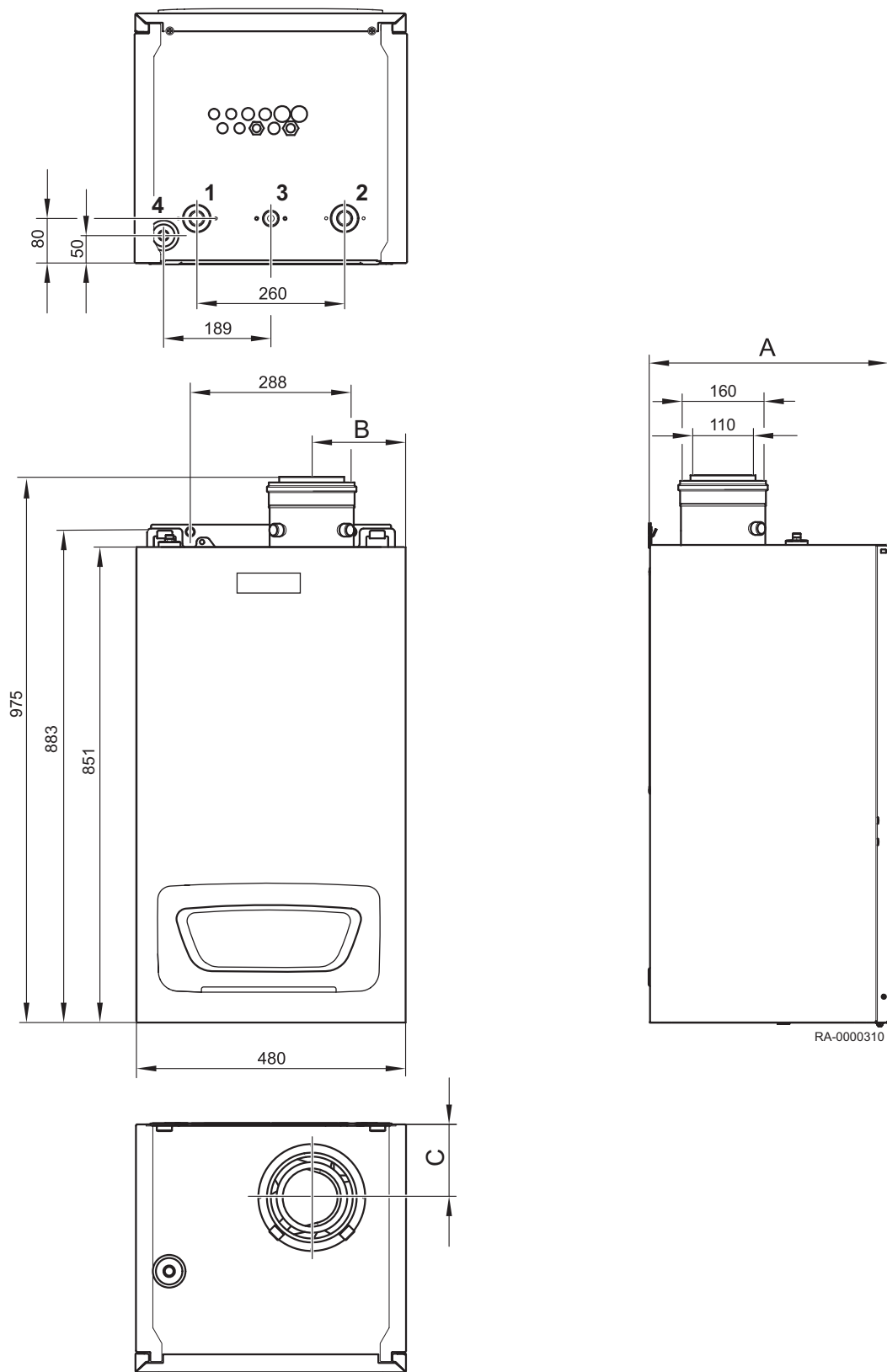
1 HV – Heating flow   **2** HR – Heating return

3 Gas – Gas connection   **4** KA – Condensate connection

Tab.8   Dimensions and connections

Model			Paramount four 50/60	Paramount four 80	Paramount four 95	Paramount four 115
HV	– Heating flow		G 1 $^1/_2$"	G 1 $^1/_2$"	G 1 $^1/_2$"	G 1 $^1/_2$"
HR	– Heating return		G 1 $^1/_2$"	G 1 $^1/_2$"	G 1 $^1/_2$"	G 1 $^1/_2$"
Gas	– Gas connection		G 1"	G 1"	G 1"	G 1"
SiV	– Safety valve		G 3/4"	G 3/4"	G 3/4"	G 3/4"
KA	– Condensate connection		Ø 25 mm	Ø 25 mm	Ø 25 mm	Ø 25 mm
Dimension A		[mm]	447	542	580	580
Dimension B		[mm]	168	168	163	163
Dimension C		[mm]	132	132	152	152

3.5 Wiring diagram

Fig.4 Wiring diagram Paramount four 30 / 40

Line Power 230V 50Hz

S1

br
gnge
bl

L
N

135800_B01_20100610

T6,3A H 250V
T6,3A H 250V

Line Power

BE

Bus EM
Bus BE

GND +UB Hall PWM
4 3 2 1
X8

GND PWM
2 1
P1

Integrated system automatic controller ISR (LMS14)

QX2
QX3
QX1
230V
230V

br gnge bl

M *)
M TLP
M *)
M HP

FB *)
FB *)

CL+ CL- G+
1 2 3
FB

KVF
KRF

rs bl
vi bl
gr bl
bl or

1 KVF
2 GND
3 KRF
4 +5V
5 Reset
6 H3
7 H7
8 +15V
X14

S2
F4

X12
X13

X11

RT
X6
X5
GW

H5 H4 UH H1 ATF TWF BX3 BX2 BX1 H6
M H5 M H4 5 15 M H1 M B9 M B3 M BX3 M BX2 M BX1 M H6

X17 X2
1 2 3 4 5
STB
1 2

H5 *) H4 *) H1 *) ATF TWF BX3 *) BX2 *) BX1 *)

bl br gnge bl br br bl gnge sw

4 3 2 1

B1
T1

Y2

L N 230VAC
1 2 3 4 5 24VDC
F10
M
M4

bl = blue
br = brown
gnge = green / yellow
gr = grey
or = orange
rs = pink
rt = red
sw = black
vi = purple
ws = white

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

Fig.5   Wiring diagram Paramount four 50 / 60

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 connexion 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	
		ZKP	DHW intern. circ. pump Q33	
HP	Ct - pump			
KRF	Boiler return sensor QAL 36	*)	Accessories	
KVF	Boiler flow sensor QAK 36.670			

bl	= blue
br	= brown
gnge	= green / yellow
gr	= grey
or	= orange
rs	= pink
rt	= red
sw	= black
vi	= purple
ws	= white

Fig.6   Wiring diagram Paramount four 80 - 115

Legend:

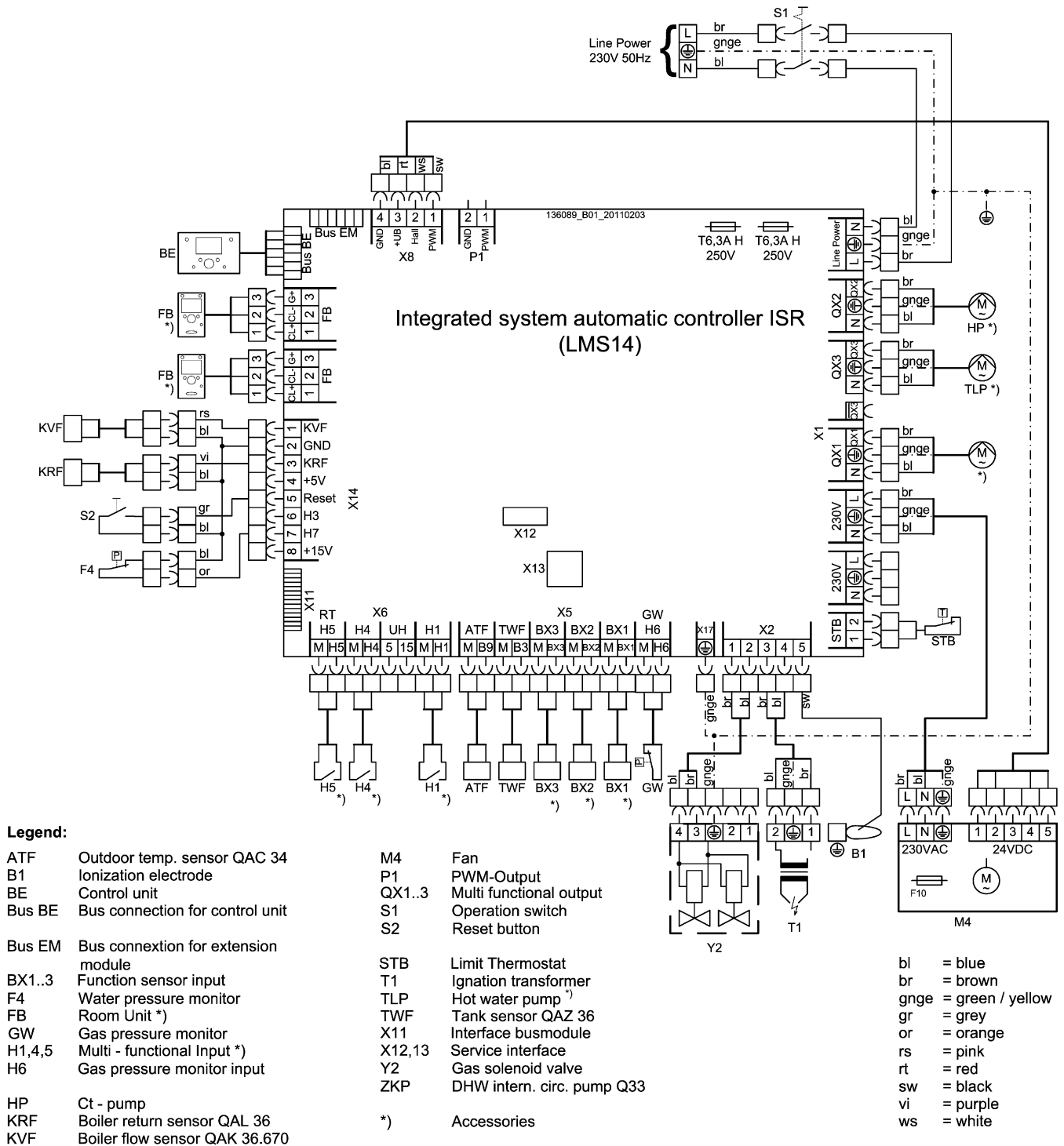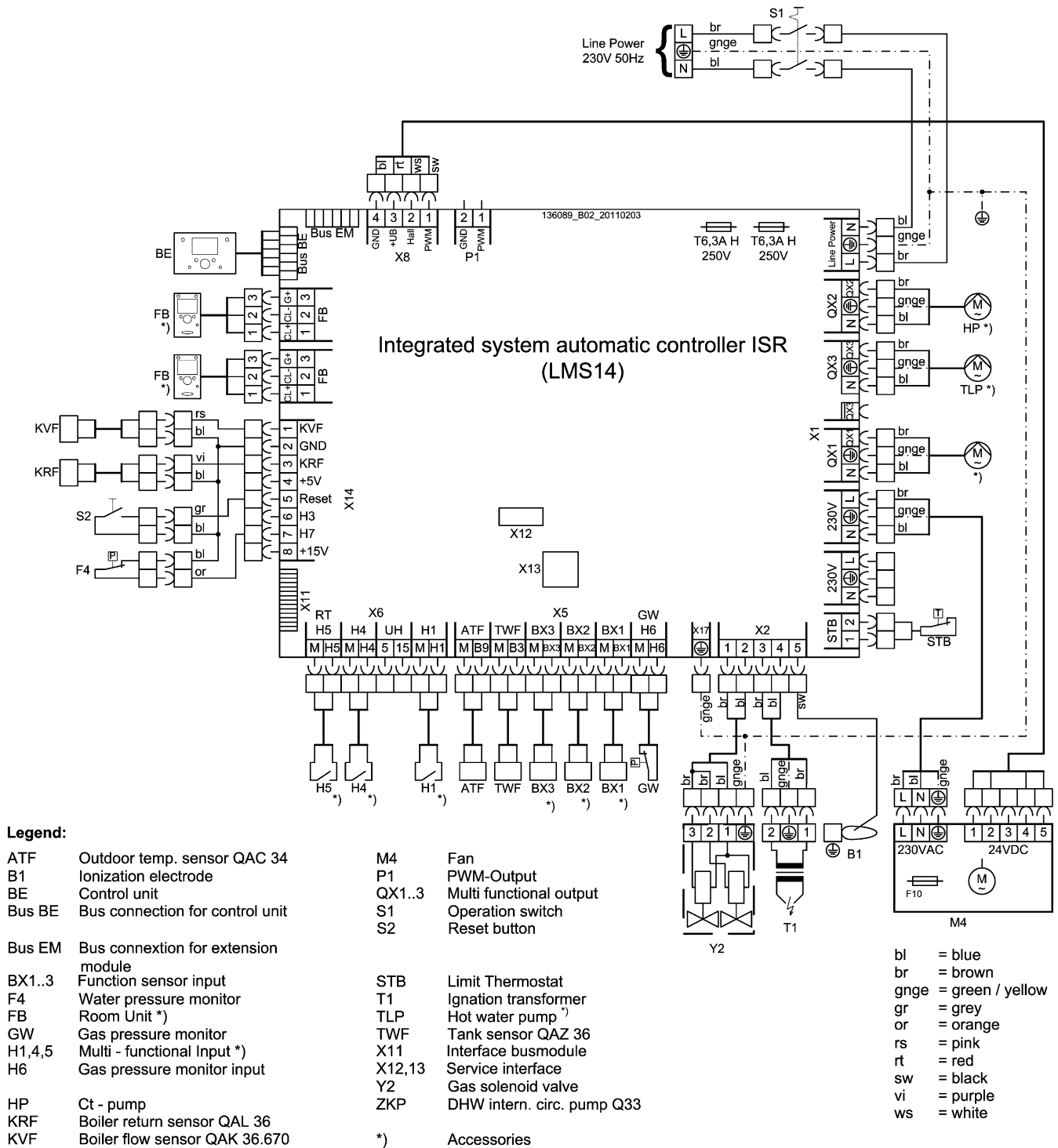|				
ATF	Outdoor temp. sensor QAC 34		M4	Fan
B1	Ionization electrode		P1	PWM-Output
BE	Control unit		QX1..3	Multi functional output
Bus BE	Bus connection for control unit		S1	Operation switch
			S2	Reset button
Bus EM	Bus connexion for extension module			
BX1..3	Function sensor input		STB	Limit Thermostat
F4	Water pressure monitor		T1	Ignation transformer
FB	Room Unit *)		TLP	Hot water pump *)
GW	Gas pressure monitor		TWF	Tank sensor QAZ 36
H1,4,5	Multi - functional Input *)		X11	Interface busmodule
H6	Gas pressure monitor input		X12,13	Service interface
			Y2	Gas solenoid valve
HP	Ct - pump		ZKP	DHW intern. circ. pump Q33
KRF	Boiler return sensor QAL 36			
KVF	Boiler flow sensor QAK 36.670		*)	Accessories

bl = blue
br = brown
gnge = green / yellow
gr = grey
or = orange
rs = pink
rt = red
sw = black
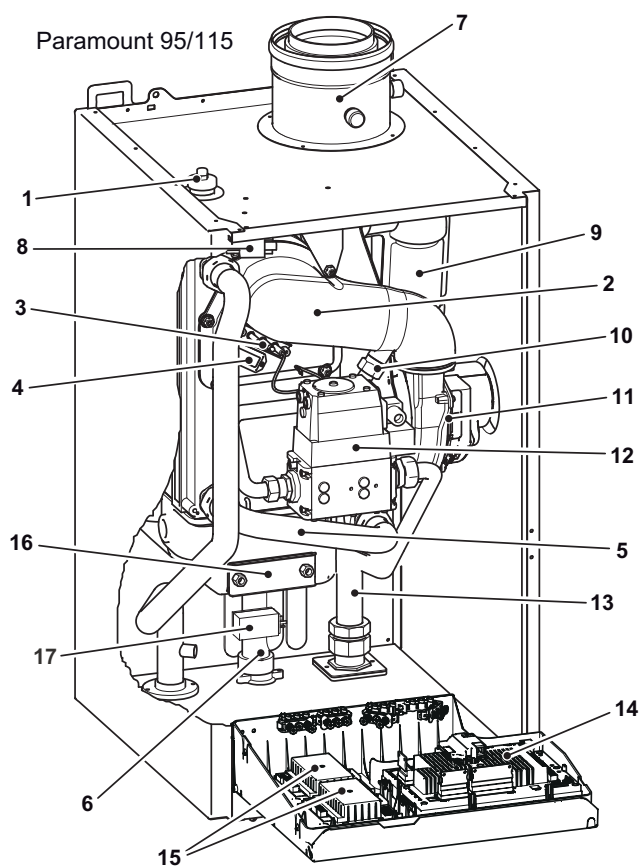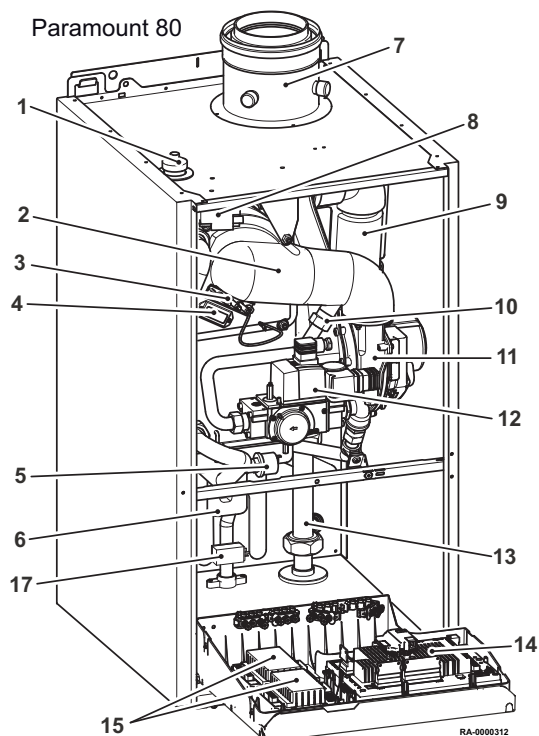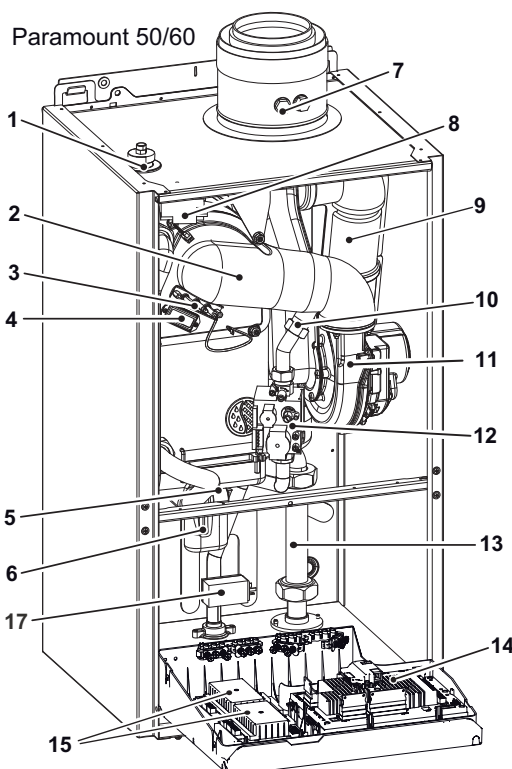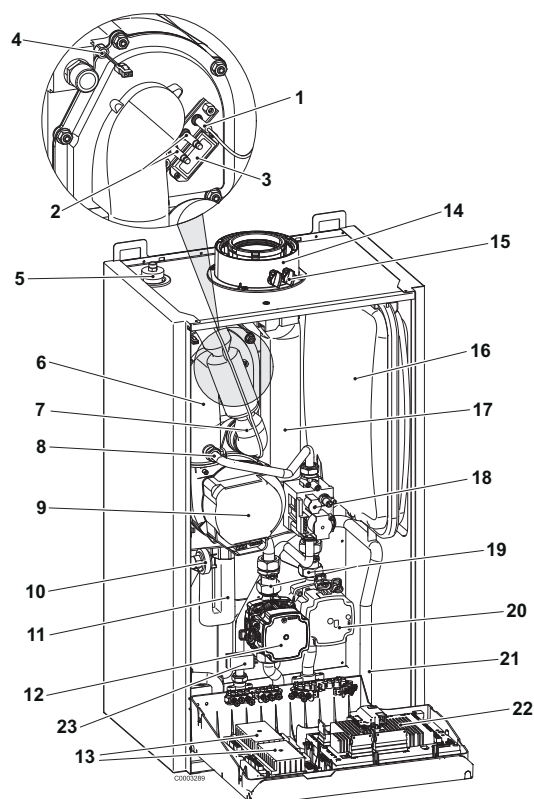vi = purple
ws = white

For more information, see
Strain reliefs, page 42

4   Description of the product

4.1   Main components

Fig.7   Boiler view Paramount four (depicted without front wall and control cover)

Paramount 30/40

Paramount four 30/40		Paramount four 50 - 115	
1	Ionization electrode	1	Air vent
2	Ignition electrodes	2	Mixing tube
3	Flame inspection window	3	Ignition and ionization electrode
4	Flow sensor	4	Flame inspection window
5	Air vent	5	Water pressure sensor
6	Mixing tube	6	Siphon
7	Air intake silencer	7	Flue gas adapter with inspection apertures
8	Gas injector	8	Ignition transformer (under the lid)
9	Fan	9	Air intake silencer
10	Pressure sensor	10	Gas jet
11	Siphon	11	Fan
12	DHW charge pump[1]	12	Gas valve
13	Extension module EWM[1]	13	Pump replacement pipe[1]
14	Flue gas adapter	14	Control LMS
15	Inspection openings	15	Extension module EWM[1]
16	Membrane expansion vessel (MAG)[1]	16	Cleaning opening
17	Flue gas pipe	17	Gas pressure monitor
18	Gas valve		1) Accessories
19	Gravity lock		
20	Heating circuit pump		
21	Connection 2. heating circuit[1]		
22	Control LMS		
23	Gas pressure monitor		
	1) Accessories		

4.1.1 Room device RGT

Remote setting of all adjustable control functions of the basic appliance is possible via the operating unit when using the room device RGT (accessory).

Fig.8 Operating interface of the room device RGT

sRE037A
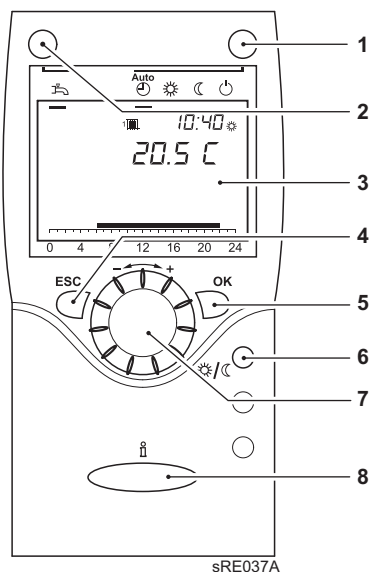
1 Operating mode key, heating mode
2 Operating mode key domestic water mode
3 Screen
4 ESC key (cancel)
5 OK key (acknowledgement)
6 Presence key
7 Control knob
8 Information key

Presence key
Manual switching over between heating operation at comfort nominal value and heating operation at reduced nominal value is possible with the presence key, irrespective of the set time programs. The value switched over to stays active until the next modification by the time program.

4.2   Control panel description
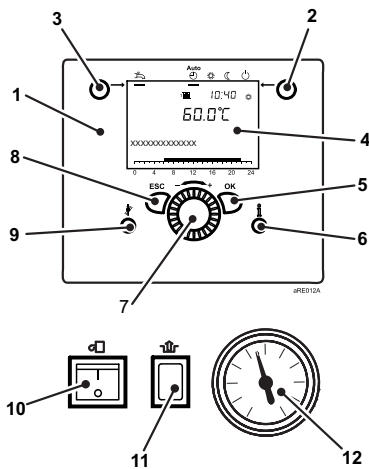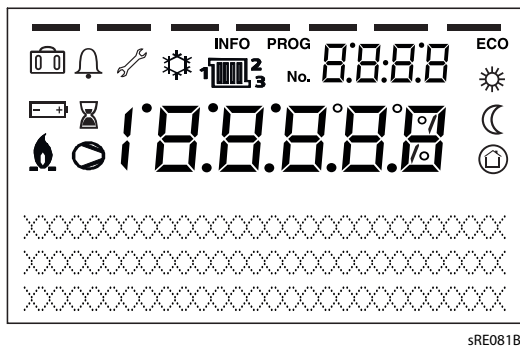

Fig.9   Operating elements

4.2.1   Operating elements

1   Regulator operating unit
2   Operating mode key, heating mode
3   Operating mode key domestic water mode
4   Screen
5   OK key (acknowledgement)
6   Information key
7   Control knob
8   ESC key (cancel)
9   Chimney sweep key
10 ON/OFF switch
11 Release key burner control
12 Pressure gauge

4.2.2   Displays

Fig.10   Symbols on the display

☼   Heating to comfort setpoint
☾   Heating to reduced setpoint
⌂   Heating to frost protection setpoint
⌛   Current process
      Holiday function active
      Reference to heating circuits
🔥   Burner in operation (boiler only)
      Cooling active (heat pump only)
      Compressor in operation (heat pump only)
      Maintenance message
🔔   Fault message
INFO Information level active
PROG Setting level active
ECO   Heating system switched off (automatic summer/winter changeover or automatic heating limit active)

4.3   Standard delivery

• Gas condensing boiler for fitting to the wall, packed in a cardboard box
• Info package with manual
• Outside temperature sensor
• Mounting rail
• Accessories

4.4   Accessories and options

A list of the accessories (selection) available for the Paramount four can be found below.

• Room device RGT
• Bus module BM
• Extension module EWM
• Shut-off set AEH
• Membrane expansion vessel MAG
• Connection pipe for mixing circuit MAR

4.4.1   Installation of extension module

If an EWM extension module is installed, an application with one or two mixed heating circuits is possible.

5 Before installation

5.1 Regulations governing installation

⚠ **Caution**
Installation of the appliance must be done by a qualified engineer in accordance with prevailing local and national regulations.

5.2 Installation requirements

5.2.1 Corrosion protection

⚠ **Caution**
The combustion air must be free from corrosive elements - especially vapours containing fluorine and chlorine which are found, for example, in solvents and cleaning agents, propellant gases etc.

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

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

5.2.2 Supply air openings

⚠ **Caution**
Keep the inflow area clear.
Never block or close off ventilation apertures. The inflow area for combustion air must be kept clear.

⚠ **Warning**
Risk of damage.
The gas condensing boiler may only be installed in rooms with clean combustion air. Foreign matter such as pollen must never filter through the inlet apertures to reach the inside of the appliance. The boiler must not be started up if there is heavy dust development e.g. during construction work. There could be damage to the boiler.

Where the Paramount four is operated based on room ventilation, there must be a sufficiently large opening for combustion air available in the installation room. The operator must be informed that this opening must never be closed or blocked and that the connecting piece for combustion air on the upper side of the Paramount four must be kept free at all times.

5.2.3 Heating water requirements

⚠ **Caution**
Observe the heating water quality requirements!
Requirements regarding heating water quality have increased in recent times as system conditions have changed:
• lower heat demand
• use of gas condensing boilers in cascade in larger projects
• increased use of buffer storage tanks in combination with solar thermal systems and solid fuel boilers.
The focus is always on designing systems that guarantee trouble-free service over a long period.

Generally speaking, the quality of drinking water is adequate, but it must be checked whether the drinking water actually filled into the system is suitable when its hardness is taken into consideration (see *water hardness diagram*). Where that is not the case, different steps can be taken:

1. Using an additive in the fill water to prevent the hardness (lime) separating inside the boiler and to ensure that the pH value of the system water remains stable (hardness stabiliser).
2. Use of a softening system to treat the fill water.
3. Use of a desalination system to treat the fill water.
   Desalination of fill and top-up water to obtain fully desalinated water should not be mistaken for softening down to 0 °dH. Corrosive salts remain in the water with softening.

> ⚠ **Caution**
> **Use only approved additives and processes.**
> When using additives, use only agents approved by Potterton Commercial. Softening and desalination must also only be carried out with systems approved by Potterton Commercial and with observation of the specified limits.
> Failure to observe this rule voids the warranty.

