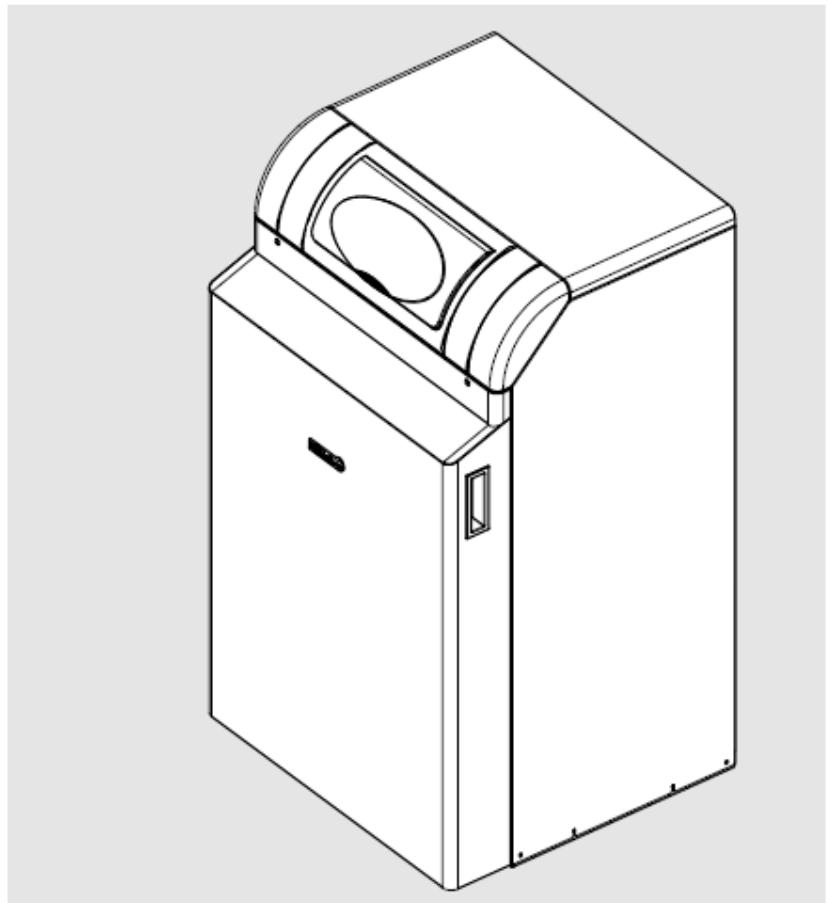


Chappee Moorea Condensing Boiler

90 – 250 kW

Installation operation & maintenance manual



September 2006

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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 EUROCONDENSE two for standard applications with 1 heating circuit and/or 1 DHW circuit.

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 your gas-fired 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 product.



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



Reference to additional information in other documents.

1.3 For whom is this manual intended?

This installation manual is intended for the heating specialist.

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 EUROCONDENSE two condensing boiler is available in eight sizes with outputs at 60°C return temperature from 86.7 kW to 474 kW. They are CE marked for use on Natural Gas on open vented systems and for use on sealed systems with a maximum operating pressure of 6 bar.

Refer to relevant British Standards and Codes of Practice for installation of condensing boilers on sealed system. The heat exchanger consists of an aluminium - silicon alloy, which allows very compact and lightweight boiler construction. The fully pre-mix burner works in a modulating range of between 35 % and 100 %. Therefore the boiler output is adapted to the particular heat requirements of the circuit. The gas/air ratio control ensures uniform CO₂ emissions and ultra low NO_x. This is obtained by comparing the target boiler temperature and the actual 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 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 gas/air ratio is maintained over the total range of the boiler modulation and that constant CO₂ values are achieved. For optimum utilisation condensing boilers should be operated at a low return temperature. However the EUROCONDENSE two will also work at designed temperatures of 70/50°C in the condensing mode as the return temperature is under the dew point (dew point is 53°C at 8.5 % CO₂). The EUROCONDENSE two is designed as a hot water heating boiler. It fulfils EN 483 and EN 677.

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

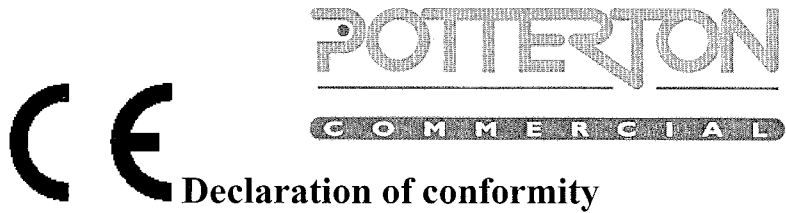
Management of H&S at Work Regulations 1998

Manual Handling Regulations 1992
Model Water By-Laws 1986
BS 7671: 1992 - Requirements for Electrical Installations, IEE Wiring, Regulations 16th Edition.
BS 5440: 2000: Part 1 - Specifications for Installation of Flues
BS 5440: 2000: Part 2 - Specifications for Installation of Ventilation for Gas Appliances.
BS 6644: 2005 - Installation of Gas Fired Hot Water Boilers for inputs between 60 kW and 2 MW.
BS 7074: 1989: Part 2 - application Selection and Installation of Expansion Vessels and Ancillary Equipment for Sealed Water Systems.
BS 6880: 1988 - codes of Practice for Low temperature Hot Water Systems.
EN 677: 1997 - Gas Fired Central Heating Boilers for Condensing Boilers with a nominal heat input not exceeding 70 kW.
CP 342:2 - Centralised Hot Water Supply Gas Safety (Installation and Use) Regulations 1998
IM/II - Flues for commercial and Industrial Gas Fired Boilers and Air Heaters.
IGE/UP/1 - Soundness Testing and Purging Procedure for Non Domestic Installations.
IGE/UP/2 - Gas Installation Pipe work, Boosters and Compressors for Industrial Commercial Premises.
Manufacturer's notes must not be taken in any way as over-riding statutory obligations.

2.5 C.E. Approvals

The CE approval symbol means that the EUROCONDENSE two fulfils 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 EUROCONDENSE two boiler fulfils the basic requirements of the Boiler Efficiency Directive 92/43/EEC for condensing boilers.

2.6 Conformity declaration

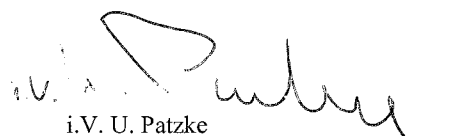


Product	Condensing gas boiler
Trade mark	EuroCondense
Product ID Number	CE-0085 BN 0577
Type, Model	EuroCondense <i>two</i> 90, 120, 160, 200, 250, 320, 400, 500
EU directives	90/396/EWG, 92/42/EWG 89/336/EWG, 73/23/EWG
Standards	DIN VDE 0722 DIN EN 50081-1, DIN EN 50082-2 DIN EN 50165, DIN EN 60335-1 DIN EN 483, DIN EN 677, DIN EN 656 DIN EN 676
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.

