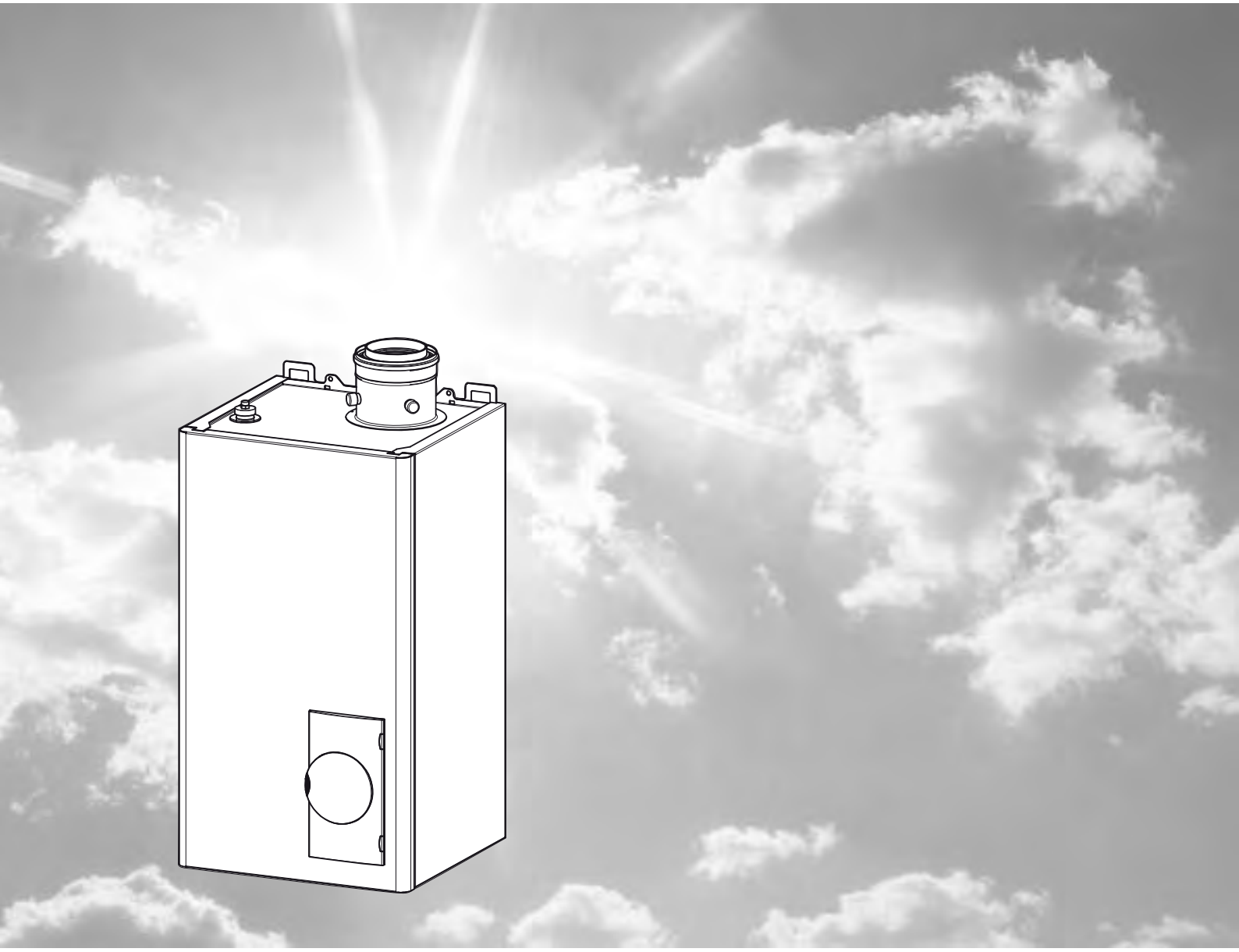
Aprill 2011

Paramount two

Wall hung condensing boiler

30 – 115kW

Installation, operation & maintenance manual



Working towards
a cleaner future

POTTERTON
COMMERCIAL
heating specialists

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1. Regarding this Manual

Read this instruction booklet thoroughly before operating the boiler!

1.1 Content of this manual

This manual contains the instructions for the installation of the PARAMOUNT two for standard applications with 1 heating circuit and/or 1 DHW circuit (WWF tank sensor required for DHW).
Further applications can be made available (for multiple boilers and multiple zones) by installing extension modules (clip-ins).
Keep all documents at the installation location of the boiler!

1.2 Used symbols

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

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

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

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

Reference to additional information in other documents.

1.3 For whom is this manual intended?

This installation manual is intended for the heating specialist.

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2. Safety

Danger! Absolutely observe the following safety instructions! Otherwise, you may endanger yourself and others.

2.1 General safety precautions

Installation of System:

Important: The boiler must be commissioned following completion of installation. Operation of an un-commissioned appliance may cause injury to personnel and damage to the boiler unit which would invalidate the warranty.
Commissioning must only be carried out by personnel approved and competent to do so. This facility is available from Potterton Commercial Service Office.
Important: the boiler unit is supplied in accordance with Potterton Commercial quality assurance plan registered to meet the requirements of BSN ISO 9002. A condition of the supply of the appliance for compliance with this is the return of the appliance commissioning report.

Electrical Installation:

The electrical installation work must be carried out by a qualified electrician.

Gas Installation:

Boiler installation as well as commissioning, servicing and maintenance must be carried out by an approved gas installer. For use with natural gas (G20) nominal supply pressure 20 mbar (LPG option available).

2.2 Use

The POTTERTON PARAMOUNT two wall hung condensing boiler is available in six sizes with outputs from 30 kW to 115 kW.
They are CE marked for use on Natural Gas (LPG) on open vented systems (min 1 bar) and are suitable for use on sealed systems with a maximum operating pressure of 3 bar (30/40 kW), 4 bar (60 - 115 kW). Refer to relevant British Standards and Codes of Practice for installation of condensing boilers on sealed system. The heat exchanger consists of aluminium - silicon alloy, which allows very compact and lightweight boiler construction. The fully premix burner works in a modulating range of between 25 % and 100 %. Therefore the boiler can adapt to the particular heat requirements of the circuit. The gas/air ratio control ensures uniform CO_2 emissions and low NO_x. This is obtained by comparing the target boiler temperature and actual boiler temperature. If there is a difference between these two values then the internal microprocessor calculates a new fan speed. The change in fan speed in turn changes the combustion chamber static air pressure which is monitored by the gas/air ratio control and the gas rate is adjusted thus maintaining the correct gas to air ratio in the boiler. This ensures that a uniform

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gas/air ratio is maintained over the total range of the boiler modulation, and that constant CO_2 values are achieved.
For optimum utilisation condensing boilers should be operated at a low return temperature. However the PARAMOUNT two will also work at designed temperatures of 70/50°C. In the condensing mode as the return temperature is below the dew point (dew point is 53°C at 8.5 % CO_2).
They fulfil EN 483 and EN 677, Type C. Installation types B23, B33, C13x, C33x, C43x, C63x. Emission value group G 61.
Category II2H3P.

2.3 Installations/Instructions

Before starting work a risk assessment should be carried out in the boiler house and its access to ensure a safe installation and working environment. Any person installing or working on the boiler must be qualified and attention is drawn to the mandatory requirements of C.O.R.G.I. registration for all gas installers.
Manual Handling: Any person or persons moving or lifting the boiler or any part there of should be trained in manual handling techniques and if necessary use suitable lifting equipment to reduce the risk of injury to themselves or other people.

2.4 Regulations and standards

The installation should comply with relevant British Standard Specifications, Codes of Practice and current Building Regulations, together with any special regional requirements of the Local Authorities, Gas undertaking and Insurance I.E.E. Regulations for the Electrical Equipment of Buildings. The installation of the boiler must be in accordance with the relevant requirements of:
Health and Safety at Work act 1974
Building Regulations 2006
Electricity at Work Regulation 1989
Management of H&S at Work Regulations 1998
Manual Handling Regulations 1992
Model Water By-Laws 1986
BS 7671: 1992 - Requirements for Electrical Installations, IEE Wiring Regulations Sixteenth Edition.
BS 5440: 2000: Part 1 - Specifications for Installation of Flues
BS 5440: 2000: Part 2 - Specifications for Installation of Ventilation for Gas Appliances.
BS 6644: 2005 - Installations of Gas Fired Hot Water Boilers for inputs between 60 kW and 2 MW.
BS 7074: 1989: Part 2 - application Selection and Installation of Expansion Vessels and Ancillary Equipment for Sealed Water Systems.
BS 6880: 1988 - codes of Practice for Low temperature Hot Water Systems.
EN 677: 1997 - Gas Fired Central Hating Boilers for Condensing Boilers with a nominal heat input not exceeding 70 kW.
CP 342:2 - Centralised Hot Water Supply Gas Safety (Installation and Use) Regulations 1998

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IM/II - Flues for commercial and Industrial Gas Fired Boilers and Air Heaters.
IGE/UP/1 - Soundness Testing and Purging Procedure for Non Domestic Installations.
IGE/UP/2 - Gas Installation Pipe work, Boosters and Compressors for Industrial Commercial Premises.
Manufacturer's notes must not be taken in any way as over-riding statutory obligations.

2.5 C.E. Approvals

The CE approval symbol means that the boilerfulfils the basic requirements of the Gas Equipment Directive 90/396/EEC, the Low Voltage Directive 73/23/EEC as well as Directive 89/336/EEC (Electromagnetic Compatibility EMC) of the Council for Unification of Legal Regulations of the members Countries. The boiler fulfils the basic requirements of the Boiler Efficiency Directive 92/43/EEC for condensing boilers.

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2.6 Conformity declaration

POTTERTON COMMERCIAL

CE **Declaration of conformity**

Product	Condensing gas boiler
Trade mark	Paramount
Product ID Number	CE – 0085 BL 0514
Type, Model	Paramount two 30 - 115
EU directives	90/396/EWG, 92/42/EWG 89/336/EWG, 73/23/EWG
Standards	DIN VDE 0722 DIN EN 50081-1, DIN EN 50082-2 DIN EN 60335-1, DIN EN 483 DIN EN 677, DIN EN 625
EC-type examination	DVGW Deutsche Vereinigung des Gas- und Wasserfaches e.V. 53123 Bonn notified body 0085
Surveillance procedure	yearly surveillance audit DVGW Deutsche Vereinigung des Gas- und Wasserfaches e.V. 53123 Bonn

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

Rastede, 05.04.2006

ppa. H. Wilken
– Leiter Konstruktion und Entwicklung

i.V. U. Patzke
– Leiter Prüfung und Zertifizierung

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3. Technical Data

3.1 Dimensions and connections PARAMOUNT two 30/40

Fig. 1: Dimensions and connections PARAMOUNT two 30/40

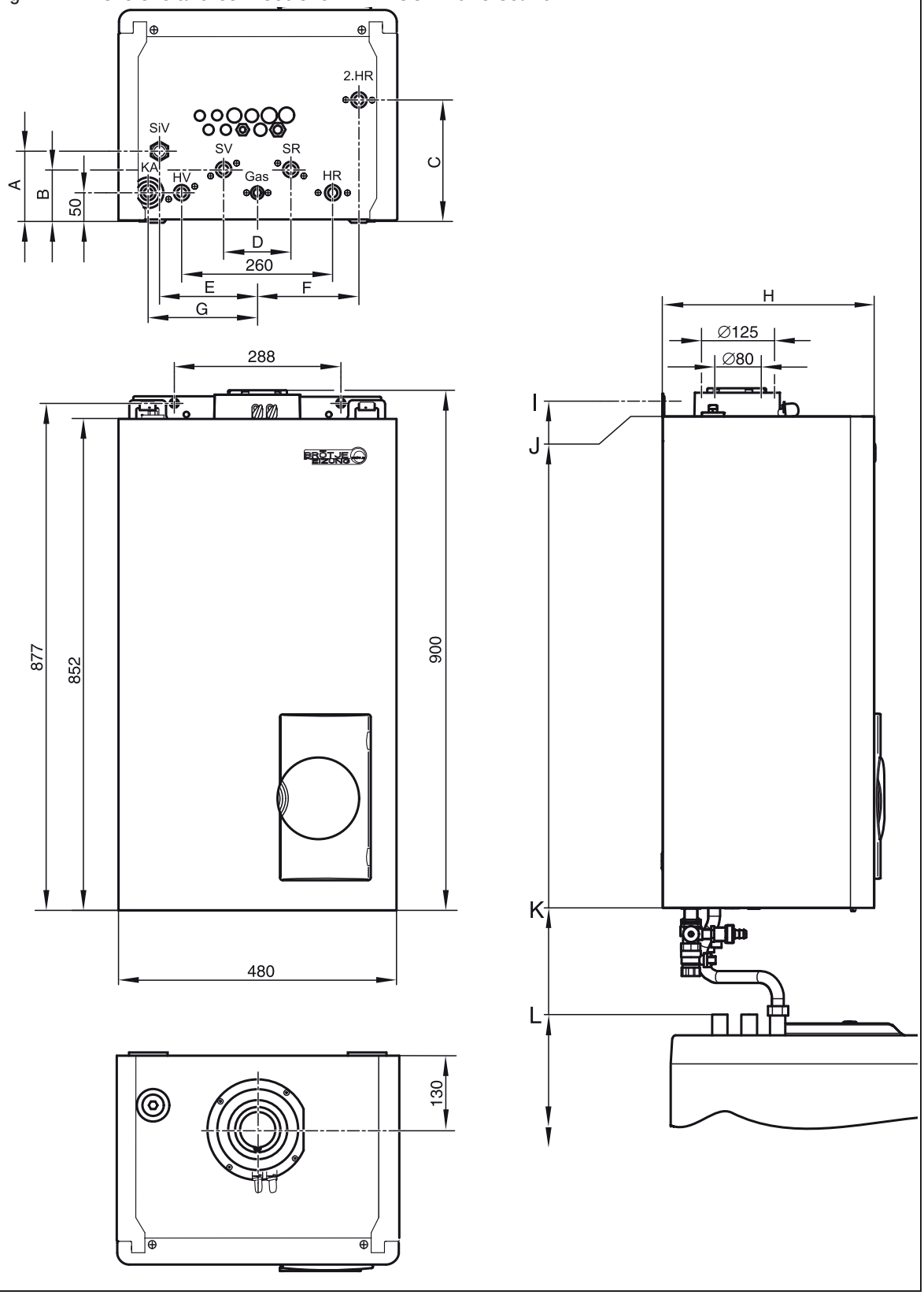

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Table 1: Dimensions and connections PARAMOUNT two 30/40

Model		**30 / 40**
HV	– Heating flow	G 1“
HR	– Heating return	G 1“
Gas	– Gas connection	G $^{3}/_{4}$“
SiV	– Safety valve	G $^{3}/_{4}$“
KA	– Condensate water connection	Ø 25 mm
Dimension A [mm]		116
Dimension E [mm]		177
Dimension F [mm]		185
Dimension G [mm]		192
Dimension H [mm]		407

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3.2 Dimensions and connections PARAMOUNT two 60-115

Fig. 2: Dimensions and connections PARAMOUNT two 60-115

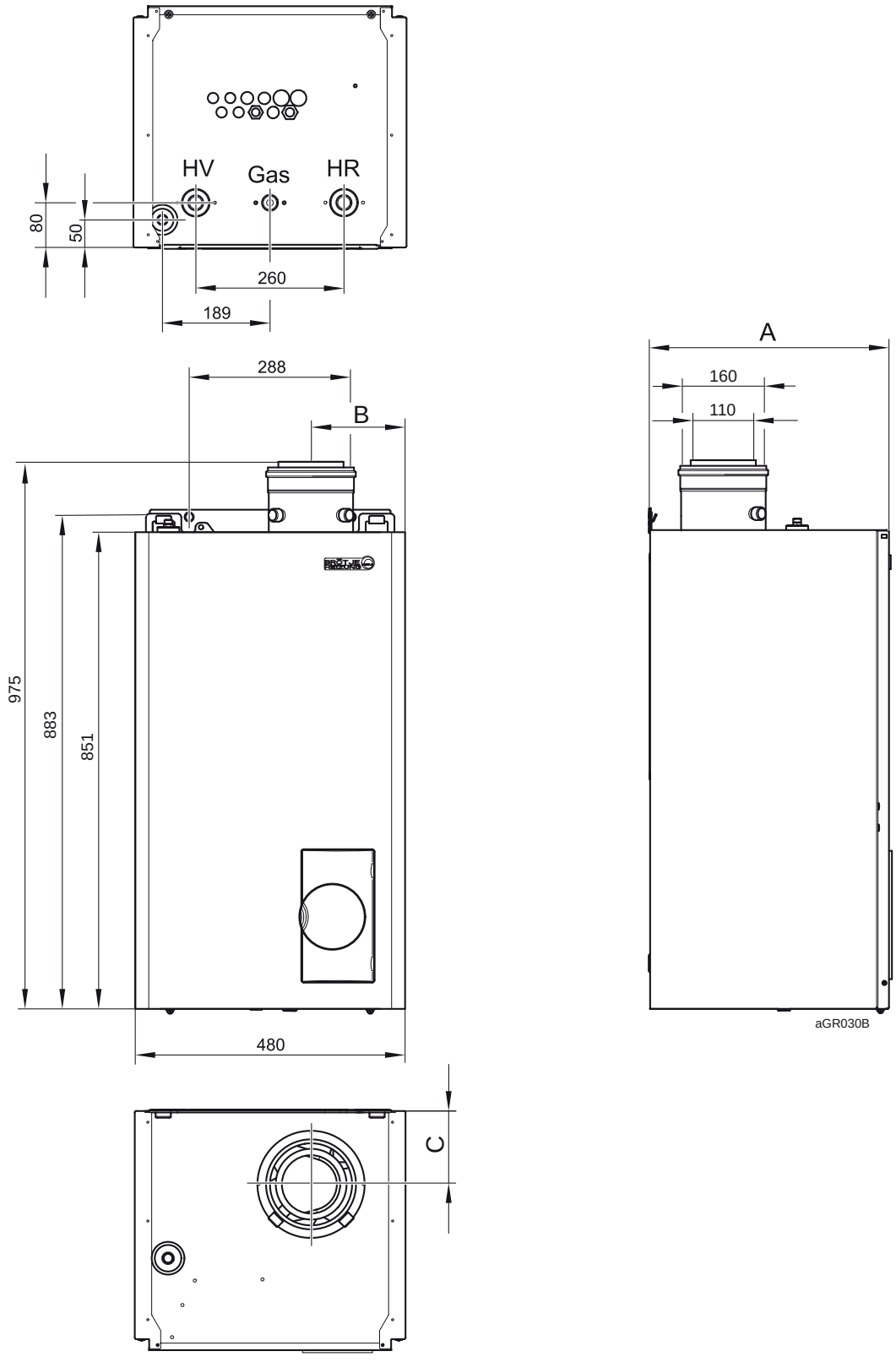

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Table 2: Dimensions and connections PARAMOUNT two 60-115

Model		Paramount 60 D	Paramount 80 D	Paramount 90 C	Paramount 110 C
HV	– Heating flow	G 1 1/2“			
HR	– Heating return	G 1 1/2“			
Gas	– Gas connection	G 1“			
SiV	– Safety valve	G 3/4“			
KA	– Condensated water connection	Ø 25 mm			
Dimension A	[mm]	446,5	541,5	585	
Dimension B	[mm]	167,5		163	
Dimension C	[mm]	131,5		151,5	

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3.3 Technical Data PARAMOUNT two