> ⚠ **Caution**
> **Check the pH value.**
> Certain conditions may result in automatic alkalisation (raising the pH value) of the system water. The pH value should therefore be checked annually.
> **The pH value must be between 8.2 and 9.0.**

> ⚠ **Caution**
> **Adherence to the conditions issued by Potterton Commercial is vital to safeguard the warranty.**

> ℹ **Note**
> The water hardness of the heating water has to be checked within the scope of the recommended maintenance of the boiler and the corresponding amount of additive has to be added if necessary.

5.2.4 Further information on the heating water

- The water must not contain any foreign matter, such as sweat beads, rust particles, scale or sludge. During commissioning, flush the system until only clean water runs out. When flushing the system,ensure that the water does not flow through the heat exchanger of 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.) care must be taken 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 storage tanks in combination with solar systems or solid fuel boilers the buffer contents must be taken into consideration when determining the fill water volume.

5.2.5 Diagram of water hardness

To avoid damage due to forming of boiler scale in the boiler the following illustration has to be observed.

Fig.11   Diagram of water hardness Paramount four 30 – 40

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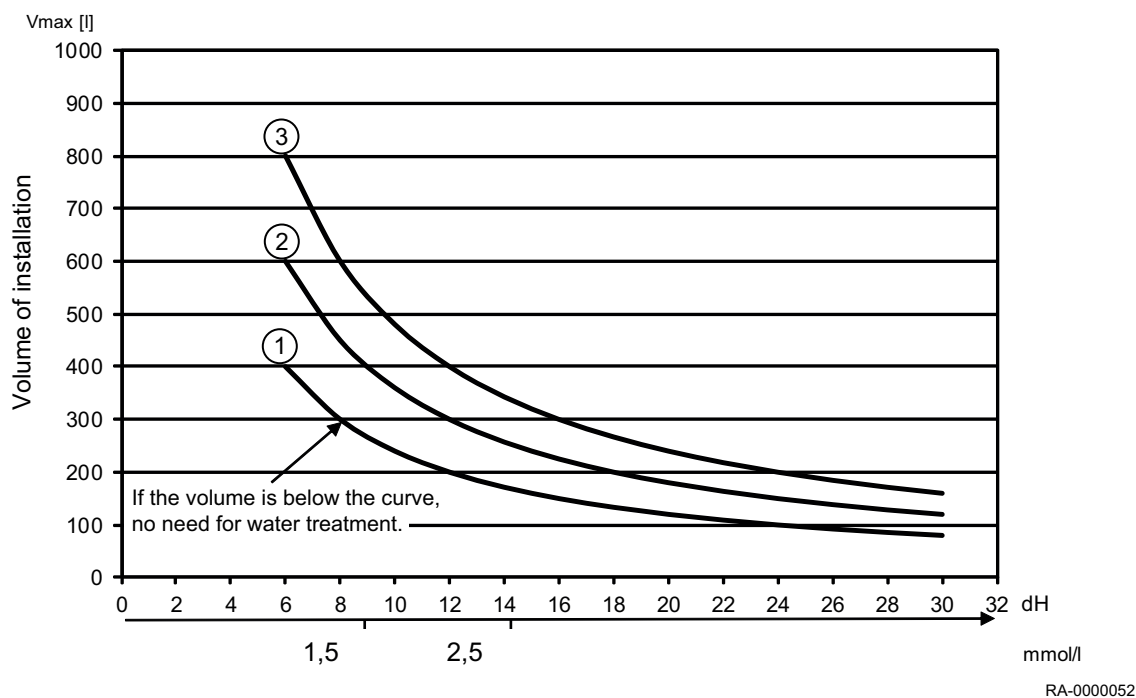
Tab.9   Key to diagram water hardness

Number	1	2	3
Boiler model	–	–	Paramount four 30 – 40

Fig.12   Diagram water hardness Paramount four 50 – 115

RA-0000313
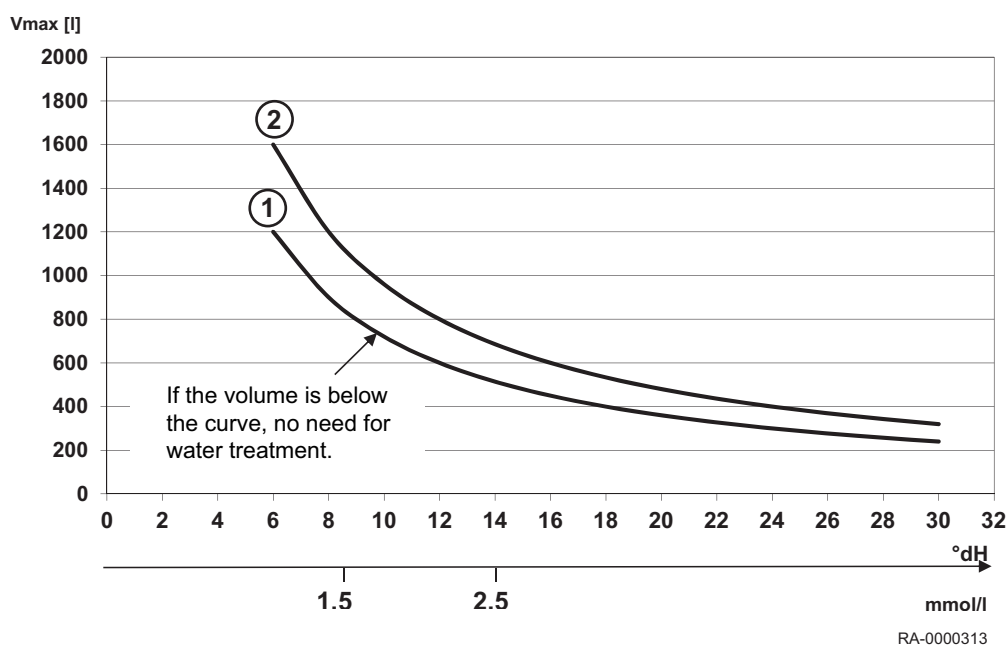
Tab.10   Key to diagram water hardness

Number	1	2
Boiler model	Paramount four 50/60	Paramount four 80 - 115

Description: The boiler type, the water hardness and the water volume of the heating system must be known. If the volume is above the curve, a

partial softening of the tap water or addition of hardness stabiliser is required. Softening of the fill and top-up water below 6 ° dH is not allowed!

Example: No addition is required if the system water has a hardness of 12°dH, a volume of up to 600 litres and a gas condensing boiler of up to 50 kW output. The usual refill volume of the system has been taken into account.

5.2.6 Treating and preparing the heating water

■ Determining the system volume

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

■ Released media

- Additives
  The following products are currently recommended by Potterton Commercial:
  - "Full heating protection" from Fernox (www.fernox.com)
  - "Sentinel X100" from Guanako (www.sentinel-solutions.net)
- Complete desalination
  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 desalination cartridge SureFill" from Sentinel (www.sentinel-solutions.net)
- Partial softening
  It must be ensured with an automatic blending device that the min. hardness is not less than 6°dH .

See
The specifications of the manufacturer must be followed.

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

■ Antifreeze agent

Note
The use of antifreeze agents with Potterton Commercial gas condensing boilers with aluminium heat exchangers.

The heat transfer medium WTF B (accessory) offered for solar thermal systems is also used in heating systems (e.g. holiday houses) as an antifreeze agent. In the mixture supplied in the canisters (42 % WTF B, 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. The heat transfer medium must be diluted 2:1 with water to set this operating point. This mixing ratio has been tested by Potterton Commercial in relation to its practical suitability for use with gas condensing boilers.

Note
Up to a mixing ratio of 2.5:1 the heat transfer medium WTF B is approved as an antifreeze agent down to -15 °C for use with Potterton Commercial gas condensing boilers.

> ⚠️ **Caution**
>
> **Keep the installation room frost-free.**
>
> If an antifreeze agent 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 frost-free. If applicable, please also note special measures for any installed domestic hot water calorifiers.

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 on the basis of this table.

Water content of the system [l]	Amount WTF B [l]	Water in the mixture[1] [l]	Frost protection down 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

(1)   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.

5.2.7   Water hardness tips

1. 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 (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.11   Table

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[1]	≤ 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

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

5.3   Choice of the location

5.3.1   Requirements for the installation room

The installation room must be dry and frost-free.

> ⚠ **Warning**
> Changes to conducts for combustion air and flue gas are only allowed after consultation a qualified installer. Such changes include:
> • Making the set-up location smaller
> • Retrofitting joint-sealed windows and outside doors
> • Sealing windows and outside doors
> • Covering or removing supply air apertures
> • Covering chimneys

> ℹ **Note**
> There are inspection apertures for the chimney sweep in the flue gas spigot on top of the boiler. Ensure that these inspection apertures are always accessible.

5.3.2   Notes for installation location

> ⚠ **Caution**
> **Danger of damage from water!**
> The following must be observed when installing the Paramount four:
> 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.

Installation room
• The installation room must be dry and frost-free.
• The installation location has to be selected particularly with respect to the routing of the flue gas pipes. When installing the boiler, the specified wall clearances have to be maintained.
• Along with the general rules of the technology, especially the regulations of the federal German states, such as fire and construction ordinances as well as heating room guidelines, must be observed. There should be sufficient space in front of the equipment to carry out inspection and maintenance work.

> ⚠ **Caution**
> **Risk of damage to the device!**
> Aggressive foreign substances in the combustion supply air can destroy or damage the heat generator. Therefore the installation in rooms with heavy dust accumulation is only allowed with room air independent operating modes.
> If the Paramount four is operated in rooms in which solvents, cleaning agents containing chlorine, paints, glues or similar substances are worked with or in which such substances are stored, only room air independent operation is permissible. This applies especially for rooms in which ammonia and its compounds are heavily used, as well as nitrites and sulphides (animal breeding and recycling facilities, battery and galvanising rooms, etc.). During the installation of the Paramount four under these conditions DIN 50929 (Corrosion probability of metallic materials with external corrosion loading) as well as information sheet i. 158; "German Copper Institute" is heeded.

For damages occurring due to the installation in an unsuitable location or based on improper combustion air supply, no warranty claims may be made.

5.3.3 Operation in wet rooms

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

In the case of installation in wet rooms, the following conditions must be met:
• Room air-independent operation
• to maintain IP rating IPx4D:
  - Do not operate the room device or thermostat in wet rooms.
  - All outgoing or incoming electrical lines must be installed through tension release screw fittings and fixed.

⚠ **Caution**
The screw fittings have to be tightened, so that no water can enter the inside of the housing!

Fig.13   Clearances in bathrooms and shower rooms
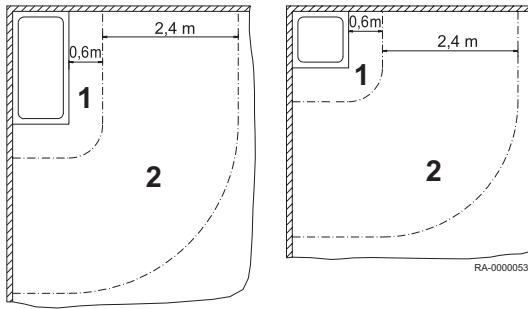
1   Protection area 2
2   Protection area 3

• When the Paramount four is installed in bath or shower rooms in residential buildings, the protection areas and minimum clearances must be heeded.
• The Paramount four complies with IP rating IPx4D (protection area 2 or 1) and may be installed in protection area 2 (refer also to the above notes "Operation in wet rooms").
• The Paramount four may only be installed in protection area 1 if no water jets are to be expected (e.g. massage showers).

6 Installation

6.1 Water connections

Fig.14 Installation of disconnector valves

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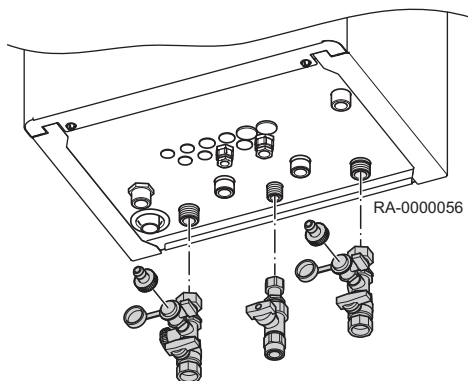
6.1.1 Connecting the heating circuit

Connect the heating circuit with flat seal screw connections to boiler flow and boiler return.

Disconnector valves have to be installed into the flow and return. To facilitate the assembly, the shut-off set ADH (accessory) or AEH (accessory) may be used.

Disconnector valves have to be installed into the flow and return. To facilitate the assembly, the shut-off set ADH (accessory) may be used.

> **Note**
> **Install heating filter.**
> Installation of a filter is recommended in the heating return. In the case of old plants, the whole heating plant should be thoroughly flushed before installation.

6.1.2 Safety valve

Mount the membrane expansion vessel with the heating systems closed.

> **Caution**
> **The connecting pipe between boiler and safety valve must not be blockable.**
> The installation of pumps and fittings or pipe reducer pieces is not permissible. The blow-off line of the safety valve must be designed in such a way that the pressure does not increase when the safety valve responds. It must not be routed to the outside, the opening must be clear and observable. Any heating water that may possibly escape should be safely drained off.

> **Caution**
> The blow-off line of the safety valve must be designed in such a way that the pressure does not increase when the safety valve responds. It must not be routed to the outside, the opening must be clear and observable. Any heating water that may possibly escape should be safely drained off.

6.1.3 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).

The condensate must be able to flow freely into a funnel. A stench trap must be installed between the funnel and drainage system.

The condensate hose of the Paramount four must be inserted through the opening in the floor.

If there is no run-off facility underneath the condensate discharge, the use of Potterton Commercial neutralisation and lifting system is recommended.

> ⚠ **Caution**
> **Risk of damage to the device!**
> The condensate hose must be laid with even gradient to the funnel. Avoid horizontal pipe routing.
> Fill the condensate discharge in the Paramount four with water before commissioning. For this, fill 0.25 l water in the flue outlet before assembly of the flue gas pipe.

6.1.4   Sealing and filling of the system

1. Fill the heating system via the return flow of the Paramount four (see note below)!
2. Check tightness (see note below for max. operating pressure).

> 📖 **For more information, see**
> Technical data, page 0
> Technical data, page 14
> Dimensions and connections, page 18

6.2   Gas connection

6.2.1   Gas connection

The gas-side connection may only be carried out by an approved installer. 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 disconnector valve must be installed upstream of the Paramount four.

If old gas pipes still exist in the region, the installation of a gas filter is recommended.

Residues in pipes and pipe joints should be removed.

6.2.2   Venting the gas line

The gas line must be vented before initial commissioning.

For this, open the measuring nozzle for the connecting pressure and vent, taking the safety precautions into account. Check for tightness of the connection after venting.

> ⚠ **Danger**
> **Danger to life by gas!**
> The entire gas inlet pipe, particularly the joints, must be checked for leakages before commissioning.

6.3   Air supply/flue gas connections

6.3.1   Flue gas connection

For the operation of the Paramount four as a gas condensing boiler, the flue gas pipe should be designed with the flue gas temperature under 120°C (flue gas pipe type B).

> ℹ **Note**
> The enclosed assembly instructions for the flue gas system have to be observed.

Fig.15   Connection possibilities with KAS (accessory)

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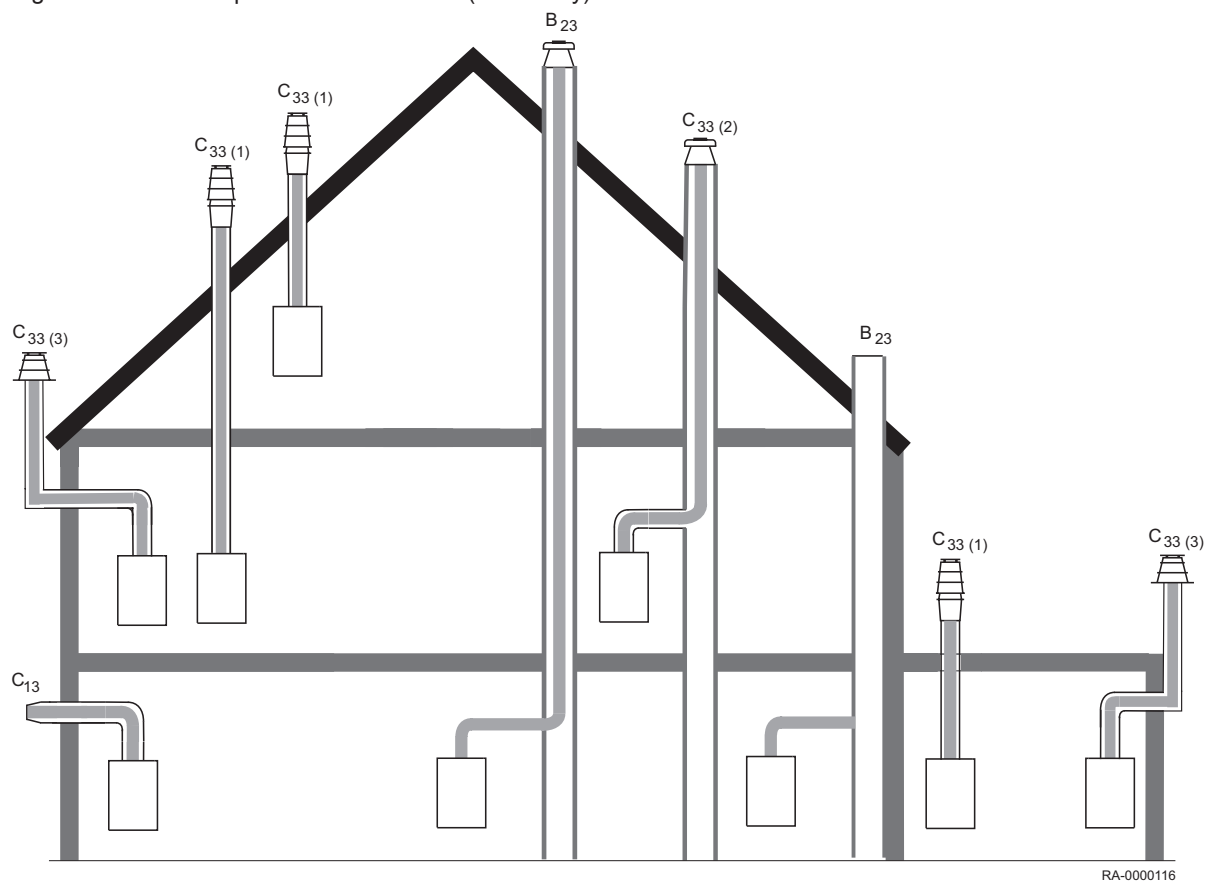
6.3.2 Permissible flue gas pipe lengths

Paramount four	30 / 40			50 / 60			80			95			115		
Flue Type	Flue Size	Max Flue Length[1]	Max. No of Bends (90°)	Flue Size	Max Flue Length[1]	Max. No of Bends (90°)	Flue Size	Max Flue Length[1]	Max. No of Bends (90°)	Flue Size	Max Flue Length[1]	Max. No of Bends (90°)	Flue Size	Max Flue Length[1]	Max. No of Bends (90°)
C13 (Balanced Flue)[2]	80/125	10(5)	2	110/150	5(5)	2	110/150	5(5)	2	110/160	5/5	2	110/160	5/5	2
C33(1) (Concentric Vertical)	80/125	13	0	110/180	22	0	110/180	13	0	110/180	10/3	0	110/180	10/3	0
C33(1) (Concentric Vertical)	110/160[3]	20	0				120/180[3]	20	0				120/180[3]		
C33(2) (Concentric Vertical)	80/125	15(3)	2	110/180	24(3)	2	110/180	15(3)	2	110/180	18/3	2	110/180	20/3	2
C33(3) (Concentric Vertical)	80/125	7(3)	2	110/180	13(2)	2	110/180	9(3)	2	110/180			110/180		
B23 (Conventional Flue)[3]	80	20(3)	3	110	25(3)	3	110	16(3)	3	110	20/3	2	110	20/3	2

(1) This is the maximum flue length, the allowable horizontal run within total flue length is shown in brackets.
(2) the maximum flue length shown may give an output reduction of 5 % with the maximum flue shown.
(3) not supplied byPotterton Commercial

📖 **See**
Flue sizes shown for the Concentric Vertical Flue are adapted sizes for flues supplied by Potterton Commercial. For flues supplied by other manufactors, please refer to technical data for standard spigot sizes.

📖 **See**
BS 5440 states a suitable guard should be provided whenever the appliance terminal is fitted less than 2 m above ground, above a balcony or flat roof.

6.3.3   General information about the exhaust gas piping system

Standards and regulations

Besides the general technical rules, the following should be particularly observed:
• Regulations of the accompanying certificate of approval
• Planning laws and building regulation.

■ **Contaminated chimneys**

Combustion of solid and liquid fuels generates deposits and pollution in the respective flue gas tract. Soot contaminated with sulphur and halogenated hydrocarbons sticks to the inside walls. Such flue gas tracts are not suitable for the combustion air supply of heat generators without pretreatment. Contaminated combustion air is one of the main causes of corrosion damage and malfunctions on fuel-burning installations. If the combustion air has to be drawn via an existing chimney, this flue gas tract should be inspected by the district chimney sweep officer responsible and cleaned if necessary. Should structural deficiencies (e.g. old, broken chimney structures) oppose its use as a 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.

If 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 flue gas pipe must run straight in the shaft.

■ **Lightning protection**

⚠ **Danger of electric shock**
Danger to life due to lightning strike.
The chimney head cover must be integrated in any existing lightning protection system and house-side potential equalisation.
This work should be carried out by an approved company specializing in lightning protection and electrical work.

■ **Shaft requirements**

Inside buildings, exhaust gas system should be laid in suitable ventilated shafts. The shafts 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.

6.3.4   Mounting the flue gas system

⚠ **Warning**
Danger of injury by not wearing working gloves.
Wearing working gloves is recommended during assembly work, particularly while cutting the pipes.

Mounting with gradient

The flue pipe must be routed at a gradient to the Paramount four so that the condensation from the flue pipe can drain from the flue pipe to the central condensation collector of the Paramount four.

The min. gradients are:
- horizontal flue pipe: min. 3° (min. 5.5 cm per metre)
- external wall duct: min. 1° (min. 2.0 cm per metre)

Shortening of the pipes

All simple and concentric pipes may be shortened. After cutting, the ends of the pipes have to be thoroughly de-burred. When a concentric pipe is shortened, a piece of pipe at least 6 cm long must be cut off the outer pipe. The spring washer for centring the inner pipe becomes obsolete.

1. The pipes and formed pieces have to be fitted together up to the connector basis. Only the original profile seals of the building kit or the original spare seals may be used between the individual elements. Before assembly, the seals must be treated with the silicone paste which is part of the scope of delivery. When routing the pipes care must be taken that the pipes are installed in line and without tension. In this way leaking of the seals is prevented.

2. For fastening the support rail in the opposite wall of the shaft opening, a bore hole (Ø=10 mm) must be provided on the level fo the opening edge. Then the pin of the support rail has to be hammered into the bore hole.

3. The flue pipe is lowered from the top into the shaft. For this, connect a rope to the support leg and insert the pipes, section by section, from the top. To prevent the components sliding apart during assembly, the rope must be kept on tension until the final assembly of the flue pipe. If spacers are necessary, these have to be fitted to the duct at least every 2 m.

4. Cant the spacers at a right angle and align centric in the shaft. Pipes and formed parts are to be installed in such a way that the connectors are arranged counter to the flow direction of the condensed water.

After the pipes have been inserted, place the support leg in the support rail and align (flush and without tension). The shaft cover at the chimney head must be assembled in such a way that no rainfall can get into the space between flue pipe and shaft and the air for back ventilation can flow freely.
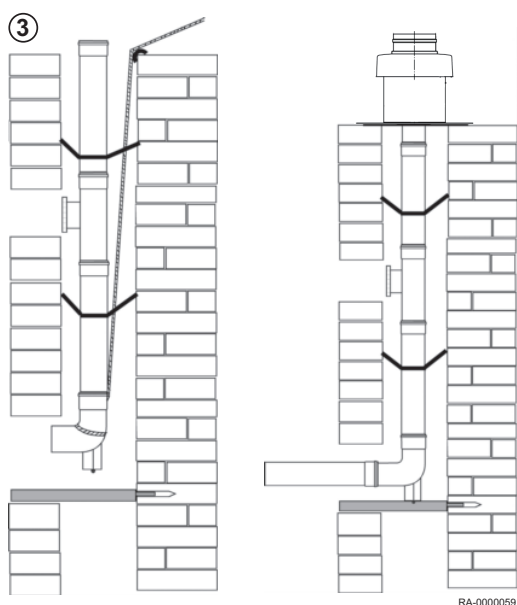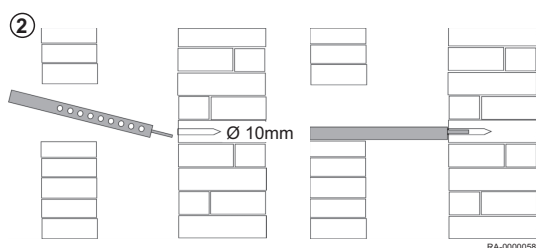
> ⚠️ **Caution**
> When the flue pipes are dis-assembled, new seals must be used for the reassembly!

6.3.5 Outlets

> ℹ️ **Note**
> When codes of practice dictate the use of a terminal guard use a suitable guard of stainless steel construction. There must be a clearance of at least 50 mm between any part of the terminal and the guard.

Fig.16 Outlets

⊗ Likely flue positions requiring a flue terminal guard
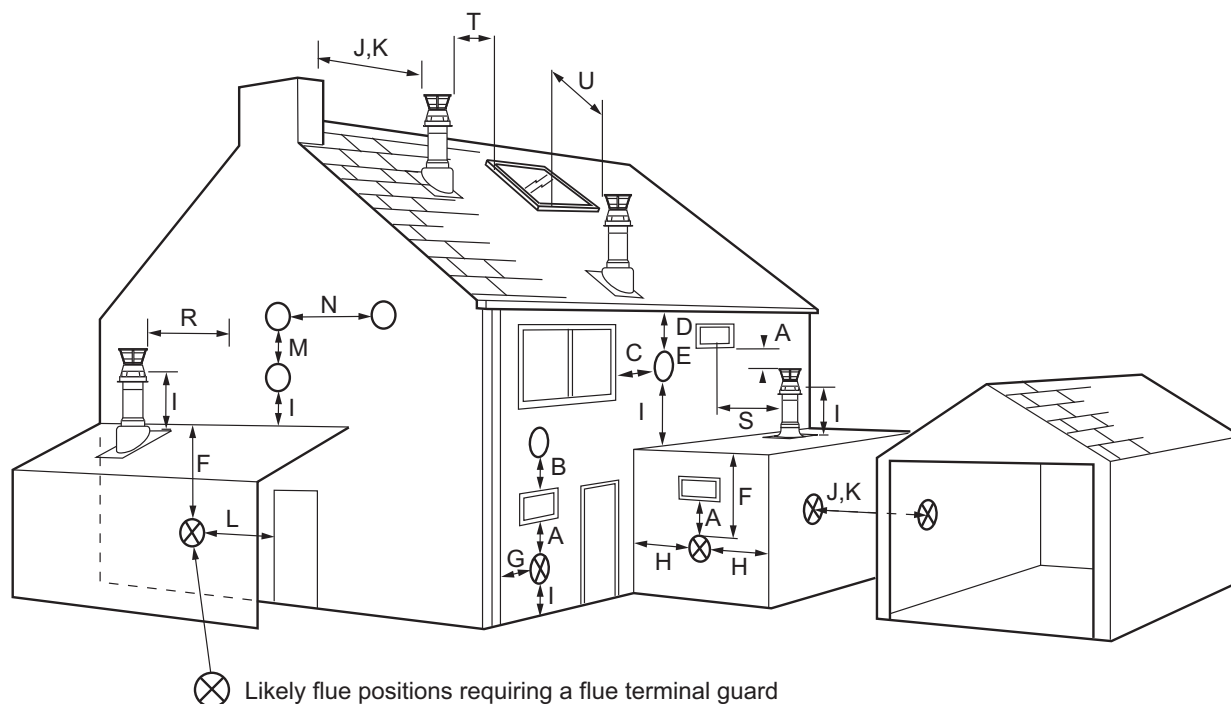
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Tab.12 Terminal position with minimum distance

A[1]	Directly below an opening, air brick, opening windows, etc.	300 mm
B[1]	Above an opening, air brick, opening window etc.	300 mm
C[1]	Horizontally to an opening, air brick, opening window etc.	300 mm
D[2]	Below gutters, soil pipes or drain pipes.	25 (75) mm
E[2]	Below eaves.	25 (200) mm
F[2]	Below balconies or car port roof.	25 (200) mm
G[2]	From a vertical drain pipe or soil pipe.	25 (150) mm
H[2]	From an internal or external corner.	25 (300) mm
I	Above ground, roof or balcony level.	300 mm
J	From a surface or boundary line facing a terminal.	600 mm
K	From a terminal facing a terminal (Horizontal flue). From a terminal facing a terminal (Vertical flue).	1200 mm 600 mm
L	From an opening in carport (e.g. door, window) into the dwelling.	1200 mm
M	Vertically from a terminal on the same wall.	1500 mm
N	Horizontally from a terminal on the same wall.	300 mm
R	From adjacent wall to flue (vertical only).	300 mm
S	From an adjacent opening window (vertical only).	1000 mm
T	Adjacent to windows or openings on pitched and flat roofs.	600 mm

U	Below windows or openings on pitched roofs.	2000 mm
(1)	In addition, the terminal should be no nearer than 150 mm to an opening in the building fabric formed for the purpose of accommodating a built-in element such as a window frame.	
(2)	Only one 25 mm clearance is allowed per installation. If one of the dimensions D, E, F, G or H is 25 mm then the remainder MUST be as shown in brackets, in accordance with BS 5440-1	

6.3.6   Chimneys already in use

If a chimney used before for oil or solid fuel-fired boilers is used as a shaft for installation of a concentric exhaust gas pipeline, the chimney must be thoroughly cleaned first by a specialist.