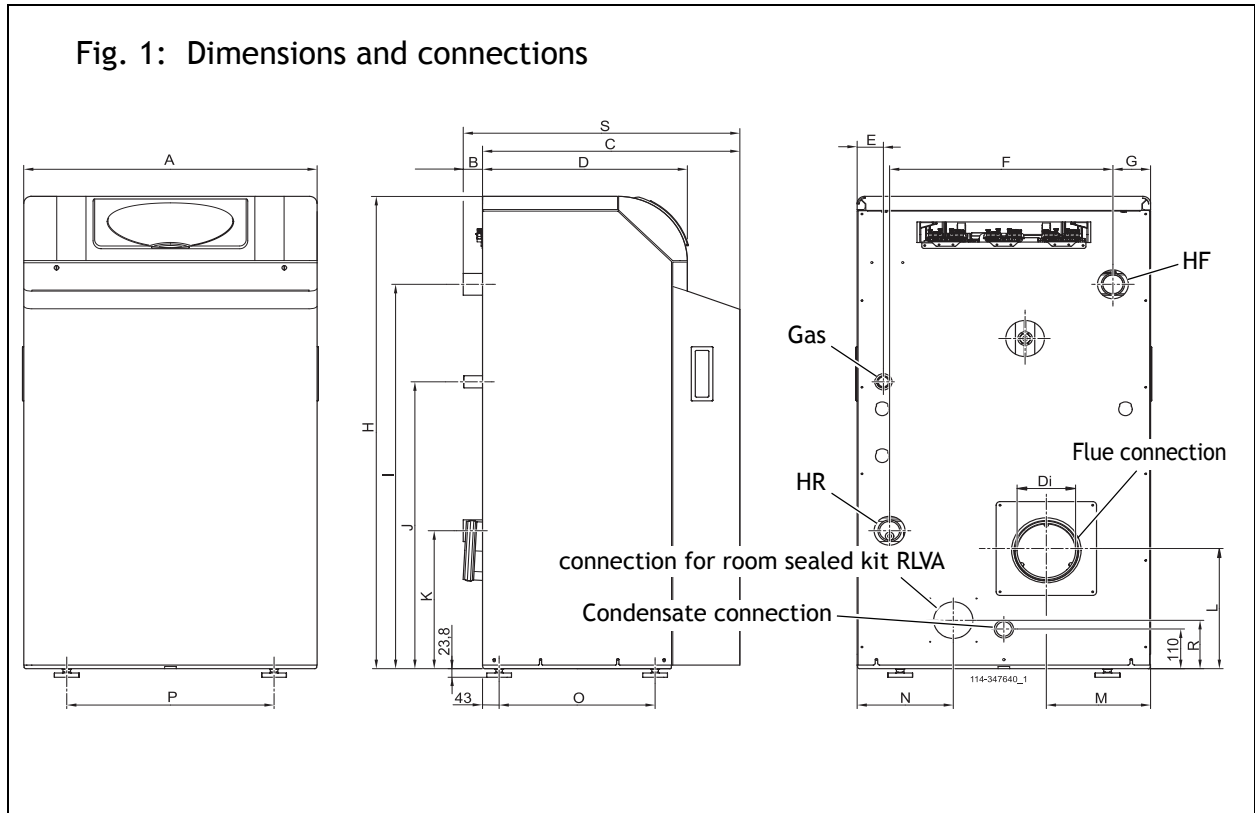
Rastede, 23.05.2006


 ppa. H. Wilken
 – Leiter Konstruktion und Entwicklung


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

3. Technical Data

3.1 Dimensions and connections EUROCONDENSE two



Model	Connections		
	HF (Heating flow)/HR (Heating return)	Gas (Gas connection)	RLVA
EC two 90	2" Male thread	1" Male thread	110 mm
EC two 120			110 mm
EC two 160	Flange 2 1/2"	1 1/2" Male thread	136 mm
EC two 200			136 mm
EC two 250			136 mm

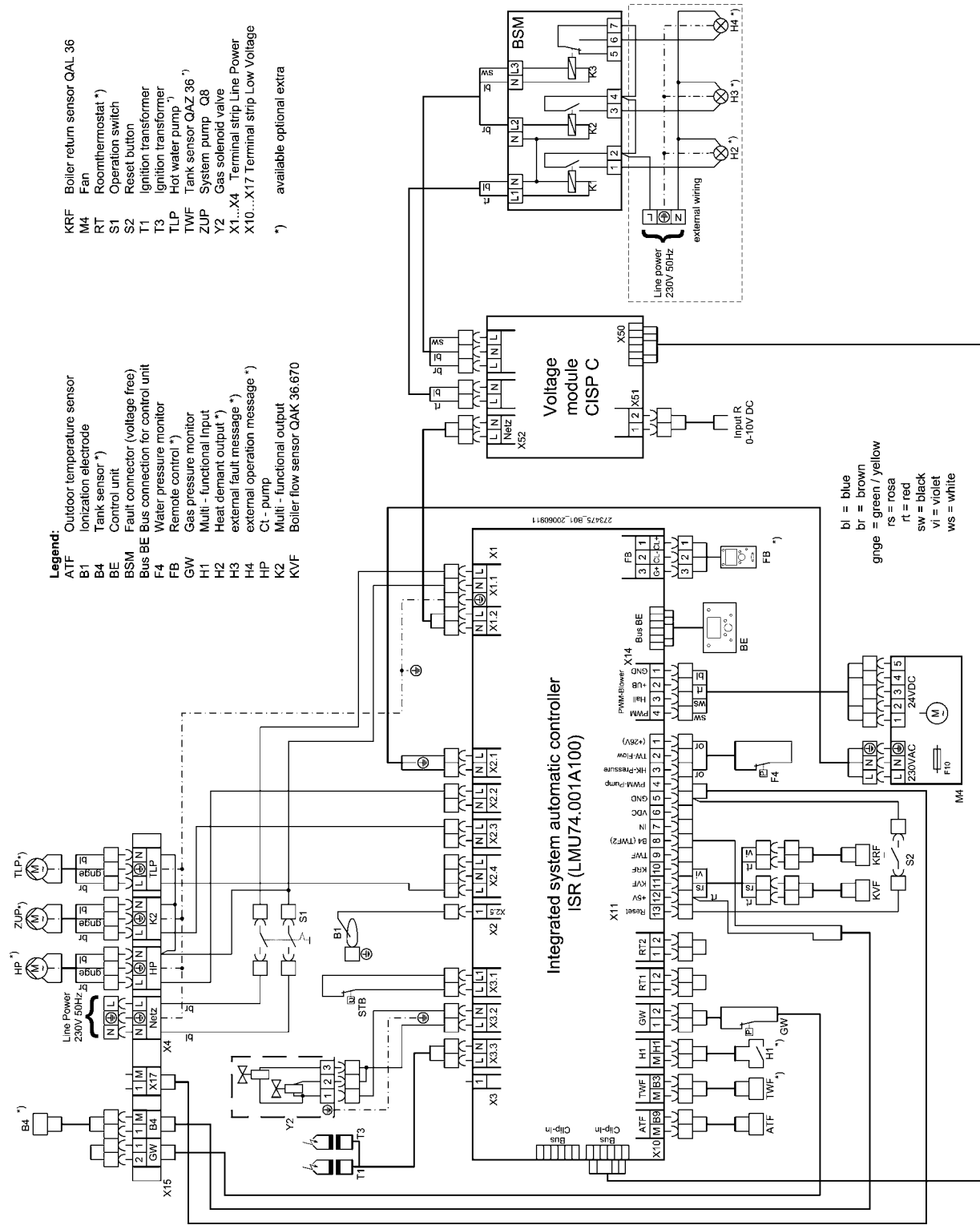
Model	Measurement in mm																		
	A	B	C	D	Di	E	F	G	H	I	J	K	L	M	N	O	P	R	S
EC two 90	760	50	667	531	152	68	579	98	1309	1065	795	382	333	270	249	404	537	134	717
EC two 120	841	50	667	531	152	64	689	83	1309	1065	795	382	327	255	270	404	647	120	717
EC two 160	1062	52	712	576	182	68	809	128	1440	1165	785	472	359	340	124	457	757	134	764
EC two 200	1142	52	712	576	182	108	919	113	1440	1165	785	472	359	325	434	457	867	134	764
EC two 250	1292	52	712	576	182	117	1029	143	1440	1165	785	472	359	355	499	457	977	134	764