Table 3: Technical data PARAMOUNT two

Model PARAMOUNT two		30	40	60	80	95	115
CE Number		CE-O085BL0514					
VDE-Reg.-No.		137392G				applied	
output @ 50/30°C	kW	31,3	39	59,5	79,1	98,3	118,6
output @ 80/60°C	kW	29,1	36,8	56,2	74,6	92,2	111,7
input kW net MAX	kW	30	38	58	77	95,0	115,0
input kW net MIN	kW	6,5	10	14	20	20,0	25,0
efficiency @ 50/30°C	%	104,3	102,7	102,5	102,7	103,5	103,1
efficiency @ 80/60°C	%	97	97	96,9	96,9	97,1	97,1
Gas Consumption (NG)	m³/hr	3,2	4	6	8	10,1	12,2
Gas Consumption (LPG)	m³/hr	1,27	1,61	2,46	3,21	3,86	4,67
Flue Temperature 80/60°C	°C	63	68	64	66	73	77
Flue Temperature 50/30°C	°C	41	50	48	48	51	56
Flue Gas Volume (15°C & 1031 mbar)	m³/hr	42,3	53,4	81,7	108,4	129	155
Nominal Gas Inlet Pressure (NG)	mbar	20					
Gas Inlet Pressure (LPG)	mbar	Min 35 - Max 45					
CO_2 for Natural Gas	%	8,3 - 8,8					
CO_2 for LPG	%	9,5 - 10,0					
Ventilation to BS5440	cm2	105	190	290	N/A	N/A	N/A
High Level Ventilation to BS6644	cm²	N/A	N/A	N/A	154	190	230
Low Level Ventilation to BS6644	cm²	N/A	N/A	N/A	308	380	460
hydraulic resistance 11°C ΔT	Kpa	29	37	25,4	27	39	48
hydraulic resistance 20°C ΔT	Kpa	10	14	8	9	13	18
flow rate @ 11°C ΔT	L/Sec	0,63	0,8	1,22	1,67	2,06	2,50
flow rate @ 20°C ΔT	L/Sec	0,354	0,44	0,67	0,92	1,13	1,36
Cold Feed Size	mm	19	19	19	25	25	25
Open Vent Size	mm	22	25	25	32	32	32
Max Pressure at Boiler Flue Outlet	bar	1,1				1,5	1,8
Combustion Air/Flue Connection	Ø mm	80/125	80/125	110/150	110/150	110/160	110/160
Electrical Supply	V/Hz	230/50					
Maximum Electrical Power	W	55	60	75	105	170	200
Consumption	Amps	0,24	0,26	0,3	0,45	0,74	1,15
maximum operating pressure	bar	3		4			
minimum operating pressure	bar	1					
max flow temp	°C	85					
water content Ltr	Ltr	3,6	3,6	5	5,8	7,8	
weight empty	kg	53	53	61	72	84	

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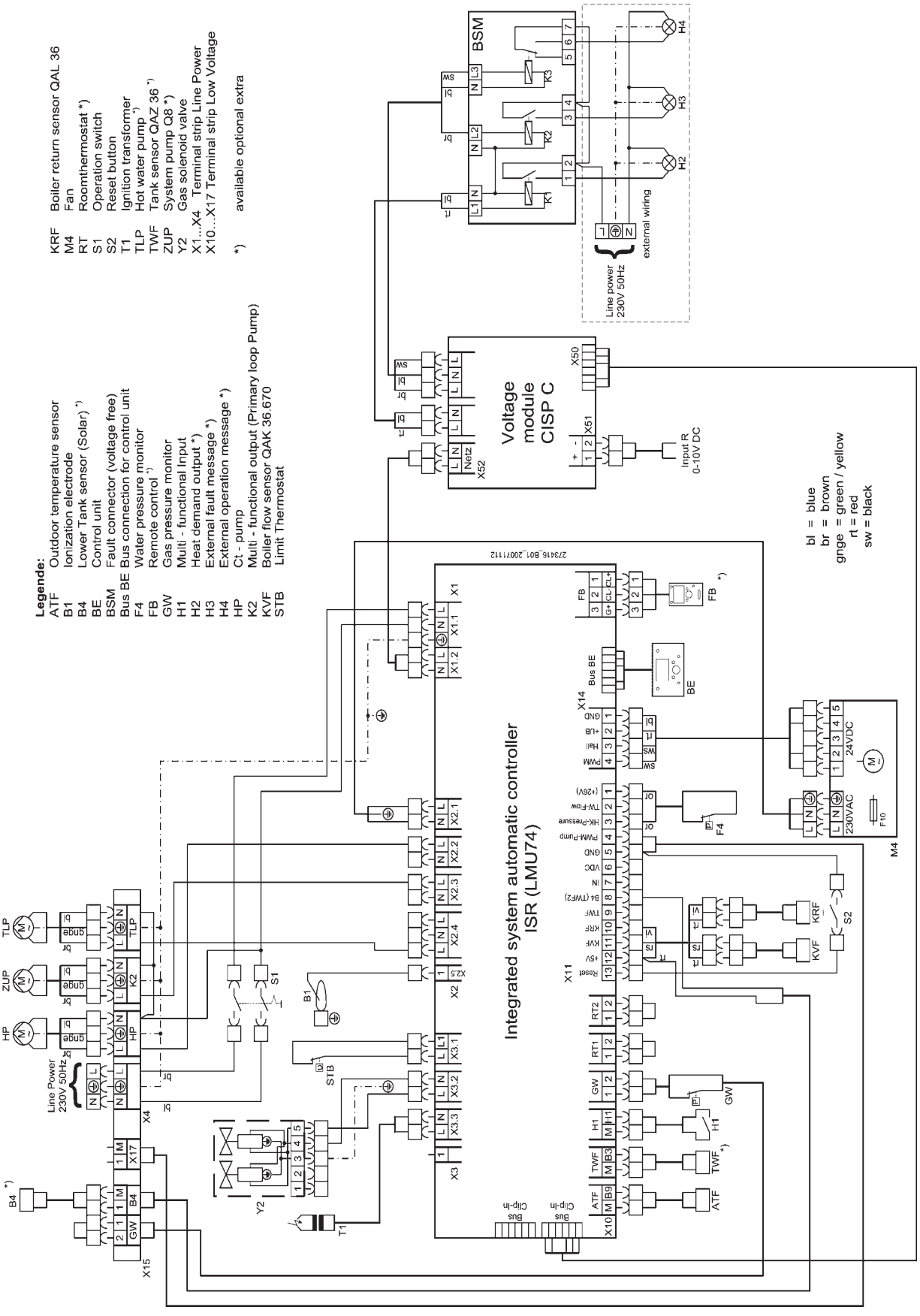
3.4 Wiring diagram



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3.5 Sensor value tables

Table 4: Resistance values for outside temperature sensor ATF

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

Table 5: Resistance values for flow sensor, DHW sensor, return sensor, sensor B4

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

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4. Before installation

4.1 Combustion air supply

Concentric Flue Applications

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

Table 6: Conventional flue Applications

Model PARAMOUNT two		30		40		60		80		95		115	
Vent Position	cm²	Low Level	High Level	Low Level	High Level	Low Level	High Level	Low Level	High Level	Low Level	High Level	Low Level	High Level
In a room direct to outside	cm²	105 Single	-	190 Single	-	290 Single	-	308	154	380	190	460	230
In a compartment direct to outside	cm²	252	126	380	190	580	290	770	385	950	475	1150	575
In a compartment via a room	cm²	504	252	760	380	1160	580	-	-	-	-	-	-

Table 7: Ventilation for use with room sealed applications

Model PARAMOUNT two		30		40		60		80		95		115	
Vent Position	cm²	Low Level	High Level	Low Level	High Level	Low Level	High Level	Low Level	High Level	Low Level	High Level	Low Level	High Level
In a room direct to outside	cm²	No vent required		No vent required		No vent required		154	154	190	190	230	230
In a compartment direct to outside	cm²	126	126	190	190	290	290	385	385	475	475	575	575
In a compartment via a room	cm²	252	252	380	380	580	580	770	770	950	950	1150	1150

Table 8: Mechanical Ventilation with conventional flue

	Mechanical Inlet m³/s	Mechanical Extract m³/l
PARAMOUNT two 30	0.03	0.02
PARAMOUNT two 40	0.04	0.03
PARAMOUNT two 60	0.06	0.04
PARAMOUNT two 80	0.06	0.04
PARAMOUNT two 95	0.07	0.04
PARAMOUNT two 115	0.08	0.05

Clean combustion air!

The PARAMOUNT two must only be installed in rooms with clean combustion air. Under no circumstances must e.g. pollen or the likes enter through the intake openings into the inside of the PARAMOUNT two.

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4.2 Corrosion protection

The combustion air must be free from corrosive elements - especially fluorine and chlorine containing vapours which are found, for example, in solvents and cleaning agents, propellant gases etc.
When connecting boilers to under-floor heating systems, employing plastic pipe work which is not impervious to oxygen, heat exchangers must be used for separation purposes.

4.3 System water quality

To ensure the boiler heat exchanger remains in good condition it is essential to condition and monitor the system water to the following criteria:

- Water hardness: if the system fill water has a hardness in excess of 259 mg/l (17,5°Clark) the water should be softened prior to filling the system to ensure that excessive scaling does not occur within the heat exchanger.
- Water acidity: the system fill water should have pH value between 7 - 8.3 to ensure corrosion of the heat exchanger does not occur.
- Copper ions: the copper content of the system water should be less than 0.05 mg/l. If large quantities of copper are present red and black copper oxide Cu2O and CuO and grey/green copper carbonate, $CuCo_2$ will be produced. Copper will corrode any iron and aluminium within the system. A special water treatment company should be consulted if in doubt.

4.4 Use of additives (e.g. hardness stabilsisers, frost protective agents, sealing agents)

If, in a special case, a need exists to use additives in a mixture (e.g. hardness stabilser, frost protecion agent, sealing agent,etc.) it has to be observed that the agents are compatible with each other and the pH-value is not altered. Preferably, agents from the same manufacturer should be used.
The instructions of the additive manufacturer have to be observed.

Released additives

Currently, the following agents have been approved by POTTERTON Commercial:

- “Full heating protection“ from Fernox
- “Sentinel 100“ from GE Betz

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

Maintenance instructions

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

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4.5 Notes for installation location

Attention! When first installing the PARAMOUNT two for heating operation or in connection with a DHW storage, the following has to be observed:
In order to prevent damage to the boiler due to water quality, particularly due to leakages in the tank, suitable precautionary measures should be taken regarding installation.

Installation room

- The installation room must be dry, the room temperature must be between 0 and 40°C.

The installation location has to be selected, especially, with respect to ducting of the flue. When installing the boiler, the specified clearances have to be maintained.
Sufficient space should exist in the front to carry out inspection and maintenance work.

4.6 Clearances

When installing the PARAMOUNT two , the following clearances must be considered:
FRONT - access for maintenance
SIDES - minimum 20 mm
TOP - access for flue connection

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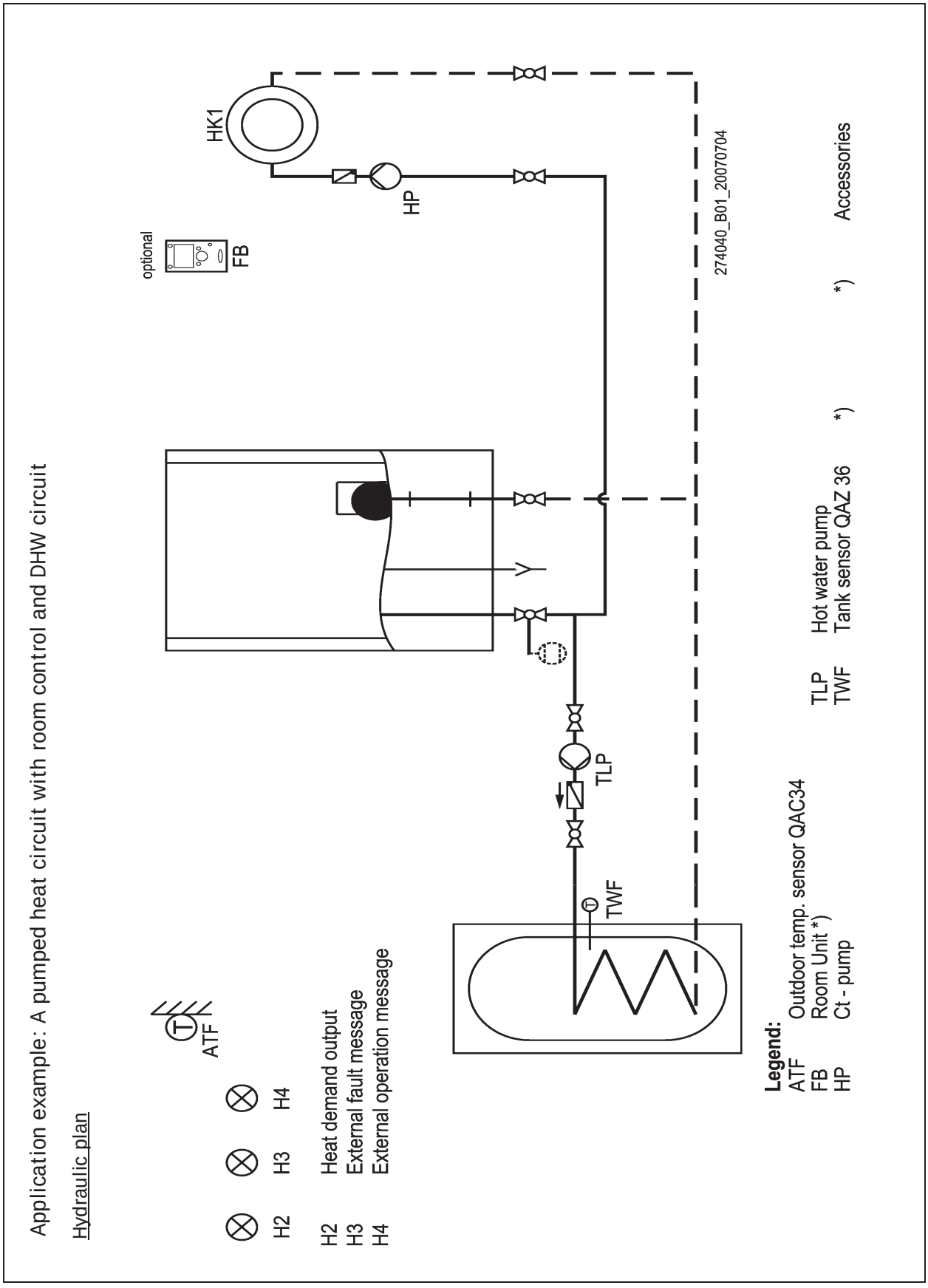
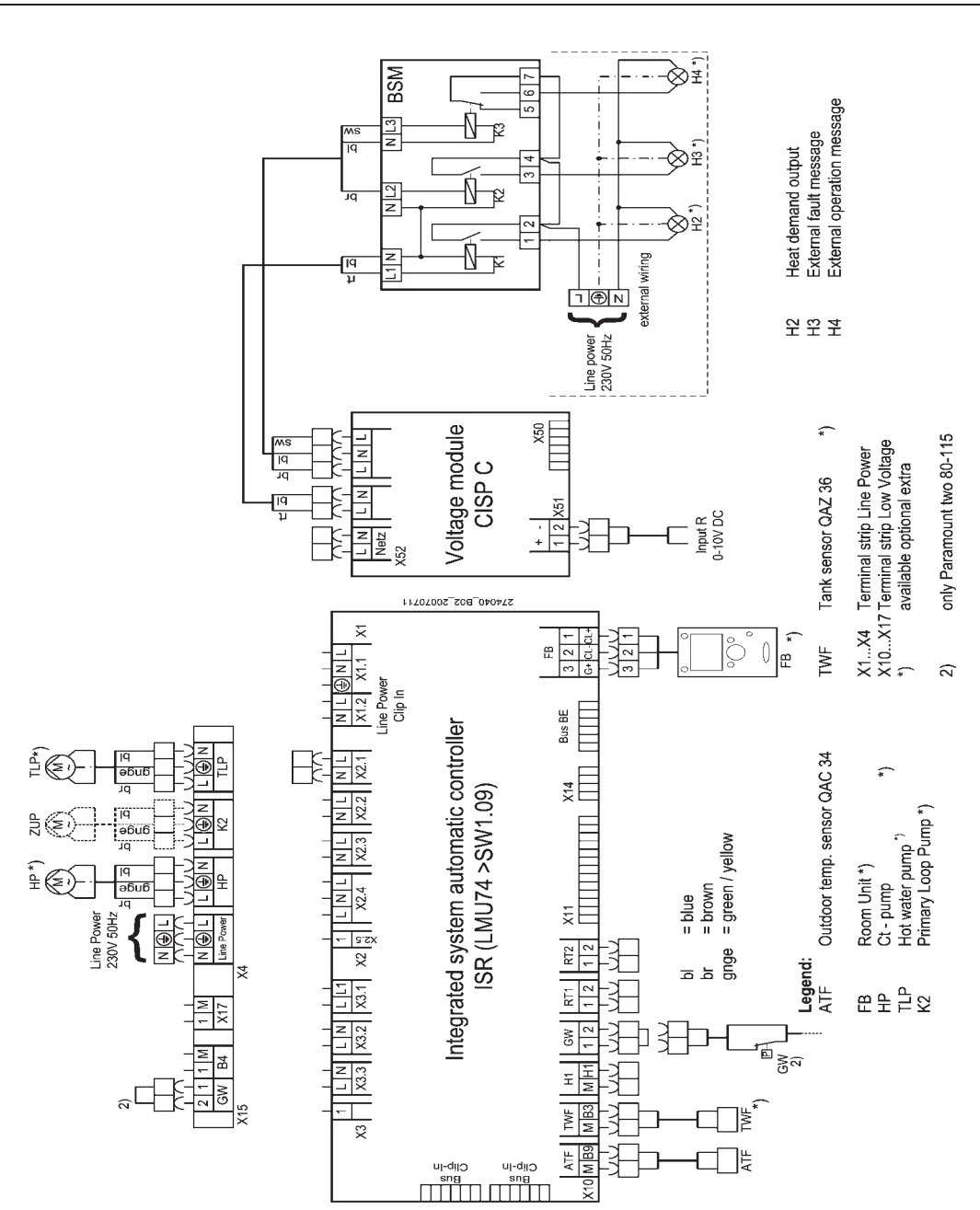
4.7 Application example



Connection plan



5. Installation

5.1 Connecting to the heating system

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

In the case of old systems, the whole heating system should be thorougly flushed before installation.

Attention! It must not be possible to shut-off the connecting pipe between the boiler and the safety valve.The installation of pumps and valves or pipe restrictions is not allowed.The blowpipe of the safety valve must be installed in such a way that no pressure increase is possible, when the valve operates. It must not be taken to the outside; the outlet must be free and observable.

5.2 Condensate

Direct introduction of the condensed water into the domestic waste water system is only allowed, if the sytem is made from corrosion-resistant materials (e.g. PP-pipe, stoneware, or similar).

The condensate must run freely into a tundish. A syphon trap must be installed between tundish and waste water system. The condensate hose of the PARAMOUNT two must be passed through the opening in the bottom. If no draining possibility exists underneath the condensate outlet, the use of a neutralising and lifing facility is recommended.

Attention! Fill the condensate drain with water before operating. For this, fill 0.25 l of water into the exhaust gas flue pipe before assembly of the flue system.

5.3 Filling the heating system

- Fill the heating plant via the return of the PARAMOUNT two.
- Check tightness (max.water test pressure 34 bar).

5.4 Flue connection

For the operation of PARAMOUNT two, the flue must be designed for flue temperatures below 120°C (flue type B). Potterton Commercial offer a comprehensive optional flue components approved for the boiler (see *fig. 3*).

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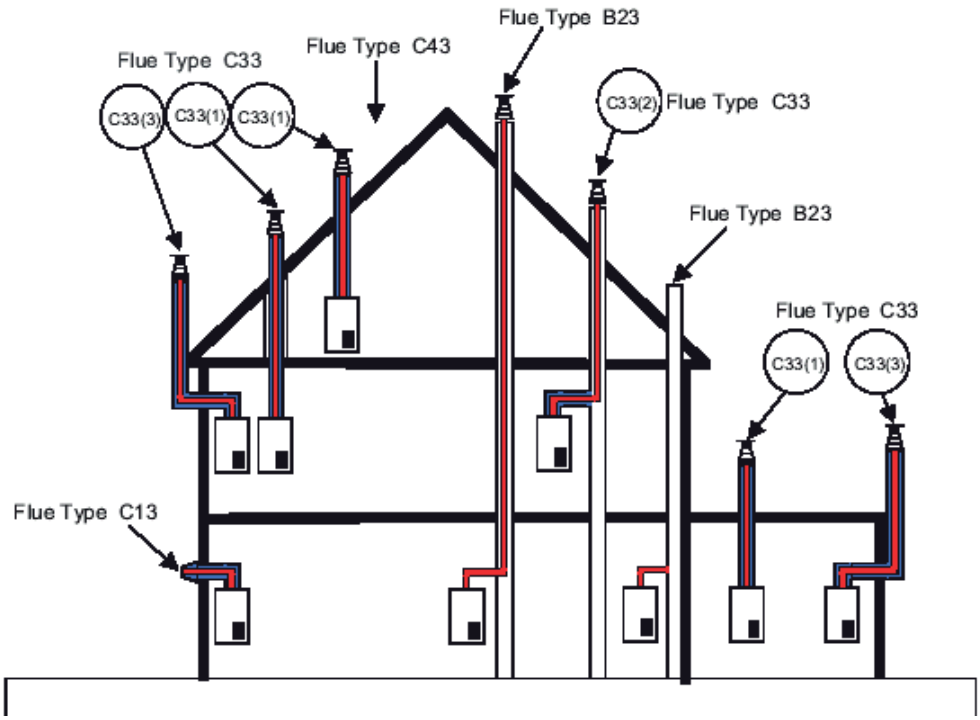
The enclosed assembly instruction for the flue system has to be observed.