> **i   Note**
> The concentric flue gas pipe must run straight in the duct.
> - **Height above the roof**
>   - With regard to the minimum height above the roof, country-specific regulations regarding chimneys and flue gas systems are applicable.

6.3.7   Cleaning and inspection openings

> ⚠ **Danger**
> **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 four.

Exhaust gas pipes in buildings, which cannot be cleaned or inspected from their port 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 four is sufficient.

The ducts for exhaust gas facilities must not have any openings other than the necessary cleaning and inspection ports as well as openings for back ventilation of the exhaust gas pipe.

6.4   Electrical connections

6.4.1   Electrical connection (general)

> ⚠ **Danger**
> **Danger to life through incorrect work!**
> All electrical work in connection with the installation may only be carried out by a trained electrician.
> • Mains supply AC 230 V +6% -10%, 50 Hz

In UK follow the relevant regulations.

The electrical connection should be made with correct and non-reversible polarity. In Germany the connection can be executed as an accessible plug and socket connection with non-reversible polarity or as a fixed connection. In all other countries, a fixed connection must be provided.

For the power supply, use the power cable attached to the boiler or cable types H05VV-F 3 x 1 mm^2 or 3 x 1.5 mm^2. The earthing cable must be longer at the connection in order to guarantee that this connection is the last cable to rupture in the event of a hazard.

It is recommended to arrange a main switch before the Paramount four. This should isolate all poles and provide contact separation of at least 3 mm.

All connected components must be executed compliant with the national regulations. Always apply strain relief to connecting cables.

Cable types

> ⚠ **Danger**
> **Danger to life. Risk of injury or a risk to life from electric shock!**
> The use of rigid lines (e.g. NYM) is not allowed because of the risk of cable damages! Flexible cables e.g H05VV-F must be used for mains voltage and e.g. LIYY for sensor/bus cables.

6.4.2   Cable lengths

Bus/sensor lines do not have mains voltage, but safety extra-low voltage. **Never** route them **in parallel to mains cables** (interference). Otherwise shielded cables must be installed.

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

Cable types : e.g. LIYY or LiYCY 2 x 0.8

6.4.3   Strain reliefs

All the cables should be fixed in the strain relief clamp of the control panel and connected according to the connection diagram.

> 📖 **For more information, see**
> Wiring diagram, page 22

Fig.17   Strain reliefs

RA-0000064
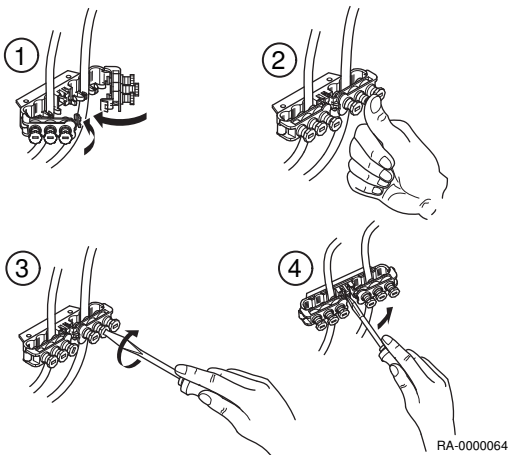
6.4.4   Replacing cables

All connecting cables, except for the mains connection cable, have to be replaced by Potterton Commercial special cables in case of replacement. When replacing the mains connection cable, only cables of the types H05VV-F 3 x 1 mm^2 or 3 x 1.5 mm^2 may be used.

6.4.5 Protection against contact

⚠ **Danger of electric shock**
Danger to life due by missing shock-proof protection.
To ensure shock-proof protection, all parts of the boiler to be screwed on – the casing parts in particular – must be screwed on correctly after work has been completed.

6.4.6 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.

6.4.7 Circulating pumps

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

6.4.8 Appliance fuses

Appliance fuse in the control unit ISR:
• Mains fuses: T 6.3A H 250V

6.4.9 Connecting sensors/components

⚠ **Danger**
Risk of electric shock! Danger to life through incorrect work!
The wiring diagram must be followed! Optional accessories must be fitted and connected according to the instructions provided. Connect to the mains. Check earthing.

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

7 Commissioning

7.1 General

> ⚠ **Danger**
> Commissioning may only be carried out by an approved installer. The installer checks the tightness of pipes, the correct function of all regulating, control and safety equipment, and measures the combustion values. If this work is not carried out correctly, there is a risk of considerable damage to persons, environment and property.

7.2 Checklist for commissioning

Tab.13 Checklist for commissioning

1.	System location				
2.	Customer				
3.	Boiler type/Designation				
4.	Serial number				
5.	Characteristic gas values	Wobbe index	kWh/m³		
6.		Operating heating value	kWh/m³		
7.	Have all pipelines and connections been checked for tightness?			☐
8.	Flue gas system checked?			☐
9.	Gas pipeline checked and vented?			☐
10.	Static pressure measured at the gas valve inlet?	mbar	
11.	Free wheeling of pumps checked?			☐
12.	Filling the heating plant			☐
13.	Water additives used		
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.		Domestic water mode		☐
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 the respective standard have been used. All system components have been installed according to the instruction of the manufacturers. The whole system conforms to the standard. To ensure the heat source operates reliably and economically for a long period, we recommend annual maintenance for the heat generator.		Date /signature Company stamp ....

7.3   Commissioning procedure

RA-0000065

7.3.1   Commissioning menu

The commissioning menu will be shown <u>once</u> during initial commissioning.

1. Change Language must be selected and confirmed with the **OK button**.
2. Year select year and confirm.
3. Set time and date set and confirm.
4. Conclude by pressing the **OK button**.

i **Note**
If the commissioning menu entry is terminated by pressing **ESC**, the menu will be shown again next time the appliance is switched on.
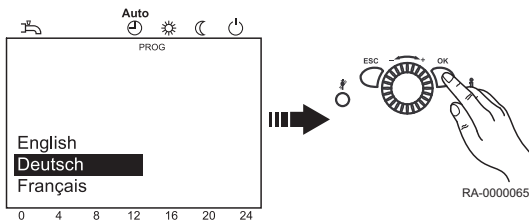
7.4   Gas settings

7.4.1   Factory settings

The Paramount four has been set to the nominal heat load by the manufacturer.

• Gas type G20 (natural gas G20 with Wobbe index W_{oN} = 15.0 kWh/m^3)

The specific set gas type can be seen on the optional label glued to the burner. The factory setting data must be checked against the on-site supply conditions before installation of the Paramount four.

7.4.2   Supply pressure

The supply pressure must be between the values given in the technical data table (see reference below).

The connecting pressure is measured as pressure in the gas flow at the measuring nozzle of the gas valve.

⚠ **Danger**
The Paramount four must not be started up when the supply pressures are outside the said range.
The gas supply company must be informed.

For more information, see
Technical data, page 14
Technical data, page 0
Gas valve, page 0
Gas valve, page 47

7.4.3 CO_2 content

The CO_2 content 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 to the burner!
Too *high* CO_2 values can lead to unhygienic combustion (high CO values) and damage to the burner.
Too *low* CO_2 values can lead to ignition problems.

The CO_2 value is set by adjusting the gas pressure at the gas valve. If the Paramount four is used in areas with fluctuating natural gas composition, the CO_2 content must be adjusted in accordance with the Wobbe index at any given time (ask the gas supply company).

The CO_2 content to be set can be decided as follows:
- CO_2 content = 8.5 - (W_{oN} - $W_{ocurrent}$) * 0,5
- until Paramount four 50: CO_2 content = 8,5 - (W_{oN} - $W_{ocurrent}$) * 0,5
- above Paramount four 50: CO_2 content = 8.8 - (W_{oN} - $W_{ocurrent}$) * 0.5

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

📖 **For more information, see**
Technical data, page 14
Technical data, page 0

7.4.4 Changing over from natural gas to LPG and vice versa

⚠ **Danger**
Danger! Danger to life by gas!
The gas type of the Paramount four may only be changed by an approved heating specialist. The Potterton Commercial conversion kit for LPG (accessory) must be used. The instructions of the conversion kit must be observed!

The CO_2 content is set by adjusting the injection nozzle pressure on the gas valve.

The CO_2-content must be between the values according to section *Technical Data* at full load as well as low load.

For more information, see
Technical data, page 14
Technical data, page 0

7.4.5 Gas valve

Fig.18   Gas valve

RA-0000476
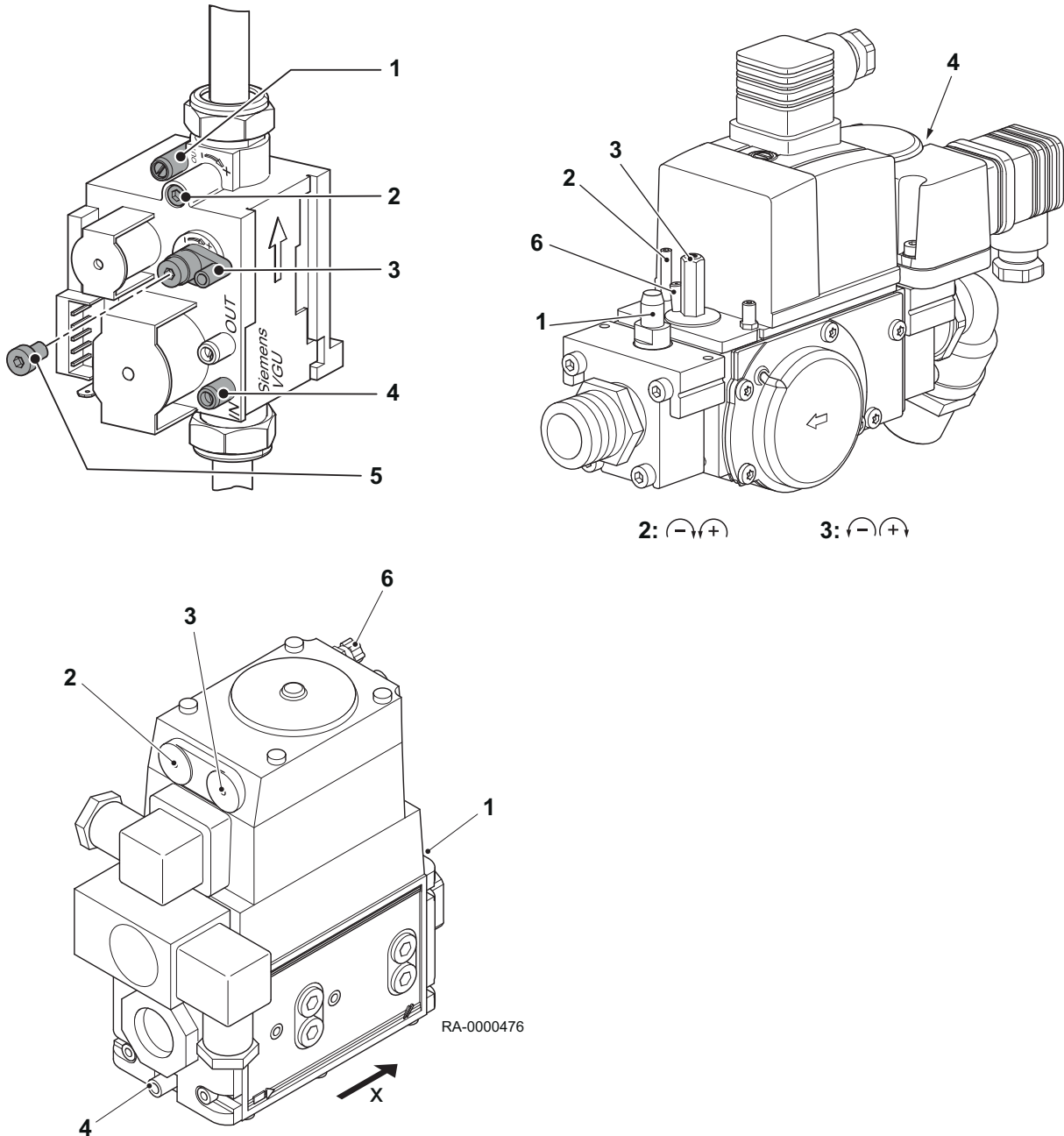
1   Measuring nozzle for injector pressure
2   Setting for full load
3   Setting for low load (remove protective plug in advance (**5**))
4   Measuring nozzle for connecting pressure
5   Protective plug
6   Fan pressure
x   Flow direction

Setting of jet pressures:
- Paramount four 30 - 60: Torx T15
- Paramount four 80: Allen key 2,0 mm
- Paramount four 95 - 115: Allen key 2,5 mm

i **Note**
The keys are located in the accessory kit.
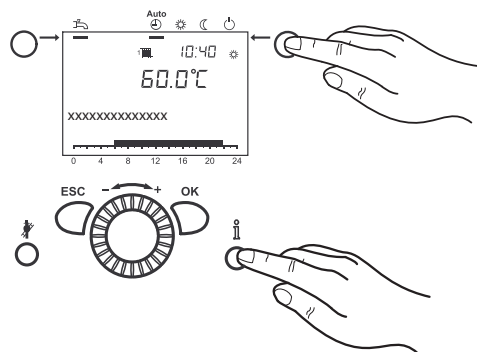
7.4.6 Manual adjustment of burner output (controller stop function)

For controlling the CO_2 values the Paramount four operated in the **control stop function**

1. Press button **Operating mode button heating operation** for approx 3 s
   The message Controller stop active is displayed.
2. Wait until the display has reached the basic display again.

3. Press the Info button
   The message Controller stop setpoint appears on the display. The actual modulation degree will be displayed on the display.
4. Press **OK**.
   The setpoint can now be changed.
5. Press **OK**.
   The setpoint displayed is then adopted by the controller.

> **i** 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 there is demand for heat from a coiled tubing storage tank, this demand will continue to be met during the controller stop function.

7.4.7 Guidance values for gas flow rate, injector pressure and CO_2 content

The values given in are for guidance. 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.

If the Paramount four is used in areas with fluctuating natural gas composition, the CO_2 content must be adjusted in accordance with the Wobbe index at any given time (ask the gas supply company).

The CO_2 content to be set can be decided as follows:
- to Paramount four 60: CO_2 content = 8,5 - (W_{oN} - $W_{ocurrent}$) * 0,5
- over Paramount four 60: CO_2 content = 8.8 - (W_{oN} - $W_{ocurrent}$) * 0,5

7.4.8 Guidance values for the gas flow rate

Tab.14 Guide values for the gas flow rate for natural gas

Model		Paramount four 30	Paramount four 40
Nominal input (full load)	kW	30	38
Gas flow rate		l/min	l/min
	7	71	90
	7.5	67	84
	8	63	79
Operating heating value	8.5	59	74
H_{uB} in kWh/m^3	9	56	70
	9.5	53	67
	10	50	63
	10.5	48	60
	11	45	58
	11.5	43	55

7.4.9 Guidance values for the gas flow rate

Tab.15   Guide values for the gas flow rate for natural gas

Model		Paramount four 50	Paramount four 60	Paramount four 80	Paramount four 95	Paramount four 115
Nominal input (full load)	kW	50,0	58.0	77.0	95.0	115.0
Gas flow rate		l/min	l/min	l/min	l/min	l/min
	7	119	138	183	226	274
	7.5	111	129	171	211	256
	8,0	104	121	160	198	240
Operating heating value	8.5	98	114	151	186	225
H_{uB} in kWh/m^3	9,0	93	107	143	176	213
	9.5	88	102	135	167	202
	10	83	97	128	158	192
	10.5	79	92	122	151	183
	11	76	88	117	144	174
	11.5	72	84	112	138	167

7.4.10 Guidance values for injector pressure

Tab.16   Guidance values for injector pressure (full load)

Model				Paramount four 30	Paramount four 40
Injector diameter for					
Natural gas E (G20)			mm	4,90	7,80
LPG (propane)			mm	3,90	5,80
Guide values for injector pressure [1]					
G20 (15,0)[2]			mbar	8,3 - 9,3	6.0 - 7.0
Propane			mbar	8,3 - 9,3	6.0 - 7.0
CO$_2$-content: see reference below					
(1) At pressure at end of boiler 0 mbar, 1013 hPa, 15 °C					
(2) Values in brackets = Wobbe Index W_{oN} in kWh/m^3					

For more information, see
Technical data, page 14
Technical data, page 0

7.4.11 Guidance values for injector pressure

Tab.17   Guidance values for injector pressure (full load)

Model		Paramount four 50	Paramount four 60	Paramount four 80	Paramount four 95	Paramount four 115
Injector diameter for						
Natural gas E (G20)	mm	7,00	7.80	9.00	8.50	10.30
LPG (propane)	mm	5,80	6,20	7,20	6.50	7,40
		Guide values for injector pressure [1]				
G20 (15,0)[2]	mbar	7.2 - 8.2	6,5 - 7,5	8.0 - 9.0	13,0 - 14,0	13,0 - 14,0
Propane	mbar	6,8 - 7,8	7,0 - 8,0	8,1 - 9,1	15,0 - 16,0	15,0 - 16,0

Model		Paramount four 50	Paramount four 60	Paramount four 80	Paramount four 95	Paramount four 115
CO_2-content: see reference below						
(1) at pressure at end of boiler 0 mbar, 1013 hPa, 15 °C (2) Values in brackets = Wobbe index W_{oN} in kWh/m^3						

For more information, see

Technical data, page 14
Technical data, page 0

8   Operation

8.1   Changing parameters

Settings which are not directly changed via the operating panel must be carried out on the setting level.

The basic programming process is depicted in the following using the example of the setting of Set time and date.
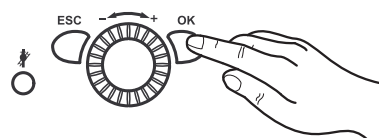
1. Press **OK**.
   The *End user* display is shown.

> **i** **Note**
> If parameters are to be changed on a level other than the end user level, please see the note below.

2. Use the control knob to select the menu item Set time and date.
3. Press **OK**.
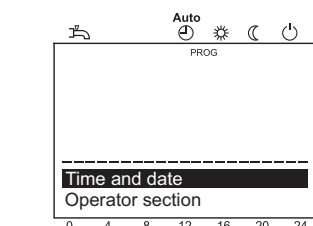
4. Use the control knob to select the menu item Hours / minutes.
5. Press **OK**.
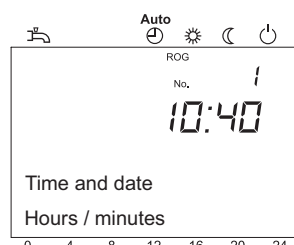
6. Carry out hour setting (e.g. 15 h) using the control knob.
7. Press **OK**.
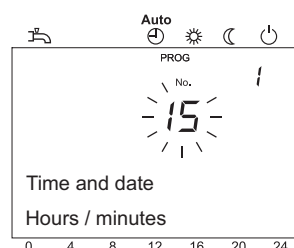
8. Carry out minute setting (e.g. 30 minutes) with the control knob.
9. Press **OK**.
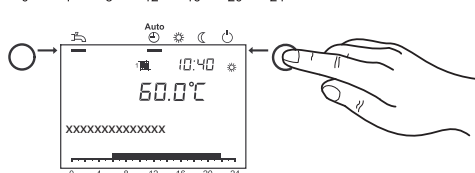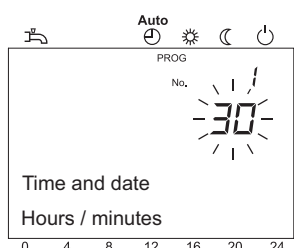
10. Leave the programming level by pressing the **operating mode key for heating mode**.

> **i** **Note**
> The previous menu item is retrieved by pressing the **ESC key** without applying previously modified values. If no settings are carried out for approximately 8 minutes, the basic display is called up without applying previously modified values.

> **📖** **For more information, see**
> Programming procedure, page 51

8.2   Programming procedure

The selection of the setting levels and menu items is done as follows:
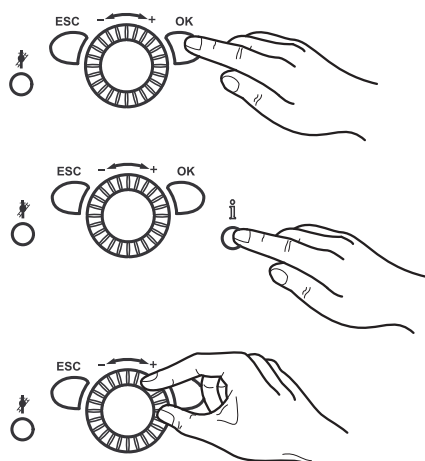
1. Press **OK**.
   The *End user* display is shown.

2. Press the **Info button** for approx. 3 s.
   The setting levels appear.

3. Select the required setting level using the control knob.

Setting levels
- End user (Eu)
- Commissioning (C), incl. end user (Eu)
- Engineer (E), incl. end user (Eu) and commissioning (C)
- OEM, includes all other setting levels (password-protected)

4. Press **OK**.
5. Select the required menu item (see parameter list) using the control knob.

> **See**
> Not all menu items will be visible, depending on the selection of the programming level and the programming.

> **For more information, see**
> List of parameters, page 57

8.3 Tips for commissioning

> ⚠ **Danger**
> Commissioning may only be carried out by an approved installer. The installer checks the tightness of pipes, the correct function of all regulating, control and safety equipment, and measures the combustion values. If this work is not carried out correctly, there is a risk of considerable damage to persons, environment and property.

> ⚠ **Warning**
> **Risk of damage.**
> The gas condensing boiler may only be installed in rooms with clean combustion air. Foreign matter such as pollen must never filter through the inlet apertures to reach the inside of the appliance. The boiler must not be started up if there is heavy dust development e.g. during construction work. There could be damage to the boiler.

> ⚠ **Caution**
> **Risk of burns!**
> For safety reasons, the discharge pipe from the safety valve must always be open so that water can escape during heating operation. The operating state of the safety valve must be checked from time to time.

8.4 Checking water pressure

• Less than 1.0 bar: Top up water.

> ⚠ **Caution**
> Observe the maximum permissible system pressure.

• Over 2.5 bar: Do not put the gas condensing boiler into operation. Drain the water.

⚠ **Caution**
Observe the maximum permissible system pressure.

• Check that there is a drip pan below the discharge pipe from the safety valve. In the case of overpressure, it collects heating water as it is expelled.

8.5 Checking the domestic water storage tank

Where systems work with a domestic water storage tank, this must always be filled with water. In addition, it must be possible for cold water to enter.

8.6 Preparing start-up

This section describes which general work has to be done to switch the boiler on.
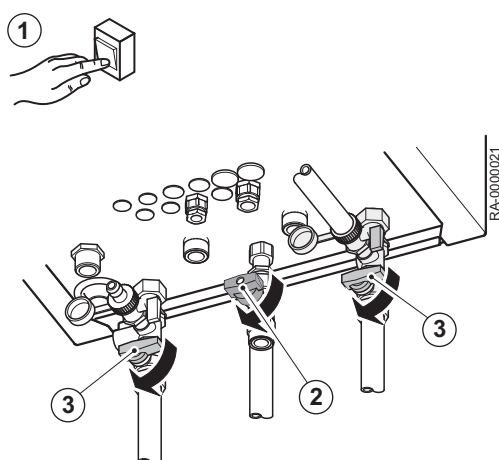
1. Switch on the heating emergency switch.

2. Open the gas tap.
3. Open the disconnector valves.
4. Open the domestic water supply.
5. Open the front panel cover and switch the ON/OFF switch on the front panel of the boiler to on.

The Paramount four can be commissioned using its standard values without any further settings. For information regarding setting e.g. an individual time program, please see the *Operation* chapter.

📖 **For more information, see**
Changing parameters, page 51

8.7 Setting the heating mode
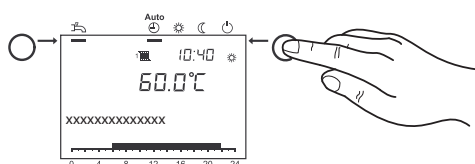
The **operating mode key for heating mode** enables a changeover between the various heating operating modes. The selected setting is marked with a bar underneath the operating mode symbol.

Automatic mode ⏱
• Heating mode according to time program
• Temperature setpoints ☀ or ☾ according to time program
• Protection functions (plant frost protection, overheating protection) activated
• Automatic summer/winter changeover (automatic switching over between heating and summer operation from a certain outside temperature onwards)
• Automatic day heating limit (automatic changeover between heating and summer operation, if outside temperature exceeds the room setpoint value)

Continuous mode ☀ or ☾
• Heating mode without time program
• Protection functions activated
• Automatic summer/winter changeover is not activated
• Automatic day heating limit is not activated

Protection mode ⏻
• No heating operation
• Temperature according to frost protection setpoint
• Protection functions activated

• Automatic summer/winter changeover active
• Automatic day heating limit active

8.8 Adjusting domestic water mode
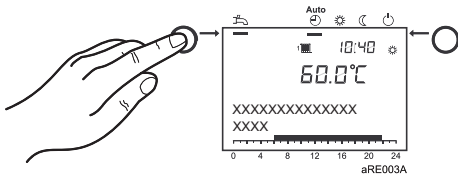
• Switched on Domestic water is prepared according to the selected switching programme.
• Switched off Domestic water preparation has been de-activated.

> **i** **Note**
> • A setting between 50 and 60°C is recommended for domestic water heating.
> • Times for domestic water heating are set in time program 4 / DHW.
>   **For reasons of convenience, domestic water heating should start approx. 1 h before central heating commences.**

> **i** **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.

8.9 Adjusting comfortable room setpoint
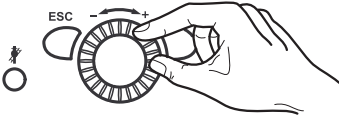
How to adjust the comfortable room setpoint is described here.

1. Set the comfort setpoint using the control knob.
   => The value is taken over automatically.

8.10 Setting reduced room setpoint
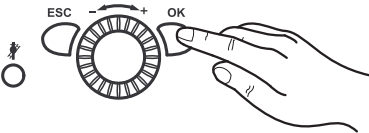
How to set the reduced room setpoint is described here.

1. Press **OK**.
2. Select the Central heating menu item.
3. Press **OK**.
4. Select the Reduced temp setpoint parameter.
5. Press **OK**.
6. Set the reduced setpoint at the control knob.
7. Press **OK**.
8. Leave the programming level by pressing the **operating mode key for heating mode**.

8.11 Pump setting (pumped heating circuit)

A hydraulic design calculation of the system is required for the correct setting of the pump modulation.

The pump inside the boiler is actuated by parameter 2320 (Pump modulation) with the modulation setting "Demand". This means that it modulates between the set minimum and maximum pump speed depend-

ing on the heating demand. The pump strives to use the least energy possible to supply the heating circuit.