3.2 Technical Data EUROCONDENSE two

Model EUROCONDENSE two		EC two 90	EC two 120	EC two 160	EC two 200	EC two 250
CE Number		CE-0085BN0577				
VDE-Reg. -No.		A117				
Nominal heat output 80/60°C (gross)	kW	24.2-86.7	32.0-115.6	43.4-153.0	53.8-190.2	66.5-237.0
Nominal heat output 50/30°C (gross)	kW	26.4-92.3	34.8-123.0	47.5-163.5	59.0-205.0	74.0-252.3
Nominal heat input (gross)	kW	99.9	133.2	177.6	220.0	277.5
Nominal heat input (net)	kW	90.0	120.0	160.0	200.0	250.0
Efficiency at 80/60°C (gross)	100%	86.8	86.8	86.1	85.7	85.4
	30%	89.9	89.6	90.5	89.8	88.8
Efficiency at 80/60°C (gross)	100%	92.4	92.3	92.1	92.3	91.9
	30%	95.9	95.5	96.3	95.9	95.9
Gas consumption (NG)	m ³ /h	9.4	12.5	16.7	20.9	26.1
Gas consumption (LPG)	m ³ /h	3.8	5.1	6.8	8.4	10.5
Flue temperature 80/60°C	°C	67	64	70	73	74
Flue temperature 50/30°C	°C	46	46	48	50	53
Flue gas volume (15°C and 1031 mbar)	m ³ /h	127	169	225	282	352
Nominal gas inlet pressure (NG)	mbar	20				
Nominal gas inlet pressure (LPG)	mbar	37				
CO ₂ for natural gas	%	8.0-8.5				
CO ₂ for LPG	%	9.5-10.0	9.5-10.0	9.5-10.0	9.0-9.5	9.0-9.5
High level ventilation to BS6644	cm ²	338	405	531	635	761
Low level ventilation to BS6644	cm ²	675	810	1062	1269	1522
Hydraulic resistance at 11°C Δt	kPa	8.3	9.7	10.6	12.6	15.9
Hydraulic resistance at 20°C Δt	kPa	3.0	3.4	3.5	4.2	5.1
Flow rate at 11°C Δt	l/s	1.95	2.61	3.47	4.34	5.43
Flow rate at 20°C Δt	l/s	1.08	1.43	1.91	2.39	2.99
Cold feed size	mm	25	25	32	32	32
Open vent size	mm	32	32	40	40	40
Max. pressure at boiler flue	mbar	1.0				
Flue spigot size	mm	150	150	180	180	180
Electrical supply	V/Hz	230/50				
Max. electr. power consumption	W	105	178	149	189	271
Minimum operating pressure	bar	1				
Maximum operating pressure	bar	6				
Maximum flow temperature	°C	88				
Boiler weight	kg	175	200	250	270	300
Boiler water content	l	12	15	20	23	26
Boiler height	mm	1309	1309	1440	1440	1440
Boiler width	mm	760	841	1062	1142	1292
Boiler depth	mm	717	717	764	764	764

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3.3 Wiring Diagram



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4. Before installation

4.1 Combustion air supply

For trouble-free operation of the EUROCONDENSE two sufficiently dimensioned inlet and outlet air openings are necessary. It has to be checked that these exist and are fully functional, in accordance with BS6644.



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

4.2 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 Cu_2O 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 stabilisers, frost protective agents, sealing agents)

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

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 permissible value of 8.3.

Maintenance instruction

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

4.5 Notes for installation location



Attention! The following has to be observed for the installation of the EUROCONDENSE two for heating operation in connection with DHW storage, in order to prevent damage from water, especially by possible leaks at the DHW storage, suitable precautions have to be taken regarding the installation.

Installation room

- The place of installation must be dry, the room temperature must lie between 0°C and 45°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 be in the front for carrying out maintenance work. The installation area for the boiler must be non-combustible and level

Pumps and hydraulic appliances

The pumps for the heating circuit and tank charging are to be arranged by the client (see Application Examples).

4.6 Clearances

When installing the EUROCONDENSE two, the following clearances should be considered:

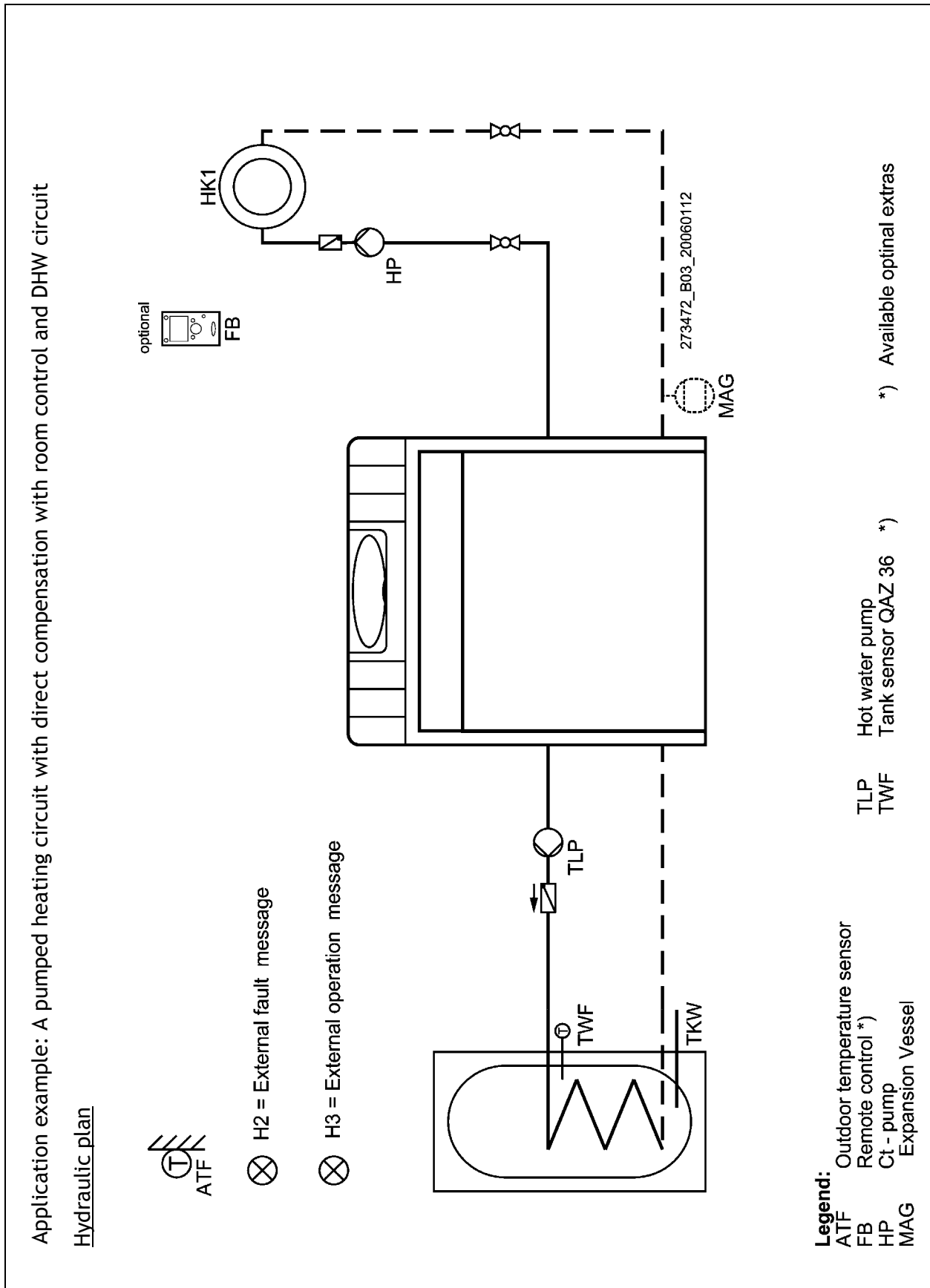
Front: 1000 mm

Top: 500 mm

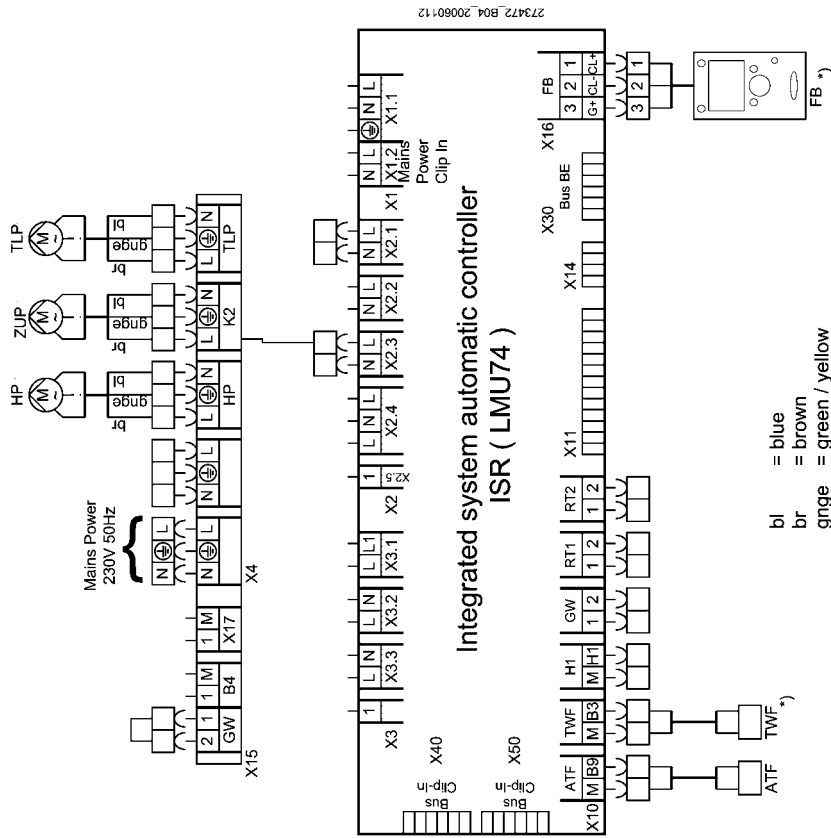
Rear: 500 mm

Sides: 300 mm

4.7 Application example



Wiring plan



- Legend:**
- ATF Outdoor temperature sensor
 - FB Remote control *)
 - GW Gas pressure monitor
 - HP Ct - pump
 - TLP Hot water pump
 - TWF Tank sensor QAZ.36
 - ZUP System pump
 - X1...X4 Terminal strip Mains Power
 - X10...X17 Terminal strip Low Voltage
 - *) available optional extra

The parameter attitude of this application corresponds to the delivery status.

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 thoroughly 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. Possibly discharged heating water must be removed without any danger.

5.2 Condensate

Direct introduction of the condensed water into the domestic waste water system is only allowed, if the system 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 EUROCONDENSE 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 lifting 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 of the heating system

- Fill the heating system via the return of the EUROCONDENSE two.
- Check tightness.

5.4 Flue connection

Typically a flue system must be constructed in 316 grade stainless steel with gasketed joints. Most flexible flue liners are unsuitable as they are not gas and water tight under positive pressure. Advice on flexible flue liners should be sought from a flue specialist.

Owing to the low flue gas temperature only single skinned flue pipe is necessary except in areas where personal protection is necessary (maximum temperature of 90 °C.)

The number of bends used should be kept to a minimum. Any bend used must be of the slow radius type, 90° tees must not be used. All flue runs should be run to allow free drainage and all low points must be drained. Material for drainage should be stainless steel or plastic, avoid the use of copper.

Flue systems should meet the applicable sections of:

- BS 6644: 2005
- British Gas publication IM11
- CIBSE Applications Manual AM3 - Condensing Boilers
- Third Edition of the 1956 Clean Air Act Memorandum

In addition to the above requirements of the Building Regulations should be strictly observed.

Care should be exercised with tall flue systems to ensure that excess buoyancy is not created. If this is unavoidable draught stabilisers should be considered plus a time delay device to prevent the boiler short cycling otherwise frequent nuisance lockouts may occur.

The boiler should be sited in accordance with BS 6644: 2005 with respect to protecting the boiler from damage, air for combustion and ventilation, discharge of products of combustion, clearances for service and access, temperatures, noise levels, the disposal of boiler water and the effects of flooding of the boiler house or seepage from a roof top boiler house.

Boiler	Nominal flue size (mm)	1 bend*	2 bends*	3 bends*	4 bends*
EC two 90	150	42	42	42	42
EC two 120	150	45	45	45	45
EC two 160	180	50	50	46	46
EC two 200	180	50	50	46	46
EC two 250	180	50	50	46	46

* bends: 90°

5.5 Gas connection

The gas connection 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 to a maximum of **150 mbar**

De-airing gas line

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

Factory settings

The EUROCONDENSE 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 burner. The data, set by the manufacturer, have to be checked with the local supply conditions before installation of the EUROCONDENSE 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: 18 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. 2).



Attention!

The boiler must not be operated at connecting pressures outside the given values!

The gas supplier has to be informed.

5.6 CO₂ -Content

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

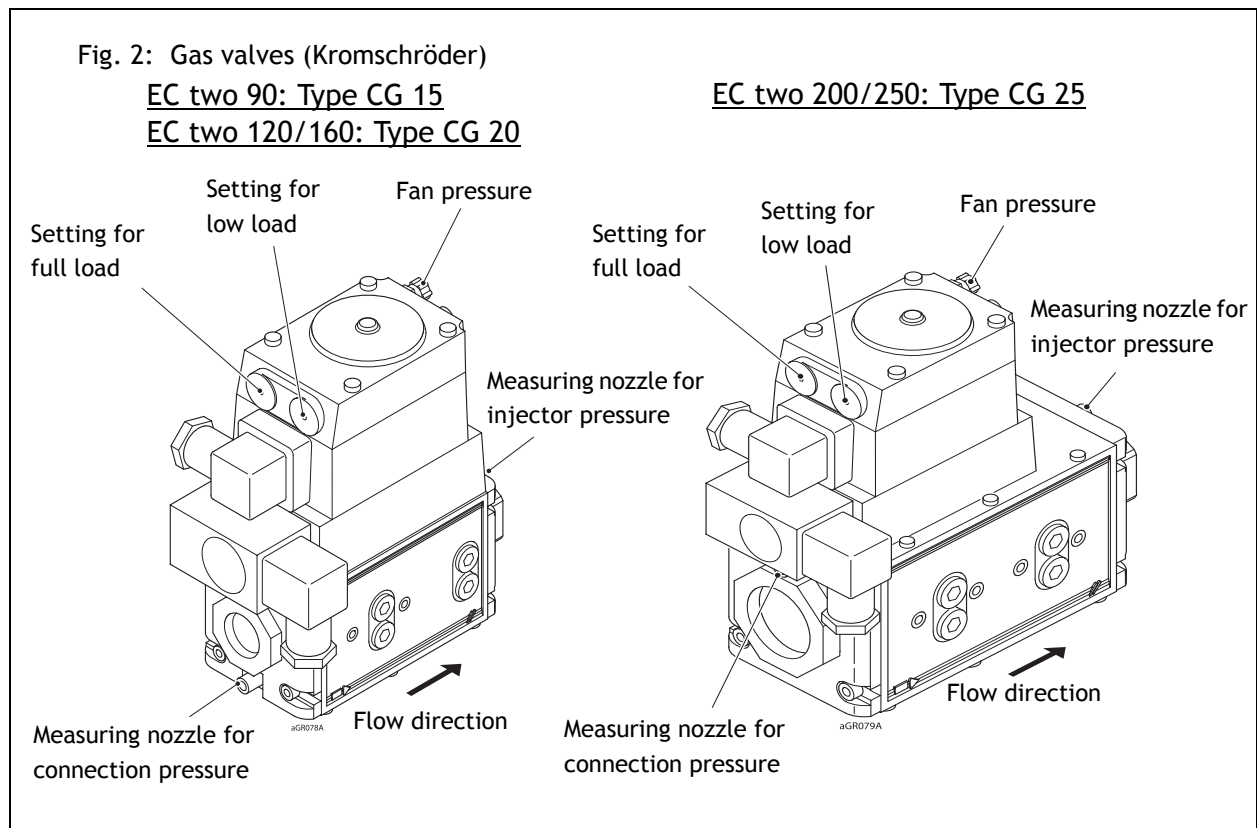
CO₂-content in operation see section 3.2 'Technical Data EUROCONDENSE two' on page 10.

Too high CO₂ -values can lead to unhygienic combustion (high CO-values) and damage to the burner.

Too low CO₂ -values can lead to ignition problems.

The CO₂ -value is set at the gas valve by adjusting the gas pressure.