Fig. 3: Flue options



Model PARA-MOUNT two	30/40			60			80			95			115		
Flue Type	Flue Size	Max Flue Length*	Max. No of Bends (90°)	Flue Size	Max Flue Length*	Max. No of Bends (90°)	Flue Size	Max Flue Length*	Max. No of Bends (90°)	Flue Size	Max Flue Length*	Max. No of Bends (90°)	Flue Size	Max Flue Length*	Max. No of Bends (90°)
C13 (Balanced Flue)	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
	110/160²	20	0				120/180²	20	0				120/180²		
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) [2)]	80	20(3)	3	110	25(3)	3	110	16(3)	3	110	20/3	2	110	20/3	2

* This is the maximum flue length, the allowable horizontal run within total flue length is shown in brackets. For lengths longer than specified in the table please contact the Technical Department for suitability.

Note: 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.

[2)] not supplied by POTTERTON

C13 the maximum flue length shown may give an output reduction of 5 % with the maximum flue shown.

Note: 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.

5.5 Flue system

Additional Bends

Reduction of total length of flue pipe by:

- per 87°elbow = 1.00 m

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- per 45° elbow = 0.50 m
- per 30° elbow = 0.35 m
- per 15° elbow = 0.20 m

Existing Chimneys

If a chimney, which was previously used for oil or solid fuel furnaces, is used for installing a concentric flue gas pipe, it is necessary for the chimney to be thoroughly cleaned.

Installation

The flue gas pipe must be installed with a slope from the PARAMOUNT two so that condensate from the flue gas pipe can drain into the central condensate sump in the PARAMOUNT two.
The minimum slope is as follows:

- Horizontal flue pipe: min 3°

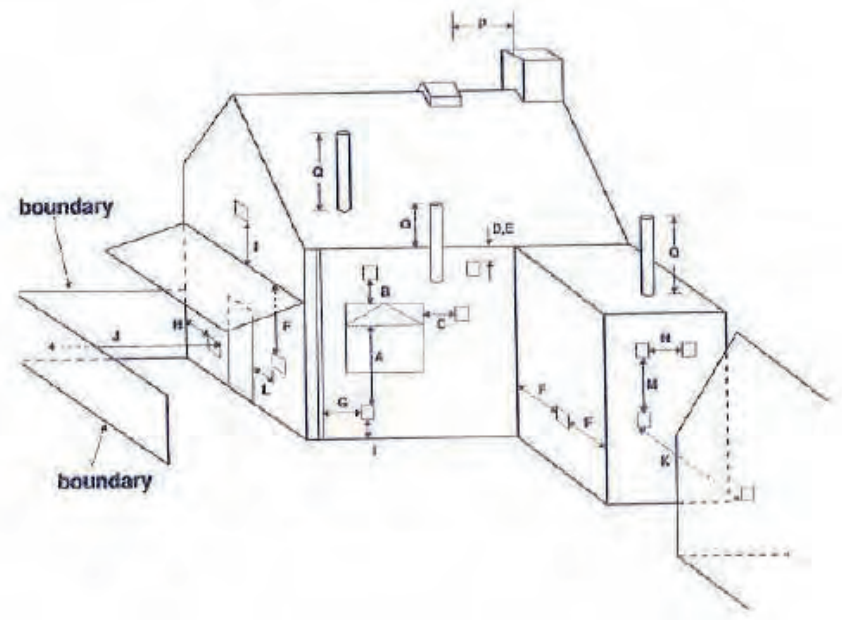
Height above Roof

Refer to relevant British Standards and Code of Practice.

5.6 Flue terminal positioning

Minimum clearances for concentric room sealed flue terminals (for conventional flue systems please refer to the relevant BS). The terminal shall be positioned so it will not cause a hazard to health of persons who may be nearby or a nuisance to other person beyond the cartilage (fig. 4).

Fig. 4:



	Location	PARAMOUNT two 30/40/60	PARAMOUNT two 80/95/115
A	Below an opening	300	600
B	Above an opening	300	600
C	Horizontally to an opening	300	600
D	Below Gutters, soil pipes or drain pipes	75	150

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	Location	PARAMOUNT two 30/40/60	PARAMOUNT two 80/95/115
E	Below eaves	200	500
F	Below Balcony or car port roof	200	500
G	From a vertical drain pipe or soil pipe	150	150
H	From an internal or an external comer or to a boundary alongside the terminal	300	600
I	Above ground, roof or balcony level	300(1)	600 (1) (2)
J	From a surface or a boundary facing the terminal	600	1000
K	From a terminal facing a terminal	1200	2000
L	From an opening in the car port into the building	1200	2000
M	Vertically from an terminal on the same wall (3)	1500	1500
N	Horizontally from a terminal on the same wall (3)	300	600
P	From a structure on the roof	600	1000
Q	Above the highest point of intersection with the roof, with a pitch less than 45°	600	1000
Q	Above the highest point of intersection with the roof, with a pitch less than 45°	1000	1000

All measurements are in mm.

1. For terminals below 2 meters from ground level a suitable guard must be fitted.
2. The height to the centre line of the flue terminal shall not be less than 2 meters from occupied external areas.
3. Groups of appliances of 150 kW total heat input need to comply with the clean air Act with respect to discharge at high level.

5.7 Gas connection

The connection of the gas must only be carried out by an approved gas installation specialist. The setting data of the manufacturer on the device and additional requirements have to be checked with the local supply conditions for the gas installation and setting.
Residues in pipes and pipe joints should be removed.

Check tightness

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

De-air gas pipe

The gas pipe has to be de-aired before commissioning.

Factory settings

The PARAMOUNT two has been set at nominal heat load by the manufacturer.
The gas type can be seen on the glued on additional plate on the boiler. The data, set by the manufacturer, has to be checked with the local supply conditions before instalation of the PARAMOUNT two. The gas pressure controller of the gas valve has been sealed.

Supply Pressure

The supply pressure must lie between the following values:
For natural gas: 17 mbar - 25 mbar
For LPG: nominal 37 mbar
The connecting pressure is measured as pressure in the gas flow at the measuring nozzle of the gas valve (fig. 5 and fig. 6).

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Attention! The boiler must not be operated at connecting pressures outside the given areas!
The gas supplier has to be informed.

5.8 CO_2 -Content

The CO2-content in the flue must be checked during commissioning and during regular maintenance of the boiler, as well as, after reconstruction work on the boiler or on the flue system.

CO_2-content during operation see section 3.2 „Technical Data PARAMOUNT two" on page 13.

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 has to be set by modifying the gas pressure at the gas valve.

5.9 Changing over from LPG to natural gas and vice versa

The gas type of the boiler must only be modified by an approved gas installer.

- De-energise gas boiler.
- Close gas shut-off facility.
- Replace injector. Use enclosed new seals!

The CO_2-content has to be set by setting the injector pressure at the gas valve (**section 5.11 „Guide Values for Injector Pressure"***)*.

The CO_2-content at full load, as well as, low load must be between the values according to **section 3.2 „Technical Data PARAMOUNT two"** *(***page 13**).

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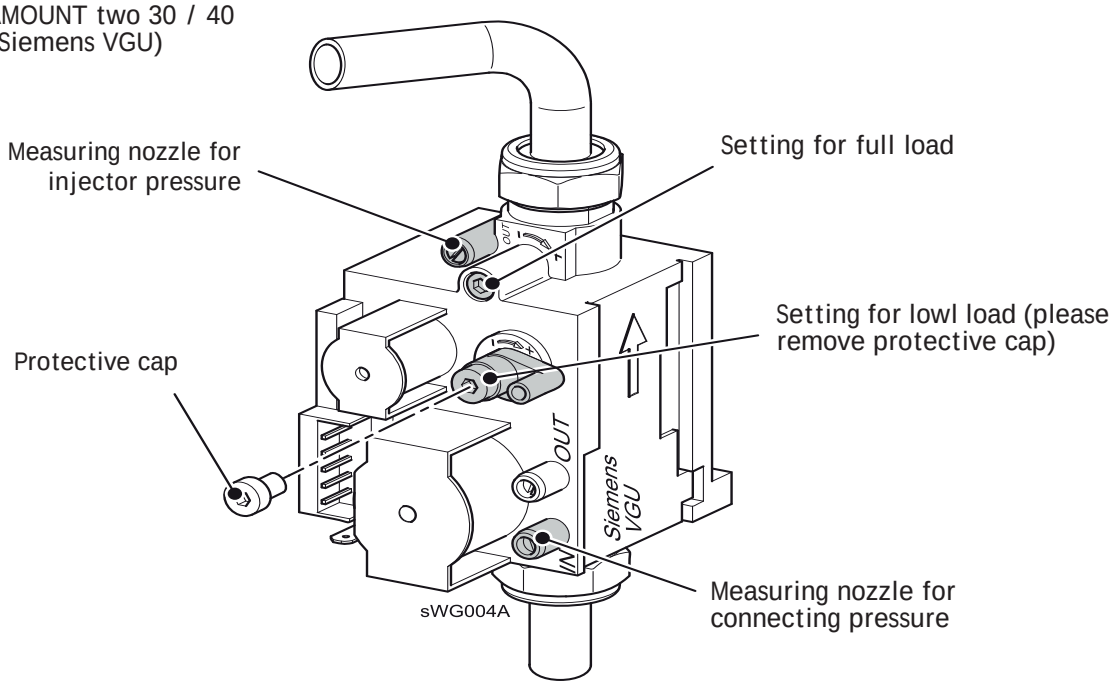
5.10 Gas valve

Fig. 5: Gas valve (setting for injector pressure with key Torx T15)

PARAMOUNT two 30 / 40
(Fa. Siemens VGU)



The Torx-key is attached.

Fig. 6: Gas valve (setting for injector pressure with Allen-key SW 2.5)

PARAMOUNT two 60
(Fa. Siemens VGU)

PARAMOUNT two 80
(Fa. Kromschroeder CG 120 R01)

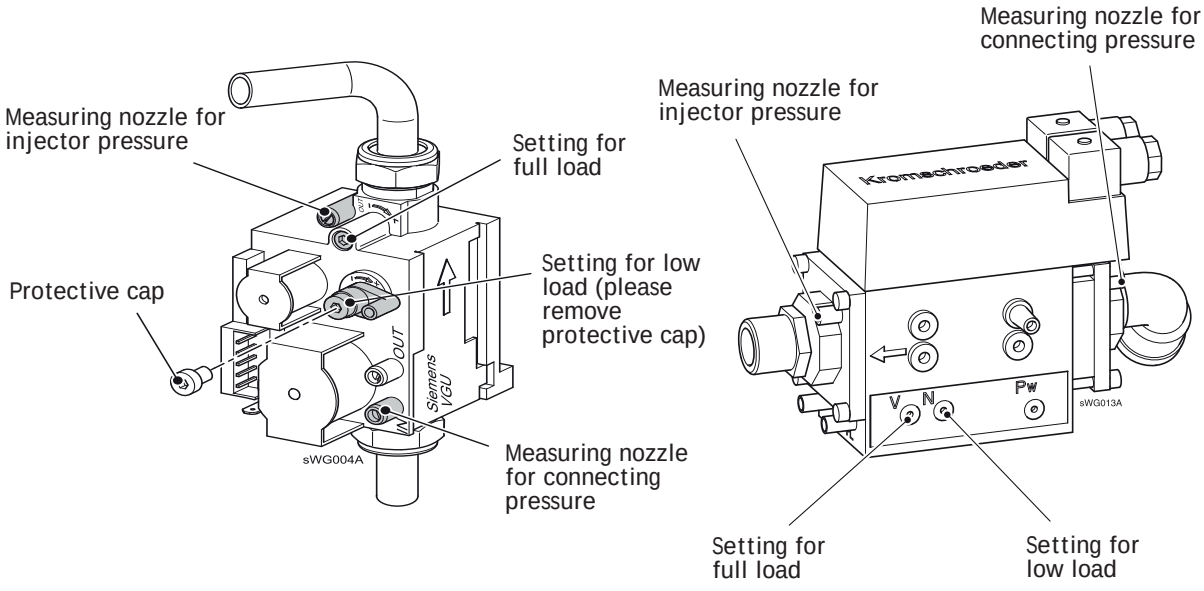


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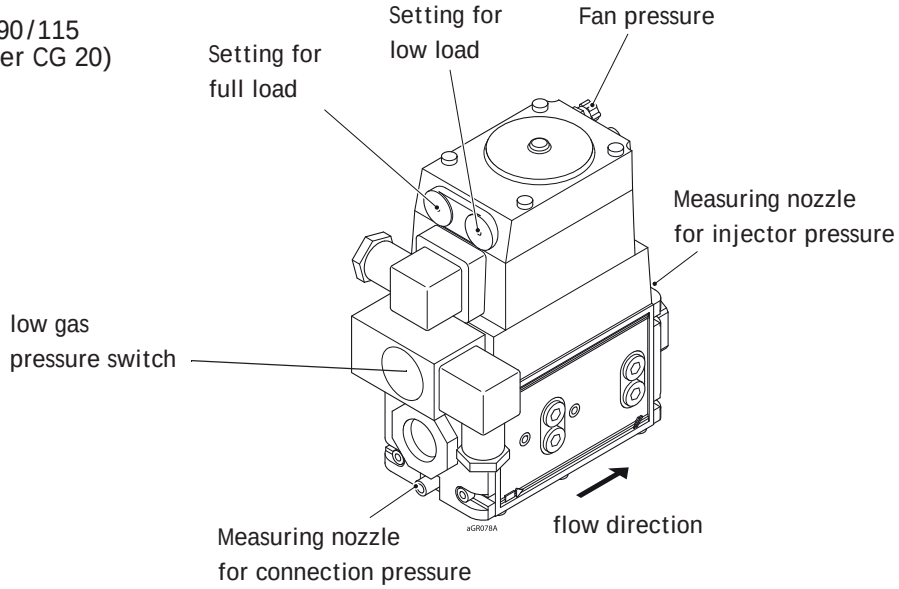
Fig. 7: Gas valve

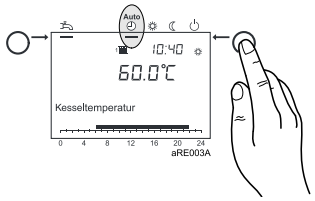
PARAMOUNT two 90/115
(Fa. Kromschroeder CG 20)



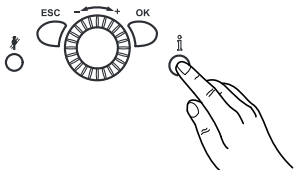
Adjusting and Checking the CO2 values

Operate the PARAMOUNT two in the controller stop mode to adjust and
check the CO2 value.

Controller Stop Mode (manual adjustment of burner load)



- Press operation mode button Heating Operation for approximately 3 seconds, until the message R*egulator Stop Function ON* is displayed.



- Wait, until the display has reached the basic display again. Press information button. The message *Regulator Stop, set Nominal Value* appears in the display. The actual modulation degree will be displayed on the display.
- Press OK-button. The nominal value can now be changed and must, afterwards, to be acknowledged with the OK-button. In this way, the displayed nominal value is taken over by the control.

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.

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5.11 Guide Values for Injector Pressure

Guide values for gas flow, injector presure and CO_2-content
The listed values in tab. 9 are to be used as guide values.

Table 9: Guide Values for injector pressure (full load)

Model PARAMOUNT two			30	40	60	80	95	115
Nominal Heat Load	Heating	kW	6.5-30.0	9.0-38.0	14.0-58.0	20.0-77.0	20.0-90.0	25.0-110.0
Nominal Heat Output	80/60°C	kW	6.3-29.1	8.7-36.8	13.5-56.2	19.2-74.6	19.4-87.3	24.3-106.8
	50/30°C	kW	7.0-31.3	9.6-39.0	14.9-59.5	21.3-79.1	21.4-93.1	26.7-113.5
Injector diameter for								
Natural Gas (G20)		mm	5.80	7.80	8.50	7.80	8.50	10.30
LPG (propane)		mm	4.70	5.80	6.20	6.20	6.50	7.40
			Guide values for injector pressure					
G20 (15.0)*		mbar	6.0-7.0	6.0-7.0	6.0-7.0	10.0-12.0	13.0-15.0	9.8-11.8
LPG (propane)		mbar	6.5-7.5	6.0-7.0	6.0-7.0	10.0-12.0	14.9-16.9	11.5-13.5

* Values in parenthesis = Wobbe Index WoN in kWh/m3

**At pressure at end of boiler 0 mbar, 1013 hPa, 15 °C,

the CO2-content should be between 8.3% and 8.8% for natural gas
for LPG be between 9.5 % and 10.0%

5.12 Electrical connection (general)

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

Supply power 1/N/PE
AC230V + 10% - 15%, 50 Hz max. 140 W, fuse: 6A
Observe the IEE and local regulations.
The electrical connection should be made so that the polarity cannot be mixed up and is connected correctly.

Electrical Supply

A 230 V 50 Hz AC single phase electrical supply is required. The incoming mains supply should be terminated via a double pole fused isolator to the boiler, see wiring diagram for wiring details. A fused supply is required. The boiler has a 6.3A internal fuse.

Cable Lengths

Cables for sensors of bus cables do not carry mains voltage, but low voltage. They should **not be put parallel to mains wires** (this may lead to disturbances) otherwise screen cable should be used.
Maximum lengths of wires for all sensors:

- Copper wires up to 20 m 0.6 mm²
- Copper wires up to 80 m 1 mm²
- Copper wires up to 120 m 1.5 mm²

Strain reliefs

All electrical cables must be fed through the holes in the boiler bottom with the enclosed cable feed-throughs and fixed. Furthermore, the cables have to be fixed in the strain reliefs in the control panel and connected according to the wiring diagram (fig. 8).

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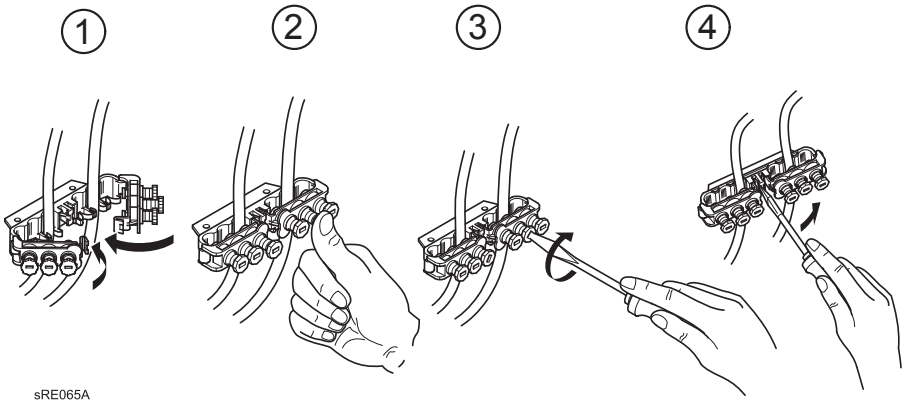
International protection IPx4D

The screwed cable connections have to be tightened in order to meet international protection IPx4D and the specified air-tight sealing of the air chamber, so that the seal rings seal the cables.

Fig. 8: Strain relief



1. Insert cables and snap shut clips until they lock
2. Press down clip screws
3. Tighten clip screw with screw driver
4. Lever open the snap-mechanism with a screw driver to open the cable clips

Circulating pumps

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

Fuses

Fuses in the Control Unit:
- F1 - T 6,3 H 250 ; mains

Connecting sensors/ components

Danger of electric shock! Observe wiring diagram!
Assemble and connect accessories according to enclosed instructions. Check earthing.

Outdoor temperature sensor (included with boilor)

The outside temperature sensor is enclosed in the enclosed package. For connection see wiring diagram.