Fig.19   Example of total dynamic head
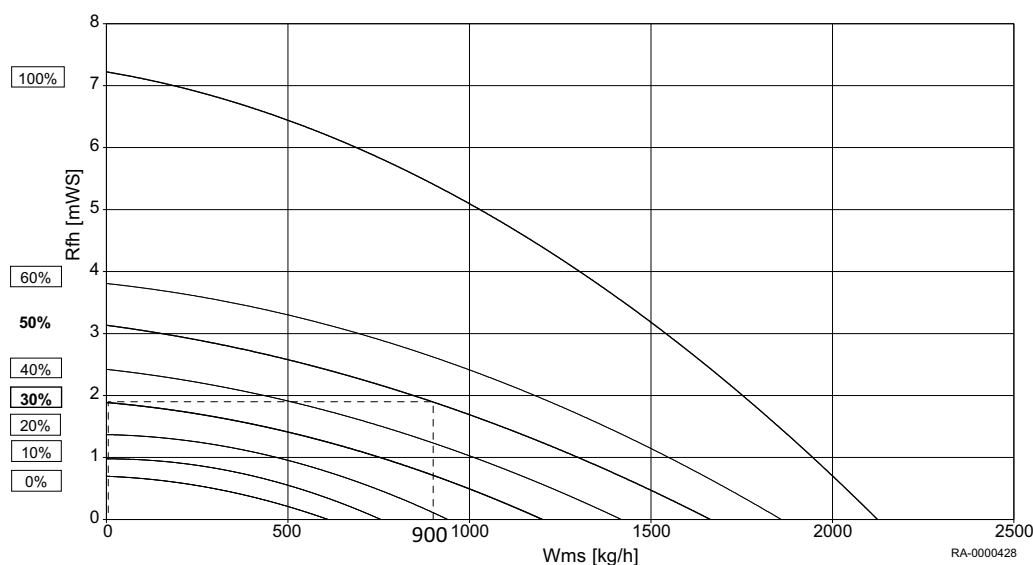
Rfh   Total dynamic head

Wms   Water mass flow

1. Parameter 883 (Pump speed max)
   The max. pump speed results from the design volume flow and the total dynamic head required at this point (see Fig.).

Tab.18   Example (Fig.)

Design volume flow	900 l/h
System resistance at the design point	19 kPa (1.9 mWS)
=> Max. speed (read off)	50%
=> Set parameter 883	50%

2. Parameter 882 (Pump speed min)
   - Heating systems with radiators
     The minimum pump speed for <u>heating systems with radiators</u> is the result of entering the system resistance again at volume flow zero l/h in the diagram (see Fig.)

Tab.19   Example (Fig.)

System resistance at the design point	19 kPa (1.9 mWS)
=> Min. speed (read off)	30%
=> Set parameter 882	30%

   - Underfloor heating systems
     The minimum pump speed for <u>underfloor heating systems</u> results from 75% of the maximum pump speed.

Tab.20   Example (without illustration)

=> Max. speed (read off)	50%
=> Min. speed (read off)	0.75 * 50% = 37.5%
=> Set parameter 882	37%

📖 **For more information, see**
Total dynamic head Paramount four, page 17

8.12   Emergency mode (Manual control)

Activation of manual control. If the manual control function is activated the boiler is controlled to the setpoint manual control. All the pumps are switched on. Additional requests e.g. for heating domestic water are ignored.

1. Press **OK**.
2. Request the menu item Maintenance.
3. Press **OK**.
4. Request the parameter Manual control (prog. no. 7140).
5. Press **OK**.
6. Select the parameter On.
7. Press **OK**.
8. Leave the programming level by pressing the **operating mode key for heating mode**.

8.13   Chimney sweep function
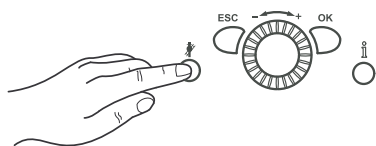
The chimney sweep function is activated or deactivated using the **chimney sweep key**.

1. Press the **chimney sweep key** 🧹.
   The activated special function is displayed by the symbol *ƒ* in the display.

ℹ️ **Note**
If there is demand for heat from a coiled tubing storage tank, this demand will continue to be met while the emissions test function (chimney sweep function) is running.

9 Settings

9.1 List of parameters

See
- Subject to system configuration, not all parameters listed in the parameter list will be shown on the display.
- To reach the end user (Eu), Commissioning (C) and Engineer (E) setting levels:
  - Press the **OK-Taste**.
  - Then press the **information button** for approx. 3 s.
  - Select the circuit using the control knob.
  - Confirm with the **OK button**.

Set time and date	Prog. no.	Level	Standard value
Hours / minutes	1	Eu	01:00 (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)

Operator section	Prog. no.	Level	Standard value
Change Language	20	Eu	English
Information Temporarily | Permanently	22	E	Temporarily
Contrast of display	25	Eu	—
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[1] No | Yes	30	E	No
Activate basic settings[2] No | Yes	31	E	No
Used as, page 0 Room unit 1 | Room unit 2 | Room unit 3 | Operator unit 1 | Operator unit 2 | Operator unit 3 | Service unit	40	C	Room unit 1
Assignment device 1[3] Temps / mode CH1 |Central heating 1 and 2 |Central Heating 1 and 3/P |All central heatings	42	C	Temps / mode CH1
Operation CH2, page 0 Commonly with HC1 | Independently	44	C	Commonly with HC1
Operation CH3/P, page 0 Commonly with HC1 | Independently	46	C	Commonly with HC1
Room temp device 1, page 0 CH circuit 1 only | For all assigned HCs	47	C	For all assigned HCs
Occupancy button device 1, page 0 None | Temps / mode CH1 | For all assigned HCs	48	C	For all assigned HCs
Readjustment room sensor, page 0	54	E	0.0 °C

Operator section	Prog. no.	Level	Standard value
Software version	70	E	—
(1) This parameter is only visible in the room device.			
(2) This parameter is only visible if a suitable standard setting is available in the operating unit.			
(3) This parameter is only visible in the room device, as the operating unit in the boiler is programmed permanently to the operating unit.			

Wireless[1]	Prog. no.	Level	Standard value
Room unit 1 Missing | In operation | No recept'n | Change batt	130	C	Missing
Room unit 2 Missing | In operation| No recept'n | Change batt	131	C	Missing
Room unit 3 Missing | In operation | No recept'n | Change batt	132	C	Missing
Outside sensor Missing | In operation| No recept'n | Change batt	133	C	Missing
Repeater Missing | In operation| No recept'n | Change batt	134	C	Missing
Operator unit 1 Missing | In operation| No recept'n | Change batt	135	C	Missing
Operator unit 2 Missing | In operation| No recept'n | Change batt	136	C	Missing
Operator unit 3 Missing | In operation| No recept'n | Change batt	137	C	Missing
Service unit Missing | In operation| No recept'n | Change batt	138	C	Missing
Delete all devices No | Yes	140	C	No
(1) Parameters only visible if wireless room device exists.			

Time program	Heating circuit 1 Prog. no.	Heating circuit 2[1] Prog. no.	Heating circuit 3 Prog. no.	Level	Standard value
Select Mon-Sun Mon-Sun | Mon-Fri | Sat-Sun | Mon | Tue | Wed | Thu | Fri | Sat | Sun	500	520	540	Eu	Mon
1st Time ON	501	521	541	Eu	06:00 (h/min)
1st Time OFF	502	522	542	Eu	22:00 (h/min)
2nd Time ON	503	523	543	Eu	--:-- (h/min)
2nd Time OFF	504	524	544	Eu	--:-- (h/min)
3rd Time ON	505	525	545	Eu	--:-- (h/min)
3rd Time OFF	506	526	546	Eu	--:-- (h/min)
Copy?	515	535	555	Eu	No
Default values No | Yes	516	536	556	Eu	No
(1) Parameters only visible if heating circuit is installed.					

Time program heating circuit 4 / DHW	Prog. no.	Level	Standard value
Select Mon-Sun Mon-Sun | Mon-Fri | Sat-Sun | Mon | Tue | Wed | Thu | Fri | Sat | Sun	560	Eu	Mon
1st Time ON	561	Eu	05:00 (h/min)
1st Time OFF	562	Eu	22:00 (h/min)
2nd Time ON	563	Eu	--:-- (h/min)
2nd Time OFF	564	Eu	--:-- (h/min)

Time program heating circuit 4 / DHW	Prog. no.	Level	Standard value
3rd Time ON	565	Eu	--:-- (h/min)
3rd Time OFF	566	Eu	--:-- (h/min)
Copy?	575	Eu	No
Default values No | Yes	576	Eu	No

Time program heating circuit 5	Prog. no.	Level	Standard value
Select Mon-Sun Mon-Sun | Mon-Fri | Sat-Sun | Mon | Tue | Wed | Thu | Fri | Sat | Sun	600	Eu	Mon
1st Time ON	601	Eu	06:00 (h/min)
1st Time OFF	602	Eu	22:00 (h/min)
2nd Time ON	603	Eu	--:-- (h/min)
2nd Time OFF	604	Eu	--:-- (h/min)
3rd Time ON	605	Eu	--:-- (h/min)
3rd Time OFF	606	Eu	--:-- (h/min)
Copy?	615	Eu	No
Default values No | Yes	616	Eu	No

Holidays heating circuit	1 Prog. no.	2[1] Prog. no.	3[1] Prog. no.	Level	Standard value
Select Period 1 | Period 2 | Period 3 | Period 4 | Period 5 | Period 6 | Period 7 | Period 8	641	651	661	Eu	Period 1
Start	642	652	662	Eu	—.— (day.month)
End	643	653	663	Eu	—.— (day.month)
Operating level Off | Reduced	648	658	668	Eu	Off

[1]   Parameters only visible if heating circuit is installed!

Heating circuit	1 Prog. no.	2[1] Prog. no.	3[1] Prog. no.	Level	Standard value
Comfort setpoint	710	1010	1310	Eu	20.0 °C
Reduced temp setpoint	712	1012	1312	Eu	18 °C
Frost protection setpoint	714	1014	1314	Eu	10.0 °C
Heating curve slope	720	1020	1320	Eu	1.24
Heating curve displacement	721	1021	1321	E	2.0 °C
Heating curve adaption Off | On	726	1026	1326	E	Off
Summer/winter heating limit	730	1030	1330	Eu	18°C
24-hour heating limit	732	1032	1332	E	0 °C
Flow temp setpoint min	740	1040	1340	E	8 °C
Flow temp setpoint max	741	1041	1341	E	80 °C
Flow temp setpoint room stat	742	1042	1342	E	- - - °C
Swi-on ratio room stat	744	1044	1344	E	- - - %
Delay heat request	746	1046	1346	E	0 s
Room influence	750	1050	1350	C	- - - %
Room temp limitation	760	1060	1360	E	0.5 °C
Central heating boost	770	1070	1370	E	- - - °C

Heating circuit	1 Prog. no.	2[1] Prog. no.	3[1] Prog. no.	Level	Standard value
Quick setback Off | Down to reduced setpoint | Down to frost prot setpoint	780	1080	1380	E	Down to reduced setpoint
Optimum start control max	790	1090	1390	E	0 min
Optimum stop control max	791	1091	1391	E	0 min
Reduced setp increase start	800	1100	1400	E	- - - °C
Reduced setp increase end	801	1101	1401	E	-15 °C
Continuous pump operation No | Yes	809	1109	1409	E	No
Overtemp protect pump circ Off | On	820	1120	1420	E	Off
Mixing valve boost	830	1130	1430	E	5 °C
Actuator running time	834	1134	1434	E	140 s
Floor curing function Off | Functional heating | Curing heating | Curing/ functional heating | Functional/curing heating | Manually	850	1150	1450	E	Off
Floor curing setp manually	851	1151	1451	E	25 °C
Floor curing setp current	855	1155	1455	E	- - - °C
Floor curing day current	856	1156	1456	E	- - -
Excess heat draw Off | Heating mode | Always	861	1161	1461	E	Heating mode
With buffer No | Yes	870	1170	1470	E	Yes
With prim contr/system pump No | Yes	872	1172	1472	E	Yes
Pump speed reduction Operating level | Characteristic | Temp differential nominal	880	1180	1480	E	Characteristic
Pump speed min	882	1182	1482	C	Paramount four 30: 35%; Paramount four 40: 35 %; Paramount four 50– 115: 30 %
Pump speed max	883	1183	1483	C	Paramount four 30: 63%; Paramount four 40: 80% Paramount four 50– 115: 80%
Curve readj at 50% speed	888	1188	1488	E	10 %
Flow setp readj speed ctrl No | Yes	890	1190	1490	E	YesNo
Operating level changeover Off | Reduced | On	898	1198	1498	E	Reduced
Optg mode changeover None | Off | Reduced | On | Timed	900	1200	1500	E	Off
(1) Parameters only visible if heating circuit is installed!					

DHW	Prog. no.	Level	Standard value
Hot water temp setpoint	1610	Eu	55 °C
Reduced temp setpoint	1612	E	45 °C
Hot water temp setpoint max	1614	E	65 °C

DHW	Prog. no.	Level	Standard value
Release 24h/day | Time setting central heating | Time hot water	1620	Eu	Time hot water
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 funct circ pump Off | On	1647	E	On
Circulating pump release Time setting 3/CHP | Hot water release | Time hot water | Time auxiliary	1660	C	Hot water 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 / swimming pool circuit	Consumer circuit 1 Prog. no.	Consumer circuit 2 Prog. no.	Swimming pool circuit Prog. no.	Level	Standard value
Flow temp setp cons request	1859	1909	1959	C	70 °C
Hot water charging priority No | Yes	1874	1924	1974	E	Yes
Excess heat draw Off | On	1875	1925	1975	E	On
With buffer No | Yes	1878	1928	1978	E	Yes
With prim contr/system pump No | Yes	1880	1930	1980	E	Yes

Swimming pool	Prog. no.	Level	Standard value
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 control/feed pump	Prog. no.	Level	Standard value
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	140 s

Primary control/feed pump	Prog. no.	Level	Standard value
Primary contr/system pump Before buffer | After buffer	2150	E	After buffer

Boiler	Prog. no.	Level	Standard value
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	85 °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 HW	2253	E	1 min
Syst frost prot boiler pump Off | On	2300	E	On
Boiler pump on heat gen lock Off | On	2301	E	Off
Impact heat generation lock Heating mode only | Heating and HW mode	2305	E	Heating mode only
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 four 30: 30 kW; Paramount four 40: 38 kW Paramount four 50: 50 kW; Paramount four 60 : 58 kW; Paramount four 80: 77 kW; Paramount four 95: 95 kW; Paramount four 115: 115 kW
Output basic stage	2331	E	Paramount four 30: 6 kW; Paramount four 40: 9 kW Paramount four 50: 10 kW; Paramount four 60: 12 kW; Paramount four 80: 21 kW; Paramount four 95: 20 kW; Paramount four 115: 25 kW
Output at pump speed min	2334	E	25 %
Output at pump speed max	2335	E	100 %

Boiler	Prog. no.	Level	Standard value
Fan output heating max[1]	2441	E	Paramount four 30: 30 kW; Paramount four 40: 38 kW Paramount four 50: 50 kW; Paramount four 60: 58 kW; Paramount four 80: 77 kW; Paramount four 95: 95 kW; Paramount four 115: 115 kW
Fan output full charging max[1]	2442	E	Paramount four 30: 30 kW; Paramount four 40: 38 kW Paramount four 50: 50 kW; Paramount four 60: 58 kW; Paramount four 80: 77 kW; Paramount four 95: 95 kW; Paramount four 115: 115 kW
Fan output DHW max[1]	2444	E	Paramount four 30: 30 kW; Paramount four 40: 38 kW Paramount four 50: 50 kW; Paramount four 60: 58 kW; Paramount four 80: 77 kW; Paramount four 95: 95 kW; Paramount four 115: 115 kW
Controller delay Off | Heating mode only | Hot water mode only | Heating and HW mode	2450	E	Heating mode only
Controller delay fan output[1]	2452	E	Paramount four 30: 10,0 kW; Paramount four 40: 14.0 kW Paramount four 50: 20,0 kW; Paramount four 60: 22,5 kW; Paramount four 80: 34,5 kW; Paramount four 95: 36,0 kW; Paramount four 115: 40.0 kW
Controller delay duration	2453	E	40 s
Switching diff on CHs	2454	E	4 °C
Switching diff off min CHs	2455	E	5 °C
Switching diff off max CHs	2456	E	10 °C
Switching diff on HW	2460	E	5 °C
Switching diff off min HW	2461	E	6 °C
Switching diff off max HW	2462	E	8 °C
Delay heat req special op	2470	E	0 s
Pressure switch shutdown Start prevention | Lockout position	2500	E	Start prevention
Gas energy metering Off | On	2550	C	Off
Gas energy metering correction	2551	C	1.0
(1) The kW settings are approximate values. Exact values can be determined by the gas meter for example.			

Cascade	Prog. no.	Level	Standard value
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	Prog. no.	Level	Standard value
Temp diff on	3810	C	8 °C
Temp diff off	3811	C	4 °C
Charg temp min HW st tank	3812	E	- - - °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 | Hot water storage tank | Buffer storage tank	3822	E	Hot water 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
Pump speed min	3870	E	10 %
Pump speed max	3871	E	100 %
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 unit yield	3887	E	10 l

Solid fuel boiler	Prog. no.	Level	Standard value
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 Hot water sensor B3 | Hot water 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	Prog. no.	Level	Standard value
Auto generation 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/CH	4722	E	-3 °C
Min st tank temp heat mode	4724	E	- - - °C
Charging temp max	4750	E	80 °C
Recooling temp	4755	E	60 °C
Recooling HW/CHs 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/B41	4813	E	With B42/B41

Domestic water storage tank[1]	Prog. no.	Level	Standard value
Forward shift charging	5011	E	60 min
Flow setpoint boost	5020	E	18 °C
Transfer boost	5021	E	10 °C
Type of charging Recharging | Full charging | Full charging legio | Full charg 1st time day | Full charg 1st time legio	5022	E	Full charging
Switching diff	5024	E	4 °C
Charging time limitation	5030	E	120 min
Discharging protection Off | Always | Automatically	5040	E	Automatically
Charging temp max	5050	E	69 °C
Recooling temp	5055	E	80 °C

Domestic water storage tank[1]	Prog. no.	Level	Standard value
Recooling collector Off | Summer | Always	5057	E	Off
El imm heater optg mode Substitute | Summer | Always	5060	E	Substitute
El immersion heater release 24h/day | Hot water release | Time hot water	5061	E	Hot water release
El immersion heater control External thermostat | Hot water sensor	5062	E	Hot water sensor
Hot water boost Off | On	5070	E	On
Excess heat draw Off | On	5085	E	On
With buffer No | Yes	5090	E	Yes
With prim contr/system pump No | Yes	5092	E	Yes
With solar integration No | Yes	5093	E	Yes
Pump speed min	5101	E	0 %
Pump speed max	5102	E	100 %
Speed Xp	5103	E	35 °C
Speed Tn	5104	E	120 s
Speed Tv	5105	E	45 s
Transfer strategy Always | Hot water 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
(1) Parameters depend on the hydraulic System!			

Configuration	Prog. no.	Level	Standard value
Temps / mode CH1 Off | On	5710	C	On
Temps / mode CH2 Off | On	5715	C	Off
Temps / mode CH3 Off | On	5721	C	Off
Hot water sensor Hot water sensor B3 | Thermostat	5730	E	Hot water sensor B3
Hot water ctrl elem Q3 No charging request | Charging pump | Diverting valve	5731	E	Charging pump
Basic pos HW div valve Last request | Central heating | Hot water	5734	E	Central heating

Configuration	Prog. no.	Level	Standard value
Hot water separate circuit Off | On	5736	E	Off
Optg action HW div valve Position on CH | Position on HW	5737	E	Position on CH
Ctrl boiler pump/HW valve All requests | Request CH1/HW only	5774	E	All requests
Boiler pump at DHW Off | On	5775	E	On
Solar controlling element Charging pump | Diverting valve	5840	E	Diverting valve
External solar exchanger Commonly | Hot water 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 HW K6 | Collector pump Q5 | Cons circuit pump VK1 Q15 | Boiler pump Q1 | Alarm output K10 | heating pump CH3 Q20 | Cons circuit pump VK2 Q18 | System pump Q14 | Heat gen shutoff valve Y4 | Solid fuel boiler pump Q10 | Time setting 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 | Hot water mixing pump Q35 | HW interm circ pump Q33 | Heat request K27 | heating pump CH1 Q2 | heating pump CH2 Q6 | Hot water ctrl elem Q3 | Status output K35 | Status information K36 | Flue gas damper K37 | Fan shutdown K38	5890	C	None
Relay output QX2 📖 **See** Parameters see Relay output QX1 (prog. no. 5890)!	5891	C	None
Relay output QX3 📖 **See** Parameters see Relay output QX1 (prog. no. 5890)!	5892	C	Hot water ctrl elem Q3
Sensor input BX1 None | Hot water sensor B31 | Collector sensor B6 |HW circulation sensor B39 | Buffer sensor B4 | Buffer sensor B41| Common flow sensor B10 | Solid fuel boiler sensor B22 |HW 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 📖 **See** Parameters see Sensor input BX1 (prog. no. 5930)!	5931	C	Hot water sensor B31
Sensor input BX3 📖 **See** Parameters see Sensor input BX1 (prog. no. 5930)! None | Hot water sensor B31 | Collector sensor B6 | HW charging sensor B36	5932	C	Buffer sensor B4
Function input H1 None | Optg mode change CHs+HW | Optg mode changeover HW | Optg mode changeover CHs | Optg mode changeover CH1 | Optg mode changeover CH2 | Optg mode changeover CH3 | Heat generation lock | Error/alarm message | Consumer request VK1 | Consumer request VK2 | Release swimpool source htg | Excess heat discharge | Release swi pool solar | Operating level HW | Operating level CH1 | Operating level CH2 | Operating level CH3 | Room thermostat CH1 | Room thermostat CH2 | Room thermostat CH3 | Hot water thermostat | Pulse count | Checkb sign flue gas damper | Start prevention | Consumer request VK1 10V | Consumer request VK2 10V | Preselected output 10V	5950	C	None

Configuration	Prog. no.	Level	Standard value
Contact type H1 NC | NO	5951	C	NO
Voltage value 1 H1	5953	E	0
Function value 1 H1	5954	E	0
Voltage value 2 H1	5955	E	10
Function value 2 H1	5956	E	100
Function input H4 None | Optg mode change CHs+HW | Optg mode changeover HW | Optg mode changeover CHs | Optg mode changeover CH1 | Optg mode changeover CH2 | Optg mode changeover CH3 | Heat generation lock | Error/alarm message | Consumer request VK1 | Consumer request VK2 | Release swimpool source htg | Excess heat discharge | Release swi pool solar | Operating level HW | Operating level CH1 | Operating level CH2 | Operating level CH3 | Room thermostat CH1 | Room thermostat CH2 | Room thermostat CH3 | Hot water 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 CHs+HW | Optg mode changeover HW | Optg mode changeover CHs | Optg mode changeover CH1 | Optg mode changeover CH2 | Optg mode changeover CH3 | Heat generation lock | Error/alarm message | Consumer request VK1 | Consumer request VK2 | Release swimpool source htg | Excess heat discharge | Release swi pool solar | Operating level HW | Operating level CH1 | Operating level CH2 | Operating level CH3 | Room thermostat CH1 | Room thermostat CH2 | Room thermostat CH3 | Hot water thermostat | Pulse count | Checkb sign flue gas damper	5977	C	None
Contact type H5 NC | NO	5978	C	NO
Function output P1 None | Boiler pump Q1 | Hot water pump Q3 | HW interm circ pump Q33 | heating pump CH1 Q2 | heating pump CH2 Q6 | heating pump CH3 Q20 | Collector pump Q5 | Solar pump ext exch K9 | Solar pump buffer K8 | Solar pump swi pool K18	6085	E	heating pump CH1 Q2Boiler pump Q1
Sensor type collector NTC | Pt 1000	6097	E	NTC
Readjustm collector sensor	6098	E	0 °C
Readjustm outside sensor	6100	E	0.0 °C
Time constant building	6110	C	10 h
Central setp compensation	6117	E	10 °C
System frost protection Off | On	6120	E	On
Save sensors No | Yes	6200	C	No
Reset to default parameters	6205	C	No
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	

Configuration	Prog. no.	Level	Standard value
Info 1 OEM	6230	E	
Info 2 OEM	6231	E	

LPB system	Prog. no.	Level	Standard value
Device address	6600	C	1
Bus power supply function Off | Automatically	6604	E	Automatically
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
Hot water assignment Local CHs | All CHs in segment | All CHs in system	6625	E	All CHs 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	Prog. no.	Level	Standard value
Message	6700	Eu	
SW diagnostic code	6705	Eu	
Burn ctrl phase lockout pos	6706	Eu	
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
Hot water charging alarm	6745	E	- - - h
History 1 • Date / Time • Fault code 1	6800	E	
SW diagnostic code 1	6805	E	
Burner control phase 1	6806	E	
History 2 • Date / Time • Fault code 2	6810	E	
SW diagnostic code 2	6815	E	
Burner control phase 2	6816	E	

Fault	Prog. no.	Level	Standard value
History 3 • Date / Time • Fault code 3	6820	E	
SW diagnostic code 3	6825	E	
Burner control phase 3	6826	E	
.	.	.	
.	.	.	
.	.	.	
History 20 • Date / Time • Fault code 20	6990	E	
SW diagnostic code 20	6995	E	
Burner control phase 20	6996	E	

Maintenance/special operation	Prog. no.	Level	Standard value
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
Controller stop function Off | On	7143	E	Off
Controller stop setpoint	7145	E	
Compulsory heat draw-off DHW Off | On	7165	E	Off
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 %
PStick status 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	

Configuration of extension modules	Prog. no.	Level	Standard value
Function extension module 1 None | Multifunctional | Temps / mode CH1 | Temps / mode CH2 | Temps / mode CH3 | Solar HW | Primary contr/system pump	7300	C	Temps / mode CH2

Configuration of extension modules	Prog. no.	Level	Standard value
Relay output QX21 module 1 None | Circulating pump Q4 | El imm heater HW K6 | Collector pump Q5 | Cons circuit pump VK1 Q15 | Boiler pump Q1 | Alarm output K10 | heating pump CH3 Q20 | Cons circuit pump VK2 Q18 | System pump Q14 | Heat gen shutoff valve Y4 | Solid fuel boiler pump Q10 | Time setting 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 | Hot water mixing pump Q35 | HW interm circ pump Q33 | Heat request K27 | heating pump CH1 Q2 | heating pump CH2 Q6 | Hot water ctrl elem Q3 | Status output K35 | Status information K36 | Fan shutdown K38	7301	C	None
Relay output QX22 module 1 📖 **See** Parameters see Relay output QX21 module 1 (prog. no. 7301)!	7302	C	None
Relay output QX23 module 1 📖 **See** Parameters see Relay output QX21 module 1 (prog. no. 7301)!	7303	C	None
Sensor input BX21 module 1 None | Hot water sensor B3 | Hot water sensor B31 | Collector sensor B6 | HW circulation sensor B39 | Buffer sensor B4 | Buffer sensor B41 | Common flow sensor B10 | Solid fuel boiler sensor B22 | HW 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	7307	C	None
Sensor input BX22 module 1 📖 **See** Parameters see Relay output QX21 module 1 (prog. no. 7307)!	7308	C	None
Function input H2 module 1 None | Optg mode change CHs+HW | Optg mode changeover HW | Optg mode changeover CHs | Optg mode changeover CH1 | Optg mode changeover CH2 | Optg mode changeover CH3 | Heat generation lock | Error/alarm message Consumer request VK1 | Consumer request VK2 | Release swimpool source htg | Excess heat discharge | Release swi pool solar | Operating level HW | Operating level CH1 | Operating level CH2 | Operating level CH3 | Room thermostat CH1 | Room thermostat CH2 | Room thermostat CH3 | Hot water thermostat| Limit thermostat CH | Start prevention | Consumer request VK1 10V | Consumer request VK2 10V | Preselected output 10V	7311	C	None
Contact type H2 module 1 NC | NO	7312	C	NO
Voltage value 1 H2 module 1	7314	E	0.5
Funct value 1 H2 module 1	7315	E	0
Voltage value 2 H2 module 1	7316	E	10
Funct value 2 H2 module 1	7317	E	100
Function input H21 module 1 None | Optg mode change CHs+HW | Operating level HW | Optg mode changeover CHs | Optg mode changeover CH1 | Optg mode changeover CH2 | Optg mode changeover CH3 | Heat generation lock | Error/alarm message | Consumer request VK1 | Consumer request VK2 | Release swimpool source htg | Excess heat discharge | Release swi pool solar | Operating level HW | Operating level CH1 | Operating level CH2 | Operating level CH3 | Room thermostat CH1 | Room thermostat CH2 | Room thermostat CH3 | Hot water flow switch | Hot water thermostat | Limit thermostat CH | Start prevention | Consumer request VK1 10V | Consumer request VK2 10V | Preselected output 10V	7321	C	None
Contact type H21 module 1 NC | NO	7322	C	NO