5.7 Gas valves

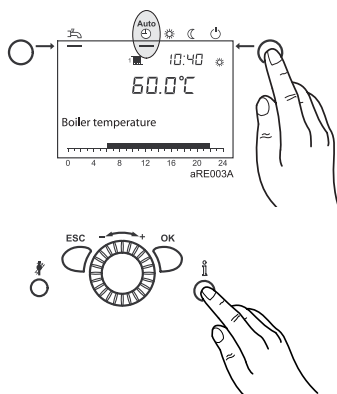


Adjusting and checking the CO₂ values

Operate the EUROCONDENSE 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 *Controller Stop Function ON* is displayed.
- Wait, until the display has reached the basic display again. Press information button. The message *Controller stop setpoint Adjust?* 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 controller stop function is stopped by pressing the *operating mode button Heating Operation* for approximately 3 seconds, reaching the maximum boiler temperature or a time limit.

5.8 Guide Values for Injector Pressure

Guide values for gas flow, injector pressure and CO₂-content
The listed values in the table are to be used as guide values.

Table 2: Guide values for injector pressure (full load)

Model			EC two 90	EC two 120	EC two 160	EC two 200	EC two 250
Nominal Heat Input	Natural Gas	kW	90.0	120.0	160.0	200.0	250.0
Nominal Heat Output	80/60 °C	kW	86.7	115.6	153.0	190.2	237.0
	50/30 °C	kW	92.3	123.0	163.5	205.0	252.3
Nominal Heat Input	LPG	kW	45.0 - 90.0	60.0 - 120.0	80.0 - 160.0	100.0 - 200.0	125.0 - 250.0
Nominal Heat Output	80/60 °C	kW	43.5 - 86.7	58.1 - 115.6	77.1 - 153.0	96.1 - 190.2	120.0 - 237.0
	50/30 °C	kW	47.4 - 92.3	63.1 - 123.0	84.3 - 163.5	105.1 - 205.0	130.0 - 252.3
Injector diameter for							
Natural Gas (G20)		mm	7,80	9,20	10,30	11,40	13,00
LPG (propane)		mm	6,20	7,40	7,50	8,50	9,50
Gas Type:			Guide values for injector pressure**				
- Propane		mbar	8,5 - 10,5	8,0 - 9,5	14,0 - 19,0	12,0 - 17,0	16,0 - 17,0

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

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

CO₂ -Content see section "Technical Data EUROCONDENSE two" on page 10.

5.9 Electrical Connection (general)



Danger 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
- AC 230 V +10% - 15%, 50 Hz, max. 140 W, fuse: 6.3 A

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 6.3 A internal fuse.

Cable lengths

Cables for sensors or 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 mm dia
- Copper wires up to 80 m 1 mm²
- Copper wires up to 120 m 1.5 mm²

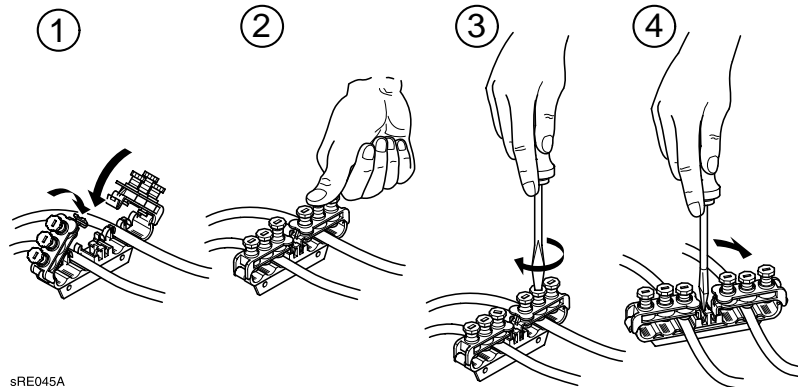
Strain reliefs

All electrical cables must be fed through the cable glands at the rear of the boiler. The cables then should be fixed into the strain reliefs (fig. 3) in the control panel and connected in accordance with the wiring diagram.

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 cable glands seal the cables.

Fig. 3: Strain relief



SRE045A

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 exit is $I_{N \max} = 1A$.

Fuses

Fuses in the control unit:

- F1 - T 6,3 H 250 ; mains

Connect sensor/ components



Danger of electric shock! Observe wiring diagram!

Assemble and connect accessories according to the enclosed instructions. Check earthing.

Outdoor temperature sensor (included with boiler)

The outdoor temperature sensor is located 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 POTTERTON 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 EUROCONDENSE two.



Initialising the sensors

After all electrical work has been finished, carry out a mains-reset. With this, all connected sensors are initialised and the control functions correctly.

Safety temperature limiter (overheat thermostat)

The safety temperature limiter (STB) has been set at the factory at 110 °C.



Test function for STB:

Press chimney sweep button. The boiler will be heated up until STB is triggered after approximately 3 seconds. The function is activated for as long as the button is depressed.

6. Commissioning

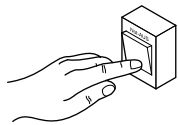


Danger! The commissioning must only be carried out by a heating specialist! The heating specialist checks tightness of the installation, correct function of all regulating, control and safety devices. See commissioning sheet at rear of manual!

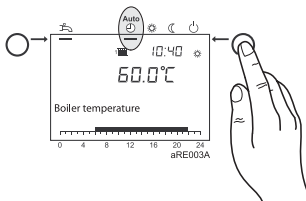
6.1 Switching on




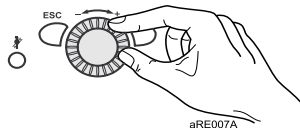
Danger of scalding! Hot water may exit from the blow out pipe of the safety valve.



1. Switch on heating 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 



5. Set the required boiler 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 a setting of 55°C is recommended.

6.3 Programming of necessary parameters

Normally, the control parameters do not have to be modified (Application example 1). Only date/time and possibly the time programmes have to be modified.



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

6.4 Instruction for the customer

Instruction

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

- The air inlet must not be restricted;

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

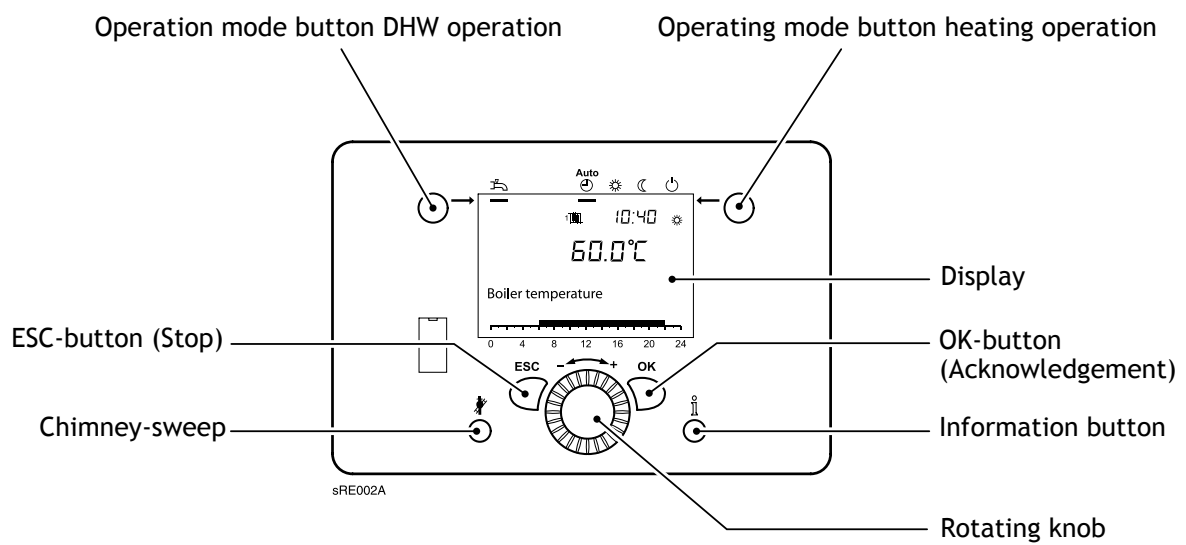
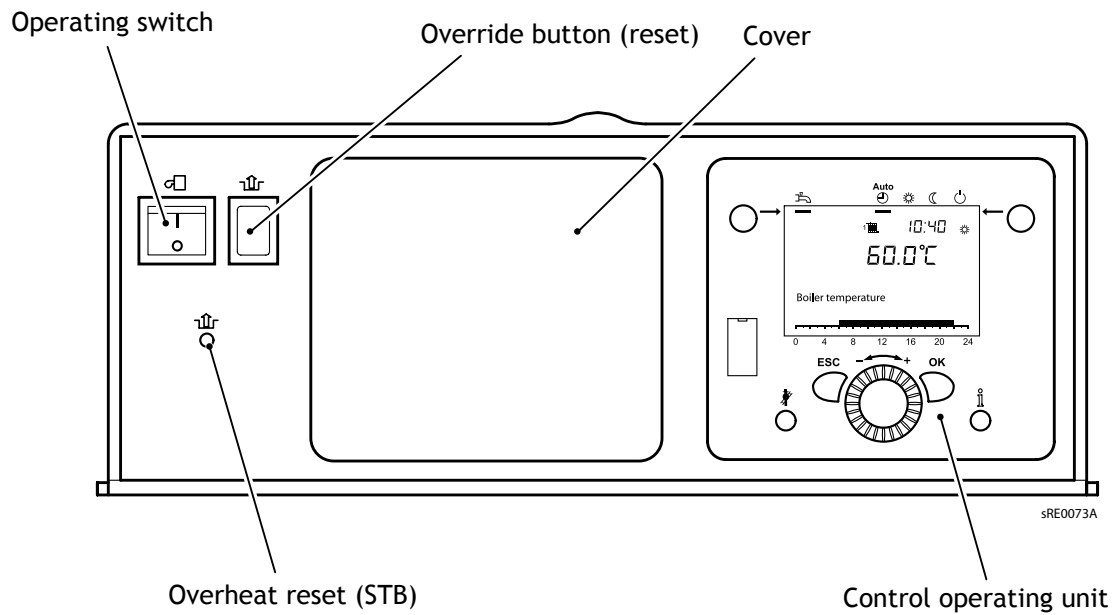
Documents