Replacing cables

All connecting cables, except for the mains connection cable, have to be replaced by POTTERON Commercial-special cables in case of replacement. When replacing the mains connection cable, only cables of the types H05VV-F can be used, complying with BS 6500.

Contact protection and international protection IPx4D

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

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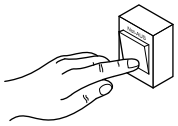
6. Commissioning

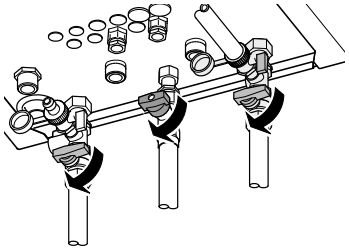
Danger! The commissioning must only be carried out by a heating specialist! The heating specialist checks tightness of the installation, correct function of all regulating, control and safety devices.
See commissioning sheet at rear of manual!

6.1 Switching on

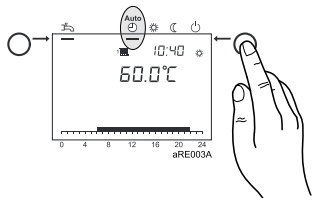
Danger of scalding! Hot water may exit from the blow pipe of the safety valve.



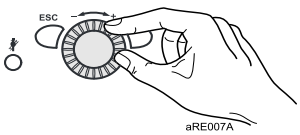
1. Switch on boiler isolator switch



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



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



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

6.2 Temperatures for heating and DHW

The information in the section *programming* for setting the temperatures for heating and DHW.
For DHW processing a setting onto 55°C is recommended.

You can adjust hours/minutes for DHW in time program 4. **For reasons of comfort, the time program for DHW should start one hour before time programe 1 and 2 start.**

6.3 Individual time program

The boiler can be commissioned having its standard values.
For adjusting parametres like individual time program, please consider the information given in the section *Programming*.

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6.4 Programming of necessary parameters

Normally, the control parameters do not have to be modified (Application example). Only date/time and possibly the time programmes have to be modified.

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

6.5 Emergency operation (Manual operation)

Setting the emergency operation of the plant>

- Press OK-button
- Select menu point maintenance/service
- Set function manual operation (7140) to ""ON"

Heating circuit pumps have been switched on and mixer is set to manual opration

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

- Press button "info"
- Acknowledge selection with OK
- Adjust nominal value by using rotating knob
- Acknowledge setting with OK.

See also section *Explanations for setting table*.

6.6 Instruction for the customer

Instruction

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

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

Documents

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

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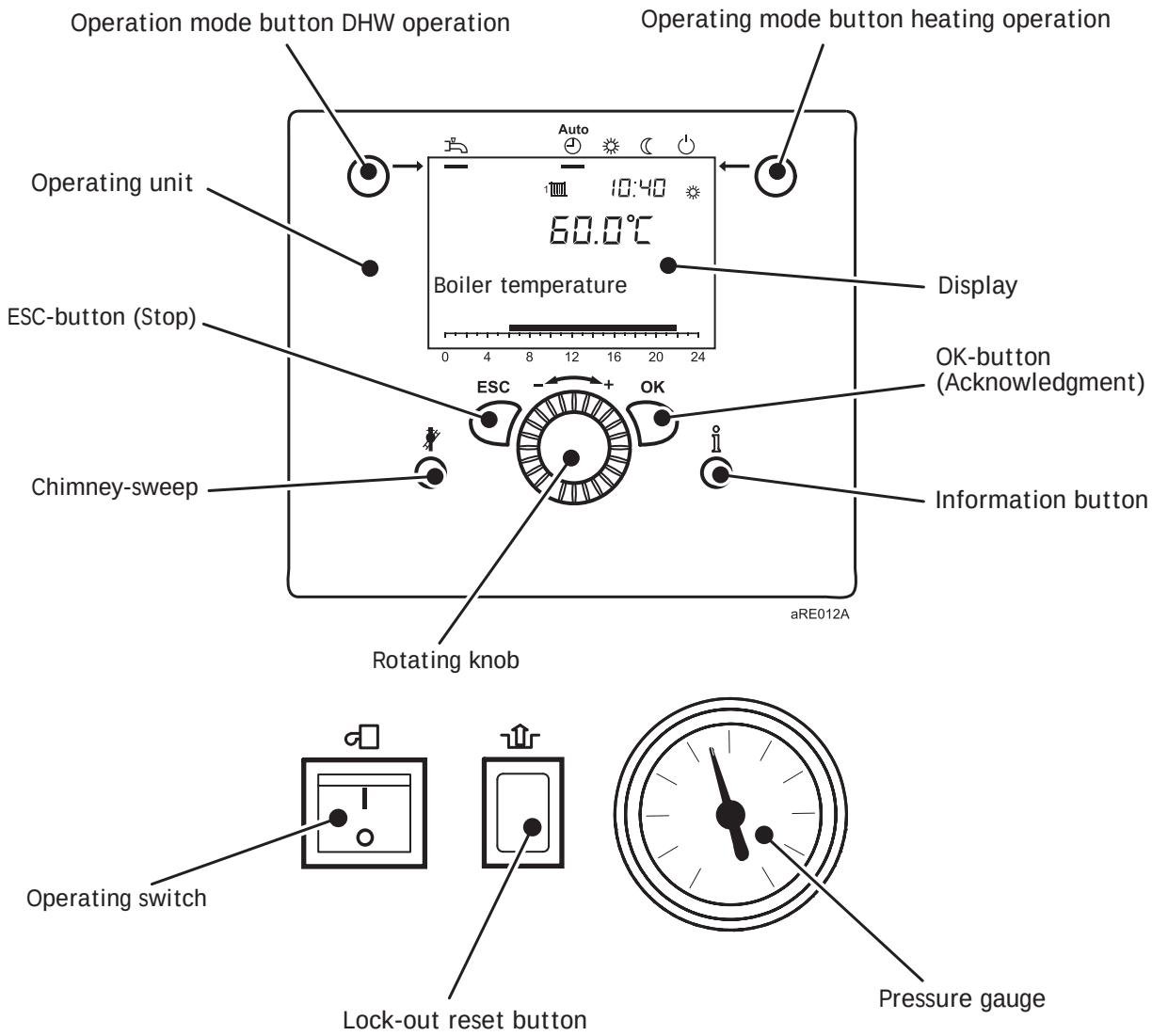
7. Operation

7.1 Operation elements

Fig. 9: Operating elements



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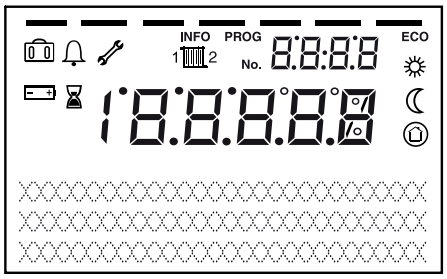
7.2 Displays

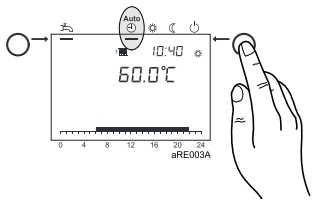
Fig. 10: Symbols in the display



Meaning of the displayed symbols

☼	Heating at comfort nominal value
☾	Heating at reduced nominal value
⌂	Heating at frost protection nominal value
⧗	Current process
🧳	Holiday function activated
1 2	Reference to heating circuit 1 or 2
🔧	Maintenance message
🔔	Fault message
INFO	Information level activated
PROG	Setting level activated
ECO	Heating operation stopped (Automatic summer/winter switch-over or automatic day heating limit activated)

7.3 Operation



Automatic operation Auto

Stop heating operation

Switching over between the operating modes for heating opration is carried out with the operating mode button heating operation. The selected setting is marked by a bar underneath the operating mode symbol.

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

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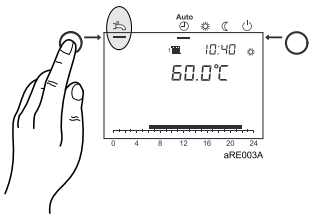
Continuous operation ☼ or ☾

- Heating operation without time programme
- Protection functions activated
- Automatic summer/winter switch-over not activated in case of continuous operation with comfort nominal value
- Automatic day heating limit not activated in case of continuous operation with comfort nominal value

Protection operation ⏻

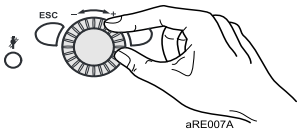
- No heating operation
- Temperature after frost protection
- Protection functions activated
- Automatic summer/winter switch-over activated
- Automatic day heating limit activated



Stop DHW operation

➜ Switched on:
DHW is processed according to the selected switching programme.

➜ Switched off:
DHW processing is deactivated.



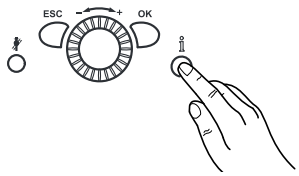
Setting nominal room value

➜ Comfort nominal value ☼
The comfort nominal value is set directly with the rotating knob higher (+) or lower (-).

➜ Reduced nominal value ☾
The reduced nominal value is set as follows:

- Push acknowledgement button (OK)
- Select heating circuit.
- Select parameter *Reduced nominal value*
- Set reduced nominal value with the rotating knob
- Push acknowledgment button (OK) again.

Return to basic display from programming or information level by operating the operation mode button *heating circuit*.



Display information

Various temperatures and messages can be called up by pushing the information button<, among others:

- Room and outside temperature
- Fault or service messages

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

Fault message 🔔

When the fault symbol 🔔 appears in the display,a fault exists in the plant.
Further information about the fault can be called up by pressing the information button (see *fault code table*).

Servicing message 🔧

When the servicing symbol 🔧 appears in the display, a servicing message exists or the plant is in a special mode.

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By pressing the information button, further information can be called up (*see servicing code table*).

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

Chimney-sweep function

The chimney-sweep function is activated or deactivated by the chimney-sweep button. The activated special function is displayed by the symbol n the display.

Restore standard values

The standard values will be restored as described below:

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

You can find more information for adjusting parameters in the section section 8. „Programming”.

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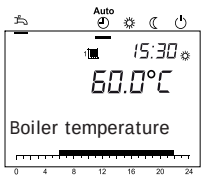
8. Programming

The controller must be programmed after installation.

8.1 Programming procedure

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

Fig. 11: Selection of setting levels and menu points



Basic display

OK Press

Information button

Press for approximately 3 s, until the display *End User* appears.

Select programming level

Setting levels:

- Enduser (E)
- Commissioning (I) incl. enduser (E)
- Engineer (F) incl. enduser (E) and commissioning (F)
- OEM includes all other setting levels and is protected by a password.

OK

Menu points:

- Time and date
- Operator section
- Time prog heating circuit 1
- Time prog heating circuit 2
- Time program 3/HCP
- Time program 4/DHW
- Holidays heating circuit 1
- Holidays heating circuit 2
- Heating circuit 1
- Heating circuit 2
- Domestic hot water
- Boiler
- Solar
- Buffer storage tank
- DHW storage tank
- Direct DHW charging
- Configuration
- LPB
- Fault
- Maintenance/Service
- State
- Diagnostics heat generation
- Diagnostics consumers

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

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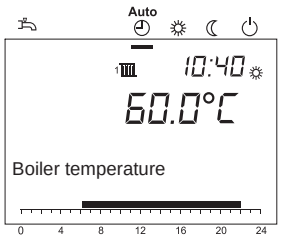
8.2 Modification of parameters

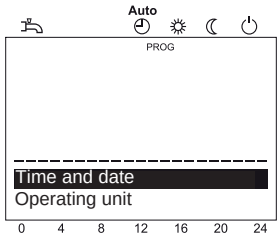
Settings, which are not directly modified via the front panel, have to be carried out in the setting level.
The basic programming processs is depicted in the following by the setting of time and date.

Basic display:



Press OK.

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

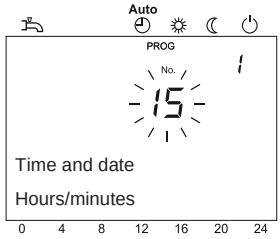


Acknowledge selection with OK.

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

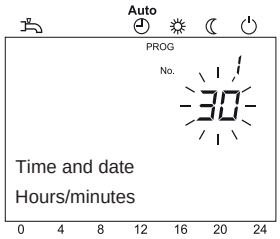
Acknowledge selection with OK.

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



Acknowledge setting with OK.

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



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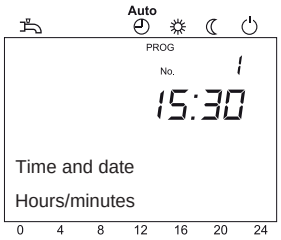
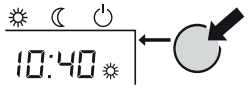
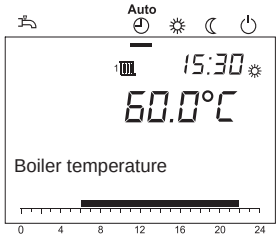
Acknowledge setting with OK.



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





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

8.3 Setting table

- Not all parameters displayed in the display are listed in the setting table.
- Depending on the plant configuration, not all parameters listed in the setting table are displayed in the display.
- In order to get to the setting levels: Enduser (E), Commissioning (I) and Engineer (F), press button OK.; After this, press for approximately 3 s the Information button, select the required level with the rotating knob and acknowledge with the OK button.

Table 10: Setting the parameters

Function	Prog. -No.	Setting level [1]	Standard value	Modified value
Time and date				
Hours/minutes	1	E	00:00 (h:min)	
Day/month	2	E	01.01 (day. month)	
Year	3	E	2004 (year)	
Operating unit				
Language	20	E	English	
Contrast of display	25	E	162	
Operation lock OFF | ON	26	F	Off	
Programming lock OFF | ON	27	F	Off	

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Function	Prog. -No.	Set-ting level [1]	Standard value	Modi-fied value
Operator section save basic settings No | Yes ⓘ This parameter is only visible in the room device!	30	F	No	
Operator section activate basic settings No | Yes	31	F	No	
Use as Room device 1 | Room device 2 | Operating device | Service device ⓘ This parameter is only visible in the room device!	40	I	Room device 1	
Attribution room device 1 Heating circuit 1 | Heating circuit 1and 2 ⓘ This parameter is only visible in the room device, as the operating unit in the boiler is fixed programmed for the operating device!	42	I	Heating circuit 1	
Operation HK2 Together with HK1 | independent	44	I	Together with HK1	
Operation HKP Together with HK1 | independent	46	I	Together with HK1	
Effect of presence button None | Heating circuit 1 | Heating circuit 2 | together ⓘ This parameter is only visible in the room device!	48	I	none	
Readjustment room sensor ⓘ This parameter is only visible in the room device!	54	F	0.0°C	
Time programme heating circuit 1				
Pre-selection Mo-Su Mo-Su | Mo-Fri | Sa-Su | Mo |Tue |Wed Thu | Fri | Sa | Su	500	E	Mo - Su	
1st phase ON	501	E	06:00 (h/min)	
1st phase OFF	502	E	22:00 (h/min)	
2nd phase ON	503	E	--:-- (h/min)	
2nd phase OFF	504	E	--:-- (h/min)	
3rd phase ON	505	E	--:-- (h/min)	
3rd phase OFF	506	E	--:-- (h/min)	
Standard values No | Yes	516	E	No	
Time programme heating circuit 2 ⓘ Parameter only visible, if heating circuit 2 exists!				
Pre-selection Mo-Su Mo-Su | Mo-Fri | Sa-Su | Mo |Tue |Wed Thu | Fri | Sa | Su	520	E	Mo - Su	
1st phase ON	521	E	06:00 (h/min)	
1st phase OFF	522	E	22:00 (h/min)	

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Function	Prog. -No.	Set-ting level [1]	Standard value	Modi-fied value
2nd phase ON	523	E	--:-- (h/min)	
2nd phase OFF	524	E	--:-- (h/min)	
3rd phase ON	525	E	--:-- (h/min)	
3rd phase OFF	526	E	--:-- (h/min)	
Standard values No | Yes	536	E	No	
Time programme 3 / HCP				
Pre-selection Mo-Su Mo-Su | Mo-Fri | Sa-Su | Mo | Tue | Wed Thu | Fri | Sa | Su	540	E	Mo - Su	
1st phase ON	541	E	06:00 (h/min)	
1st phase OFF	542	E	22:00 (h/min)	
2nd phase ON	543	E	--:-- (h/min)	
2nd phase OFF	544	E	--:-- (h/min)	
3rd phase ON	545	E	--:-- (h/min)	
3rd phase OFF	546	E	--:-- (h/min)	
Standard values No | Yes	556	E	No	
Time programme 4 / DHW				
Pre-selection Mo-Su Mo-Su | Mo-Fri | Sa-Su | Mo | Tue | Wed Thu | Fri | Sa | Su	560	E	Mo - Su	
1st phase ON	561	E	05:00 (h/min)	
1st phase OFF	562	E	22:00 (h/min)	
2nd phase ON	563	E	--:-- (h/min)	
2nd phase OFF	564	E	--:-- (h/min)	
3rd phase ON	565	E	--:-- (h/min)	
3rd phase OFF	566	E	--:-- (h/min)	
Standard values No | Yes	576	E	No	
Holidays heating circuit 1				
Start	642	E	--.-- (day. month)	
Finish	643	E	--.-- (day. month)	
Operation level Frost protection | Reduced	648	E	Frost Protection	
Holidays heating circuit 2 ⓘ Parameter only visible, if heating circuit 2 exists!				
Start	652	E	--.-- (day. month)	
Finish	653	E	--.-- (day. month)	
Operation level Frost protection | Reduced	658	E	Reduced	
Heating circuit 1				
Comfort nominal value	710	E	20.0°C	
Reduced nominal value	712	E	18.0°C	

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Function	Prog. -No.	Set-ting level [1]	Standard value	Modi-fied value
Frost protection nominal value	714	E	10.0°C	
Nominal line gradient	720	E	3.50	
Summer/winter heating limit	730	E	20°C	
Room influence	750	I	- - - %	
Boost heating	770	F	- - -°C	
Quick setback Off | Down to reduced setpoint | Down to frost prot setpoint	780	F	Down to reduced setpoint	
Floor curing function Off | Functional heating | Curing heating | Functio-nal/ curing heating | Manual	850	F	Off	
Floor curing setp manually	851	F	25°C	
Speed step design point	884	I	3017 / 20 / 30 / 30	
Pump-PWM Minimum	885	I	41 / 40 / 40 / 40 %	
Normal outside temperature	886	I	- 20 °C	
Flow nominal value Normal outside temperature	887	I	75°C	
dT Spreading Normal outside temperature	894	I	20.0°C	
Heating circuit 2 ⓘ Parameter only visible, if heating circuit 2 exists!				
Comfort nominal value	1010	E	20.0°C	
Reduced nominal value	1012	E	18.0°C	
Frost protection nominal value	1014	E	10.0°C	
Nominal line gradient	1020	E	1.50	
Summer/winter heating limit	1030	E	20°C	
Room influence	1050	I	- - - %	
Boost heating	1070	F	- - -°C	
Quick setback Off | Down to reduced setpoint | Down to frost prot setpoint	1080	F	Down to reduced setpoint	
Mixing valve boost	1130	F	6°C	
Floor curing function Off | Functional heating | Curing heating | Functio-nal/ curing heating | Manual	1150	F	Off	
Floor curing setp manually	1151	F	25°C	
Domestic hot water				
Nominal value	1610	E	55°C	
Reduced nominal value	1612	F	40°C	
Release 24h/day | Time programmes Heating circuits | Time programme 4/TWW	1620	I	Time programme 4/TWW	
Legionella function Off | Periodically | Fixed weekday	1640	F	Fixed weekday	