Configuration of extension modules	Prog. no.	Level	Standard value
Input value 1 H21 module 1	7324	E	0
Funct value 1 H21 module 1	7325	E	0
Input value 2 H21 module 1	7326	E	10
Funct value 2 H21 module 1	7327	E	100
Funct input EX21 module 1 None | Temperature monitor HC	7342	C	None
Funct output UX21 module 1 None | Boiler pump Q1 | Hot water pump Q3 | HW interm circ pump Q33 | Heating pump CH1 Q2 | Heating pump CH2 Q6 | Heating pump CH3 Q20 | Collector pump Q5 | Solar pump ext exch K9 | Solar pump buffer K8 | Solar pump swi pool K18	7348	E	None
Signal output UX21 module 1 10 V | PWM	7350	E	PWM
Funct output UX22 module 1 📖 **See** Parameters see Funct output UX21 module 1 (prog. no. 7348)!	7355	E	None
Signal output UX22 module 1 10 V | PWM	7357	E	PWM
Function extension module 2 None | Multifunctional | Temps / mode CH1 | Temps / mode CH2 |Temps / mode CH3 | Solar HW | Primary contr/system pump	7375	C	None
Relay output QX21 module 2 None | Circulating pump Q4 | El imm heater HW K6 | Collector pump Q5 | Cons circuit pump VK1 Q15 | Boiler pump Q1 | Alarm output K10 | heating pump CH3 Q20 |Cons circuit pump VK2 Q18 | System pump Q14 | Heat gen shutoff valve Y4 | Solid fuel boiler pump Q10 | Time setting 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 | Hot water mixing pump Q35 | HW interm circ pump Q33 | Heat request K27 | heating pump CH1 Q2 | heating pump CH2 Q6 | Hot water ctrl elem Q3 | Status output K35 | Status information K36 | Fan shutdown K38	7376	C	None
Relay output QX22 module 2 📖 **See** Parameters see Relay output QX21 module 2 (prog. no. 7376)!	7377	C	None
Relay output QX23 module 2 📖 **See** Parameters see Relay output QX21 module 2 (prog. no. 7376)!	7378	C	None
Sensor input BX21 module 2 📖 **See** Parameters see Sensor input BX21 module 1 (prog. no. 7307)!	7382	C	None
Sensor input BX22 module 2 📖 **See** Parameters see Sensor input BX21 module 1 (prog. no. 7307)!	7383	C	None
Function input H2 module 2 📖 **See** Parameters see Function input H2 module 1 (Prog. no. 7311)!	7386	C	None
Contact type H2 module 2 NC | NO	7387	C	NO

Configuration of extension modules	Prog. no.	Level	Standard value
Voltage value 1 H2 module 2	7389	E	0,5
Funct value 1 H2 module 2	7390	E	0
Voltage value 2 H2 module 2	7391	E	10
Funct value 2 H2 module 2	7392	E	100
Function input H21 module 2 See Parameters see Function input H21 module 1 (prog. no. 7321)!	7396	C	Optg mode change CHs+HW
Contact type H21 module 2 NC | NO	7397	E	NO
Input value 1 H21 module 2	7399	E	0.0
Funct value 1 H21 module 2	7400	E	0
Input value 2 H21 module 2	7401	E	10.0
Funct value 2 H21 module 2	7402	E	100
Funct input EX21 module 2 None | Limit thermostat HC	7417	C	None
Funct output UX21 module 2 See Parameters see Funct output UX21 module 1 (prog. no. 7348)!	7423	E	None
Signal output UX21 module 2 10 V | PWM	7425	E	PWM
Funct output UX22 module 2 See Parameters see Funct output UX21 module 1 (prog. no. 7348)!	7430	E	None
Signal output UX22 module 2 10 V | PWM	7432	E	PWM

Input/output test	Prog. no.	Level	Standard value
Relay test	7700	C	No test
Output test P1	7713	C	- - - %
PWM signal P1	7714	C	
Outside temp B9	7730	C	
Hot water temp B3/B38	7750	C	
Boiler temp B2	7760	C	
Output test UX21 module 1	7780	C	
Output signal UX21 module 1 None | Closed (ooo), Open (---) | Pulse | Frequency Hz | Voltage V | PWM %	7781	C	None
Output test UX22 module 1	7782	C	
Output signal UX22 module 1 See Parameters see Output signal UX21 module 1 (prog. no. 7781)!	7783	C	None
Output test UX21 module 2	7784	C	- - - %
Output signal UX21 module 2 See Parameters see Output signal UX21 module 1 (prog. no. 7781)!	7785	C	None

Input/output test	Prog. no.	Level	Standard value
Output test UX22 module 2	7786	C	
Output signal UX22 module 2 See Parameters see Output signal UX21 module 1 (prog. no. 7781)!	7787	C	
Sensor temp BX1	7820	C	
Sensor temp BX2	7821	C	
Sensor temp BX3	7822	C	
Sensor temp BX21 module 1	7830	C	
Sensor temp BX22 module 1	7831	C	
Sensor temp BX21 module 2	7832	C	
Sensor temp BX22 module 2	7833	C	
Voltage signal H1	7840	C	
Contact state H1 Open | Closed	7841	C	
Voltage signal H2 module 1	7845	C	
Contact state H2 module 1 Open | Closed	7846	C	
Voltage signal H2 module 2 Parameters see Contact state H1	7848	C	
Contact state H2 module 2 Open | Closed	7849	C	
Frequency H4	7862	C	
Contact state H5 Open | Closed	7865	C	
Contact state H6 Open | Closed	7872	C	
Input EX21 module 1	7950	C	
Input EX21 module 2	7951	C	

Status	Prog. no.	Level	Standard value
State central heating CH1	8000	C	
State central heating CH2	8001	C	
State central heating CH3	8002	C	
State hot water	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	Prog. no.	Level	Standard value
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	

Diagnostics cascade	Prog. no.	Level	Standard value
Priority/state source 2 **See** Parameters see Priority/state source 1 (prog. no. 8100)!	8102	C	
Priority/state source 3 **See** Parameters see Priority/state source 1 (prog. no. 8100)!	8104	C	
.	.	.	
.	.	.	
.	.	.	
Priority/state source 16 **See** 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	Prog. no.	Level	Standard value
Boiler pump Q1	8304	E	
Boiler pump speed	8308	E	
Boiler temperature	8310	C	
Boiler setpoint	8311	C	
Boiler switching point	8312	C	
Control sensor Boiler sensor B2 | Return sensor B7 | HW charging sensor B36 | HW outlet sensor B38 | HW circulation sensor B39 | 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	
Hours run heating mode	8338	Eu	
Hours run HW	8339	Eu	
Overall gas energy heating	8378	Eu	
Overall gas energy DHW	8379	Eu	
Overall gas energy	8380	Eu	
Overall heating	8381	Eu	
Overall DHW	8382	Eu	
Gas energy	8383	Eu	
Current phase number	8390	E	
Collector pump 1	8499	C	
Solar ctrl elem buffer	8501	E	

Diagnostics heat generation	Prog. no.	Level	Standard value
Solar ctrl elem swi pool	8502	E	
Speed collector pump 1	8505	E	
Speed solar pump ext exch	8506	E	
Speed solar pump buffer	8507	E	
Speed solar pump swi pool	8508	E	
Collector temp 1	8510	C	
Collector temp 1 max	8511	C	
Collector temp 1 min	8512	C	
dt collector 1/HW	8513	C	
dt collector 1/buffer	8514	C	
dt collector 1/swimming pool	8515	C	
Solar flow temp	8519	E	
Solar return temp	8520	E	
Solar Gain 24 Hour	8526	Eu	
Total Solar Gain	8527	Eu	
Hours run solar	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	Prog. no.	Level	Standard value
Outside temp	8700	Eu	
Outside temp min	8701	Eu	
Outside temp max	8702	Eu	
Outside temp attenuated	8703	E	
Outside temp composite	8704	E	
Central heating 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 CH pump 1	8735	C	
Room temp 1	8740	C	
Room setpoint 1	8741	C	
Flow temp 1	8743	C	
Flow temp setpoint 1	8744	C	
Room thermostat 1 No demand | Demand	8749	C	
Central heating 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 CH pump 2	8765	C	
Room temp 2	8770	C	

Diagnostics consumers	Prog. no.	Level	Standard value
Room setpoint 2	8771	C	
Flow temp 2	8773	C	
Flow temp setpoint 2	8774	C	
Room thermostat 2 No demand | Demand	8779	C	
Central heating pump 3 Off | On	8790	C	
HC mixing valve 3 open Off | On	8791	C	
HC mixing valve 3 closed Off | On	8792	C	
Speed CH pump 3	8795	C	
Room temp 3	8800	C	
Room setpoint 3	8801	C	
Flow temp setpoint 3	8803	C	
Flow temp 3	8804	C	
Room thermostat 3 No demand | Demand	8809	C	
Speed HW pump	8825	E	
Speed HW interm circ pump	8826	E	
Hot water temp 1	8830	C	
Hot water temp setpoint	8831	C	
Hot water temp 2	8832	C	
Hot water circulation temp	8835	E	
HW 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 temp	8950	E	
Common flow temp setpoint	8951	E	
Common return temp	8952	E	
Common output setpoint	8962	E	
Buffer temp 1	8980	C	
Buffer setpoint	8981	C	
Buffer temp 2	8982	C	
Buffer temp 3	8983	C	
Relay output QX1 Off | On	9031	C	
Relay output QX2 Off | On	9032	C	
Relay output QX3 Off | On	9033	C	
Relay output QX21 module 1 Off | On	9050	C	

Diagnostics consumers	Prog. no.	Level	Standard value
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	Prog. no.	Level	Standard value
Prepurge time	9500	E	15 s
Required output prepurging[1]	9504	E	Paramount four 30: 14,5 kW; Paramount four 40: 19.5 kW Paramount four 50: 32,0 kW; Paramount four 60: 35,0 kW; Paramount four 80: 50,0 kW; Paramount four 95: 50,8 kW; Paramount four 115: 56.6 kW
Required output ignition[1]	9512	E	Paramount four 30: 14,5 kW; Paramount four 40: 19.5 kW Paramount four 50: 32,0 kW; Paramount four 60: 35,0 kW; Paramount four 80: 50,0 kW; Paramount four 95: 50,8 kW; Paramount four 115: 56.6 kW
Required output LF[1]	9524	E	Paramount four 30: 5,6 kW; Paramount four 40: 9.0 kW Paramount four 50: 10,0 kW; Paramount four 60: 14,0 kW; Paramount four 80: 21,0 kW; Paramount four 95: 20,0 kW; Paramount four 115: 25.0 kW
Required output HF[1]	9529	E	Paramount four 30: 30,0 kW; Paramount four 40: 38.0 kW Paramount four 50: 50,0 kW; Paramount four 60: 58,0 kW; Paramount four 80: 77,0 kW; Paramount four 95: 95,0 kW; Paramount four 115: 115,0 kW
Postpurge time	9540	E	10 s

Burner control	Prog. no.	Level	Standard value
Fan output/speed slope	9626	E	Paramount four 30: 214,3; Paramount four 40: 150.0 Paramount four 50: 111,3; Paramount four 60: 98,9; Paramount four 80: 69,6; Paramount four 95: 63,1; Paramount four 115: 57,0
Fan output/speed Y-section	9627	E	Paramount four 30: 100,0; Paramount four 40: 100.0 Paramount four 50: 138,0; Paramount four 60: 70,0; Paramount four 80: 240,0; Paramount four 95: 320,0; Paramount four 115: 300,0
(1) The kW settings are approximate values. Exact values can be determined by the gas meter for example.			

Info option[1]	Prog. no.	Level	Standard value
Fault message			
Maintenance			
Setpoint manual operation			
Setpoint control stop			
Boiler temperature			
Outside temp			
Domestic water temperature			
Collector temp			
Solar Gain 24 Hour			
Total Solar Gain			
Solid fuel boiler temp			
Buffer storage tank temperature			
Swimming pool temp			
State central heating CH1			
State central heating CH2			
State central heating CH3			
State hot water			
State boiler			
State solar			
State solid fuel boiler			
State buffer			
State swimming pool			
Year			
Date			
Time			
Telephone customer service			
(1) The display of the information values depends on the operating Status!			

9.2 Description of the parameters

9.2.1 Time and date

■ **Time and date (1–3)**

The regulator 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)**

The start of summer time can be set under prog. no. 5; the end of summer time is set under prog. no. 6. The time changing is carried out on the Sunday following the set date.

9.2.2 Operator section

■ **Change Language (20)**

This is where you can change the language of the users prompts.

■ **Information (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)**

You can select the contrast of the display here.

■ **Operation lock (26)**

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

■ **Programming lock (27)**

If this lock is activated, parameters can be displayed but not changed.

- Temporary unlocking:
  Press OK and ESC simultaneously for at least 3 s. The lock will be re-activated after leaving the setting level.
- Permanent unlocking:
  First temporary unlocking, then prog.no. 27 to Off.

■ **Units (29)**

Here you can choose between SI units (°C, bar) and US-American units (°F, PSI).

■ **Save basic settings (30)**

The parameters of the regulator are written into the room unit/backed up (only available for room unit).

⚠ **Caution**
The parameters of the room unit are overwritten! With this, the individual programming of the regulator in the room unit can be ensured.

■ **Activate basic settings (31)**

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

⚠ **Caution**
The control parameters are overwritten. The factory settings are stored in the operating unit.

- Activation of prog. no. 31 at the *operating unit*.
  The regulator is reset to **factory setting**.
- Activation of prog. no. 31 at the *room unit*.

The individual programming of the room unit is written into the control.

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

■ **Used as (40)**

- Room unit 1/Room unit 2/Room unit 3: this setting establishes which heating circuit the room unit on which this setting is made is to be used. When Room unit 1 is selected, further heating circuits can be assigned under prog.no. 42, whereas when Room unit 2/Room unit 3 is selected only the relevant heating circuit can be operated.
- Operator unit 1/Operator unit 2/Operator unit 3: this setting is provided for pure operation without room functions and is note required in connection with this controller.
- Service unit: this setting is used, for example, to back up or save controller settings.

■ **Assignment device 1 (42)**

If setting Room unit 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 CH2/Operation CH3/P (44/46)**

When Room unit 1 or Operator unit 1 (prog.no. 40) is selected, it must be defined under prog.no. 44 or 46 whether the heating circuits HK2 and HK3/P are to be operated together with heating circuit 1 or independently of heating circuit 1.

■ **Room temp device 1 (47)**

The assignment of room unit 1 to the heating circuits can be selected here.

- CH circuit 1 only: The room temperature is sent exclusively to heating circuit 1.
- For all assigned HCs: The room temperature is sent to the heating circuits assigned under prog. no. 42.

■ **Action occupancy button (48)**

You can select the assignment of the presence key here.

- None: Pressing the presence key has no effect on the heating circuits.
- CH 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 here.

■ **Software version (70)**

Display of the current software version.

9.2.3 Wireless

■ **Device list (130-138)**

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

■ **Delete all devices (140)**

The wireless connections to all units is cancelled here.

9.2.4   Time programs

■   **General information about the time programs.**

> ℹ️ **Note**
> Time programs 1 and 2 are always assigned to the respective heating circuits (1 and 2) and only displayed if these heating circuits are present and also turned on in the menu **Configuration** (prog.-no. 5710 and 5715).

Time program 3 can be used for 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.

■   **Select (500 – 600)**

Selection of weekday or day blocks. The day blocks (Mon-Sun, Mon-Fri and Sat-Sun) 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.

> ℹ️ **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 select groups of days (Mon-Sun, Mon-Fri or Sat-Sun), turn the control knob anti-clockwise; to select individual days (Mon, Tue, Wed, Thu, Fri, Sat, Sun), turn the control knob clockwise.

■   **Heating phases (501 — 606)**

Up to 3 heating phases can be set per heating circuit. These are active on the days selected under Select (prog.no. 500, 520, 540, 560, 600). During the heating phases the system heats to the set comfort setpoint. Outside the heating phases, the system heats to the reduced setpoint.

> ℹ️ **Note**
> The time programs are only activated in Automatically operating mode.

■   **Copy? (515–615)**

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

> ℹ️ **Note**
> Day blocks cannot be copied.

■   **Default values (516–616)**

Setting of the default values given in the setting table

9.2.5   Holiday programs

■   **Select (641 - 661)**

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

8 holiday periods can be selected with this preselection.

■   **Start of holiday (642 - 662)**

Entering the holiday start.

■ **End of holiday (643 - 663)**

Entering the holiday end.

■ **Operating level (648-668)**

Selection of the operating level (Reduced or Off) for the holiday programme

> **i** **Note**
> A holiday period always ends on the last day at 12:00 AM (23:59). The holiday programmes are only activated in the operation mode Automatically.

> **See**
> Refer to the user instructionsParamount four.

9.2.6 Heating circuits

■ **Operating mode (700, 1000, 1300)**

The operating mode can be set via the operation mode button at the room device or via this operating line.
• Off: The heating is switched off in protection mode. The room remains protected against frost however (Frost protection setpoint, e.g. prog. no. 714).
• Timed: In automatic mode the room temperature is controlled in accordance with the time program selected.
• Reduced: In reduced operation mode the room temperature is kept constantly to the set Reduced temp setpoint(e.g. prog. no. 712).
• On: In comfort mode the room temperature is kept constantly to the set Comfort setpoint(e.g. prog. no. 710). Eco functions are not activated.

■ **Comfort setpoint (710, 1010, 1310)**

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

■ **Reduced temp setpoint (712, 1012, 1312)**

Setting of the desired room temperature during the reduced heating phase. Without room sensor or with the room influence switched off (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 required room temperature during frost protection mode. 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 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 that is used to regulate the heating circuit, subject to the outside temperature. The gradient indicates how much the flow temperature changes by with changing outside temperature.

Fig.20 Heating curve diagram
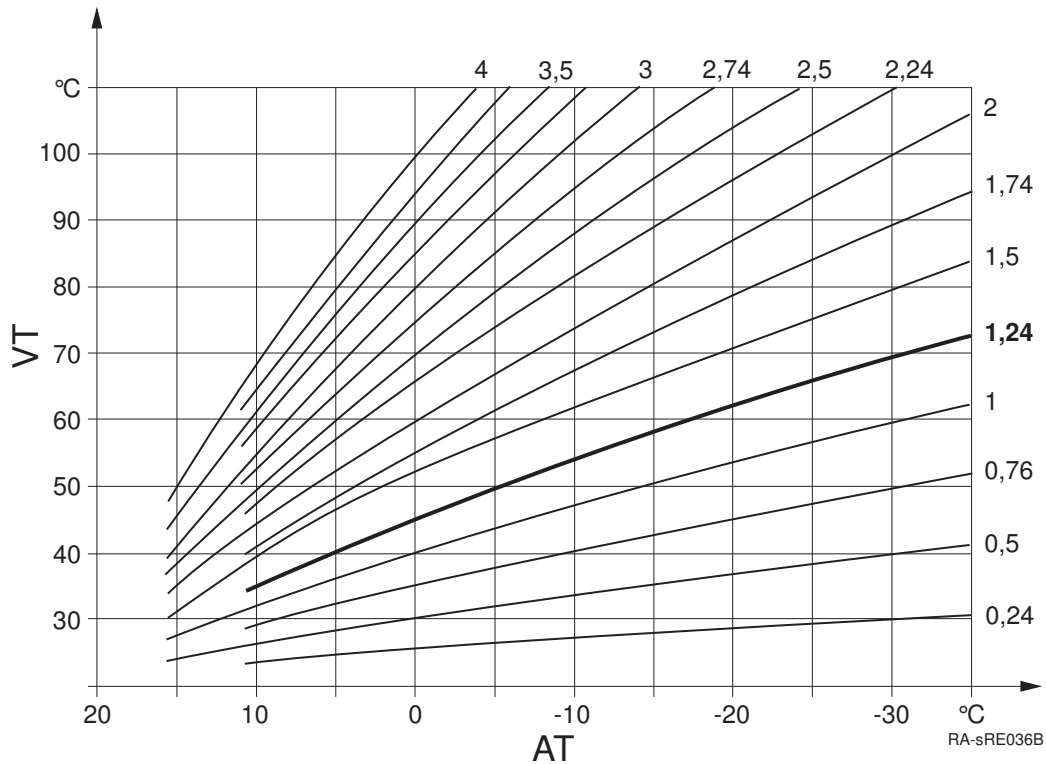
AT   Outdoor temperature

VT   Flow temperature

Determination of the heating curve gradient

Enter the lowest calculated outside temperature in accordance with the climate zone (e.g. -12 °C in Frankfurt) into the diagram (see fig.) (e.g. vertical line at -12°C). Enter the maximum flow temperature of the heating circuit, at which a room temperature of 20 °C is still calculated to be reached at -12 °C outside temperature (e.g. horizontal line at 60 °C).

The intersection of both lines provides the value for the heating curve slope.

- **Heating curve displacement (721, 1021, 1321)**

Heating curve correction by parallel offset if the room temperature is generally too high or too low.

- **Heating curve adaption (726, 1026, 1326)**

Automatic adaptation of the heating curve to the actual conditions, as a result of which no correction of the heating curve slope is required.

> **i** Note
> Automatic adaptation of the heating curve requires the connection of a room sensor. The value for Room influence (see prog. no. 750, 1050, 1350) must be set between 1% and 99%. Should there be radiator valves in the lead room (where the room sensor is installed), these must be fully opened.

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

Fig.21   Summer/winter heating limit
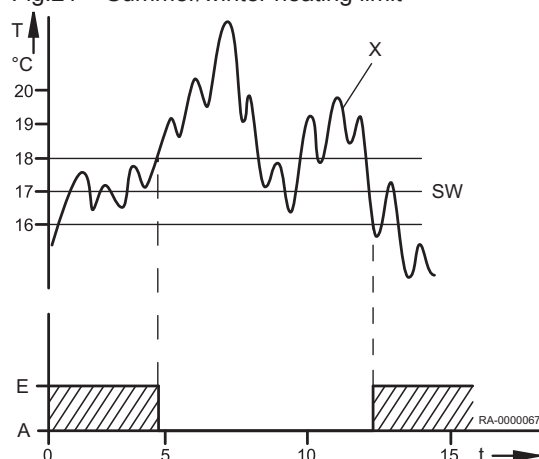
A   Off
E   On
SW Summer/winter heating limit
T   Temperature
t   Time
x   Outside temp attenuated (prog.no. 8703)

The heating circuit switches to summer operation as soon as the average outside temperature over the past 24 hours rises 1°C above the value set here. 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.

■   **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 differential set here to the current operating level (reduced or comfort setpoint). The heating switches on again if the current outside temperature falls again below the set differential minus 1 °C.

> **i** **Note**
> In the operating mode **continuous mode** ☼ or ☾ this function is not activated.

■   **Flow temp setpoint min (740, 1040, 1340) and Flow temp setpoint max (741, 1041, 1341)**

With this function, a range can be defined for the flow setpoint. When the flow temperature setpoint reaches the respective limit, this remains constant, even if heat demand rises or falls.

If a pump heating circuit is operated parallel with other requirements, it can cause higher resulting temperatures in the pump heating circuit.

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

For room thermostat mode the flow setpoint set here applies.

With the setting **--°C**, the value calculated via the heating curve is used as the flow setpoint.

■   **Swi-on ratio room stat (744, 1044, 1344)**

The boiler tries to adapt the flow temperature so that the switch-on ratio set under this parameter is achieved by the ambient thermostats

■   **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.

> **i** **Note**
> If the option Absolute is selected under prog.no. 1630, the value **0** must be set under this prog.no. For special functions (e.g. chimney-sweep function) the delay does not have an effect (see prog.no. 2470).

> **📖** **For more information, see**
> Charging priority (1630), page 91
> Delay heat req special op (2470), page 96

■   **Room influence (750, 1050, 1350)**

The flow temperature is calculated by means of the heating curve subject to outside temperature. This type of control assumes that the heating curve is set correctly, since room temperature is not taken into consideration with this setting.

Fig.22   Room temp limitation

Note

However, if there is a RGT/RGTF or RGB room unit connected, and the setting "room influence" is set between 1 and 99%, the deviation of the actual and set room temperatures is captured and taken into account in the temperature control. In this way any external heat can be taken into account enabling a constant room temperature to be achieved. The influence of the deviation can be set in percentage. The more representative the lead room is (correct room temperature, correct installation location etc.), the higher the value can be set, giving the room temperature even greater relevance.

Caution

Should there be radiator valves in the lead room (where the room sensor is installed), they must be opened fully.

• 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)**

TRx	Room temperature actual value
TRw	Room temperature setpoint
SDR	Room switching difference
P	Pump
t	Time
1	On
0	Off

The heating circuit pump is switched on or off subject to room temperature in line with the switching differential set here. The switch-off point of the pump is set as the difference to the set room setpoint. The pump switch-on point is 0.25 °C below the room setpoint. This function is only possible with the RGT/ RGTF or RGB room unit and active room influence.
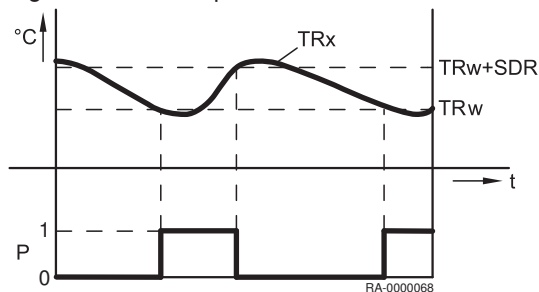
Note

A room sensor must be connected. This function only applies to pumped heating circuits.

■   **Central heating boost (770, 1070, 1370)**

TRw	Room temperature setpoint
TRx	Room temperature actual value
TRSA	Room temperature setpoint-raised

The boost heating becomes active when the room temperature setpoint is switched over from protection or reduced mode to comfort mode. During the boost heating, the room temperature setpoint is increased by the value set here. This causes the actual room temperature to rise to the new temperature setpoint quickly. The boost heating ends when the actual room temperature captured by a RGT/RGTF or RGB room unit (*accessories*) rises to 0.25 °C below the comfort setpoint.

Without room sensor or without room influence, boost heating is implemented in accordance with an internal calculation. Due to the room setpoint 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.23   Boost heating

■   **Quick setback (780, 1080, 1380)**

Quick reduction becomes active if the room temperature setpoint is switched from comfort level to another operating level (reduced mode or protection mode). During quick reduction the heating circuit pump is switched off and the mixing valve is also closed in the case of mixed circuits. During quick reduction no heat requirement is sent to the heat generator.

Quick reduction is possible with or without room sensor: with room sensor the heating circle function is switched off until the room temperature has dropped to the reduced setpoint or frost protection setpoint. When the room temperature has dropped to the reduced setpoint or the frost protection setpoint, the heating circuit pump starts again and the mixing valve is
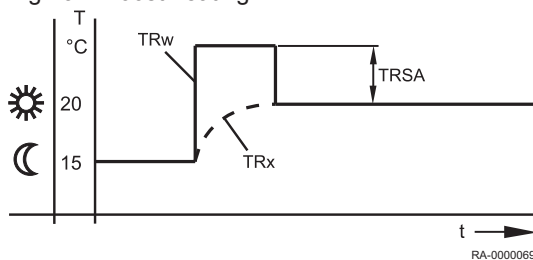
enabled. Without room sensor the quick reduction switches the heater off depending on the outside temperature and the building time constant (prog.no. 6110) until the temperature has theoretically dropped to the reduced target value or the frost protection value.

Tab.21   Duration of the quick reduction

Duration of the quick reduction for reduction by **2**°C in hrs:							
Outside temperature mixed:	Building time constant (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 reduction for reduction by **4**°C in hrs:							
Outside temperature mixed:	Building time constant (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

For more information, see

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

Fig.24   Optimum start and stop control
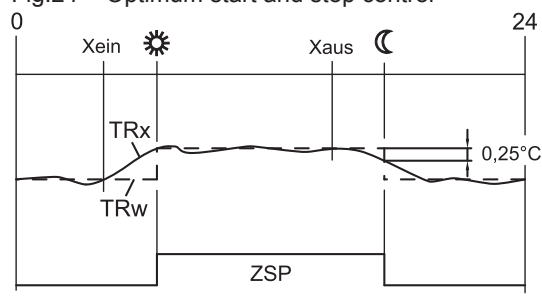
Xon	Start time set forward
Xoff	Stop time set forward
ZSP	Time switching program
TRw	Room temperature setpoint
TRx	Room temperature actual value

The optimisation of the on/off switching times is a function of time and possible with or without room unit. With a room unit the changeover of operating level compared to the programmed time moves forward so that the building dynamics (heat-up and cool-down times) are taken into account. In this way the required temperature level is reached exactly at the programmed time. If this is not the case (too early or too late) a new switching time is calculated that is applied next time.

Without room sensor an advance time is calculated based on the outside temperature and the building time constant (prog. no. 6110). The optimisation time (advance) is limited here to a maximum value. By setting the optimisation time = 0, the function is switched off.