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

7. Operation

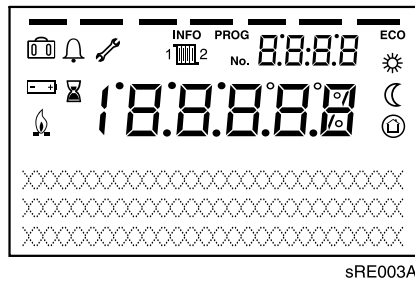
7.1 Operation elements

Fig. 4: Operation elements












7.2 Displays

Fig. 5: Symbols in the display



Meaning of the display symbols



	Heating at comfort nominal value
	Heating at reduced nominal value
	Heating at frost protection nominal value
	Current process
	Burner activated
	Holiday function activated
	Reference to heating circuit 1 or 2
	Sevicing message
	Fault message
INFO	Information level activated
PROG	Setting level activated
ECO	Heating switched off (ECO-function activated)

7.3 Operation

Stop heating operation

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

Automatic operation

- 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 activated

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

Stand by operation

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

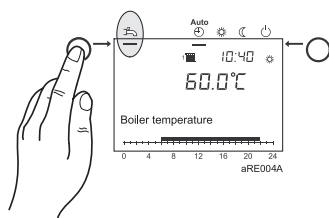
DHW operation

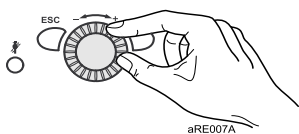
→ Switched on:

DHW is processed according to the selected switching programme.

→ Switched off:

DHW processing is deactivated.



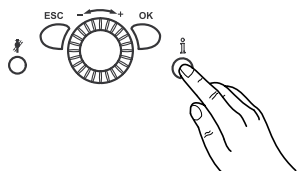


Setting nominal room value

- 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 acknowledgement 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.

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

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



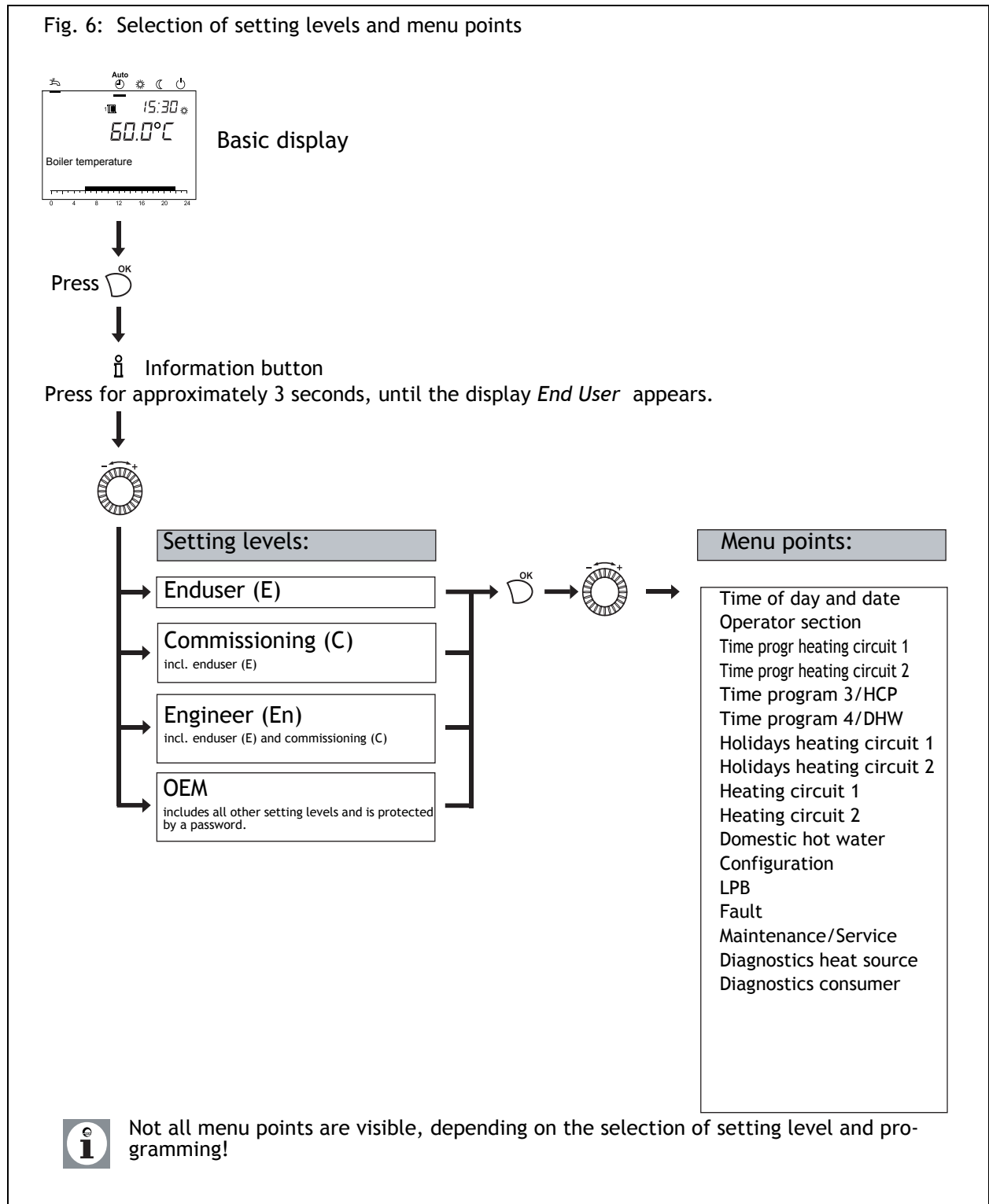
Chimney-sweep function 🧑🔧

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

8. Programming

8.1 Programming procedure

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

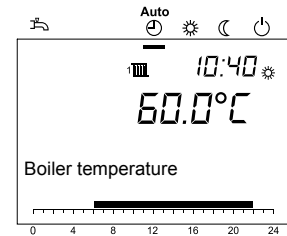


8.2 Modification of LMU parameters


Settings, which are not directly modified via the front panel, have to be carried out in the setting level of the LMU.