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Function	Prog. -No.	Set-ting level [1]	Standard value	Modi-fied value
Legionella funct periodically	1641	F	3	
Legionella funct weekday Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday	1642	F	Sunday	
Legionella funct time	1644	F	- - : - -	
Legionella funct setpoint	1645	F	65°C	
Legionella funct duration	1646	F	- - -	
Circulating pump release Time programme 3/HKP | Drinking water release | Time programme 4/TWW	1660	I	Drinking water release	
Circulation pump cycle operation OFF | ON	1661	I	ON	
Boiler				
Nominal value manual operation	2214	E	60°C	
Drinking water storage ⓘ Parameter according to hydraulic diagram!				
Flow setpoint boost	5020	F	18°C	
Configuration				
Hydraulic scheme	5701	I	2	
Heating circuit 1 OFF | ON	5710	I	ON	
Heating circuit 2 OFF | ON	5715	I	ON	
Zones with feed pump No | Yes	5761	I	No	
HK1with feed pump No | Yes			No	
HK2 with feed pump No | Yes			No	
TWW with feed pump No | Yes			No	
Relay output K2 Default | Message output | Alarm output | operation message | External transformer | Heating circuit pump HK2 | Circulation pump | Gate veil function | Pump hydraulic bypass | Feed pump Q8 | Basic function K2 | TWW-charging | Threshold analoguous signal RelCl | Exhaust gas flap | Collector pump | Fan switch-off | Pump Q1 | DHW mixing pump Q35	5920	I	Fan switch-off Feed pump	
Relay output 1 RelCl Default | Message output | Alarm output | Operation message | External transformer | Heating circuit pump HK2 | Circulation pump | Gate veil function | Pump hydraulic bypass | Feed pump Q8 | Basic function K2 | TWW-charging | Threshold analoguous signal RelCl | Exhaust gas flap | Collector pump | Fan switch-off | Pump Q1 | DHW mixing pump Q35	5922	I	Default	
Relay output 2 RelCl Default | Message output | Alarm output | Operation message | External transformer | Heating circuit pump HK2 | Circulation pump | Gate veil function | Pump hydraulic bypass | Feed pump Q8 | Basic function K2 | TWW-charging | Threshold analoguous signal RelCl | Exhaust gas flap | Collector pump | Fan switch-off | Pump Q1 | DHW mixing pump Q35	5923	I	Default	

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Function	Prog. -No.	Set-ting level [1]	Standard value	Modi-fied value
Relay output 3 RelCl Default | Message output | Alarm output | Omessage | External transformer | Heating circuit pump HK2 | Circulation pump | Gate veil function | Pump hydraulic bypass | Feed pump Q8 | Basic function K2 | TWW-charging | Threshold analoguous signal RelCl | Exhaust gas flap | Collector pump | Fan switch-off | Pump Q1 | DHW mixing pump Q35	5924	I	Default	
Relay output 1 SolCl Default | Message output | Alarm output | Operation message | External transformer | Heating circuit pump HK2 | Circulation pump | Gate veil function | Pump hydraulic bypass | Feed pump Q8 | Basic function K2 | TWW-charging | Threshold analoguous signal RelCl | Exhaust gas flap | Collector pump | Fan switch-off | Pump Q1 | DHW mixing pump Q35	5926	I	Default	
Relay output 2 SolCl Default | Message output | Alarm output | Operation message | External transformer | Heating circuit pump HK2 | Circulation pump | Gate veil function | Pump hydraulic bypass | Feed pump Q8 | Basic function K2 | TWW-charging | Threshold analoguous signal RelCl | Exhaust gas flap | Collector pump | Fan switch-off | Pump Q1 | DHW mixing pump Q35	5927	I	Default	
Relay output 3 SolCl Default | Message output | Alarm output | Operation message | External transformer | Heating circuit pump HK2 | Circulation pump | Gate veil function | Pump hydraulic bypass | Feed pump Q8 | Basic function K2 | TWW-charging | Threshold analoguous signal RelCl | Exhaust gas flap | Collector pump | Fan switch-off | Pump Q1 | DHW mixing pump Q35	5928	I	Default	
Function input H1 No | Modem function | Modem function inversely | Gate veil function | Feed-back Exhaust gas flap| generator lock | Generaror lock inverse	5950	I	none	
Modem function BA-switch-over HK's + TWW | BA-switch-over HK's | BA-switch-over HK 1| BA-switch-over HK 2	5957	I	BA-switch-over HK's + TWW	
Configuration Room thermostat 1 None | Room thermostat | timer Room level | timer heating request | timer TWW level	5970	I	Room thermostat	
Configuration Room thermostat 2 None | Room thermostat | timer Room level | timer heating request | timer TWW level	5971	I	none	
Function input RelCl No | Modem function | Modem function inverse | Gate veil function | Nominal value specification | Power specification | Sensor hydraulic bypass | Feed-back exhaust gas flap | generator lock | generator lock inverse | Generator lock sensor	5973	I	none	
Ext. Flow nominal value maximum	5975	I	100 °C	
Ext. Power specification threshold	5976	I	5 %	
Function input SolCl No | collector sensors	5978	I	none	
Time constant building	6110	I	10 h	
ConfigContr1.0	6240	F	0	
ConfigContr1.1		F	0	
ConfigContr1.4		F	1	

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Function	Prog. -No.	Set-ting level [1]	Standard value	Modi-fied value
ConfigContr1.7		F	0	
LPB				
Equipment address	6600	I	1	
Fault				
SW Diagnosis code	6705	E		
FA phase disturbance position		E		
Maintenance / Service				
Message	7001	E	0	
Acknowledgement message	7010	E	0	
Manual control OFF | ON	7140	E	Off	
State				
Status heating circuit 1	8000	I		
Status heating circuit 2	8001	I		
Status DHW	8003	I		
Status boiler	8005	I		
Status solar	8007	I		
Diagnosis genera-tor				
Boiler temperature/Boiler nominal value	8310	I		
Boiler return temperature	8314	I		
Operation display FA	8328	I		
Ionization current	8329	I		
Operating hours burner	8336	I		
Start counter burner	8337	I		
Operating hours heating operation	8338	I		
Operating hours TWW	8339	I		
Operating hours zones	8340	I		
Collector temperature 1	8510	I		
Operating hours solar gains	8530	E		
Diagnosis consumer				
Outside temperature	8700	I		
Outside temperature decreased	8703	I		
Outside temperature mixed	8704	I		
Room temperature 1	8740	I		
Room nominal value 1		I		
Flow temperature 1	8743	I		
Flow nominal value 1		I		
Room temperature 2	8770	I		
Room nominal value 2		I		
Flow temperature 2	8773	I		

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Function	Prog. -No.	Set-ting level [1]	Standard value	Modi-fied value
Flow nominal value 2		I		
DHW temperature 1	8830	I		
DHW nominal value		I		
DHW temperature 2	8832	I		
DHW charging temp	8836	I		
Buffer temp 1	8980	I		
Information values The display of the information values depends on the operation status!				
Fault message		E		
SW Diagnosis code		E		
Message		E		
State manual control		E		
Controller stop nominal value		E		
Screed nominal value actual		E		
Screed day actual		E		
Room temperature		E		
Room temperature minimum		E		
Room temperature maximum		E		
Boiler temperature		E		
Drinking water temperature 1		E		
Collector temperature 1		E		
Status boiler		E		
Status solar		E		
Status DHW		E		
Status heating circuit 1		E		
Status heating circuit 2		E		
Outside temperature		E		
Buffer temp 1		E		
Room temperature 1		E		
Room nominal value 1		E		
Room temperature 2		E		
Room nominal value 2		E		
Operation display FA		E		

1. E = Enduser; I = Commisioning; F = Engineer

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

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8.4 Explanations for setting table

Time and date

Time and date (1 to 3)

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

Operating unit

Language (20)

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

Operation lock (26)

If this function is activated the following operating elements are locked:

- Operating mode buttons for heating and DHW mode
- Control knob (comfort-setpoint room temperature)
- Presence button (only room device)

Programming lock (27)

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

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

Save basic settings (30)

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

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

Activate basic settings (31)

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

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

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

Used as (40)

Selection of the operating unit. Depending on the selected operating unit, further settings are necessary, which are described under the following program numbers.

Assignment device 1 (42)

If the setting **Room unit 1** (prog. no. 40) has been selected at the room unit, it must be set under program number 42, if the room unit will be attributed to heating circuit 1 or both heating circuits.

Operation HC2/HCP (44, 46)

When selecting **Room unit 1** or **Operator unit** (prog. no. 40), it must be set under prog. no. 44 or 46, if the heating circuits HC2 and HCP have to be operated together with heating circuit 1 or independent from heating circuit 1 by the operator unit.

Action occupancy button (48)

The effect of the presence button on the heating circuits has to be set under prog. no. 48.

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Re-adjustment room sensor (54)

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

Time programs

Preselection (500, 520, 540, 560)

Before a time programme is set, the individual days (Mo, Tu, We, etc.) or day groups (Mo-Su, Mo-Fr, Sa-Su) have to be selected, at which the time programme has to be activated.

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

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

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

The time programs are only activated in the operation mode “Automatic“.

Default values (516, 536, 556, 576)

Setting of the default values given in the setting table

Holiday programs

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

Start (642, 652)

Entering the holiday start

End (643, 653)

Input of holiday end

Operation level (648, 658)

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

The holiday programmes are only activated in the operation mode “ Automatic “.

Heating circuits

Comfort setpoint (710, 1010)

Setting the comfort setpoint

Reduced setpoint (712, 1012)

Setting the reduced setpoint to reduce the room temperature during secondary usage times (e.g. at night or when absent).

Frost protection setpoint (714, 1014)

Setting the frost setpoint, so that a too big decrease of the room temperature is prevented.

Heating curve slope (720, 1020)

The flow temperature nominal value is formed with the help of the heating curve, which is used to control the flow temperature depending on the weather.

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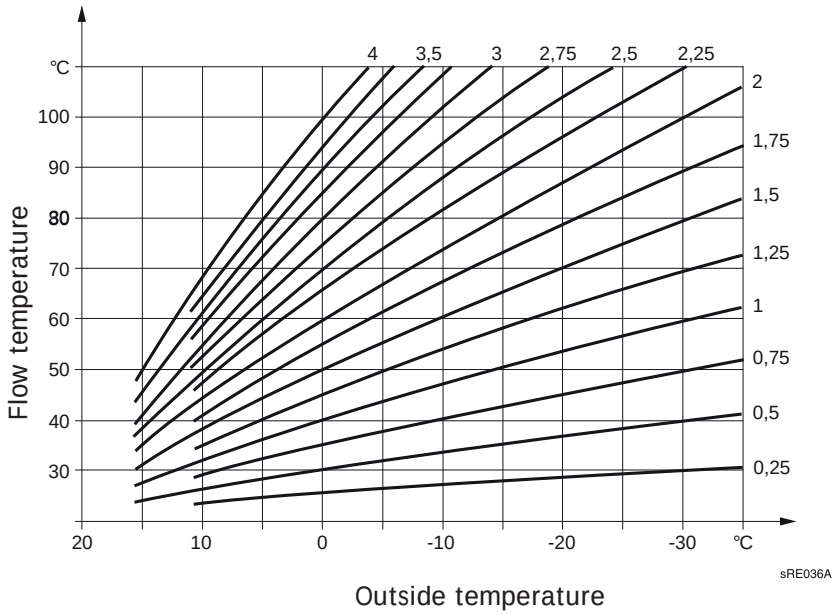
Determination of the heating curve slope

Enter lowest calculated outside temperature according to climate zone into the diagram (see *fig. 12*), e.g. vertical line at -10°C. Enter maximum flow temperature of the heating circuit (e.g. horizontal line at 60°C).
The intersecting point gives the value for the heating curve slope.

Fig. 12: Heating curve diagram.



Summer/winter heating limit (730, 1030)

The heating will be switched over to summer or winter operation at the temperature set here, whereby the reduced outside temperature becomes the reference temperature (prog. no. 8703).
- - - °C: deactive

Room influence (750, 1050)

In the case of room influence, the deviations from the room temperature setpoint is recorded by a room sensor and taken into account for the temperature control.

A room sensor must be connected. The value for the room influence mut be between 1% and 99%. Should there be radiator valves in the leading room (assembly location of the room sensor), these have to be fully opened.
Setting for weather compensation with room influence: 1% - 99%
Setting for pure weather compensation: ---%
Setting for pure room compensation: 100%

Boost heating (770, 1070)

In case of a change from reduced to comfort setpoint, heating is carried out by boost heating at an increased flow temperature until reaching the comfort setpoint, so that the room is heated up quickly.

Quick setback (780, 1080)

If this function is activated the heating pump will be switched off. When reaching the setpoint, the heating pump will be re-started and the temperature controlled to the reduced setpoint or the frost protection setpoint. The duration of the quick setback depends on the outside temperature, time constant building (prog.

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no. 6110) an the temperature difference, by which the room temperature will be lowered.

Duration of the quick setback for setback by 2°C in hrs:							
Outside temperature mixed**:**	**Time constant building (Configuration, prog. no. 6110)**						
	0 hrs	2 hrs	5 hrs	10 hrs	15 hrs	20 hrs	50 hrs
15°C	0	3,1	7,7	15,3	23		
10°C	0	1,3	3,3	6,7	10	13,4	
5°C	0	0,9	2,1	4,3	6,4	8,6	21,5
0°C	0	0,6	1,6	3,2	4.7	6,3	15,8
-5°C	0	0,5	1,3	2,5	3,8	5.0	12,5
-10°C	0	0,4	1,0	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 quick setback for setback by 4°C in hrs:							
Outside temperature mixed**:**	**Time constant building (Configuration, prog. no. 6110)**						
	0 hrs	2 hrs	5 hrs	10 hrs	15 hrs	20 hrs	50 hrs
15°C	0	9,7	24,1				
10°C	0	3,1	7,7	15,3	23,0		
5°C	0	1,9	4.7	9,3	14,0	18,6	
0°C	0	1,3	3,3	6,7	10,0	13,4	
-5°C	0	1,0	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

Floor curing function (850, 1150)

The floor curing function serves controlled drying out of screed floors

Off: the function is switched off.

Functinal heating (Fh): Part 1 of the temperature profile will be run through automatically.

Curing heating (Ch): Part 2 of the temperature profile will be run through automatically.

Functional/curing heating: The whole temperature profile will be run through automatically.

Manually: Control to the **Floor curing setpoint manually**.

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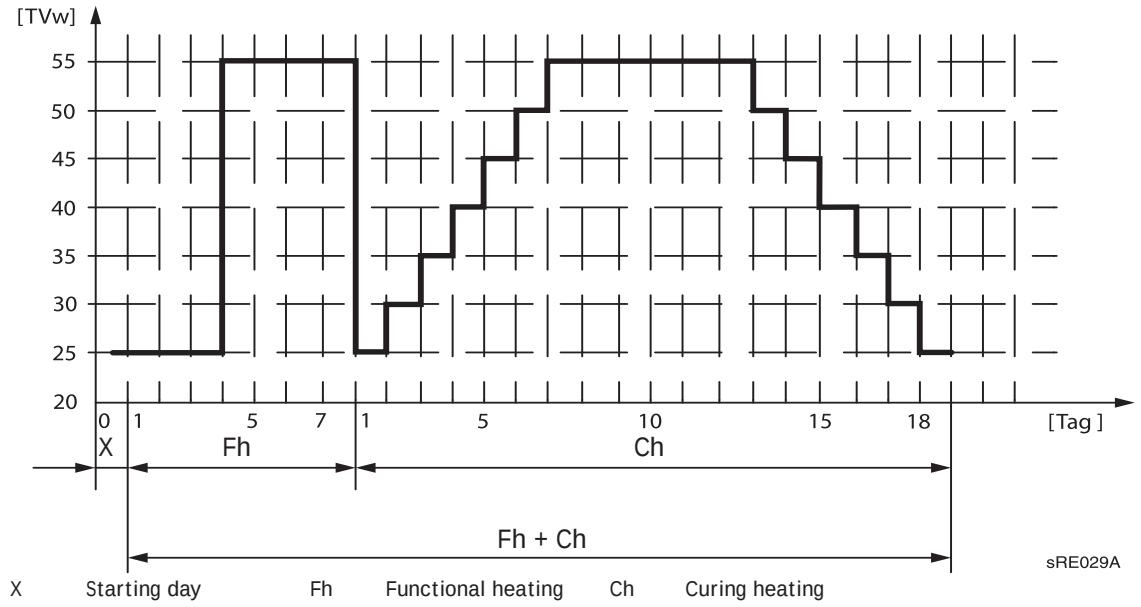
Fig. 13: Temperature profile of the floor curing function



Important! The respective regulations and standards of the screed manufacturer have to be observed.
A correct function is only possible with a correctly installed plant (hydraulic, electrical systems and settings).
Deviations can only lead to damage of the screed.
The floor curing function can be stopped prematurely by setting **OFF**.

Floor curing setp manually (851, 1151)

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

General for control of modulating pump
(only with PWM-pump or pump with a 0-10V input and KPM)

The operating range of the modulating pump can be set exactly on the design temperatures of the heating circuit. For this, two parameters have to be modified:
Speed design point (prog. no. 884) = maximum adjustable pump speed (NqmodNenn)
Pump PWM min (prog. no. 885) = maximum permissible pump speed (NqmodMin)

Speed design point (884)

It is recommended to adjust this value for heat saving of the heating system (hydraulic balance). It corresponds to the speed step of the pump in the design point to reach the nominal volume flow. The function speed design point is comparable to an analogue speed selection switch of an HC pump, which has 30 speed steps available. Der Einstellbereich erstreckt sich von 6m auf 1m Wassersäule Förderdruck.

Pump PWM min (885)

The minimum permissble pump speed (NqmodMin) of the HC pump is set via prog. no. 885. This speed is sufficient to guarantee sufficient water supply in the heating circuit, it is entered in percent of the maximum speed step.

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Procedure to set the operating range of the modulating pump by the heating specialist

If the design data of the heating plant deviate significantly (i.e. differences in the design temperature of 10 K) from the standard temperature settings of the pump, a correction should be carried out in the following sequence:

Standard outside temp (886)

1. Set standard outside temperature, prog. no. 886, according to the design point of the heating plant (factory setting: - 20°C).

Flow temp setp standard OT (887)

2. Set flow temperature setpoint standard outside, prog. no. 887, according to flow temperature (factory setting: 75°C).

dT differential standard OT (894)

3. Set dT-differential standard outside temperature, prog. no. 894, according to heating system design (factory setting: 20°C).
4. Adjusting of PWM pump in the design point with thermostat valves open by modifying prog. no. 884 (NqmodNenn).

Function control:

Radiators do not get warm?

If this problem exists over the whole outside temperature range, the speed step in the design point is possibly too low; i.e. prog. no. 884 (NqmodNenn) must be increased accordingly

If this problem appears at higher outside temperatures, the speed for heating operation has been set too low, i.e. prog. no. 885 (Nq-modmin)must be increased accordingly.

The effects of setting modifications have to be controlled.

Mixing valve boost (1130)

Increasing the flow temperature achieves a constant mixer flow temperature.

Increasing: Mixer flow temperature undershoot is avoided

Lowering: Mixer flow temperature undershoot possible

DHW

Nominal setpoin (1610)

Setting the DHW nominal setpoint

Reduced setpoint (1612)

The DHW reduced setpoint is set under prog. no. 1612.

Release (1620)

24h/day: The DHW temperature will be continuously controlled to the nominal setpoint independent from the time switching pro-grammes.

Time programs HCs: The DHW temperature will be switched over between the nominal setpoint and the reduced setpoint depending

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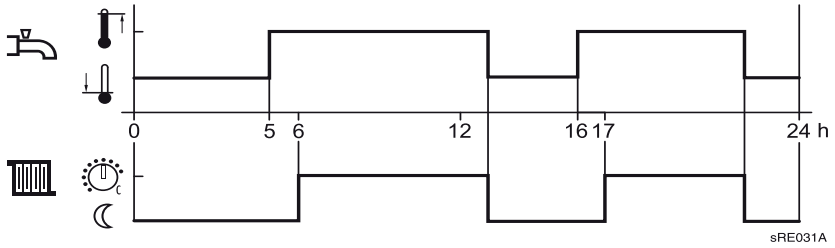
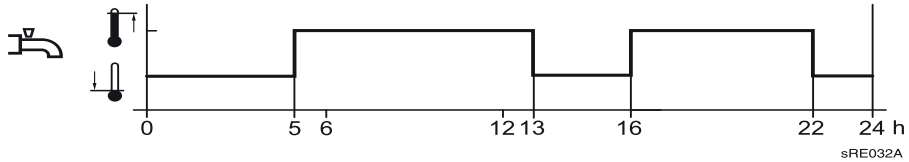
on the time switching programs. Every time, the switching-on time will be moved forward by one hour (see *fig. 14*).

Fig. 14: Release depending on the time switching programmes of the heating circuits (example)



Time program 4/DHW: The DHW temperature will be switched over between the nominal setpoint and the reduced setpoint independent from the time switching programs of the heating circuits. In this case, the time switching program 4 will be used (see *fig. 15*).