📖 **For more information, see**
Time constant building (6110), page 111

■   **Reduced setp increase start (800, 1090, 1390) and Reduced setp increase end (801, 1101, 1401)**

Fig.25   Reduced setpoint increase
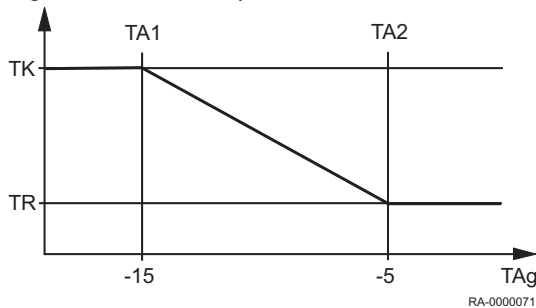
TA1   Reduced setpoint increase start
TA2   Reduced setpoint increase end
TK   Comfort setpoint
TR   Room temperature reduced setpoint
TAg   Outside temperature mixed

When only a small heating output is required to cover demand, the reduced room setpoint can be increased in the case of cold outside temperatures. This increase is subject to outside temperature. The lower the outside temperature, the higher the reduced room temperature setpoint will be increased. The start and end of the increase can be selected. Between these two points there is a linear increase of the "reduced setpoint" up to the "comfort setpoint".

■   **Continuous pump operation (809, 1109, 1409)**

This function is used to suppress the pump switching off during the quick reduction and when the room setpoint is reached (room thermostat, room sensor or room model).
• No: the heating circuit pump /boiler pump can be switched off by quick reduction or reaching the room set point.
• Yes: the heating circuit pump/boiler pump remains switched on even during the quick reduction and after the room setpoint has been reached.

■   **Overtemp protect pump circ (820, 1120, 1420)**

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

■   **Mixing valve boost (830, 1130, 1430)**

The heat request of the mixed heating circuit to the heat source is raised above the value set here. This boost is intended to correct temperature fluctuations to be able to be compensated with the mixer controller.

■   **Actuator running time (834, 941, 1134)**

Setting the actuator running time of the mixing valve used.

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 is controlled in direction OPEN and CLOSED.

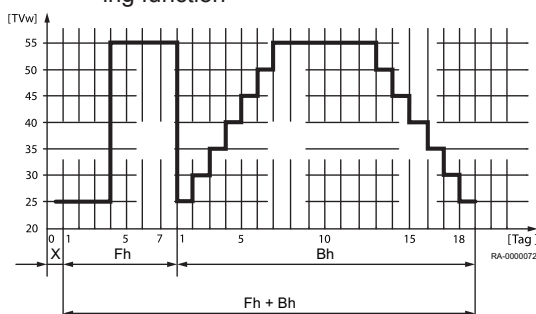The time of activation in direction OPEN corresponds to the drive running time.

■   **Floor curing function (850, 1150, 1450)**

Fig.26   Temperature profile of the floor curing function

X   Start day
Fh   Functional heating
Ch   Curing heating

The floor curing function serves controlled drying out of screed floors
• Off: The function is switched off.
• Functional heating: Part 1 of the temperature profile is run automatically.
• Curing heating: Part 2 of the temperature profile is run automatically.
• Functional/curing heating: The whole temperature profile is run automatically.
• Manually: Manual control to the screed setpoint.

> ⚠ **Caution**
> Observe the requirements and standards issued by the screed manufacturer.

A correct function is only possible with a correctly installed heating system (hydraulic, electrical systems and settings).

Deviations can result in damage to the screed.

The screed function can be stopped prematurely by setting **0=OFF**.

■ **Floor curing setp manually (851, 1151, 1451)**

Setting of the temperature to which manual control is carried out with floor curing function activated.

> 📖 **For more information, see**
> Floor curing function (850, 1150, 1450), page 88

■ **Floor curing setp current (855, 1155, 1455)**

Display of the current floor curing setpoint.

■ **Days complete.current (856, 1156, 1456)**

Display of the current floor curing function day.

■ **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 only limited to one draw-off during the heating times.
• 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 storage tank or only by a heat generator. The function also determines whether the system pump goes into operation when a heat demand is submitted.
• No: The heating circuit is supplied from the boiler.
• Yes: The heating circuit can be supplied from the buffer storage tank.

■ **With prim contr/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 is supplied without primary controller/system pump.
• Yes: The heating circuit is supplied from the primary controller by the system pump.

■ **Pump speed reduction (880, 1180, 1480)**

Speed regulation of the heating circuit pump can be done according to *operating level* or *pump curve*.
• *Operating level*: With this option the speed of the heating circuit pump is actuated according to the operating level. The pump is controlled in operating level *Comfort* (incl. optimization) or during active floor curing function at 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 actual flow temperature and the current flow setpoint. 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 for which parameters can be set).
• Temp differential nominal: The spread between boiler flow temperature and boiler return temperature is called the temperature rise.

> **i** Note
> Since regulation is via the boiler sensor, this setting is only suitable if <u>one</u> pump heating circuit is available.

■ **Pump speed min (882, 1182, 1482)**

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

■ **Pump speed max (883, 1183, 1483)**

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

■ **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 using 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 is not added.
• Yes: The temperature request includes the flow setpoint correction.

■ **Operating level changeover (898, 1198, 1498)**

When an external timer is used above the inputs *Hx* selection of the operating level to which the heating circuits are to be switched is possible.
• Off
• Reduced
• On

■ **Optg mode changeover (900, 1200, 1500)**

With external change of operating mode via Hx it can be selected whether during automatic operation it is changed from comfort set point to the frost prevention setpoint or reduced setpoint.

9.2.7   Domestic water

■ **Operating mode (1600)**

The domestic hot water charging can be switched to On, Off or Eco mode using "operating mode".
• Off: The DHW is kept permanently at frost protection temperature (5°C).
• On: The DHW charging is done automatically to the DHW nominal setpoint or the DHW reduced setpoint based on the set DHW release.

■ **Hot water temp setpoint (1610)**

Setting the drinking water nominal value

■ **Reduced temp setpoint (1612)**

Setting the DHW reduced setpoint.

■ **Hot water temp setpoint max (1614)**

Set the maximum permissible DHW nominal value.

■ **Release (1620)**

• 24h/day: The DHW temperature is continuously controlled to the nominal drinking water temperature value independently of the time switching programmes.

Fig.27   Release depending on the time
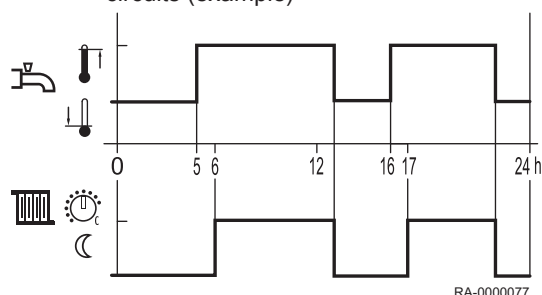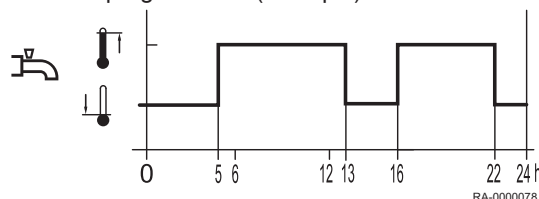switching programmes of the heating
circuits (example)

RA-0000077

Fig.28   Release according to time switching
programme 4 (example)

RA-0000078

• Time setting central heating: 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 is moved forward.
  - It is moved forward by 1 hour.

Time hot water: The DHW temperature is changed over between the DHW temperature setpoint and the reduced DHW temperature setpoint independently of time switching programs of the heating circuit. For this, time switching program 4 is used.

■ Charging priority (1630)

This function ensures that the boiler capacity is primarily made available for DHW in case of simultaneous capacity demand by room heating and DHW.
• Absolute: Mixer and pumped heating circuits are blocked until the DHW has been heated up.
• Shifting: Should the boiler capacity not be sufficient to heat up DHW, mixer and pumped heating circuits will be restricted.
• None: 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, the mixer circuit will also be restricted.

> **For more information, see**
> Delay heat request (746, 1046, 1346), page 85

■ 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 storage tank mixing pump).

■ Legionella funct weekday (1642)

Selection of the weekday for the legionella function.

■ Legionella funct time (1644)

Setting the start time for the legionella function. With setting --- the legionella function will be carried out the first time DHW heating is enabled.

■ Legionella funct setpoint (1645)

Selecting the set temperature required for killing the bacteria.

■ Legionella funct duration (1646)

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

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

■ **Legionella funct circ pump (1647)**

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

> **⚠ Warning**
> When legionella function is active, there is a risk of scalding at the draw-off points.

■ **Circulating pump release (1660)**

• Time central heating CH3: The circulating pump is released subject to time program 3 (see prog. no. 540 to 556).
• Hot water release: The circulating pump is released when DHW heating is released.
• Time hot water: The circulating pump is released subject to time program 4.

■ **Circulating pump cycling (1661)**

To save energy, the circulation pump is switched on for 10 minutes and off for 20 minutes within the release time.

■ **Circulation setpoint (1663)**

If a sensor is placed in the drinking water distribution pipe, it monitors regulation and actual value during the legionella function. The setpoint set must be observed on the sensor during the dwell time set (prog.no. 1646). The maximum setting of the circulation value is limited by the nominal setpoint.

■ **Optg mode changeover (1680)**

Using external switching above the entrance H1 it can be selected into which operating mode is switched into.
• Off: The function is switched off.

9.2.8   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.

■ **Hot water charging priority (1874, 1924, 1974)**

Setting as to whether domestic hot water charging takes priority over the consumer circuit/swimming pool circuit or not.

■ **Excess heat draw (1875, 1925, 1975)**

If an excess temperature discharge is activated, the excess energy can be discharged heat being drawn by the consumer circuits. This can be set separately for each consumer circuit.

■ **With buffer (1878, 1928, 1978)**

This parameter establishes whether the heating circuit can be supplied by a buffer or storage tank or only by a heat generator. The function also determines whether the system pump goes into operation when a heat demand is submitted.
• No: The heating circuit is supplied from the boiler.
• Yes: The heating circuit can be supplied from the buffer storage tank.

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

• No: The consumer circuit is supplied without primary control unit/system pump
• Yes: The consumer circuit is supplied from the primary controller on/by the system pump.

9.2.9 Swimming pool

■ **Setpoint solar heating (2055)**

When solar energy is used, 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.

> **For more information, see**

■ **Swimming pool temp max (2070)**

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

■ **With solar integration (2080)**

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

9.2.10 Primary control/feed pump

■ **Flow temp setpoint min (2110) and 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 the system pump is also locked or not when the generator lock is active.
• Off: The system pump is not locked.
• On: When the generator lock is active the system pump is also locked.

■ **Mixing valve boost (2130)**

For the admixture the boiler flow temperature actual value must be higher than the requested setpoint of the mixer flow temperature, since this cannot be corrected otherwise. The controller forms 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 mixing valve used.

■ **Primary contr/system pump (2150)**

• Before buffer: The primary controller/feed pump is arranged with existing buffer storage tank hydraulically upstream of the buffer storage tank.
• After buffer: The primary controller/feed pump is arranged with existing buffer storage tank hydraulically downstream of the buffer storage tank.

9.2.11 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 charging buffer storage tank) is selected, whether and when the buffer storage tank is fully charged despite automatic generator lock. Under prog.no. 2203 it is set whether the boiler takes part in the full charging or not.
• Off: The boiler does not take part in the full charging of the buffer storage tank.
• On: The boiler takes part in the full charging of the buffer storage tank.

> **For more information, see**
> Full charging (4810), page 102

■   Setpoint min (2210) andSetpoint 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 is controlled in manual control mode.

> **For more information, see**
> Manual control (7140), page 116

■   Burner running time min (2241)

Here, the period following the commissioning of the burner is selected during which the shutdown differential is increased by 50%. However, this setting can**not** guarantee that the burner remains operational for the selected period.

■   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 a switching difference is exceeded,Burner off time min (prog. no. 2243) is aborted. The boiler starts despite pausing time.

■   Pump overrun time (2250) andPump overr time after HW (2253)

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

■   Boiler pump on heat gen 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)

This parameter is used to set whether the heat generator lock should be effective only for heating requests or also for DHW requests.
• Heating mode only: Only heating requests are locked. DHW requests are still operated.
• Heating and HW mode: All heating and DHW requests are locked.

■   Temp differential max (2316)

When the pump reaches the maximum speed with the setting temperature rise nominal, the temperature difference increases via the boiler. The val-

ue set in temperature rise maximum is not exceeded. This is achieved by reducing the boiler setpoint to the current return temperature plus the value shown here.

> ⚠ **Caution**
> The limit of the boiler rise may only be performed if a modulating heat circuit pump is configured, i.e. if prog. no. 6085 (Function output P1) is assigned to a heating circuit pump.

■ **Temp differential nominal (2317)**

The spread 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 at 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 should be increased 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 observed.
  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 at low speed. During high boiler output the boiler pump should run at high speed.

■ **Pump speed min (2322)**

The working range can be defined in percent of output for the modulating pump. The control translates the percent data internally to 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) and 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 output.

■ **Output at pump speed min (2334) and Output at pump speed max (2335)**

If the option burner output is selected under prog. no. 2320, the boiler pump is operated up to the set burner output under prog. no line 2334 to minimum pump speed. From the 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.

■ **Fan parameters**

• Prog.no. 2441: With this parameter the maximum boiler capacity can be limited in heating mode.
• Prog.no. 2442: With this parameter the maximum boiler capacity can be limited in full charging mode for stratification cylinders.

• Prog.no. 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.

■ 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. Modulation is only released after this time has elapsed.

Prog. no. 2450 is used to set the operating mode at which the controller delay is active.

■ Controller delay fan output (2452)

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

■ Controller delay duration (2453)

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

■ Switching diff on CHs (2454), Switching diff off min CHs (2455), Switching diff off max CHs (2456), (2460), Switching diff on HW (2461) and Switching diff off min HW (2462)Switching diff off max HW

|	
Sd	Switching difference off
Sd1	Switching diff off max CHs, Switching diff off max HW
Sd2	Switching diff off min CHs, Switching diff off min HW
Sd3	Switching diff on CHs, Switching diff on HW
t	Time
Ti	Actual temperature

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

Fig.29   Switching difference
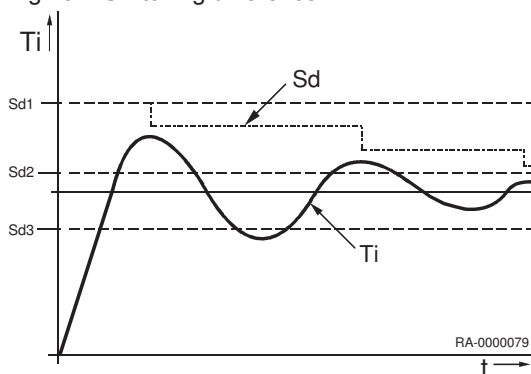
■ Delay heat req special op (2470)

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 option set (*Start prevention* or *Lockout position*) a start prevention or lockout position is carried out with a corresponding diagnosis.

A closed water pressure switch releases the startup of the burner control and the actuation of the pumps. A start prevention or lockout position is triggered with the pressure switch open.

The pump actuation is also locked for protection against dry running. If the water pressure increases again and the switch closes again, this is automatically cancelled again with a start prevention and the pump actuation is released again.

■ Gas energy metering (2550)

This parameter is used to switch gas energy metering on or off. The counter values are not deleted during this process.

> **i** **Note**
> The parameter Charging priority (1630) should be set to "Absolute" when gas energy metering has been activated. If the charging priority is not "Absolute" and there is a requirement for heating operation at the same time as domestic water charging, the gas energy is only taken into consideration in the meter for the heating circuit.

■ **Gas energy metering correction (2551)**

The gradient of the linear approximation function is adapted here.
• Value < 1: Leads to lower gas energy metering.
• Value > 1: Leads to increased gas energy metering.

A value of 1 means there is no change compared to the approximation function stored.

9.2.12 Cascade

■ **Lead strategy (3510)**

The heat generators are switched on and off acc. to the set lead strategy taking the specified output range into account. To switch off the effect of the 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 boilers are switched on as late as possible (output range max) and switched back off again as soon as possible (output range max). I.e. as few boilers as possible in operation or short running times for additional boilers.
• Late on, late off: Additional boilers are switched on as late as possible (output range max) and switched back off again as late as possible (output range max). I.e. as few switching on and off processes as possible for the boilers.
• Early on, late off: Additional boilers are switched on as early as possible (output range min) and switched back off again as late as possible (output range min). I.e. as many boilers as possible in operation or long running times for additional boilers.

■ **Release integral source seq (3530)**

A value generated from temperature and time. The lag boiler is switched on when the set limit is exceeded.

■ **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 a switched off boiler being switched back on again. It is only released again after the set time period has elapsed. This prevents the boiler switching on and off too often 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 is changed. The boiler with next higher device address operates as lead boiler.

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

■ **Auto source seq exclusion (3541)**

• None: The boiler sequence changes after expiry of the time set in prog. no. 3540.

- First: The first boiler in the addressing works as the lead boiler; for all the other boilers the boiler sequence is changed after expiry of the time set in prog. no. 3540.
- Last: The last boiler in the addressing always remains the last boiler; for all other boilers the boiler sequence is changed after expiry of the time set in prog. no. 3540.

■ Leading source (3544)

The setting of the leading generator is only used in combination with the fixed sequence of the generator 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 becomes 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 generator is switched off as early as possible independently of the set lead strategy. Once the temperature difference is sufficient again, the set lead strategy is switched over again.

9.2.13 Solar

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

Fig.30   Charging control /schematic)

1 / 0	On / off collector pump
T	Temperature
T1	Temp diff on
T0	Temp diff off
TK	Collector temperature
TL	Charging temperature min buffer storage tank / swimming pool
TS	Storage tank temperature
t	Time

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.

■ Charg temp min HW st tank (3812)

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

■ Temp diff on buffer (3813),Temp diff off buffer (3814) andCharging 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 storage tank.

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) andTemp diff off swi pool (3817)

The solar circuit pump starts or stops if the difference between the solar collector temperature and the swimming pool temperature is exceeded or undershot.

■ 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)**

If several heat exchangers/indirect coils are tied into the system, the heating sequence for the connected cylinders can be determined by setting the heating process.

• None: Every storage tank is charged alternately with a temperature increase of 5 °C, until the setpoint has reached level A, B or C (tab. 1). Once all setpoints have been reached, the setpoints of the next level are applied.
• Hot water storage tank: The DHW storage tank is charged as priority during any heating with solar energy at any level (A, B or C). Other consumers with the same level will only be charged afterwards. Once all setpoints have been reached, the setpoints of the next level are applied. For this, heating the DHW cylinder still takes priority.
• Buffer storage tank: During any heating with solar energy, the buffer storage tank is charged first at any level (A, B or C). Other consumers with the same level will only be charged afterwards. Once all setpoints have been reached, the setpoints of the next level are applied. For this, charging the buffer cylinder still takes priority.

Tab.22 Storage tank setpoints

Lev-el	Domestic water storage tank	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 swimming pool heating set as priority (prog. no. 2065), the swimming pool will be heated before the storage tanks.			

For more information, see
Charging priority solar (2065), page 93

■ **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)**

Transfer of priority is delayed by the time selected here.

■ **Waiting time parallel op (3827)**

Parallel operation is feasible when using solar primary pumps subject to there being sufficient solar energy available. For this, in addition to the storage tank currently being heated, the next storage tank in the priority order can also be heated in parallel. The storage tank switching on for parallel operation can be delayed and stepped by the value set here.

■ **Delay secondary pump (3828)**

Operation of the secondary pump of the heat exchanger/indirect coil can be delayed to enable any cold water that may be present to be flushed through the primary circuit first by the pump.

■ **Collector start function (3830)**

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

⚠️ **Caution**
The temperatures at certain collectors cannot be measured correctly if the pump is switched off. For this reason, the pump must be activated from time to time.

■   **Min run time collector pump (3831)**

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

■   **Collector start function on (3832) and Collector start function off (3833)**

The time when 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 selected here, the greater the temperature rise 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 tank is continued in order to remove heat. When the storage tank safety temperature has been reached, charging of the storage tank 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.

■   **Pump speed min (3870) andPump speed max (3871)**

Input of the minimum and maximum solar circuit pump speeds in percent.

■   **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 unit yield (3887)**

Defines the flow per pulse for the Hx input. The Hx input must be configured to pulse count for this.

9.2.14 Solid fuel boiler

■   **Locks other heat sources (4102)**

If the solid fuel boiler is activated, other heat generators, e.g. oil./gas boilers, are blocked as soon as an increase in the boiler temperature is established that indicates that the comparative temperature has been exceeded (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.

Fig.31   Storage tank charging
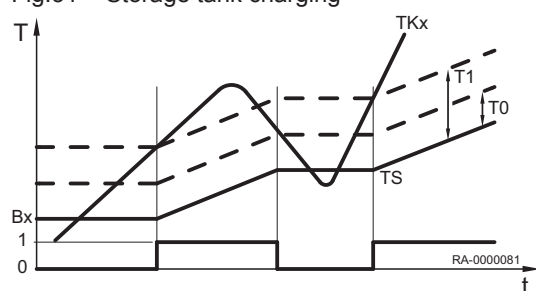
- **Temp diff on (4130), Temp diff off (4131) and Comparative temp (4133)**

1 / 0	On / off boiler pump
Bx	Comparative actual temperature
T1	Temp diff on
T0	Temp diff off
TKx	Boiler temperature
TS	Storage temperature
t	Time

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

To maintain the comparative temperature, the following settings are available under prog. no. 4133:
- Hot water sensor B3 / Hot water sensor B31: The comparative temperature is supplied by the DHW sensor B3/B31.
- Buffer sensor B4 / Buffer sensor B41: The comparative temperature is supplied by the buffer storage tank sensor B4/B41.
- 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 overrun time (4140)**

Setting pump after-run time.

9.2.15 Buffer storage tank

- **Auto generation lock (4720)**

The hydraulic separation of heat generator and buffer storage tank is achieved by the automatic heat generator lock. The heat generator is only put into operation if the buffer can no longer cover the current heat demand. The following settings are possible:
- None: The automatic heat generator lock is deactivated.
- With B4: The automatic heat generator lock is triggered by the buffer cylinder B4.
- With B4 and B42/B41: The automatic heat generator lock is triggered by the buffer cylinders B4 and B41/B42.

- **Auto heat gen lock SD (4721)**

The heat generator is locked if the the temperature in the buffer storage tank is higher than the boiler setpoint+Auto heat gen lock SD.

- **Temp diff buffer/CH (4722)**

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

- **Min st tank temp heat mode (4724)**

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

- **Charging temp max (4750)**

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

> **i** | **Note**
> 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 HW/CHs (4756)**

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

■   **Recooling collector (4757)**

Recooling when the buffer storage tank temperature is too high by transmitting energy to the environment via the collector area.
• Off: Recooling has been deactivated.
• Summer: Recooling is only active in summer.
• Always: Recooling is always active.

■   **With solar integration (4783)**

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

■   **Temp diff on return div (4790),Temp diff off return div (4791) andCompar temp return div (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 section. 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.

> **i** **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 consumers 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 flow. The return temperature drops even lower with this, which leads to a higher efficiency with a condensing boiler, for example.
• Temp increase: If the return temperature of the consumers is lower than the temperature on the selected sensor (prog. no. 4795), the return flow can be preheated by redirecting over the lower part of the storage tank. In this way, for example, return flow preheating can be implemented.

■   **Full charging (4810)**

The function *full charging* makes it possible for the released generator to be switched off first despite automatic generator lock if the buffer storage tank is fully charged. During active function the generator parameterized for the full charging function is only switched off when the full 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: Full charging becomes active if the automatic generator lock blocks the heat source during valid heat request based on the buffer temperature. If the buffer storage tank reaches the requested temperature at the sensor parameterized for the full charging function, the function is ended.
• Always: Full charging becomes active if the automatic generator lock blocks the generator during valid heat request based on the buffer temperature or the heat request is invalid. If the buffer storage tank reaches

the requested temperature at the sensor parameterized for the full charging function, the function is ended.

■ Full charging temp min (4811)

The buffer storage tank is charged minimally o 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.
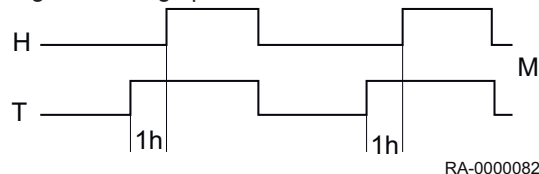
9.2.16 DHW storage tank

■ Forward shift charging (5011)

Fig.32   Charge push forward time

H   Heating program
M   Several times during the day
T   DHW release

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.

■ Flow setpoint boost (5020)

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

■ Transfer boost (5021)

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

■ Type of charging (5022)

Charging a stratification cylinder (if available):
• Recharging : The cylinder is only recharged at every DHW demand.
• Full charging: The cylinder is fully charged at every DHW demand.
• Full charging legio: The cylinder is fully charged if the legionella function is enabled; otherwise it is only recharged.
• Full charg 1st time day: During the first charging of the day, the cylinder is fully charged, then recharged.
• Full charg 1st time legio: The cylinder is fully charged during the first charging of the day and if the legionella function is enabled; otherwise it is recharged

Explanations:
• <u>Full charging</u>: The stratification cylinder is fully charged. 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, recharging takes place automatically.
• <u>Recharging</u>: The stratification cylinder is recharged 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).

■ 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. It is therefore often practical to restrict the time of DHW charging.

■ Discharging protection (5040)

This function ensures that the DHW circulation pump (Q3) only switches on when the temperature in the heat source is high enough.
• **Application with sensor**
  - The charging pump is only switched on when the heat source temperature is above the DHW temperature plus half of the heating excess. If

the boiler temperature drops below the DHW temperature plus 1/8 of the charging excess during the charging again, the charging pump is switched off again. 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 primary pump is only switched on if the boiler temperature is above the set DHW temperature. If the boiler temperature drops below the DHW nominal setpoint minus the DHW switching difference, charging pump is switched off again.

- Off: The function is switched off.
- Always: The function is always active.
- Automatically: The function is only active if the heat generator cannot deliver heat or is not available (malfunction, generator lock).

■ **Charging temp max (5050)**

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

ℹ **Note**
The collector pump can be re-activated by the collector overheating protecting function (see programme number 3850) until the storage safety temperature has been reached.

📖 **For more information, see**

■ **Recooling temp (5055)**

Setting the temperature for recooling the DHW-storage.

■ **Recooling collector (5057)**

Recooling of the overhaeted collector through giving off of the energie to the surrounding of the collector.

■ **El imm heater optg mode (5060)**

- Substitute: The DHW is only heated by an immersion heater if the boiler signals a malfunction or a boiler lock exists.
- Summer: The DHW is heated by an 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 taken over by the boiler again. The conditions listed for the immersion heater under the substitute operating mode are also activated in summer mode.
- Always: DHW is heated exclusively by the immersion heater.

■ **El immersion heater release (5061)**

- 24h/day: Immersion heater permanently released
- Hot water release: Immersion heater released subject to DHW-release (see prog. no. 1620).
- Time hot water: Release of the immersion heater via the time switching programme 4 of the local controller.

■ **El immersion heater control (5062)**

- External thermostat: The storage tank temperature is achieved with an external thermostat without the controller providing a set temperature.
- Hot water sensor: The storage tank temperature is achieved with an external thermostat with setpoint control of the controller.

■ **Hot water boost (5070)**

The DHW-push can activated manually or automatically. It causes a one-time DHW charging to the nominal setpoint.
- Off: The DHW-push can only activated manually.
- On: If the DHW temperature drops by more than two switching differences (prog. no. 5024) below the reduced setpoint (prog. no. 1612), it will be recharged once to the DHW nominal setpoint (prog.no.1610).

> **i** **Note**
> The automatic push only works when DHW operating mode is set.

■ **Excess heat draw (5085)**

Excess heat draw-off can be triggered by the following functions: Maximum storage tank temperature, automatic push, heating priority time push, excess heat draw-off, active inputs H1, H2, H3 or EX2, storage tank reverse cooling, solid boiler excess heat draw-off. If an excess temperature discharge is activated, the excess energy can be dissipated through the central heating drawing off heat. This can be separately set for each heating circuit.

■ **With buffer (5090)**

• No: The DHW storage tank is supplied directly by the boiler.
• Yes: The DHW storage tank is supplied by the buffer storage tank.

■ **With prim contr/system pump (5092)**

• No: The DHW storage tank is supplied without primary controller/feed pump.
• Yes: The DHW cylinder is supplied from the primary controller on/by the feed pump.

■ **With solar integration (5093)**

This function determines whether the DHW cylinder should be heated by solar energy.

■ **Pump speed min (5101) andPump speed max (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 stratification cylinder is charged 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 and on the charging sensor B36.

■ **Min start temp diff Q33 (5148)**

This parameter determines the 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 results in the intermediate circuit pump being switched on as soon as the boiler temperature is 5°C below the boiler setpoint .

■ **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.

9.2.17 Configuration

■ **Temps / mode CH1 (5710), Temps / mode CH2 (5715) and Temps / mode CH3 (5721)**

The heating circuits can be switched on or off using this setting. Heating circuit parameters are hidden in the deactivated state.

> **i** **Note**
> This adjustment only affects the heating circuits directly and has no influence on operation.