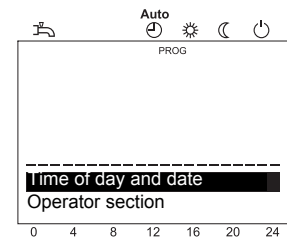
The basic programming process is depicted in the following by the setting of time of day and date.

Basic display:




Press .

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




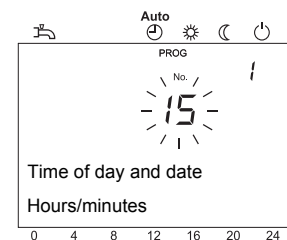
Acknowledge selection with .


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




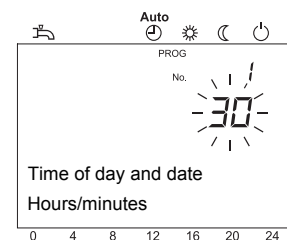
Acknowledge selection with .


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

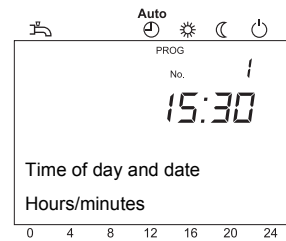


Acknowledge setting with .

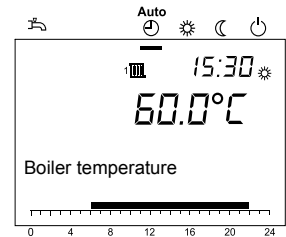
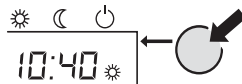
Carry out minute setting (e.g. 30 minutes) with .



Acknowledge setting with .



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



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

8.3 Setting table LMU





- 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 (C) and Engineer(En), press OK button. After this, press the Information button for approximately 3 s, select the required level with the rotating knob and acknowledge with the OK button.

Table 3: Setting the parameters


Function	Prog.-No.	Setting level ¹	Standard value	Modified value
Time of day and date				
Hours/minutes	1	E	00:00 (h:min)	
Day/month	2	E	01.01 (day.month)	
Year	3	E	2004 (year)	
Operator section				
Language	20	E	English	
Read data No Yes	30	En	No	
Write data No Yes	31	En	No	
Use as Room unit 1 Room unit 2 Operator unit Service unit	40	C	Room unit 1	
This parameter is only visible in the room unit!				
Assignment room unit 1 Heating circuit 1 Heating circuits 1 and 2	42	C	Heating circuit 1	
This parameter is only visible in the room unit, as the operator unit in the boiler is fixed programmed for the operating device!				
Operation HC2 Commonly with HC1 Independently	44	C	Commonly with HC1	
Operation HCP Commonly with HC1 Independently	46	C	Commonly with HC1	
Action occupancy button None Heating circuit 1 Heating circuit 2 Commonly	48	C	None	
This parameter is only visible in the room unit!				
Time prog heating circuit 1				
Preselection Mo-Su Mo-Su Mo-Fr Sa-Su Mo Tu We Th 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)	
Default values No Yes	516	E	No	
Time prog heating circuit 2 Parameter only visible, if heating circuit 2 exists!				
Preselection Mo-Su Mo-Su Mo-Fr Sa-Su Mo Tu We Th Fri Sa Su	520	E	Mo - Su	

114-394-423.4 09.06 Sa

Function	Prog.- No.	Setting level ¹	Standard value	Modi- fied value
1st phase ON	521	E	06:00 (h/min)	
1st phase OFF	522	E	22:00 (h/min)	
2nd phase ON	523	E	--:-- (h/min)	
2nd phase OFF	524	E	--:-- (h/min)	
3rd phase ON	525	E	--:-- (h/min)	
3rd phase OFF	526	E	--:-- (h/min)	
Default values No Yes	536	E	No	
Time program 3 / HCP				
Preselection Mo-Su Mo-Su Mo-Fr Sa-Su Mo Tu We Th 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)	
Default values No Yes	556	E	No	
Time program 4 / DHW				
Preselection Mo-Su Mo-Su Mo-Fr Sa-Su Mo Tu We Th Fri Sa Su	560	E	Mo - Su	
1st phase ON	561	E	06:00 (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)	
Default 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)	
Operating level Frost protection Reduced	658	E	Reduced	
Heating circuit 1				
Comfort setpoint	710	E	20.0 °C	
Reduced setpoint	712	E	16.0 °C	
Frost protection setpoint	714	E	10.0 °C	
Heating curve slope	720	E	1.50	
Summer/winter heating limit	730	E	20 °C	
Room influence	750	C	- - -%	
Speed design point	884	C	20	
Pump PWM min	885	C	40 %	
Standard outside temp	886	C	- 20 °C	
Flow temp setpoint standard OT	887	C	80 °C	
dT differential standard OT	894	C	20.0 °C	

Function	Prog.- No.	Setting level ¹	Standard value	Modi- fied value
Heating circuit 2  Parameter only visible, if heating circuit 2 exists!				
Comfort setpoint	1010	E	20.0°C	
Reduced setpoint	1012	E	16.0°C	
Frost protection setpoint	1014	E	10.0°C	
Heating curve slope	1020	E	1.50	
Summer/winter heating limit	1030	E	20°C	
Room influence	1050	C	- - %	
Domestic hot water				
Nominal setpoint	1610	E	55°C	
Release 24h/day Time programs HCs Time program 4/DHW	1620	C	Time programs HCs	
Circulating pump release Time program 3/HCP DHW release Time program 4/ DHW	1660	C	DHW release	
Circulating pump cycling Off On	1661	C	ON	
Configuration				
Hydraulic diagram	5701	C		
Zones with system pump No Yes	5761	C	No	
HC1 with system pump No Yes			No	
HC2 with system pump No Yes			No	
DHW with system pump No Yes			No	
Relay output K2 Default Status output Alarm output Status informa- tion External transformer Heating circuit pump HC2 Circulation pump Warm air curtain function Pump pressureless header System pump Q8 Basic function K2 Full DHW charging Threshold analog signal RelCl Flue gas damper Collector pump Fan shutdown	5920	C	System pump Q8	
Relay output 1 RelCl Default Status output Alarm output Status informa- tion External transformer Heating circuit pump HC2 Circulation pump Warm air curtain function Pump pressureless header System pump Q8 Basic function K2 Full DHW charging Threshold analog signal RelCl Flue gas damper Collector pump Fan shutdown	5922	C	Status output	
Relay output 2 RelCl Default Status output Alarm output Status informa- tion External transformer Heating circuit pump HC2 Circulation pump Warm air curtain function Pump pressureless header System pump Q8 Basic function K2 Full DHW charging Threshold analog signal RelCl Flue gas damper Collector pump Fan shutdown	5923	C	Alarm output	
Relay output 3 RelCl Default Status output Alarm output Status informa- tion External transformer Heating circuit pump HC2 Circulation pump Warm air curtain function Pump pressureless header System pump Q8 Basic function K2 Full DHW charging Threshold analog signal RelCl Flue gas damper Collector pump Fan shutdown	5924	C	Status information	
Relay output 1 SolCl Default Status output Alarm output Status informa- tion External transformer Heating circuit pump HC2 Circulation pump Warm air curtain function Pump pressureless header System pump Q8 Basic function K2 Full DHW charging Threshold analog signal RelCl Flue gas damper Collector pump Fan shutdown	5926	C	Default	