Fig. 15: Release according to time switching programme 4 (example)



Legionella function (1640)

Function to kill legionella germs by heating up to the set legionella function setpoint (see prog. no. 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 function periodically (1641)

Setting the interval for the **legionella function periodically** (recommended setting in case of additional DHW heating by solar system).

Legionella function weekday (1642)

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

Legionella function time (1644)

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

Legionella function setpoint (1645)

Setpoint, at which potentially existing legionella germs will be killed.

Legionella function duration (1646)

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

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

Circulating pump release (1660)

Time program 3: The circulation pump is released, depending on the time program 3 (see prog. no. 540 to 556).
DHW release: The circulation pump will be released, when the DHW preparation has been released.
Time program 4/DHW: The circulation pump will be released, depending on the time program 4 of the local controller.

Circulation pump cycle operation (1661)

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

Boiler

Setpoint manual control (2214)

Temperature, to which the boiler will be contolled in manual control mode (also see prog. no. 7140).

DHW storage tank

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.

Configuration

Hydraulic diagram (5701)

Setting of the code for the hydraulic system. The data of the codes are included in the respective instructions of the accessories.

Heating circuit 1/2 (5710 ad 5715)

With this parameter the heating circuits can be deactivated.

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

System pump (5761)

The system pump can be used to support the heating circuits and the DHW circuit. Under prog. no. 5761 it is specified, which kind of heat request will be supported by the system pump. The following kinds of heat requests are available:
Zones with system pump
HC1 with system pump
HC2 with system pump
DHW with system pump

Relay outputs (5920 to 5928)

Default: Function according to hydraulic diagram.
Status output: The status output will be operated when a command exists from the controller to the firing automation. If there is a fault, which prevents the firing automation to operate, the status output will be switched off.
Alarm output: The output will be set, when there is a fault in the device, which requires manual unlocking.
Status information: The output is set, when the burner operates.

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External transformer: This output serves to switch off an external transformer. The output is activated, when the external transformer is needed, otherwise it is not activated. The external transformer should be switched off as often as possible to minimize the total energy consumption of the system.
Heating circuit pump HC2: This ouput supplies the control signal for the pump of the 2nd heating circuit. The pump of the 2nd heating circuit is generally attributed to the mixer clip-in (CIM C). If the 2nd heating circuit is designed as a pumped circuit, the pump can also be controlled by the prgrammable output.
Circulation pump: Function to control a DHW circulation pump (see prog. no. 1660).
Warm air curtain function: With this funtion the programmable output is activated, when the input for the warm air curtain function has been set. If this input has not been set, also the output will be set back. The warm air curtain funtion allows the maximum nominal boiler temperature to be achieved. Furthermore, a heating request for the heating circuit 2 will be set.
Pump pressureless header: This function controls the pump behind the hydraulic bypass.

This function is only available for hydraulic diagrams, which have no further heating circuits apart from heating circuit 1 (pumped heating circuit).
System pump Q8: This function controls the system pump.
Basic function K2: Function according to hydraulic diagram.
Full DHW charging: The output is activated by this function during an active charging of the DHW layer storage tank.

This function can only be activated when using a layer storage tank.

Threshold analog signal RelCI: The output is activated with this function, when the input signal at the clip-in module is above the trigger threshold.

This function is only possible in connection with the setting of nominal value or power via the input of the clip-in module.
Flue gas damper: 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.
Collector pump: The control of a circulating pump is exercised by this function, when a solar collector is used.
Fan shutdown: This output serves to stop the fan. The output is activated, when the fan is needed; otherwise it is not activated. The fan should be switched off as often as possible, to minimize the total energy consumption of heating system.
Pump Q1: This output serves the heating circuit pump Q1.
DHW mixing pump Q35: This output is triggered during activated legionella function to stir e.g. a storage tank with solar support.

Function input H1 (5950)

None: No function.
Modem: The modem function serves to centrally switch off the heating system into stand-by or reduced operation (telephone remo-

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te switch). The modem function is activated when the contact is closed.
Modem inverse: The modem function is activated when the contact is opened.
Warm air curtain function: With this funtion the programmable output is activated, when the input for the warm air curtain function has been set. If this input has not been set, also the output will be set back. The warm air curtain funtion allows the maximum nominal boiler temperature to be achieved. Also, a heat request is set for heating circuit 1.
Check sign flue gas damper: Checkback via input H1 in case of activated flue gas damper control.
Heat generation lock: The heat generation lock is needed to lock the burner in case of integrating alternative energies (e.g. solar energy). The heat generation lock is activated, when the contact is closed (see also prog. no. 2201, prog. no. 6330, and programming manual)
Heat generation lock inverse: The heat generation lock is activated, when the contact is opened.

Modem function (5957)

Optg mode change HCs+DHW: Changing over of the operating mode for heating circuit and DHW via telephone remote switch.
Optg mode changeover HC 1/2: Changing over of the operating mode for heating circuit 1/2 via telephone remote switch.

Configuration room thermostat 1/2 (5970, 5971)

None: Switching the input has no effect.
Room themostat: the switching status of the contact decides, if a heat request has to be generated.
It applies:
Input open: Heat request locked
Input closed: Heat request released

If no room thermostat is connected, the heat request remains locked.

Timer room level: This function switches over the room setpoint.
It applies:
Input open: Room setpoint = Reduced setpoint
Input closed: Room setpoint = Comfort setpoint
Time switch heat request: See function *Room thermostat.*
Time switch DHW level: This function switches over the DHW setpoint.
It applies:
Input open: DHW setpoint = Reduced setpoint
Input closed: DHW setpoint = Nominal setpoint

Function input relay clip-in (5973)

None: No function.
Modem: See prog. no. 5950.
Modem inverse: See prog. no. 5950.
Warm air curtain function: See prog no. 5920.
Specified setpoints (heat request:) The existing voltage signal or current signal will be converted into a temperature value and used

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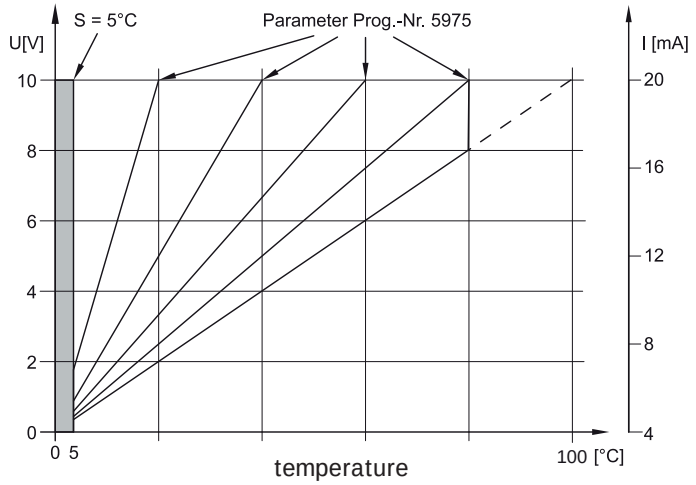
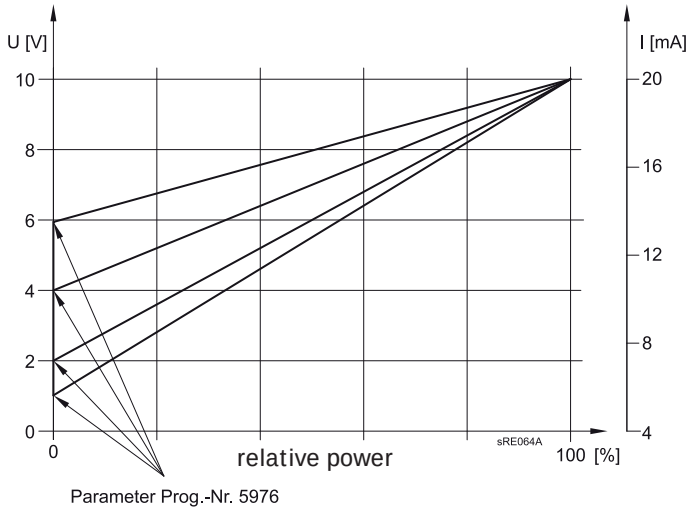
as a flow setpoint. The maximum value will be set under prog. no. 5975.

Fig. 16: *Heat request* (examples)



Specified capacity: The existing voltage signal or current signal will be transferred to the controller and converted into a percent value, which gives the relative boiler capacity. The threshold, from which the existing signal is supposed to activate the capacity specification, will be set under prog. no. 5976. Due to this, the minimum value of the signal is set at the same time. If the signal is of the size of the value set in prog. no. 5976, the boiler is operated at minimum relative capacity; at the maximum value of the signal, the control is at maximum relative boiler capacity. If the signal is below the set value, the specified capacity is not activated, i.e. the burner will be switched off.

Fig. 17: Specified capacity (examples)



Pump pressureless header: This function enables a control of the boiler at flow temperature after the hydraulic bypass. For this, a

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sensor is connected at the input, which must be installed in the flow behind the hydraulic bypass.
Check sign flue gas damper: See prog. no. 5920 and 5950.
Heat generation lock: See prog. no. 5950.
Heat generation lock inverse: See prog. no. 5950.
Heat generation lock sensor: If there is a temperature at the sensor which is higher than the actually requested nominal value, the boiler will be locked. The control of the heating circuits and the utility water stays activated.

External maximum nominal flow value (5975)

See prog no. 5973.

External capacity process threshold (5976)

See prog no. 5973.

Time constant building (6110)

The reaction speed of the nominal flow value at fluctuating outside temperatures is influenced by the value set here, depending on the building design.
Example values:
40 for buildings with thick walls or outer insulation.
20 for buildings of normal building design.
10 for buildings of light building design.

Bit-settings

Only the listed settings may be changed. Record every change!
All other bit settings must not be changed!

ConfigRG1 (6240)

Priority DHW

RG1.0 = 0 and RG1.1 = 0: Absolute priority
RG1.0 = 0 and RG1.1 = 1: No priority
RG1.0 = 1 and RG1.1 = 0: Shifting

System Frost Protection

RG1.4 = 0: Frost protection OFF
RG1.4 = 1: Frost protection ON

Operation mode of the heating circuit at activated modem function

RG1.7 = 0: Standby operation
RG1.7 = 1: Reduced mode operation

LPB

Device address (6600)

The actual LPB device address will be displayed.

Fault

If the sign  appears in the display, a fault exists and the respective fault message can be called up via the information button

SW Diagnosics code (6705)

In case of a disturbance, the display *Disturbance* is on permanently. In addition, the diagnosis code is issued via the display (see chapter *Maintenance, fault code table)*.

Burner ctrl phase lockout pos

Phase, in which the fault occured, which led to the disturbance.

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Maintenance / Service

Message (7001)

Messages to signal necessary maintenance work. The following causes may be the reason for the occurance of a maintenance message:

- Burner operating hours interval time exceeded since the last maintenance work
- Start-up interval time exceeded since the last maintenance
- Number of month exceeded since the last maintenance
- Ionisation current maintenance threshold undercut

After the appearance of a maintenance message, the heating specialist has to be informed. If necessary, the heating specialist can instruct the end user to call up the maintenance code, so that the maintenance cause can be found. In this way, preparations can be made to carry out servicing, if necessary.

Acknowledge ment message (7010)

The end user has the opportunity to acknowledge on end user level the displayed maintenance message by editing parameters. After this, the message is cancelled in the whole system.

Reset messages (7012)

Reset messages 1	1 = Individual reset of operation hours maintenance message
Reset messages 2	1 = Individual reset of start-up maintenance message
Reset messages 3	1 = Individual reset of the months-service-maintenance message
Reset messages 4	1 = Individual reset of ionisation current maintenance message
Reset messages 6	1 = Total reset of all maintenance messages

Manual control (7140)

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

State

State (8000 to 8007)

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

The following messages are possible under **Heating circuit 1/2**:

Display	Dependend on
---	No heating circuit available
Manual control active	Manual control active
Floor curing function active	Floor curing function active
Opt start ctrl+boost heating	
Optimum start control	
Boost heating	
Comfort heating mode	Time switching program, operating mode, occupancy button
Optimum stop control	
Reduced heating mode	Time switching program, holiday program, operating mode, occupancy button, H1
Frost prot room active	Holiday program, operating mode, H1
Summer operation	
24-hour Eco active	
Setback reduced	Time switching program, holiday program, operating mode, occupancy button, H1
Setback frost protection	Holiday program, operating mode, H1
Room temp limitation	

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

Display	Dependend on
---	Not available
Manual control active	Manual control active

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Display	Dependend on
Push, legionella function	
Push, nominal setpoint	
Charging, legionella setpoint	Legionella function activated
Charging, nominal setp	
Charging, reduced setp	
Charged, max st tank temp	
Charged, max charging temp	
Charged, legionella temp	
Charged, nominal temp	
Charged, reduced temp	

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

Display	Dependend on
---	Normal operation
Fault	
Monitor has tripped	
Manual control active	Manual control active
Chim sweep fct, full load	Chimney sweep funct active
Locked	e.g. Input H1
System Frost Protection	

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

Display	Dependend on
---	Not available
Manual control active	Manual control active
Fault	
Frost prot collector active	Collector too cold
Recooling active	Recooling via collector active
Max st tank temp reached	Storage tank charged to the security temperature
Overtemp prot active	Collector overtemp protection and pumps off
Charging DHW	
Radiation insufficient	

Diagnostics heat generation/consumers

Diagnostics heat generation/consumers (8310 to 8980)

Display of the different nominal and actual values and meter readings for diagnosis purposes.

Info

Different information values will be displayed, depending on the operating state. Also, informations about the different operating states will be displayed (see below).

State boiler

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

Display	Dependend on
---	Normal operation
Fault	
Monitor has tripped	
Manual control active	Manual control active
Chim sweep fct, full load	Chimney sweep funct active
Locked	e.g. Input H1
System Frost Protection	

State solar

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

Display	Dependend on
---	Not available
Manual control active	Manual control active
Fault	
Frost prot collector active	Collector too cold
Recooling active	Recooling via collector active
Max st tank temp reached	Storage tank charged to the security temperature

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Display	Dependend on
Overtemp prot active	Collector overtemp protection and pumps off
Charging DHW	
Radiation insufficient	

State DHW

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

Display	Dependend on
---	Not available
Manual control active	Manual control active
Push, legionella function	
Push, nominal setpoint	
Charging, legionella setpoint	Legionella function activated
Charging, nominal setp	
Charging, reduced setp	
Charged, max st tank temp	
Charged, max charging temp	
Charged, legionella temp	
Charged, nominal temp	
Charged, reduced temp	

State heating circuit 1/2

The following messages are possible under **Heating circuit 1/2**:

Display	Dependend on
---	No heating circuit available
Manual control active	Manual control active
Floor curing function active	Floor curing function active
Opt start ctrl+boost heating	
Optimum start control	
Boost heating	
Comfort heating mode	Time switching program, operating mode, occupancy button
Optimum stop control	
Reduced heating mode	Time switching program, holiday program, operating mode, occupancy button, H1
Frost prot room active	Holiday program, operating mode, H1
Summer operation	
24-hour Eco active	
Setback reduced	Time switching program, holiday program, operating mode, occupancy button, H1
Setback frost protection	Holiday program, operating mode, H1
Room temp limitation	

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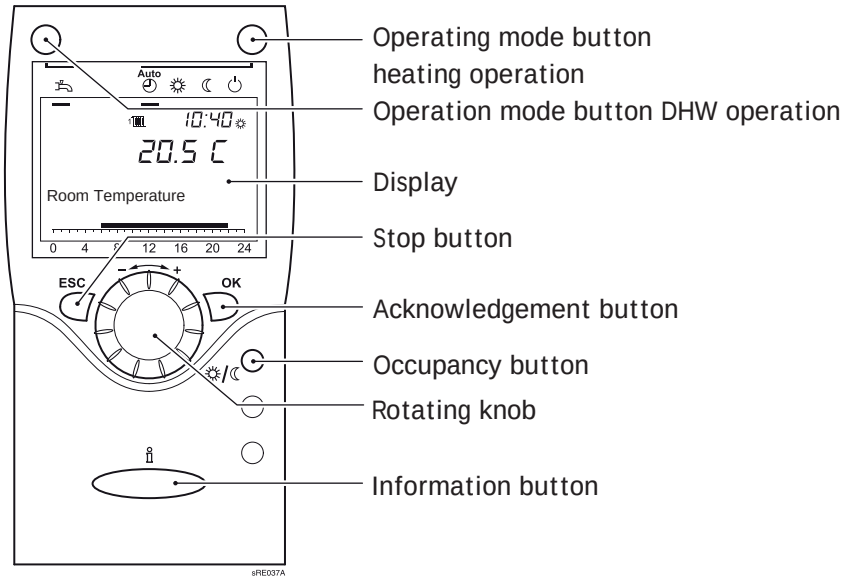
9. General

9.1 Room unit RGT

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

Fig. 18: Operating interface of the room device RGT



Presence button

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

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10. Servicing

Danger of electric shock! Before removing parts of the cover, the boiler has to be deenrgised.
Work under voltage (removed cover) must only be carried out by an electrician!

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

10.1 Maintenance work

Maintenance work includes among others:

- PARAMOUNT two Clean SOB outside.
- Check connection and seal locations of water filled parts.
- Check safety valves for correct function.
- Check operating pressure and, possibly, fill in water.
- De-aerate heating plant and return gravity lock into operating position.

It is recommended to carry out maintenance and cleaning of the PARAMOUNT two annually.
The burner has to be checked for contamination and, possibly, to be cleaned and serviced.
Die Abgassammelschale auf Ablagerungen überprüfen (Reinigungs-öffnung).

10.2 Replace air-vent

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

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

10.3 Condensate siphon

The condensate syphon should be cleaned every one to two years. For this, loosen the upper screw connection at the siphon and pull the siphon downwards. Remove the siphon complete with hose out of the boiler, dismantle and rinse with clean water. Assemble the siphon in reverse order.

At the same time, the flue gas collecting sump should be checked for soiling and if needed should be cleaned (rinsed).

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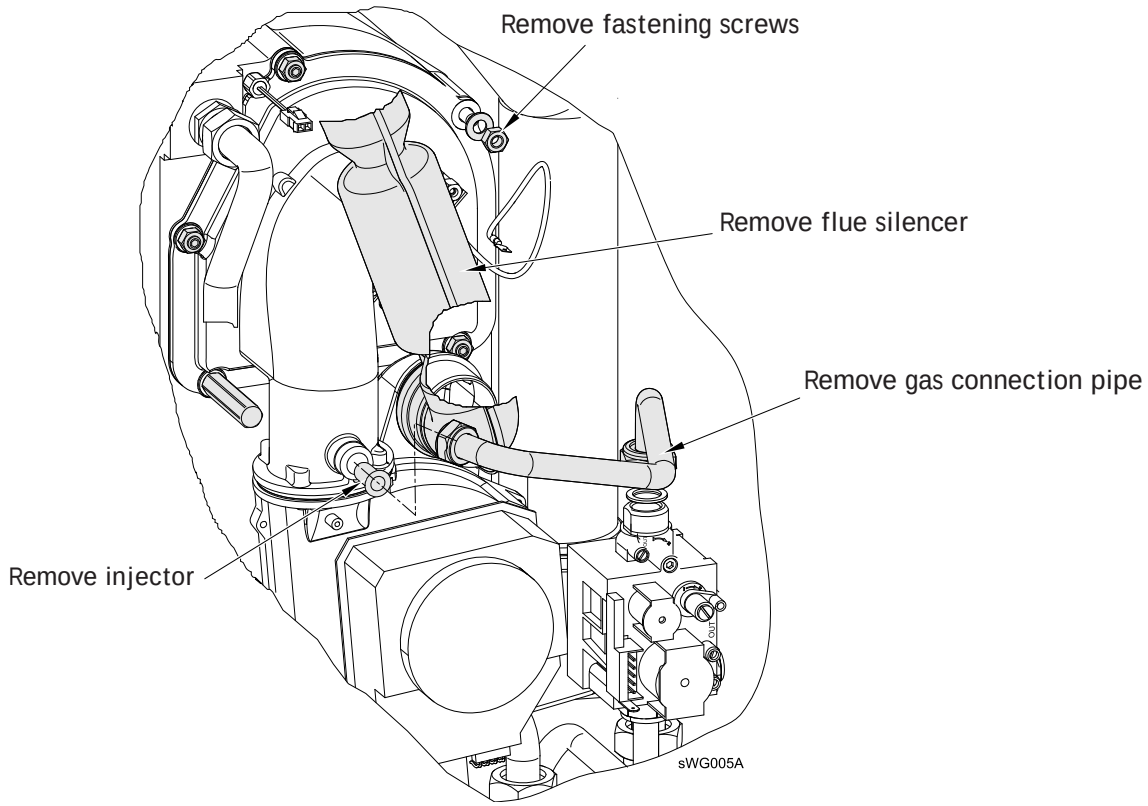
10.4 Removing gas burner

The gas burner has to be dismantled before cleaning the heating surfaces.