■ **Hot water sensor (5730)**

• None: No DHW sensor available.
• Hot water sensor B3: There is a DHW storage tank sensor available. 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.

> **i** **Note**
> No reduced mode is possible when a DHW thermostat is used. 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.

■ Hot water ctrl elem Q3 (5731)

• No charging request: DHW charging disabled via Q3.
• Charging pump: DHW charging via the connection of a charging pump to Q3/Y3.
• Diverting valve: DHW charging via the connection of a diverting valve to Q3/Y3.

■ Basic pos HW 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.
• Central heating: The diverting valve (DV) goes into the heating circuit position after the last request has ended.
• Hot water: The diverting valve (DV) goes into the DHW position after the last request has ended.

■ Hot water separate circuit (5736)

The DHW separate circuit can only be used in a boiler cascade.
• Off: The DHW separate circuit function is disabled. Each available boiler can feed the DHW storage tank.
• On: The DHW separate circuit function is enabled. The DHW charging is only done from the boiler defined for this.

> **i** Note
> The DHW actuator Q3 must be set under prog. no. 5731 to "Diverting valve" for a DHW separate circuit to become effective.

■ Ctrl boiler pump/HW 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 circuits.
• 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 CH1/HW 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.

■ Boiler pump at DHW (5775)

This parameter determines, whether the boiler pump for DHW charging is switched on or off.

■ 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.
• Charging pump: When used with charging pump all exchangers can be flowed through simultaneously. Parallel or alternative mode is possible.
• Diverting valve: When used with a diverting valve only one exchanger can be flowed through. Only 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*.

■ Combi storage tank (5870)

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

■ **Relay output QX1 (5890) and Relay output QX2 (5891)**

- None: Relay outputs deactivated.
- Circulating pump Q4: The connected pump serves as a DHW circulation pump (see prog. no. 1660).
- El imm heater HW K6: With the connected immersion heater, the DHW can be charged according to the operating side DHW storage operating line immersion heater.

> **i** **Note**
> The operating mode is set under prog.no. 5060.

- Collector pump Q5: Connection of a circulating pump in case of solar collector use.
- Cons circuit pump VK1 Q15: 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 recirculation of the boiler water.
- Alarm output K10: Any new fault will be signalled by means of this alarm relay. The contact is closed with the delay time selected under prog. no. 6612. If no fault message exists, the contact opens without delay.

> **i** **Note**
> The alarm output is actuated with a delay of 5 minutes so that short-term faults which only lead to a restart, for example, are not displayed.

- heating pump CH3 Q20: Activating the pump heating circuit HC3.
- Cons circuit pump VK2 Q18: Activating the consumer circuit VK2.
- System pump Q14: Connection of a feed pump.
- Heat gen shutoff valve Y4: Connection of a changeover valve for hydraulic de-coupling of the heat generator from the rest of the heating system.
- Solid fuel boiler pump Q10: Connection of a circulation pump for the boiler circuit for the connection of a solid fuel boiler.
- Time setting 5 K13: The relay is controlled by the time program 5 according to the settings.
- Buffer return valve Y15: This valve must be configured for the return temperature increase/reduction or partial charging of the buffer storage tank.
- Solar pump ext exch K9: The solar circuit pump for the external heat exchanger K9 must be set here.
- Solar ctrl elem buffer K8: If several exchangers are connected, the buffer storage tank must be set at the respective relay output and the type of solar regulating unit must be defined under prog.no.5840.
- Solar ctrl elem swi pool K18: If several exchangers are connected, the swimming pool must be set at the respective relay output and the type of the solar regulating unit must be defined in prog.no. 5840.
- Swimming pool pump Q19: Connection of a swimming pool pump at the input Q19 .
- Cascade pump Q25: Common boiler pump for all boilers in a cascade.
- St tank transfer pump Q11: The DHW storage tank can be heated by the buffer storage tank subject to it being hot enough. This transfer is brought about by transfer pump Q11.
- Hot water mixing pump Q35: Separate pump for storage circulation during active legionella function.
- HW interm circ pump Q33: Charging pump for DHW cylinder with external heat exchanger.
- Heat request K27: Output K27 is activated as soon as a heat demand exists in the system.
- heating pump CH1 Q2/heating pump CH2 Q6: The relay is used for actuating the heating circuit pump Q2/Q6.
- Hot water ctrl elem Q3: Depending on the hydraulics a connected DHW charging pump or diverting valve.
- Status output K35: The status output is operated when a command exists from the controller to the burner control. If there is a disturbance, which prevents the burner control from operating, the status output is switched off.

- Status information K36: The output is set when the burner is in operation.
- Flue gas damper K37: This function activates the flue gas damper control. If the flue gas damper control is activated the burner will only start operating when the flue gas damper is open.
- Fan shutdown K38: This output serves to switch the fan off. The output is activated when the fan is needed; otherwise it is not activated. The fan should be switched off as often as possible in order to minimise the total energy consumption of the system.

■   **Sensor input BX1 (5930), Sensor input BX2 (5931) und Sensor input BX3 (5932)**

Functions in addition to the basic functions are made possible by configuring the sensor inputs.
- None: Sensor inputs deactivated.
- Hot water sensor B31: Second DHW sensor, which is used for full charging of the legionella function.
- Collector sensor B6: First solar collector sensor in a collector field.
- HW circulation sensor B39: Sensor for DHW circulation return.
- Buffer sensor B4: Lower buffer storage tank sensor.
- Buffer sensor B41: Centre buffer storage tank 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.
- HW charging sensor B36: DHW sensor for DHW charging systems.
- Buffer sensor B42: Upper buffer storage tank sensor.
- Common return sensor B73: Return sensor for the return diversion function.
- Cascade return sensor B70: Common return sensor for boiler cascades.
- Swimming pool sensor B13: Sensor for measurement of swimming pool temperature.
- 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 input H1 (5950) Function input H4 (5970) and Function input H5 (5977)**

- None: No function.
- Optg mode change CHs+HW: Changeover of the operating modes of the heating circuits to reduced or protection operation (prog.nos. 900, 1200, 1500) and locking of domestic hot water charging in case of closed contact at H1/H4/H5/H2.
- Optg mode changeover CH1 up to Optg mode changeover CH3: Operating mode changeover for heating circuits to protection or reduced operation.

> **i** **Note**
> Locking of domestic hot water charging is only possible under the setting **Optg mode change CHs+HW**.

- 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/Consumer request VK2: The set flow temperature setpoint is activated via the connecting terminals (e.g. a ventilation heater function for door curtain units).

> **i** **Note**
> The setpoint is set under prog.no. 1859/1909.

- Release swimpool source htg: activation triggers heating of the swimming pool by the heat source.
- Excess heat discharge: Active excess heat discharge enables, for example, an external source to force consumers (heating circuit, DHW storage tank, Hx pump) to draw off excess heat with a signal. For each

consumer the parameter excess temperature discharge can be set to determine whether the forced signal is taken into account and should therefore 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 HW: The operating level can be set via the contact instead of via the internal time switching program (external time switching program)

• Room thermostat CH1 up to Room thermostat CH3: With the input a room thermostat request can be generated for the set heating circuit.

> **i   Note**
> The quick decrease should be switched off for the corresponding heating circuits.

• Hot water thermostat: Connection of the DHW thermostat.
• Pulse count: By querying the input the low frequency pulse, e.g. for flow measurement is recorded.
• Checkb sign flue gas damper: 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 VK1 10V/Consumer request VK2 10V: The application node 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 10V: The generator 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).

> **For more information, see**
> Optg mode changeover (900, 1200, 1500), page 90
> Flow temp setp cons request (1859, 1909, 1959), page 92

■ Contact type H1 (5951) Contact type H4 (5971) and Contact type H5 (5978)

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

■ Voltage value 1 H1 (5953),Voltage value 2 H1 (5955), Function value 1 H1 (5954) andFunction value 2 H1 (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".
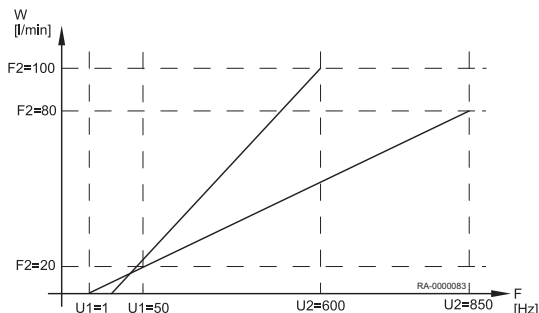
■ Frequency value 1 H4 (5973), Function value 1 H4 (5974), Frequency value 2 H4 (5975) and (5976)Function value 2 H4

F   Frequency
W   Water flow

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

Fig.33   Example for two different sensor curves

■ **Function output P1 (6085)**

This parameter is used to specify the function for the modulating pumps.
• None: No output P1 exists.
• Boiler pump Q1: The connected pump is used for recirculation of the boiler water.
• Hot water pump Q3: Actuator for DHW storage tank.
• HW interm circ pump Q33: Charging pump for DHW cylinder with external heat exchanger.
• heating pump CH1 Q2: The pumped heating circuit HC1 is activated.
• heating pump CH2 Q6: The pumped heating circuit HC2 is activated.
• heating pump CH3 Q20: The pumped heating circuit HC3 is 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. In addition, 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. In addition, 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 collector sensor (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 flow setpoint in case of fluctuating outside temperatures as a function of the building design.

Example values (refer also to Quick setback):
• 40 for buildings with thick walls or outer insulation.
• 20 for buildings of normal building design.
• 10 for buildings of light building design.

> **For more information, see**
> Quick setback (780, 1080, 1380), page 86
> Optimum start control max (790, 1090, 1390) and Optimum stop control max (791, 1091, 1391), page 87

■ **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 larger adaptation should be required.

■ **System frost protection (6120)**

The heating circuit pump is activated without heat request subject to outside temperature. If the outside temperature reaches the lower limit value of -4°C, the heating circuit pump is activated. The pump is activated every 6 hours for 10 minutes when the outside temperature is between -5°C and +1.5°C. When the upper limit value of 1.5°C is reached, the pump switches off.

■ **Save sensors (6200)**

Sensor modes can be saved under prog. no. 6200. This is done automatically; however, after change of the heating system (removal of a sensor) the state must be saved again to the sensor terminals.

■ **Reset to default parameters (6205)**

The factory setting of the regulator is written to the regulator.

> ⚠ **Caution**
> The regulator parameters are overwritten. The factory settings are stored in the regulator.
> • Activation of prog. no. 6205:
>   The regulator is reset to **factory setting**.

■ **Check no. heat source 1 (6212), Check no. heat source 2 (6213), Check no. storage tank (6215) and Check no. heating circuits (6217)**

The standard device generates a check number to identify the system scheme; this comprises the numbers listed in the table below.

Tab.23 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					(1)
3					DHW/B
5	X				
6		X			
8	X				DHW+B
9		X			DHW/B
10	X				DHW
11		X			DHW
12	X				P
13		X			P
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		P
27		X		X	P
(1) The domestic hot water storage tank is charged using collector pump Q5					

Tab.24 Check no. storage tank (prog.-no. 6215)

Buffer storage tank		Domestic water storage tank	
0	No buffer storage tank	00	No DHW storage tank
1	Buffer storage tank	01	Immersion heater
2	Buffer storage tank, solar connection	02	Solar connection

Buffer storage tank		Domestic water storage tank	
4	Buffer storage tank, heat generation shutoff valve	04	Primary pump
5	Buffer storage tank, solar connection	05	Charging pump, solar connection
	Heat gen shutoff valve	13	Diverter valve
		14	Diverting valve, solar connection
		16	Primary controller, without heat exchanger
		17	Primary controller, 1 heat exchanger
		19	Intermediate circuit, without heat exchanger
		20	Intermediate circuit, 1 heat exchanger
		22	Primary pump/intermediate circuit, without heat exchanger
		23	Charging pump/intermediate circuit, 1 heat exchanger
		25	Diverting valve, intermediate circuit, without heat exchanger
		26	Diverting valve, intermediate circuit, 1 heat exchanger
		28	Primary controller/intermediate circuit, without heat exchanger
		29	Primary controller/intermediate circuit, 1 heat exchanger

Tab.25   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	DHW circulation via boiler circuit pump	01	DHW circulation via boiler circuit pump	01	DHW circulation via boiler circuit pump
2	Heating circuit pump	02	Heating circuit pump	02	Heating circuit pump
3	Heating circuit pump, mixer	03	Heating circuit pump, mixer	03	Heating circuit pump, mixer

■   **Software version (6220)**

Display of the actual software version.

9.2.18 LPB system

■   **Device address (6600) andSegment address (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 controller does not provide the bus power supply.
• Automatically: The bus power supply is switched on and off by the controller in accordance with the power demand of the bus system.

■   **Bus power supply state (6605)**

• Off: The bus system power supply by the controller is currently inactive.
• On: The bus system power supply by the controller is currently active.

■   **Display system messages (6610)**

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

■   **Alarm delay (6612)**

The transmission of the alarm to the BM module can be delayed in the basic device by an adjustable time. This allows the prevention of unnecessary messages to a service location caused by malfunctions which only occur briefly (e.g. temperature monitor queried, communication errors). How-

ever, it must be noted that malfunctions which occur briefly and quickly re-occur are also filtered out by this.

■   **Action changeover functions (6620)**

If the setting Central is activated under prog. no. 6221 and 6223 respectively, 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.
• Locally: Depending on the settings made in prog. no. 6620, either the heating circuits in this section or all heating circuits in the entire system are 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 circuits in this section or all heating circuits in the entire system are switched on and off.

■   **Manual source lock (6624)**

• Locally: The local generator is locked.
• Segment: All generators in the cascade are locked.

■   **Hot water assignment (6625)**

This setting is only necessary if the DHW heating control is provided by the heating circuit time program (see prog. no. 1620 and 5061).
• Local CHs: DHW heating applies only to the local heating circuit.
• All CHs in segment: DHW heating applies to all heating circuits in this section.
• All CHs in system: DHW heating applies to all heating circuits in the system.

> **i** | **Note**
> | For all settings the controllers which are in holiday status are also taken into account for the DHW preparation.

■   **Note OT limit ext source (6632)**

Additional generators connected via the LBP bus can be locked or released according to their own parameters based on the outside temperature (e.g: air heat pump/water heat pump). This status is distributed via LPB. The master thus knows via a cascade whether an additional generator (slave) is available according to its own application limits (outside temperature) or not, and can then connect another generator accordingly.

• No: External generator is not taken into account.
• Yes: The external generator is taken into account and the cascade is controlled according to the available generators.

> **i** | **Note**
> | If an ISR-Plus regulator (slave) is connected a further generator, this parameter must be set to "No".

■   **Clock mode (6640)**

This setting determines the effect of the system time on the controller time setting. The following settings are possible:
• Autonomously: The time can be adjusted at the controller. The time of the controller is not adapted to the system time.
• Slave without remote setting: The time cannot be adjusted at the controller. The controller time is constantly synchronised to the system time.
• Slave with remote setting: The time can be adjusted at the controller. The system time is synchronised simultaneously as the change is adop-

ted by the master. The time of the controller is then continually adapted to the system time.

• Master: The time can be adjusted at the controller. The controller time is defaulted to 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 controllers without a sensor. The first figure in the display is the section number, the second is the appliance number.

9.2.19 Fault

■   **Message (6700)**

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

■   **Display 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.

■   **Burn ctrl phase lockout pos (6706)**

Phase during which the fault 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.

■   **Flow temp 1 alarm (6740), Flow temp 2 alarm (6741), Flow temp 3 alarm (6742), Boiler temp alarm (6743) and Hot water charging alarm (6745)**

Setting the time after which a fault 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 codes and time of occurrence are saved to the error memory.

9.2.20 Maintenance / 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.

> **i**   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.

> **i**   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.

> **i** **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 ionization current maintenance message. The maintenance message can only be reset if the reason for maintenance has been eliminated.

■ **Chimney sweep function (7130)**

The chimney sweep function is switched on or off under this prog no.

> **i** **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 is controlled to the setpoint manual control. All the pumps are switched on. 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 directly requested by the device.

■ **Controller stop setpoint (7145)**

With activated controller stop function the output set here is requested by the device.

■ **Compulsory heat draw-off DHW (7165)**

This parameter is used to set that heat pumping to the domestic hot water circuit takes priority when the chimney sweep function is active.

• Off: Compulsory pumping of the heat to the heating circuits.
• On: When the chimney sweep function is active, heat is pumped with priority into the domestic hot water circuit.

■ **Telephone customer service (7170)**

Here the desired telephone number of customer service can be entered.

■ **PStick storage pos (7250)**

The parameter PStick storage pos can be used to select the data set (data set number on the stick) to be written or read.

■ **PStick Des Data set (7251)**

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

■ **PStick command (7252)**

• No operation: This is the basic state. 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 to the LMS control. First a check is carried out as to whether the data set may be imported. If the data set is incompatible, it must not be imported. The display resets to No operation and displays an error message. The text Reading from stick remains until the operation is completed or an error occurs. As soon as data transmission begins, the LMS

control goes in a parameterization position. As soon as parameters are transferred, the LMS control must be unlocked transmission has ended. Fault 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 into the previously set data set. Before writing of the data begins, it is checked whether the stick has sufficient capacity for the data and that the respective customer number is correct. The textWriting on stick remains until the operation is completed or a fault occurs.

■   **PStick progress (7253)**

The read or write progress is displayed as a percentage. If no operation is active or a fault occurs, 0% is displayed.

■   **PStick status (7254)**

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

9.2.21 Configuration of extension modules

■   **Function extension module 1 (7300), Function extension module 2 (7375)**

When a function is selected, the inputs and outputs are occupied on the extension module with the functions according to the following table:

Connection terminal on module	QX21	QX22	QX23	BX21	BX22	H2/H21	H22
Multi-functional	*	*	*	*	*	*	*
Heating circuit 1	Y1	Y2	Q2	B1	*	*	*
Heating circuit 2	Y5	Y6	Q6	B12	*	*	*
Heating circuit 3	Y11	Y12	Q20	B14	*	*	*
Solar DHW	*	*	Q5	B6	B31	*	*
Primary control/ system pump	Y19	Y20	Q14	B15	*	*	*
* Freely selectable in QX.../ BX... FS = DHW flow switch; AVS75.390 = H2; AVS75.370 = H21							

Tab.26   Legend

Q1	Boiler pump
Q2	1. Heating circuit pump
Q5	Collector pump
Q6	2. Heating circuit pump
Q14	System pump
Q20	Heating circuit pump HC3
Y1	1. Heating circuit mixer OPEN
Y2	1. Heating circuit mixer CLOSED
Y5	2. Heating circuit mixer OPEN
Y6	2. Heating circuit mixer CLOSED
Y11	3. Heating circuit mixer OPEN
Y12	3. Heating circuit mixer CLOSED
Y19	Primary control mixer OPEN
Y20	Primary control mixer CLOSED
B1	Flow sensor HC1
B6	Collector sensor
B12	Flow sensor HC2
B14	Flow sensor HC3
B15	Flow sensor primary control

■   **Relay output QX21 module 1(7301), Relay output QX22 module 1, (7302), Relay output QX23 module 1, (7303), Relay output QX21 module 2, (7376), Relay output QX22 module 2(7377) und Relay output QX23 module 2 (7378)**

- None: Relay outputs deactivated.
- Circulating pump Q4: The connected pump serves as a DHW circulation pump (see prog. no. 1660).
- El imm heater HW K6: With the connected immersion heater, the DHW can be charged according to the operating side DHW storage operating line immersion heater.

> **i** Note
> The operating mode is set under prog.no. 5060.

- Collector pump Q5: Connection of a circulating pump in case of solar collector use.
- Consumer circuit pump VK1/2: 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 recirculation of the boiler water.
- Alarm output K10: Any new fault will be signalled by means of this alarm relay. The contact is closed with the delay time selected under prog. no. 6612. If no fault message exists, the contact opens without delay.

> **i** Note
> The alarm relay can be reset without having the fault remedied (see prog. no. 6710). The alarm relay can also be closed temporarily by a message which, for example, leads to restart.

- heating pump CH3 Q20: Activating the pump heating circuit HC3.
- Cons circuit pump VK2 Q18: Activating the consumer circuit VK2.
- System pump Q14: Connection of a feed pump.
- Heat gen shutoff valve Y4: Connection of a changeover valve for hydraulic de-coupling of the heat generator from the rest of the heating system.
- Solid fuel boiler pump Q10: Connection of a circulation pump for the boiler circuit for the connection of a solid fuel boiler.

- Time setting 5 K13: The relay is controlled by time program 5 according to the settings.
- Buffer return valve Y15: This valve must be configured for return temperature increase/decrease or the buffer storage tank partial charging.
- Solar pump ext exch K9: The solar circuit pump for the external heat exchanger K9 must be set here.
- Solar ctrl elem buffer K8: If several exchangers are connected, the buffer storage tank must be set at the respective relay output and the type of solar regulating unit must be defined under prog.no.5840.
- Solar ctrl elem swi pool K18: If several exchangers are connected, the swimming pool must be set at the respective relay output and the type of the solar regulating unit must be defined in prog.no. 5840.
- Swimming pool pump Q19: Connection of a swimming pool pump at the input Q19.
- St tank transfer pump Q11: The DHW storage tank can be charged from the buffer storage tank providing it is hot enough. This transfer is brought about by transfer pump Q11.
- Hot water mixing pump Q35: Separate pump for cylinder content circulation whilst pasteurisation is active.
- HW interm circ pump Q33: Charging pump for DHW cylinder with external heat exchanger.
- Heat request K27: Output K27 is activated as soon as a heat demand exists in the system.
- Heating circuit pump HC1/HC2: The relay is used for actuating the heating circuit pump Q2/Q6.
- Hot water ctrl elem Q3: Depending on the hydraulics a connected DHW charging pump or diverting valve.
- Status output K35: The status output is operated when a command exists from the controller to the burner control. If there is a disturbance, which prevents the burner control from operating, the status output is switched off.
- Status information K36: The output is set when the burner is in operation.
- Fan shutdown K38: This output serves to switch the fan off. The output is activated when the fan is needed; otherwise it is not activated. The fan should be switched off as often as possible in order to minimise the total energy consumption of the system.

■ Sensor input BX21 module 1 (7307), Sensor input BX22 module 1 (7308), Sensor input BX21 module 2, (7382), Sensor input BX22 module 2 (7383)

Functions in addition to the basic functions are made possible by configuring the sensor inputs.
- None: Sensor inputs deactivated.
- Hot water sensor B31: Second DHW sensor, which is used for full charging of the legionella function (pasteurisation).
- Collector sensor B6: First solar collector sensor in a collector field.
- HW circulation sensor B39: Sensor for DHW circulation return.
- Buffer sensor B4: Lower buffer storage tank sensor.
- Buffer sensor B41: Centre buffer storage tank 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.
- HW charging sensor B36: DHW sensor for DHW charging systems.
- Buffer sensor B42: Upper buffer storage tank sensor.
- Common return sensor B73: Return sensor for the return diversion function.
- Cascade return sensor B70: Common return sensor for boiler cascades.
- Swimming pool sensor B13: Sensor for measurement of swimming pool temperature.
- Solar flow sensor B63: This sensor is required for the solar usage measurement.
- Solar return sensor B64Solar return sensor B64: this sensor is required for the solar usage measurement

■ Function input H2 module 1 (7311), Function input H21 module 1 (7321), Function input H2 module 2 (7386), Function input H21 module 2 (7396)

• None: no function.
• Optg mode changeover HW: Locking of the domestic hot water charging in case of closed contact at H1/H4/H5/H2.
• Optg mode changeover CHs: Operating mode changeover for heating circuits to protection or reduced operation.

> **i** **Note**
> Locking of domestic hot water charging is only possible under the setting **Optg mode change CHs+HW**.

• Heat generation lock: the heat generator is locked through connecting terminal H2. All temperature demands for heating circuits and DHW are ignored. The boiler frost protection function is maintained.

> **i** **Note**
> The chimney sweeper function can be applied in spite of the heat generation lock.

• Error/alarm message: Closing the inputs Hx results in 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.
• Consumption requirement VK1/VK2: the set flow temperature setpoint is activated via the connecting terminals (e.g. a ventilation heater function for door curtain units).

> **i** **Note**
> The setpoint must be set under progr. no. 1859/1909/1959.

• Release swimpool source htg: Closing the input Hx (e.g. manual switch) releases the swimming pool heater. Heating is by means of 'heat generator heating'.
• Excess heat draw: an active excess heat discharge enables, for example, an external source to force the consumer (heating circuit, DHW storage tank, heating circuit pump) to take up the excess heat.
• 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/HCs: The operating level can be set via the contact instead of via the internal time switching program (external time switching program).
• Ambient thermostat HCs: With the input a room thermostat request can be generated for the set heating circuit.

> **i** **Note**
> The quick decrease should be switched off for the corresponding heating circuits.

• Hot water thermostat: Connection of the DHW thermostat.
• Limit thermostat CH: If the extension module is used for the heating circuit, an external temperature monitor can be cut in at the inlet (e.g. for underfloor heating).
• Start prevention: With this input a burner start can be prevented.
• Consumption requirement VKx 10V: The application node 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 10V: The generator 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).

■ Contact type H2 module 1 (7312), Contact type H21 module 1 (7322), Contact type H2 module 2 (7387), Contact type H21 module 2 (7397)

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

Fig.34   Example of heat demand 10 V
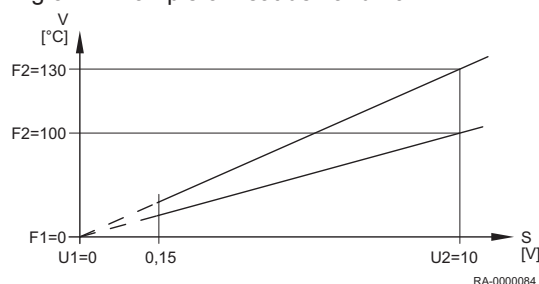
■   **Voltage value 1 H2 module 1 (7314) to Funct value 2 H2 module 1 (7317), Voltage value 1 H2 module 2 (7389) to Funct value 2 H2 module 2 (7392)**

F1	Function value 1
F2	Function value 2
S	Voltage to Hx
U1	Voltage value 1
U2	Voltage value 2
V	Flow temperature setpoint

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

■   **Funct input EX21 module 1 (7342) , Funct input EX21 module 2 (7417)**

• None: No function.
• Limit thermostat CH: If the extension module is used for the heating circuit, an external temperature monitor can be cut in at the inlet (e.g. for underfloor heating).

■   **Funct output UX21 module 1 (7348), Funct output UX22 module 1 (7355), Funct output UX21 module 2 (7423), Funct output UX22 module 2 (7430)**

• None: No function.
• Boiler pump Q1: The connected pump is used for recirculation of the boiler water.
• DHW pump Q3: Actuator for DHW storage tank.
• DHW intermediate circuit pump Q33: Actuation of a charge pump for domestic hot water storage with external heat exchanger.
• Heating circuit pumps HCs: Activation of the pump heating circuits HC1-HC3.
• Collector pump Q5: Actuation of a circulating pump when a solar collector is used.
• Solar pump ext. exchanger K9: The solar circuit pump for the external heat exchanger K9 must be set here.
• Solar pump buffer K8: If several exchangers are connected, the buffer storage tank must be set at the respective relay output and the type of solar regulating unit must be defined under prog.no.5840.
• Solar pump swimming pool K18: If several exchangers are connected, the swimming pool must be set at the respective output and the type of the solar regulating unit must be defined in prog.no. 5840.
• Solid fuel boiler pump Q10: Connection of a circulation pump for the boiler circuit for the connection of a solid fuel boiler.

■   **Signal output UX21 module 1 (7350), Sign logic out UX22 module1 (7357), Signal output UX21 module 2 (7425) und Signal output UX22 module 2 (7432)**

Specifies whether the signal is to be outputted as a 0..10V signal or pulse width modulated (PWM) signal.

9.2.22 Input/output test

■   **Input/output tests**

Tests for checking the function of connected components.