Dismantling of the gas burner (PARAMOUNT two 30/40)

- Disconnect the connecting wires to the fan.
- Disconnect ionisation cable.
- Disconnect ignition cable.
- Remove fastening screws of the bracket on the housing lid.
- Remove the screw connections of the gas connection pipe at the mixing chamber and the gas valve.
- Remove the gas connection pipe and the gas injector.
- Disconnect the gas connection pipe at the gas valve and remove gas valve.
- Undo the 5 fastening screws at the mixing chamber/heat exchanger.
- Remove bracket.
- Pull out the burner together with mixing chamber, fan and flue silencer to the front (fig. 20).
- Clean burner bar with soft brush.

Fig. 19: Dismantle gas burner (PARAMOUNT two 30/40)



The gas burner has to be disassembled before cleaning the heating surfaces.

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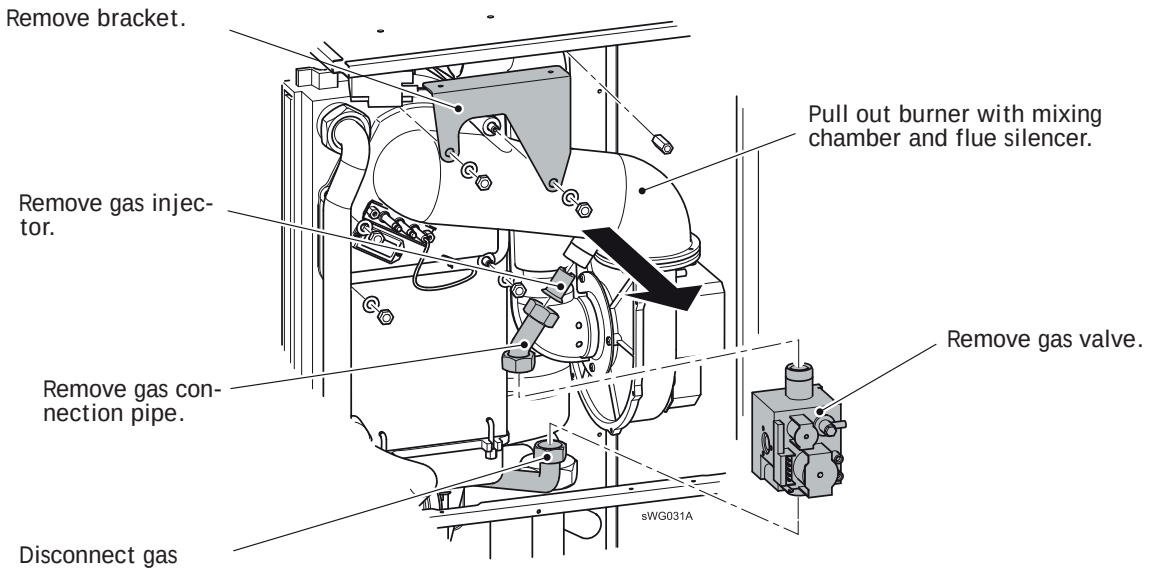
Dismantling of the gas burner (PARAMOUNT two 60 D)

- Disconnect the connecting lines to the fan.
- Disconnect ionisation line.
- Disconnect ignition cable.
- Disconnect fastening screws of the bracket on the housing lid.
- Disconnect the screw connections of the gas connection pipe at the mixing chamber and the gas valve.
- Remove the gas connection pipe and the gas injector.
- Disconnect the gas connection pipe at the gas valve and remove gas valve.
- Undo the 5 fastening screws at the mixing chamber/heat exchanger.
- Remove bracket.
- Pull out the burner together with mixing chamber, fan and eahaust gas muffler to the front (see figure 19)siehe *Abb. 20*
- Clean burner pipe with soft brush.

Fig. 20: Dismantle of the gas burner (PARAMOUNT two 60 D)

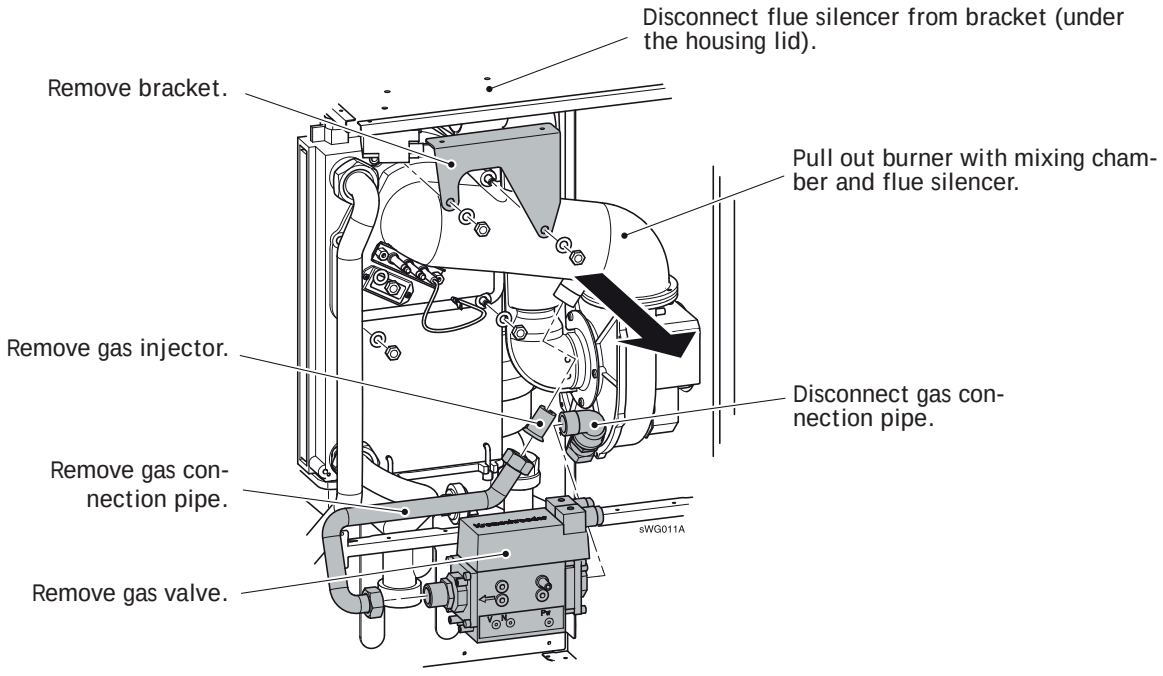


Use new seals when installing.

Dismantling of the gas burner (PARAMOUNT two 80 D)

- Disconnect the connecting lines to the fan.
- Disconnect ionisation line.
- Disconnect ignition cable.
- Disconnect fastening screws of the bracket on the housing lid.
- Disconnect the screw connections of the gas connection pipe at the mixing chamber and the gas valve.
- Remove the gas connection pipe and the gas injector.
- Disconnect the gas connection pipe at the gas valve and remove gas valve.
- Undo the 5 fastening screws at the mixing chamber/heat exchanger.
- Remove bracket.
- Disconnect flue silencer from the bracket.
- Pull out the burner together with mixing chamber, fan and eahaust gas muffler to the front (see figure 19)siehe *Abb. 21*
- Clean burner pipe with soft brush.

Fig. 21: Dismantle of the gas burner (PARAMOUNT two 80 D)



Use new seals when installing.

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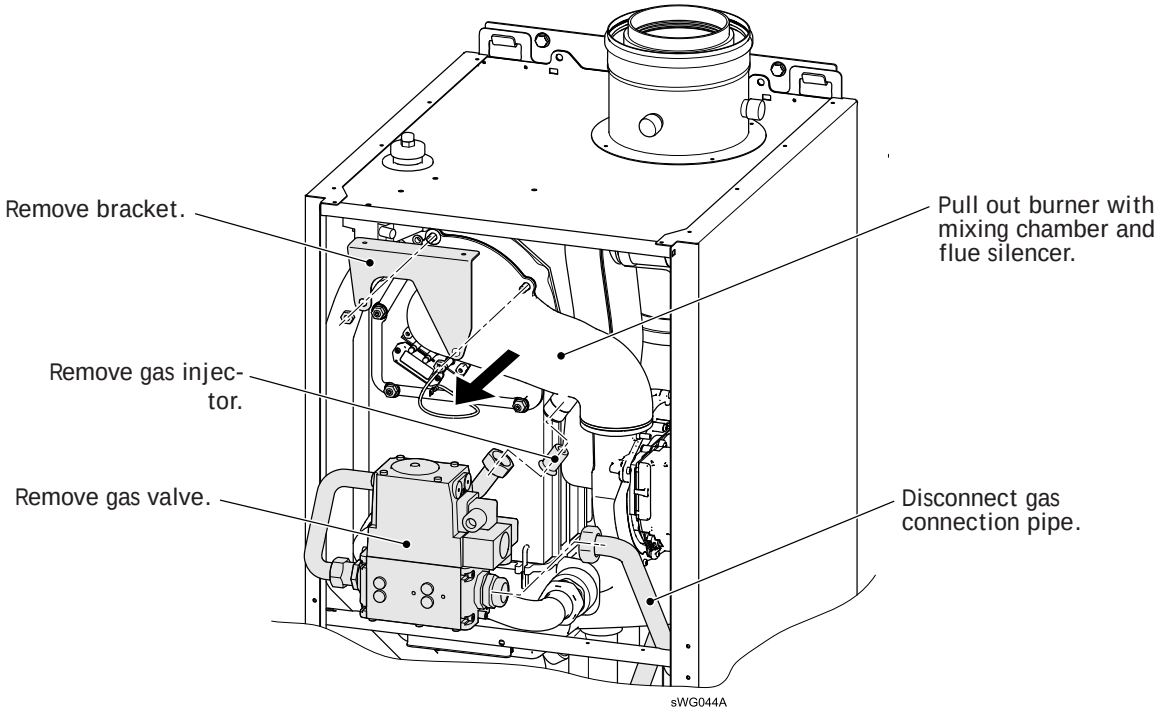
Dismantling gas brenner (PARAMOUNT two 95/115)

- Disconnect the connecting lines to the fan.
- Disconnect ionisation line.
- Disconnect ignition cable.
- Disconnect fastening screws of the bracket on the housing lid.
- Disconnect the screw connections of the gas connection pipe at the mixing chamber and the gas valve.
- Remove the gas connection pipe and the gas injector.
- Disconnect the gas connection pipe at the gas valve and remove gas valve.
- Undo the 5 fastening screws at the mixing chamber/heat exchanger.
- Remove bracket.
- Pull out the burner together with mixing chamber, fan and eahaust gas muffler to the front (siehe *Abb. 22*).
- Clean burner pipe with soft brush.

Fig. 22: Dismantle gas brenner (PARAMOUNT two 95/115)



Use new seals when installing.

10.5 Protection against electrical shock

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

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10.6 Boiler view PARAMOUNT two

Fig. 23: Boiler views PARAMOUNT two 30/40 (depicted without front case and control cover)

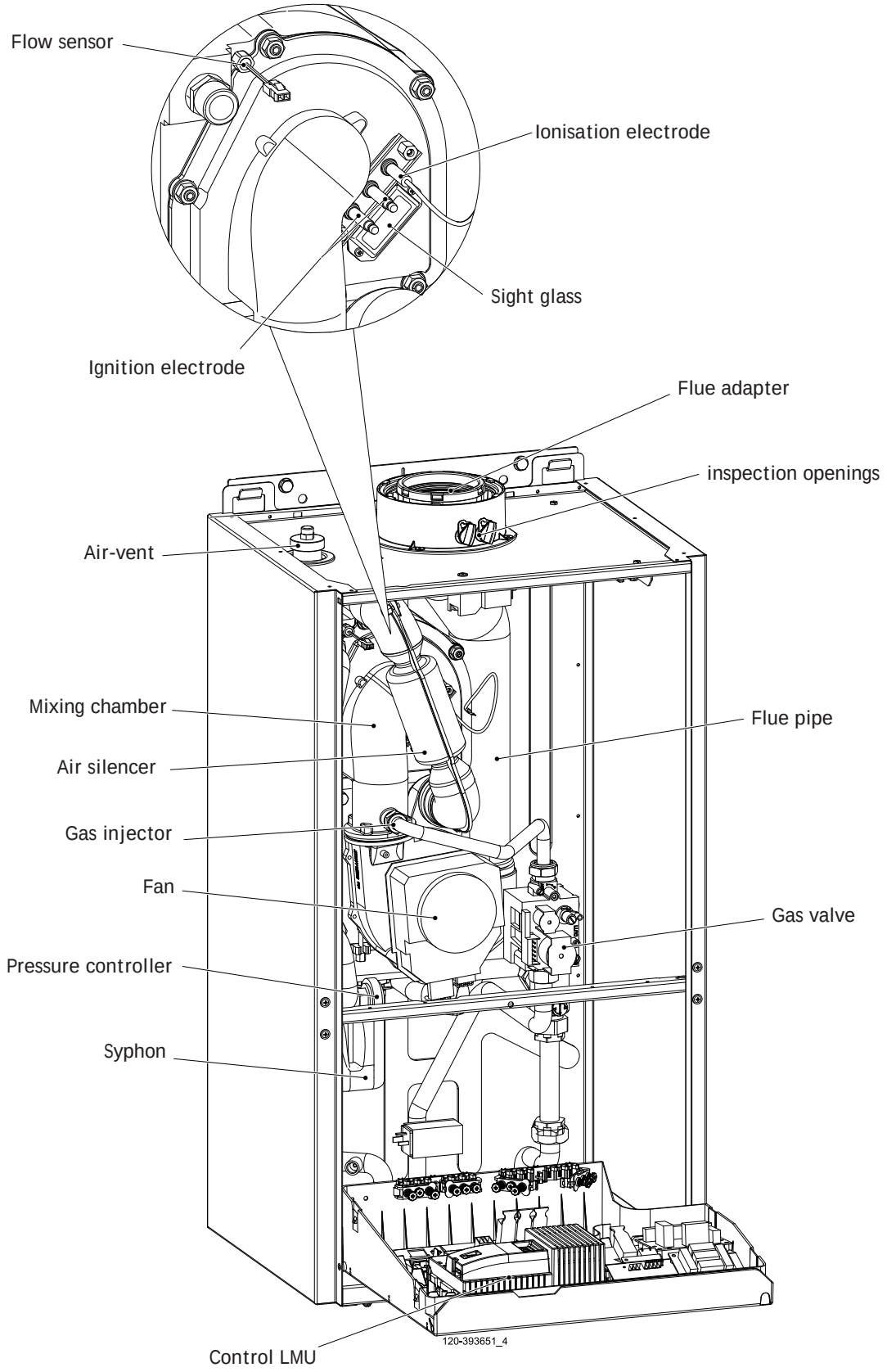

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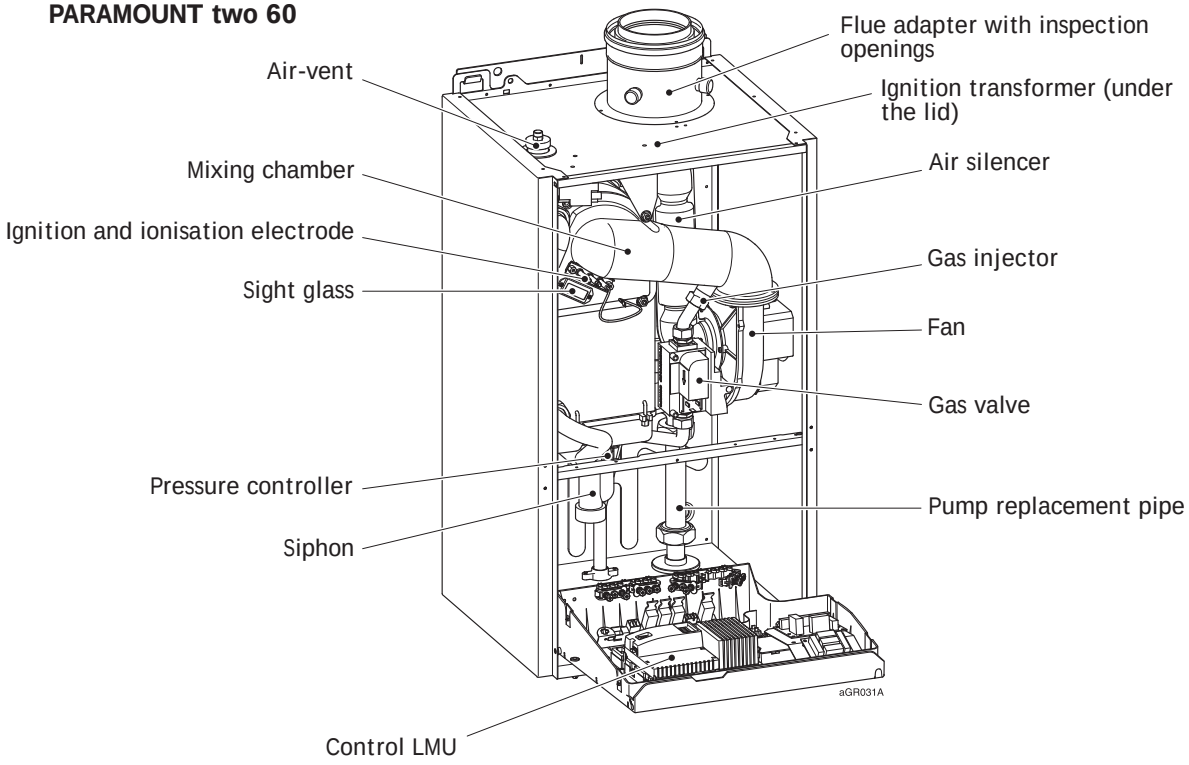
Fig. 24: Boiler views (depicted without front case and control cover)