9.2.23 Status

■   **State**

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

Tab.27   Status table heating circuit

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

End user (Eu)	Commissioning, Engineer (menu Status)
Limitter has tripped	Limitter has tripped
Manual control active	Manual control active
Floor curing function active	Floor curing function active
Heating mode restricted	Overtemp protect active
	Restricted, boiler protection
	Restricted, HW priority
	Restricted, buffer
Forced draw	Forced draw HW
	Forced draw source
	Overrun active
On heating mode	Opt start ctrl+CH boost
	Optimum start control
	Central heating boost
	On heating mode
Reduced heating mode	Optimum stop control
	Reduced heating mode
Frost protection active	Frost prot room active
	Frost protection flow active
	System frost protect active
Summer operation	Summer operation
Off	24-hour Eco active
	Setback reduced
	Setback off
	Room temp limitation
	Off

Tab.28   Status table domestic water

The following messages are possible under **Drinking water**:

End user (Eu)	Commissioning, Engineer (menu Status)
Limitter has tripped	Limitter has tripped
Manual control active	Manual control active
Consumption	Consumption
Hot water preheat on	Hot water preheat active
	Hot water preheat on
Recooling active	Recooling via collector
	Recooling via heat gen/CHs
	Recooling via HW/CHs
Charging lock active	Discharging prot active
	Charg time limitation active
	Charging locked
Forced charging active	Forced, max st tank temp
	Forced, max charging temp

End user (Eu)	Commissioning, Engineer (menu Status)
	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
Boost active	Boost legionella setpoint
	Boost hot water setpoint
Charging active	Charging, legionella setp
	Charging, nominal setp
	Charging, reduced setp
Frost protection active	Frost protection active
	Frost prot instant 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

Tab.29   Status table boiler

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

End user (Eu)	Commissioning, Engineer (menu Status)
SLT has tripped	SLT has tripped
Fault	Fault
Limitter has tripped	Limitter has tripped
Manual control active	Manual control active
Chimney sweep funct active	Chim sweep fct, full load
	Chim sweep fct, 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

End user (Eu)	Commissioning, Engineer (menu Status)
	Return limitation, part load
Charging buffer	Charging buffer
In part load op for CH, HW	In part load op for CH, HW
In part load op for CH, HW	In part load op for CH, HW
Released for CH and HW	Released for CH and HW
In operation for HW	In operation for HW
In part load op for HW	In part load op for HW
Released for HW	Released for HW
In operation for CH	In operation for CH
In part load op for CH	In part load op for CH
Released for CH	Released for CH
Overrun active	Overrun active
Released	Released
Frost protection active	Frost protection active
Off	Off

Tab.30   Status table solar

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

End user (Eu)	Commissioning, Engineer (menu Status)
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 protect active	Overtemp protect active
Max charging temp reached	Max charging temp reached
Charg HW+buffer+swi pool	Charg HW+buffer+swi pool
Charging HW+buffer	Charging HW+buffer
Charging HW+swi pool	Charging HW+swi pool
Charging buffer+swi pool	Charging buffer+swi pool
Charging HW	Charging HW
Charging buffer	Charging buffer
Charging swimming pool	Charging swimming pool
Radiation insufficient	Min charg temp not reached
	Temp diff insufficient
	Radiation insufficient

Tab.31   Status table solid fuel boiler

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

End user (Eu)	Commissioning, Engineer (menu Status)
Manual control active	Manual control active
Fault	Fault

End user (Eu)	Commissioning, Engineer (menu Status)
Overtemp protect active	Overtemp protect active
Released	Locked, manual
	Locked, automatic
Min limitation active	Min limitation
	Min limitation, part load
	Min limitation active
In operation for CH	Protective start
	Protective start, part load
	Return limitation
	Return limitation, part load
	In operation for CH
In part load op for CH	In part load op for CH
In operation for HW	In operation for HW
In part load op for HW	In part load op for HW
In op for CH, HW	In op for CH, HW
In part load op for CH, HW	In part load op for CH, HW
Overrun active	Overrun active
In operation	In operation
Assisted firing active	Assisted firing active
Released	Released
Frost protection active	System frost protect active
	Boiler frost prot active
Off	Off

Tab.32 Status table burners

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

End user (Eu)	Commissioning, Engineer (menu Status)
Lockout position	Lockout position
Start prevention	Start prevention
In operation	In operation
Startup	Safety time
	Prepurge
	Startup
	Postpurge
	Shutdown
	Home run
Standby	Standby

Tab.33 State table buffer storage tank

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

End user (Eu)	Commissioning, Engineer (menu Status)
Hot	Hot
Frost protection active	Frost protection active

End user (Eu)	Commissioning, Engineer (menu Status)
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, HW priority
Charging active	Forced charging active
	Partial charging active
Recooling active	Recooling via collector
	Recooling via HW/CHs
Charged	Charged, max st tank temp
	Charged, max charging temp
	Charged, forced temp
	Charged, required temp
	Part charged, required temp
	Charged, min charging temp
Cold	Cold
No request	No request

Tab.34   Status table swimming pool

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

End user (Eu)	Commissioning, Engineer (menu Status)
Manual control active	Manual control active
Fault	Fault
Heating mode restricted	Heating mode source
Heated, max swi pool temp	Heated, max swi pool temp
Heated	Heated, setpoint solar
	Heated, setpoint source
Heating mode	Heating mode solar off
	Heating mode source off
Cold	Cold

9.2.24 Diagnostics cascade/heat generation/consumers

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

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

■   **Gas energy**

There are 6 energy meters available, comprising the estimated gas energy used with the aid of the fan speed and a linear approximation of the actual burner output. The energy meters must be switched on and off using prog.no. 2550. The results can be corrected under prog.no. 2551.

- 2 overall meters can be reset on the engineer level:
  - Prog.no. 8378: Overall gas energy heating
  - Prog.no. 8379: Overall gas energy DHW
- The end consumer can reset 2 meters:

- Prog.no. 8381: Gas energy heating
- Prog.no. 8382: Gas energy DHW

> **i** **Note**
> Prog.no. 8380 and 8383 are the result of adding the previous parameters.

9.2.25 Burner control

■ **Prepurge time (9500)**

Pre-venting time.

> ⚠ **Caution**
> This parameter must only be changed by a heating specialist!

■ **Required output prepurging (9504)**

Nominal output fan speed during preventing.

■ **Required output ignition (9512)**

Nominal output fan speed during ignition.

■ **Required output LF (9524)**

Nominal output fan speed under boiler in part load.

> **i** **Note**
> If you change this value, please note that prog.no. 2452 (Controller delay fan output) is <u>always</u> higher.

> 📖 **For more information, see**
> Controller delay fan output (2452), page 96

■ **Required output HF (9529)**

Nominal output fan speed under boiler in HF

■ **Postpurge time (9540)**

After-venting time.

> ⚠ **Caution**
> This parameter must only be changed by a heating specialist!

■ **Fan output/speed slope (9626) and Fan output/speed Y-section (9627)**

The speed of the fan can be adjusted with this. This is important for complex installations or change to LPG.

• Prog 9626 corresponds to the slope of the fan curve
• Prog 9627 corresponds to the displacement of the fan curve in Y-direction

9.2.26 Info option

Different information values are displayed depending on the operating conditions. In addition, information about the status is displayed.

> 📖 **For more information, see**
> Status, page 121
> State, page 121

10 Maintenance

10.1 General

10.1.1 General instructions

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.

> ⚡ **Danger of electric shock**
> Before any work, switch off the mains supply to the boiler.
> Before removing parts of the casing, the boiler has to be de-energised.
> Work under voltage (removed casing) may only be carried out by a trained electrician.

> ⚠ **Caution**
> Only a qualified professional is authorised to clean the inside of the boiler.

Cleaning of heating surfaces and burner should be carried out by the approved installer. Before beginning work, the gas tap and the shut-off valves of the heating water should be closed.

10.1.2 Inspection and service as required

> ℹ **Note**
> We recommend having the Paramount four inspected annually.
> If the need for maintenance work is found during inspection, this should be carried out according to need.

Maintenance work includes:
• Paramount four Cleaning the outside.
• Checking the burner for contamination and, possibly, cleaning and servicing.
• Cleaning burner areas and heating surfaces
• Replacing wear parts (see *Spare parts list*).

> ⚠ **Caution**
> Only use original spare parts.

• Checking connection and seal locations of water filled parts.
• Check safety valves for correct function.
• Check operating pressure and top up the water if necessary.
• Vent the heating system.
• Put the gravity lock back into operating position.
• End control and documentation of service work performed.

10.1.3 Protection against contact

> ⚡ **Danger of electric shock**
> Danger to life due by missing shock-proof protection.
> To ensure shock-proof protection, all parts of the boiler to be screwed on – the casing parts in particular – must be screwed on correctly after work has been completed.

10.1.4 Approved detergents

Cleaned heat exchangers improve heat transfer and save energy. The following detergents have been tested and approved by Potterton Commercial for cleaning heat exchangers:
- Sanit Care Aluminium-Wärmetauscher Spezialreiniger
- Sotin 240 Heizkesselreiniger

> ⚠ **Danger**
> **Cleaning agents for aluminium heat exchangers are irritants and/or corrosive.**
> Before starting work the corresponding security and safety measures of the manufacturer must be observed. In addition the instructions for use and transport printed on the packaging and container must be observed.

> 📖 **See**
> The Potterton Commercial maintenance instructions must be observed.

> ℹ **Note**
> The safety data sheets for the detergents listed are included with the product or are available from the respective manufacturers.

> ⚠ **Caution**
> During application of the detergent only the heat exchanger on the flue gas side may be treated. No detergent residue may remain on the boiler components, the cable plugs or casing, since this can otherwise lead to corrosion and appliance malfunction. Residues sprayed by mistake must be cleaned off immediately using a damp cloth.

10.1.5 Unhooking the control panel

To make assembly e.g. installation of a charging pump easier, the control panel can be unhooked.

1. Fold the control panel (KSF) down.
2. Unhook the straps on the left and right of the KSF.

> ⚠ **Caution**
> Hold the KSF to make sure it does not flop forwards.

3. The KSF can be pulled out to the right.
4. Unhook the complete KSF to the right.

> ℹ **Note**
> Make sure that the KSF can be set down safely in an appropriate place.

Fig.35   Unhooking the control panel

RA-0000089
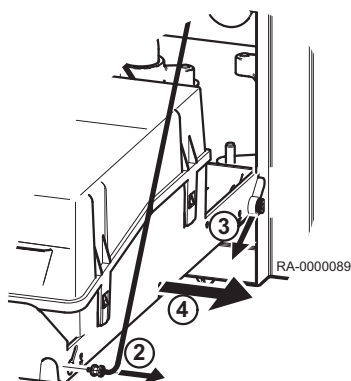
10.1.6 At the end of the maintenance work

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

10.2   Maintenance messages

10.2.1 Maintenance code table

Servicing code	Maintenance description
1	Burner operating hours exceeded
2	Burner starts exceeded
3	Maintenance interval exceeded

10.2.2 Operating phases of the Control Centre LMS

The operating phases are displayed after the **information key** has been pressed.

Phase number		
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
TI	Interval time	Flame stabilisation
MOD	Modulating mode	Operating burner
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 current fault mode is displayed.

For more information, see
Fault code table, page 134

10.3   Standard inspection and maintenance operations

10.3.1 Clean siphon

The condensate siphon should be cleaned every year.

1. Loosen the upper screwed fitting on the siphon.
2. Pull the siphon down and off.
3. Remove the siphon completely from the Paramount four together with the hose.

4. Dismantle the siphon and flush it through with clean water.
5. Installation of the siphon is done in reverse order.

> **ℹ Note**
> At the same time, the exhaust gas collecting tray should be checked for soiling and should be cleaned (rinsed) if necessary.

10.3.2 Check electrodes

Fig.36   Electrodes

RA-0000256

Ionization electrode (1)
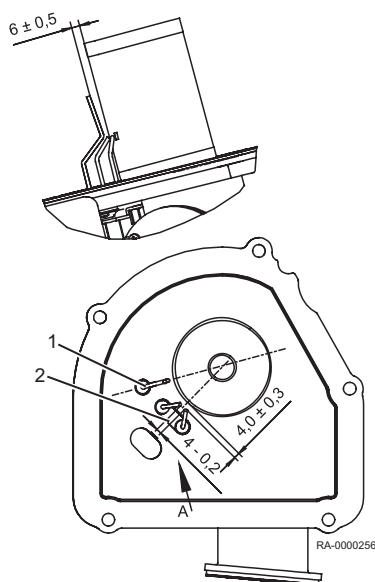
> **⚡ Danger of electric shock**
> Danger to life due to high voltage.
> Do not touch plug contacts during the ignition process.

> **⚠ Caution**
> The wire of the ionization electrode must not be bent since it can break easily.

The ionization electrode must always be in contact with the flame.

The distance from the ionization electrode to the blast tube must be maintained in accordance with Fig. When replacing the ionization electrode, check its distance to the burner and correct if required. To do this, loosen the burner on the mixing tube and move it until the distance corresponds to the required dimension.

> **⚡ Danger of electric shock**
> **Risk of electric shock! Danger to life due to high voltage.**
> **Caution! Do not touch plug contacts during the ignition process.**
> For measurement of the ionization current, pull plug from the gas burner control and connect an ampere-meter between plug and electrode.

Ignition electrodes (2)

To ensure that the Paramount four unit ignites reliably and quietly, the installation position and the spacing between the ignition electrodes shown in the illustration must be complied with.

10.4   Specific maintenance instructions

10.4.1 Replacing air vent

> **⚠ Caution**
> Only use original spare parts.

> **⚠ Caution**
> Drain off boiler water.
> The boiler water has to be drained before the air vent is removed, otherwise water will leak out.

A defective air vent may only be replaced by a genuine spare part; this guarantees optimum venting.

10.4.2 Removing the gas burner

> **⚠ Caution**
> Close the gas valve before carrying out any work.

Remove the gas burner before cleaning the heating surfaces.

Fig.37   Removing the gas burner
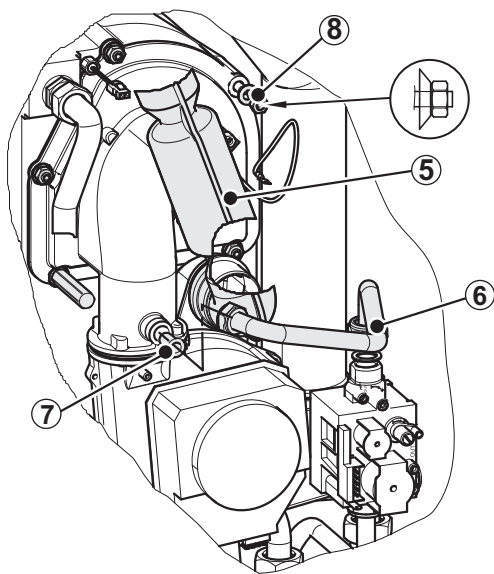
Paramount 30/40   Paramount 50/60
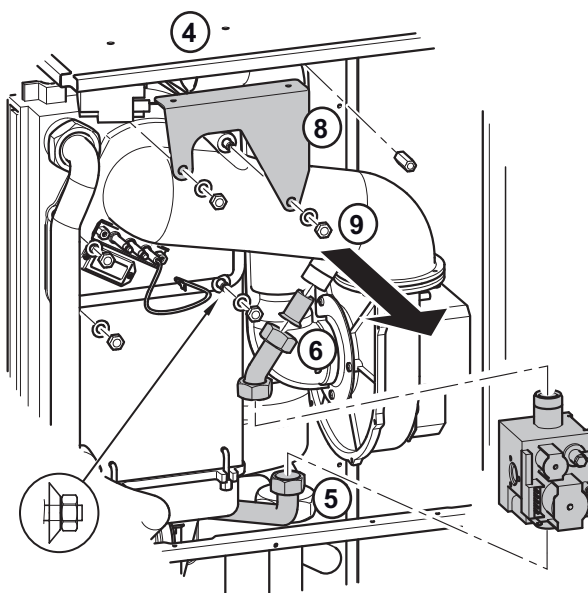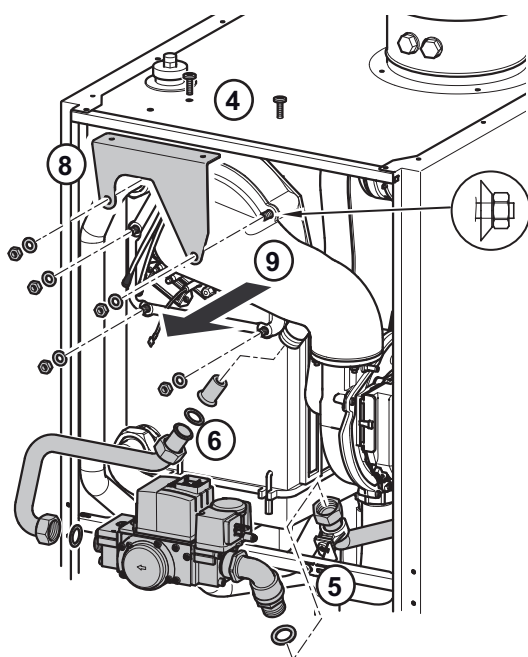
Paramount 80   Paramount 95/115
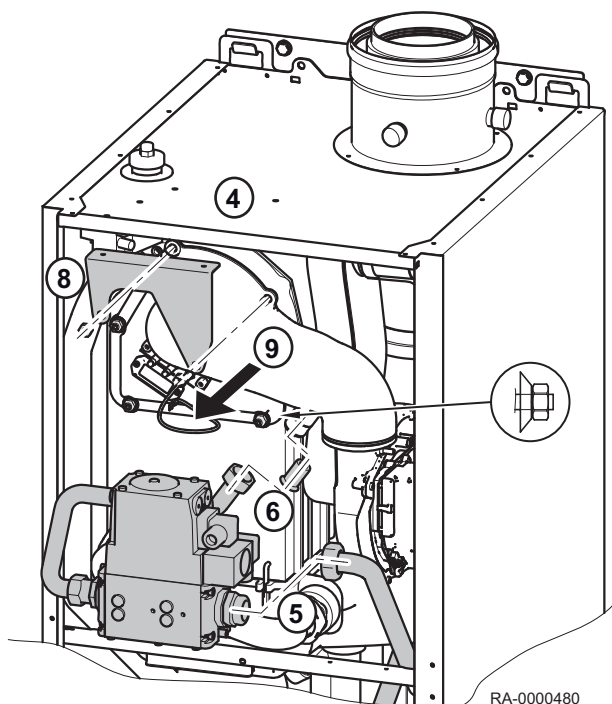
RA-0000480

1. Disconnect the electrical connection cables to the fan at the coupler.

2. Pull the air hose off the fan.
3. Pull the connector off the electrodes.
4. Undo the attachment screw for the air intake silencer at the top of the Paramount four.
5. Remove the air intake silencer.
6. Loosen the screw connections of the gas connection pipe at the mixing tube and the gas valve.
7. Remove the gas connection pipe and the gas nozzle.
8. Loosen the 5 fastening screws at the mixing tube/heat exchanger.
9. Remove the bracket.
10. Pull the burner together with mixing tube and fan forwards and out.

11. Pull the burner together with mixing tube, fan and air intake silencer forwards and out.
12. Clean the burner pipe with a soft brush.
13. Use a new seal when installing the gas burner.

> ⚠ **Caution**
> Use new seals.
> When re-fitting, new seals should be used, particularly for the the gas connecting pipe.

> ⚠ **Caution**
> Make sure the spring disc is in the right position.
> Make sure the spring disc is in the right position during installation. Check the torque again after setting the burner.
> Recommended torque: 9 Nm.

10.4.3 Removing gas valve

1. Remove the electrical connections from the gas valve.
2. Loosen both threaded connections on the gas valve and remove the gas valve.

> **i** **Note**
> Use new seals when installing the gas valve.

10.4.4 Removing the heat exchanger

Carry out the following steps if the heat exchanger has to be completely removed.

> **i** **Note**
> • The burner must have been removed.
> • To make removal easier, the gas valve should also have been removed.

Fig.38   Removing the heat exchanger

RA-0000481
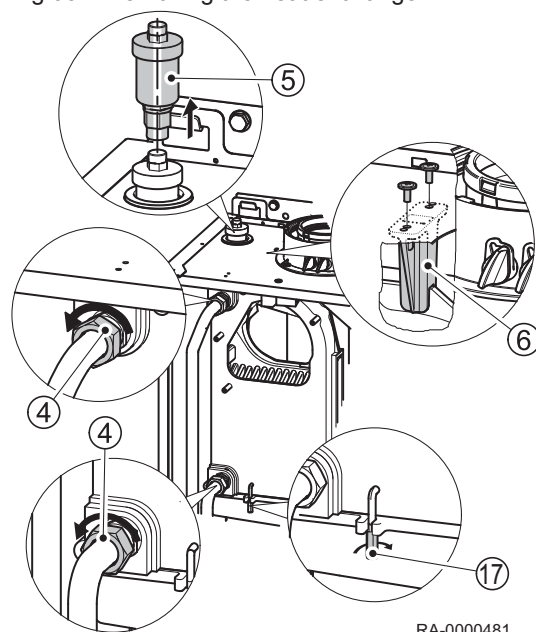
1. Close disconnector valves in flow and return.
2. Drain off the boiler water.
3. Pull the plugs from boiler sensors (flow and return).
4. Loosen the screw connectors of flow and return on the heat exchanger (flat seal).
5. Remove the air vent.
6. Paramount four 30/40: Remove the plastic retainer from the top of the heat exchanger. For this, remove 2 screws from the casing cover
7. Take the holding clips off.
8. Lift the heat exchanger off the flue gas collector and lift it out.
9. Pull the cable off the water pressure monitor.
10. Undo the screwed connector at the pump replacement pipe and remove the pipe or pump.
11. Paramount four 50/80: Remove the return pipe.
12. Pull the plug off the gas valve, loosen and remove the gas valve.
13. Paramount four 95/115: Remove the connection line between the heat exchanger and the collector box.
14. Remove the retaining ring and push the slide coupling on the flue pipe upwards.
15. Paramount four 50/80: Remove the gas pipe.
16. Pull the siphon off.
17. Loosen nuts at the collector box, remove clip and disassemble collector box.
18. Loosen nuts for the retaining plate on the rear wall, lift heat exchanger with retaining plate from the rear wall and take out.
19. Clean the heat exchanger according to the maintenance instructions.

> 📖 **For more information, see**
> Removing the gas burner, page 131
> Removing gas valve, page 133

11 Troubleshooting

11.1 Error codes

11.1.1 Fault code table

The following is an extract from the fault code table. If other fault codes are displayed, please inform the installer.

Fault code	Fault description	Explanations/causes
0	No fault	
10	Outside temp sensor fault	Check connection or outside temp 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 assignment (prog.no. 42)
85	BSB wireless commissioning 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	Maintenance message	See maintenance code (press information button once) for detailed information
109	Boiler temperature monitoring	

Fault code	Fault description	Explanations/causes
110	Safety temperature limiter lockout	No heat removal, faulty sensor, STB/interruption, possible short circuit in the gas valve[(2)], internal fuse faulty; allow device to cool down and carry out reset; if the fault occurs several times inform the installer[(3)]
111	Temperature monitor switching off	No heat supply; pump defect, radiator valves closed [1)]
119	Fault water pressure	Check water pressure or fill in water [1)]
121	Flow temperature 1 (Heating circuit 1) monitoring	
122	Flow temperature 2 (Heating circuit 2) monitoring	
126	DHW charging monitoring	
127	Legionnaire's disease germs temperature not reached	
128	Flame failure during operation	
132	Gas pressure monitor or air pressure monitor 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 installer, lack of gas, polarity of mains connection, safety period, check ignition electrode and ionization current [1) 3)]
146	Configuration fault common message	
151	Internal fault	Check parameters (see adjustment table installer and/or call-up values), unlock LMS, replace LMS, installer [1) 3)]
152	Parameterization fault	
160	Fan fault	Fan possibly defective, speed threshold set wrongly [3)]
162	Air pressure monitor does not 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 monitoring	
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	Mains frequency outside of valid range	
320	DHW charging temp sensor fault	
324	BX same sensors	
325	BX / extension module same sensors	
326	BX / mixer group same sensors	
327	Extension module same function	
328	Mixer group same function	
329	Extension module / mixer group same function	
330	Sensor BX1 no function	
331	Sensor BX2 no function	
332	Sensor BX3 no function	
335	Sensor BX21 no function (EM1, EM2 or EM3)	

Fault code	Fault description	Explanations/causes
336	Sensor BX22 no function (EM1, EM2 or EM3)	
339	Collector pump Q5 missing	
341	Collector sensor B6 missing	
342	Solar DHW sensor B31 missing	
343	Solar interconnection missing	
344	Solar actuator buffer K8 missing	
345	Solar actuator swimming pool K18 missing	
346	Solid fuel boiler pump Q10 missing	
347	Solid fuel boil comp sensor missing	
348	Solid fuel boiler address error	
349	Storage buffer return valve Y15 missing	
350	Storage buffer address error	
351	Primary controller/supply pump address error	
352	Low-loss header address error	
353	Common flow sensor B10 missing	
371	Flow temperature 3 (Heating circuit 3) monitoring	
372	Temperature monitor HK3	
373	Expansion module 3 fault (collective fault)	
378	Repetition counter internal fault expired	
382	Repetition counter fan fault expired	
384	External light	
385	Mains undervoltage	
386	Fan speed has left valid range	
387	Air pressure switch fault	
426	Feedback flue damper	
427	Configuration flue damper	
432	Functional earth X17 not connected	

(1) Switch off, start prevention, re-start after elimination of fault
(2) Check parameter in accordance with table Check the installer adjustment table and program to the basic settings or query internal LMS SW diagnosis code and correct the corresponding parameter faults according to fault specification
(3) switch-off and locking; can only be unlocked by reset

11.2 Fault finding

11.2.1 Fault switch-off

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

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 the display), the digit in the display on the operating panel indicates 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*)

• Gas tap closed
• No ignition

Burner goes into fault mode (no flame formation):
• No ignition
• Ionization electrode has ground connection
• Ionization electrode is not connected
• No gas
• Gas pressure too low

In spite of flame formation the burner goes into fault mode after expiration of the safety time:
• Ionization electrode defective or soiled
• Ionization electrode does not penetrate the flame
• Ionization electrode is not connected
• Gas pressure not stable

12 Disposal

12.1 Disposal/recycling

12.1.1 Packaging

As part of the packaging regulations, Potterton Commercial provides local disposal facilities for the specialist company to ensure correct recycling of all the packaging. In order to protect the environment, the packaging is 100% recyclable.

See
Please follow the legal requirements applicable to disposal in your country.

12.1.2 Appliance disposal

The appliance can be returned to Potterton Commercial for disposal via a specialist company. The manufacturer undertakes to recycle the appliance correctly.

Note
The appliance is recycled by a disposal company. If possible, the materials, especially the plastics, are identified. This enables correct sorting for recycling.

13 Appendix

13.1 Declaration of conformity

13.1.1 Declaration of conformity

CE

Konformitätserklärung des Herstellers Nr. 2016/002
Declaration of Conformity
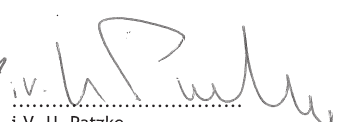
Produkt *Product*	Gas-Brennwertkessel
Handelsbezeichnung *Trade Mark*	Paramount four
Produkt-ID Nummer *Product ID Number*	CE-0085 BL 0514
Typ, Ausführung *Type, Model*	30, 40, 50, 60, 80, 95, 115
EU-Richtlinien *EU Directives*	92/42/EWG, 2009/125/EG, 2009/142/EG, 2010/30/EU, EU/813/2013, 2014/30/EU, 2014/35/EU
Normen *Standards*	DIN EN 15502-1:2012-10; DIN EN 15502-2-1:2013-01 DIN EN 60335-1:2012-10; EN 60335-1:2012 DIN EN 60335-1 Ber.1:2014-04; EN 60335-1:2012/AC:2014; EN 60335-1:2012/A11:2014 DIN EN 60335-2-102:2010-07; EN 60335-2-102:2006+A1:2010 DIN EN 62233:2008-11; EN 62233:2008 DIN EN 62233 Ber.1:2009-04; EN 62233 Ber.1:2008 DIN EN 55014-1:2012-05; EN 55014-1:2006 + A1:2009 + A2:2011 DIN EN 55022:2011-12; EN 55022:2010 DIN EN 61000-3-2:2010-03; EN 61000-3-2:2006 + A1:2009 + A2:2009 DIN EN 61000-3-3:2014-03; EN 61000-3-3:2013 DIN EN 55014-2:2009-06; EN 55014-2:1997 + A1:2001 + A2:2008 Anforderungen der Kategorie II
EG Baumusterprüfung *EC-Type Examination*	TÜV Rheinland Energie GmbH Am Grauen Stein 51105 Köln
Überwachungsverfahren *Surveillance Procedure*	Modul D EG Gasgeräterichtlinie DVGW CERT GmbH 53123 Bonn

Wir erklären hiermit als Hersteller:

Die entsprechend gekennzeichneten Produkte erfüllen die Anforderungen der aufgeführten Richtlinien und Normen. Sie stimmen mit dem geprüften Baumuster überein, beinhalten jedoch keine Zusicherung von Eigenschaften. Die Herstellung unterliegt dem genannten Überwachungsverfahren.
Das bezeichnete Produkt ist ausschließlich zum Einbau in Warmwasserheizanlagen bestimmt. Der Anlagenhersteller hat sicherzustellen, dass die geltenden Vorschriften für den Einbau und Betrieb des Kessels eingehalten werden.

AUGUST BRÖTJE GmbH

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