PARAMOUNT two 60



PARAMOUNT two 80

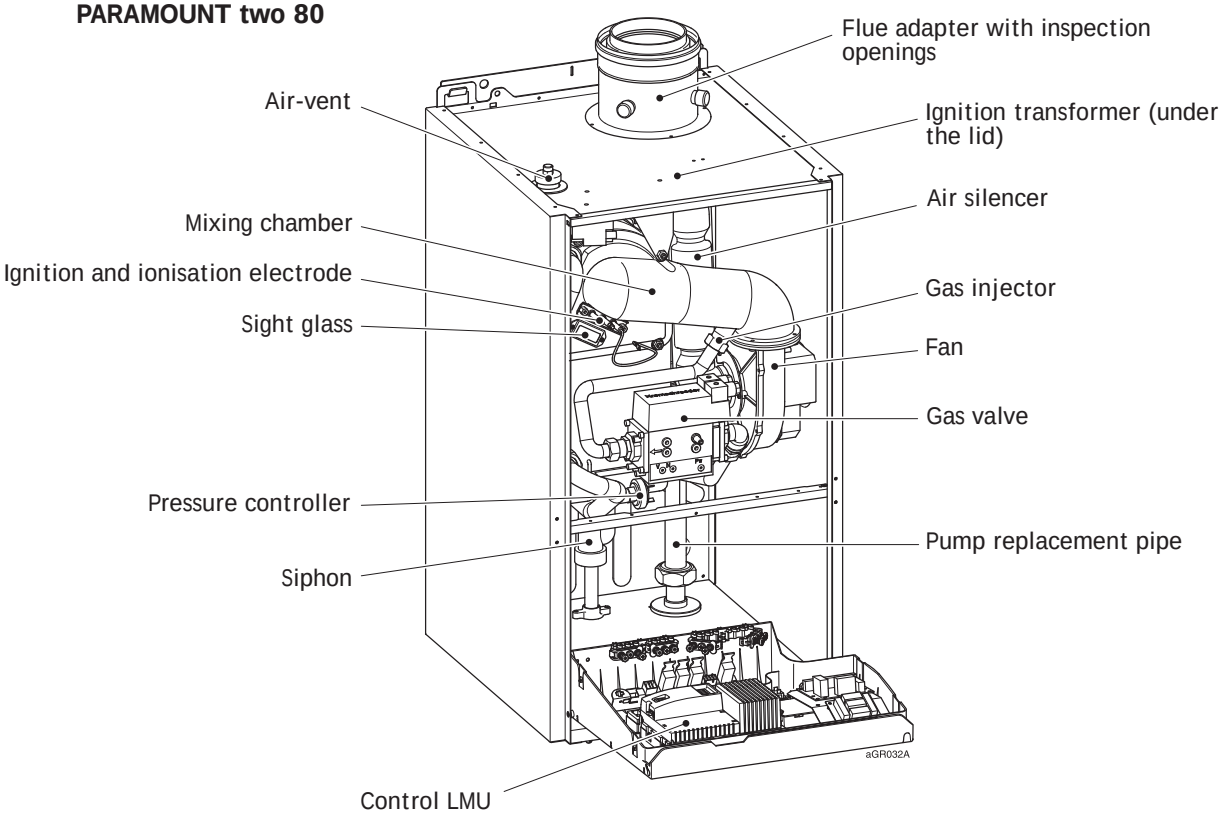


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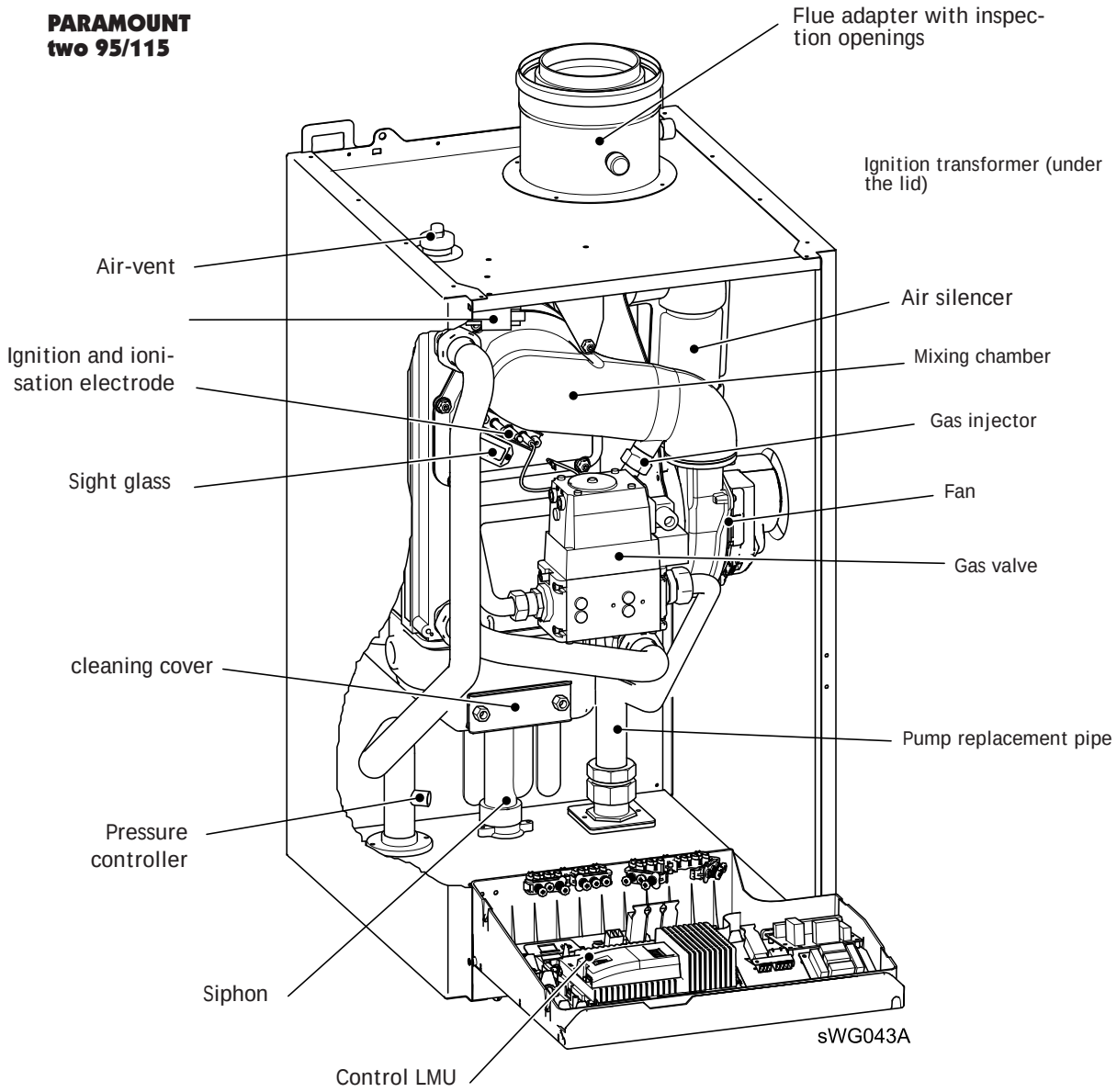
Fig. 25: Boiler views (depicted without front wall and control cover)



10.7 Dismantling the heat exchanger

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

- The burner must have been removed.
- Close isolation valve of flow and return and drain boiler water.
- Loosen plugs of boiler sensors (flow and return).
- Loosen screw connectors of flow and return at the heat exchanger (flat seal).
- Pull off cable from water pressure gauge.
- Undo the joint threat of the pump replacement pipe and remove it.
- Remove return pipe.
- Pull off plug from gas valve, loosen and disassemble gas valve.
- Remove connection pipe between heat exchanger and condensat sump.
- Push up the sliding sleeve of the flue gas pipe.
- Loosen nuts at condensat sump, remove yoke and dismantle collecting tray.
- Remove air vent.
- Loosen nuts of holding sheet at the rear casing, lift heat exchanger from the rear casing and take out.
- For cleaning the heat exchanger, rinse with soft water jet (without additives).

At the end of the maintenance work

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

10.8 Check electrodes

Ignition electrodes

To avoid an influence of the ionisation current by the ignition

- The ignition electrode must only immerse into the edge of the flame.
- The ignition spark must not spark-over to the ionisation electrode.

Installation position and electrode clearance has to be maintained according to fig. 26

Ionisation electrode

The ionisation electrode must always be in contact with the flame. During burner operation, the measured ionisation flow must not be less than.

- At minimum power > 5 µA DC (switching threshold at 0.7 µA DC)
- At maximum power 10 µA DC

For measurements put the ionisation lead at spade connection at ignition assembly and attach µA DC meter between them.
Caution! Do not touch plug contacts during the ignition process!

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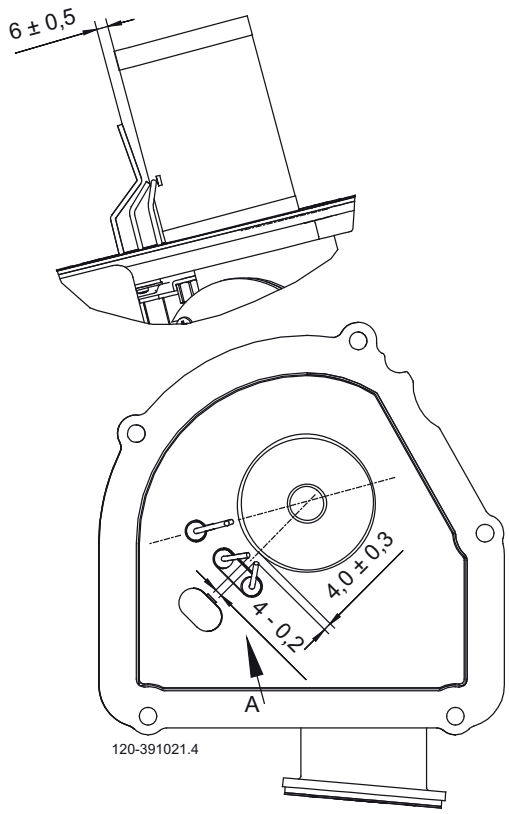
Fig. 26: Electrodes



10.9 Control and regulating centre LMU

Description of function

Control and monitoring of the burner with contol and regulating centre LMU, with ionisation electrode

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

The display on the opertating display shows the individual operating or programme statuses by means of digits and text (see fault code table).

Reset

After a reset (voltage OFF/ON) the control and regulating centre LMU starts into home run.

10.10 Fault switch-off

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

After every safety stop, a new ingition attempt according to programme is carried out. If this does not lead to a flame forming, shut-off is carried out.

In case of fault switch-off, the reset button on the control panel should be pressed.

In case of operation failure (bell symbol in the display), the digit in the display on the operating panel indicates the cause of the fault (see fault code table).

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Burner does not start:

No voltage at the control and regulating centre, e.g. no “burner ON“ signal from the heating circuit control (see fault code table).

Burner goes into fault status:

Without flame formation:
No ignition, ionisation electrode has earth connection, no gas.
Despite flame forming, the burner changes to fault status after the safety period: Ionisation electrode defective or contaminated. Ionisation electrode does not immerse into the flame, boiler connected to wrong terminal (live and neutral reversed).
If the failure symbol 🔔 appears, a fault exists in the plant. Further information about the fault can be called-up by pressing the information button.

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10.11 Fault code table

Fault code	Fault description	Explanations/causes
10	Outside temperature sensor short or interruption	Connection or outside sensor, emergency operation
20	Boiler flow sensor short or interruption	Check connection, inform heating specialist[1)]
32	Flow sensor (CITF, CIM) short or interruption	Check connection, inform heating specialist[1)]
40	Boiler return sensor - short or interruption	Check connection, inform heating specialist[1)]
50	WWF-sensor 1 short or interruption	Check connection, inform heating specialist, emergency operation[1]
52	WWF-sensor 2 short or interruption	Check connection, inform heating specialist[1)]
61	Fault room device	Check room device, emergency operation[1)]
62	Wrong room device connected	Connect compatible room control module
81	Short circuit on LPB-bus or no bus feed	Communication fault, check bus line or plug, LPB-bus feed not activated
82	Address collision on LPB-bus	Check addresses of connected control modules
91	Data loss in EEPROM internal fault LMU	Internal fault LMU, process sensor, replace LMU, heating specialist
92	Hardware error in the electronics	Internal fault LMU, process sensor, replace LMU, heating specialist
95	Invalid time	Correct time
100	Two time masters system fault	Check time master
105	Servicing message	See maintenance code (press information button once) for detailled information
110	Overheat (STB) has triggered (over temperature)	No heat removal, STB/interruption, possibly short in gas valve [2),] internal fuse defective, let device cool down and reset; if this fault occurs several times, inform heating specialist[3)]
111	Temperature monitor tripped (excess temperature)	No heat removal, pump defect,radiator valves closed[1)]
119	Water pressure switch tripped	Check or refill water pressure[1)]
132	Safety shut-off (e.g. by gas pressure monitor)	Lack of gas, contact GW opened
133	Automatic firing device disabled (no flame message after expiration of the safety time)	Reset, if the fault re-occurs several times, contact heating specialist, lack of gas, polarity of mains connection, safety period, check ignition electrode and ionisation current[1) 3)]
134	Flame failure during operation	Reset[3)]
135	Incorrect air supply	Speed threshold of fan exceeded or undercut, fan defective[1)]

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Fault code	Fault description	Explanations/causes
140	Impermissible LPB segment number or equipment number	Check setting of regulation
148	Incompatibility between LPB interface/basic unit	Check setting of regulation
151	Internal fault of LMU	Check parameters (see setting table heating specialist or call-up values),unlock LMU, replace LMU, heating specialist[1) 3)]
152	Fault of LMU-parameter setting	Repeat programming
153	Boiler locked (reset pressed)	Operate unlocking button[1)]
154	Plausibility criterion of electronic STB infringed	Return temperature higher than flow temperature or to fast temperature increase in the boiler[3)]
160	Speed threshold not reached	Fan possible defective, speed threshold set wrongly, no voltage at the output transformer (program number 5920)[3)]
161	Max. speed exceeded	Check parameters
183	Boiler in parameter setting mode	[3)]

[1)] Stopping, start prevention, re-start after fault removal
[2)] Check parameter according to table Setting Table Heating Specialist and program basic settings or call-up internal LMU SW-diagnosis code and correct respective parameter fault according to fault information!
[3)] Switching off and interlock can only be unlocked by reset
[4)] Only fault display, no switching off

10.12 Operation phases of control and regulation centre LMU (Press information button)

Display	Operating Status	Description of function
0	Standby (no heat demands)	Burner on stand-by
1	Start prevention	No internal or external release exists (e.g. no water pressure, lack of gas)
2	Fan startup	Self-test for burner start and fan startup
3	Pre-purging time	Pre-purging, fan deceleration time to starting load speed
4	Waiting time	Internal safety tests
5	Ignition phase	Ignition and start of safety period flame forming Ionisation current build-up
6	Safety time constant	Flame monitoring with ignition
7	Safety time variable	Flame monitoring without ignition
10	Heating mode	Room heating mode, burner in operation
11	Hot water mode	HW-tank charging, burner in operation
12	Parallel operation for heating and hot water	Heating and hot water mode

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Display	Operating Status	Description of function
20	Subsequent ventilation with last operating fan speed	Fan continues to run
21	Subsequent ventilation with pre-purging fan speed	Fan continues to run
22	Shutdown	Self-test after controlled shut-down
99	Fault position	The actual fault code is displayed, *see fault code table*

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11. Commissioning report

POTTERTON COMMERCIAL
Wood Lane, Erdington
Birmingham B24 9QP
Telephone 08706 050607 Fax 08706 001516

	REPORT SENT TO INSTALLER: YES ☐ NO ☐
	SITE VISIT ☐ COMMISSIONING ☐
	Date:..... Signature: .....
REPORT No: ..... SITE ADDRESS:	INSTALLER NAME & ADDRESS:..... .... VISIT/COMMISSIONING DATE: .....

1.0	BOILER							
1.1	Type:							
1.2	No of Sections:							
1.3	Boiler No/Position:		RH		LH		Centre	
1.4	Serial No:							
1.5	Fuel:	N/Gas		LPG				
2.0	BURNER							
2.1	Type:	Standard		Low NOx		Ultimate		
2.2	Flame Detection Probe:		UV Cell		Thermocouple			
2.3*	Control Box Type:							
2.4	Electrical Supply:							
2.5	Main Gas Valve Type & Size:							
2.6	Pilot Gas Valve Type & Size:							
2.7	Gas Train Serial Number:							
3.0	BURNER SETTINGS							
3.1	Main Burner Injector Size:						mm	
3.2	Pilot Burner Injector Size:						mm	
3.3	Are Burners & Injectors Clean?:							
3.4	Kanthal Bars Fitted? (Modified & Ultimate only):							
3.5*	Is the Probe of the Correct Type?							
3.6	Electrode Settings as Manual?							
4.0	PRE-COMMISSIONING CHECKS (See Note)							
4.1	Is boiler house ventilation as per manual?							
4.2	Electric supply fused, isolated & earth wire attached?							
4.3	Check external controls allow operation							
4.4	Check boiler/system flooded and pumps operational and any isolation valves open							
4.5	Check gas available at burner							
4.6c	Check condensate trap fitted, filled and connected to drain with air break							
4.7	Check gas meter sizing adequate							
4.8	Check flue system clear							

5.0	COMBUSTION				
		Pilot	Low	High	Unit
5.1	Gas rate				m^3/hr
5.2	Main Burner Pressure				mmwg
5.3	Pilot Burner Pressure				mmwg
5.4*	Ionisation Probe/UV Cell Current				uA
5.5c	Air Shutter Position				-
5.6	CO2 or O2				%
5.7	CO				ppm
5.8	Gross Flue Gas Temperature				°C
5.9	Ambient Temperature				°C
5.10	Flue Draught				mmwg
5.11	Inlet Gas Pressure (Main Burner). If multi-boiler installation, inlet gas pressure all boilers high fire)				mmwg

NOTE: 5.5 to 5.9 TO BE MEASURED IN SECONDARY FLUE 600mm UP FROM THE FLUE SOCKET OR AT THE SAMPLING POINT PROVIDED (CONDENSING BOILERS ONLY). THESE MEASUREMENTS ARE INTENDED AS SAFETY CHECKS ONLY. LEVELS ARE DEPENDENT ON FLUE DRAUGHT AND SITE CONDITIONS AND HENCE CANNOT BE USED FOR COMBUSTION EFFICIENCY DETERMINATION.

* FULLY ELECTRIC BOILERS ONLY
¶ THERMO-ELECTRIC BOILERS ONLY
c CONDENSING BOILERS ONLY
§ CONVENTIONAL ATMOSPHERIC BOILERS ONLY

NOTE: It is the installer's responsibility to ensure that the boiler is correctly commissioned by a competent engineer and that this report is completed and kept as a record. A commissioning service available from Potterton at the address listed on the back page of this manual. When a Potterton engineer commissions, this completed report will be sent to the installer. It is the installers responsibility to action any points arising. Commissioning by Potterton engineers is restricted to equipment of our supply. No responsibility is accepted for the on site assembly or installation of the equipment unless specifically carried out by Potterton. The installer must ensure that the boiler is installed in accordance with the manufacturer's instructions and all relevant BS Codes of Practice and Regulations (see manufacturers instructions for full details). Items 4.1 to 4.6 are related to the boiler installation and as such these pre-commissioning checks should be carried out in the presence of the installer.

Potterton is a Member of the Boiler & Radiator Manufacturers Association (BARMA), and the terms of this Commissioning Document follow the generally agreed conditions of the Association. Potterton, in line with its policy of continuous product development, reserves the right to alter and amend this Document as is deemed necessary at any time.

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6.0	OPERATIONAL SAFETY CHECKS		
6.1	Check control stat operation		
6.2	Check limit stat operation		
6.3	Check high/low stat operation		
6.4*	Check for gas leaks		
6.5*	Check for gas leakage past valve assembly		
6.5¶	Check for oil leaks		
6.6	Check boiler locks out on loss of flame signal		
6.7	Check boiler locks out on air pressure switch operation		
6.8	Check boiler locks out on all other safety functions		
6.9*	Check gas booster interlocks operational		
6.10	Record INLET and OUTLET pressure switch settings:- INLET …….. OUTLET ……		
7.0	BOILER/SYSTEM CHECK LIST		
7.1	Control stat left at	°C	
7.2	Limit stat left at	°C	
7.3	High/low stat left at	°C	
7.4	Maximum flow temperature recorded	°C	
7.5	Maximum return temperature recorded	°C	
7.6	Boiler water pressure		
7.7	Are pipework connections as per manual?		
7.8	Is safety valve fitted? If so, SIZE _____ PRESSURE RATING _____		
7.9	Are water isolating valves fitted?		
7.10	Are water flow switches fitted?		
7.11	Are return water shut off or diverter valves fitted?		
7.12	Is shunt pump fitted?		
7.13	Is pump overrun fitted?		
7.14	Flue type and diameter of connection to boiler:- TYPE ……DIAMETER (mm) …… Where appropriate and for multi boiler installations sketch details of flue system showing length of runs and diameters. Conventional ☐ Fan Assisted ☐ Flue Dilution ☐ Approximate overall height …….. m Is the fan interlocked with the boiler? YES / NO		
7.15	Are flue dampers fitted? YES / NO If so, interlocked? YES / NO		
7.16	Fan assisted ventilation? YES / NO		
7.17	Any evidence of condensate formation? YES / NO		
7.18	Any evidence of water leakage? YES / NO		
7.19	Any evidence of flue gas leakage? YES / NO		
7.20	Has boiler been built and cased correctly? YES / NO		
7.21*	Is gas service cock installed? YES / NO If so, accessible? YES / NO		
7.22¶	Is oil filter fitted? YES / NO		
7.23¶	Is fire valve fitted? YES / NO		
7.24¶	Oil supply:	Single Pipe	
		Two Pipe	
		Ring Main	
8.0	COMMENTS ON ACCESSIBILITY FOR MAINTENANCE		

9.0	NOTES & COMMENTS BY COMMISSIONING ENGINEER

FINDINGS		
	YES	NO
Is the installation safe for use?		
If the answer is NO, has a warning label been raised?		
Is any remedial work required?		
Have warning labels been fitted?		
Has RIDDOR form been raised?		
Customer Signature:		
Print Name:		
Date:		

ENGINEER DETAILS
NAME
COMPANY
SIGNATURE
DATE

Document ID Ref: PCF/029/5

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heating specialists