Function	Prog.- No.	Setting level ¹	Standard value	Modi- fied value
Relay output 2 SolCl Default Status output Alarm output Status informa- tion External transformer Heating circuit pump HC2 Circulation pump Warm air curtain function Pump pressureless header System pump Q8 Basic function K2 Full DHW charging Threshold analog signal RelCl Flue gas damper Collector pump Fan shutdown	5927	C	Default	
Relay output 3 SolCl Default Status output Alarm output Status informa- tion External transformer Heating circuit pump HC2 Circulation pump Warm air curtain function Pump pressureless header System pump Q8 Basic function K2 Full DHW charging Threshold analog signal RelCl Flue gas damper Collector pump Fan shutdown	5928	C	Default	
Function input H1 None Modem Modem inverse Warm air curtain Checkb sign flue gas damper Heat generator lock Heat generaror lock inverse	5950	C	None	
Modem function None Optg mode change HCs+DHW Optg mode chan- geover HCs Optg mode changeover HC1 Optg mode changeover HC2	5957	C	Optg mode change HCs+DHW	
Config room thermostat 1 None Room thermostat Time switch room level Time switch heat request Time switch DHW level	5970	C	None	
Config room thermostat 2 None Room thermostat Time switch room level Time switch heat request Time switch DHW level	5971	C	None	
Function input RelCl None Modem Modem inverse Warm air curtain Preselected setpoint Preselected output Sensor pres- sureless header Checkb sign flue gas damper Heat generator lock Heat generator lock inverse Heat generation lock sensor	5973	C	None	
Ext flow temp setpoint max	5975	C	100 °C	
Ext preselected output threshold	5976	C	5 %	
Function input SolCl No collector sensors	5978	C	None	
Time constant building	6110	C	15 h	
LPB				
Device address	6600	C	1	
Fault				
SW diagnostic code	6705	E		
Burn ctrl phase lockout pos		E		
Maintenance / Service				
Message	7001	E	0	
Acknowledgement message	7010	E	0	
Diagnostics heat source				
Boiler temperature	8310	C		
Boiler return temperature	8314	C		
Status indic burner control	8328	C		
Ionization current	8329	C		
Hours run counter burner	8336	C		
Start counter burner	8337	C		
Hours run heating mode	8338	C		
Hours run DHW	8339	C		
Hours run zones	8340	C		
Collector temperature 1	8510	C		
Hours run solar yield	8530	E		




Function	Prog.- No.	Setting level ¹	Standard value	Modi- fied value
Diagnostics consumers				
Outside temperature	8700	C	-°C	
Outside temp attenuated	8703	C	-°C	
Outside temp composite	8704	C	-°C	
Room temperature 1	8740	C	- - -°C	
Room setpoint 1		C	15°C	
Flow temperature 1	8743	C	-°C	
Flow temperature setpoint 1		C	20°C	
Room temperature 2	8770	C	- - -°C	
Room setpoint 2		C	15°C	
Flow temperature 2	8773	C	-°C	
Flow nominal value 2		C	20°C	
DHW temperature 1	8830	C	-°C	
DHW temperature setpoint		C	55°C	
DHW temperature 2	8832	C	-°C	
Information values  The display of the information values depends on the operation status!				
Message	6700	E		
SW diagnostic code	6705	E		
Message	7001	E		
Controller stop setpoint	7145	E	- - - %	
Floor curing setp current		E	-°C	
Floor curing day current		E	0	
Room temperature	8741	E	-°C	
Room temperature min		E	-°C	
Room temperature max		E	-°C	
Boiler temperature	8310	E	-°C	
DHW temperature 1	8830	E	-°C	
Collector temperature 1	8510	E	0°C	
Outside temperature	8700	E	-°C	
Room temperature 1		E	-°C	
Room setpoint 1	8741	E	-°C	
Room temperature 2		E	-°C	
Room setpoint 2	8771	E	-°C	
Status indic burner control	8362	E		

1. E = Enduser; C = Commissioning; En = Engineer



Parameters with the program numbers 1-48 are individual parameters of the operating unit and the room device and may, therefore, be set differently on both devices. All parameters from programme number 500 onwards are stored in the controller and, therefore, identical. The value modified last, is the valid value.

8.4 Explanations for settings table

Time and date (1 to 3)	Time of day and date	<p>The control has a year clock with setting possibilities for time, day/month and year. Time and date must be correctly set, so that the heating programs can operate according to programming.</p>
Language (20)	Operator section	<p>The language of the menu guidance can be modified under program number 20.</p>
Read data (30)	<p>The data of the controller unit LMU will be written into the room unit (only available for the room unit).</p>	<p>Attention! The data stored in the room unit will be overwritten! In this way the individual programming of the controller unit can be stored in the room unit!</p>
Write data (31)		<p>The data entered into the operating unit respectively the room unit will be written into the controller unit LMU.</p>
Usage as (40)		<p>Attention! The data stored in the in the controller unit LMU will be overwritten! In the operating unit the default parameters are stored so by writing the data to the controller unit LMU all data will be set back to the default parameters</p>
Assignment room device 1 (42)	<p>Selection of the operating unit. Depending on the selected operating unit, further settings are necessary, which are described under the following program numbers</p>	<p>If the setting room device 1 (program number 40) has been selected at the room device, it must be set under program number 42, if the room device will be attributed to heating circuit 1 or both heating circuits.</p>
Operation HC2/HCP (44, 46)	<p>When selecting room device 1 or operating unit (program number 40), it must be set under program number 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 operating unit.</p>	
Action occupancy button (48)	<p>The effect of the occupancy button on the heating circuits has to be set under program number 48.</p>	
Preselection (500, 520, 540, 560)	Time programs	<p>Before a time program is set, the individual days (Mo, Tue, Wed, etc) or day groups (Mo-Sun, Mo-Fri, Sa-Su) have to be selected, at which the time program has to be activated.</p>
Heating phases (501 to 506, 521 to 526, 541 to 546 and 561 to 566)	<p>Up to three heating phases may be set per heating circuit, which will be activated on the days, set under the pre-selection (program numbers 500, 520, 540, 560). In the heating phases, it will be heated at the set comfort nominal value. Outside the heating phases, it will be heated at the reduced nominal value.</p>	<p>The time programs are only activated in the operation mode "Automatic".</p>
		

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 program during a certain holiday period.

Holiday start
(642, 652)

Entering the holiday start

Holiday end
(643, 653)

Input of holiday end

Operation level
(648, 658)

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



The holiday programs are only activated in the operation mode "Automatic".

Heating circuits

Comfort setpoint
(710, 1010)

Setting the comfort nominal value

Reduced setpoint
(712, 1012)

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

Frost protection setpoint
(714, 1014)

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

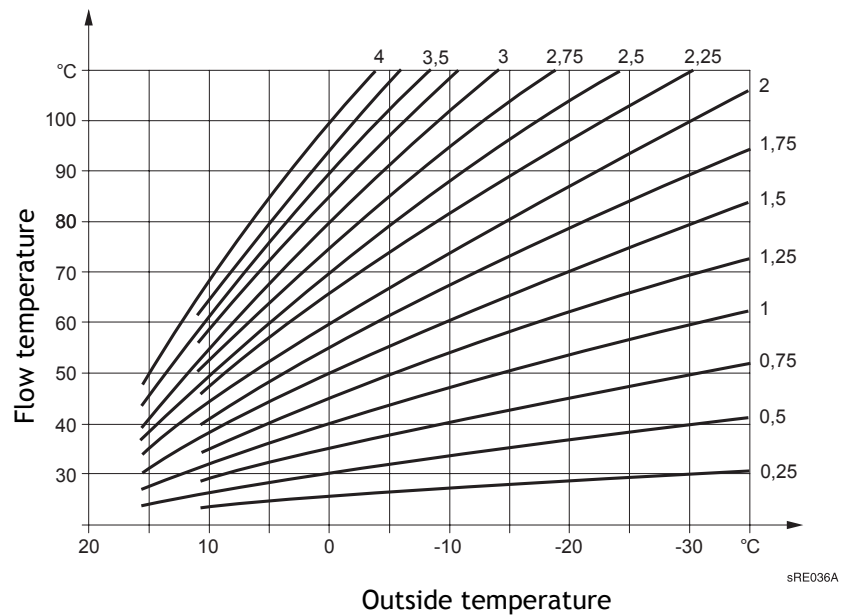
Heating curve slop
(720, 1020)

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.

Determination of the heating nominal line gradient

Enter lowest calculated outside temperature according to climate zone into the diagram (siehe *Abb. 7*) (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 nominal line gradient.

Fig. 7: Heating nominal line 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 (program number 8703).

**Room influence
(750, 1050)**

In the case of room influence, the deviations from the room temperature nominal value 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 must be between 1% and 99%. Should there be radiator valves (TRV's) 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%

General for control of modulating pump

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 (program number 884) = max. to be set pump speed (NqmodNenn)

Pump-PWM Minimum (program number 885) = min. permissible, to be set pump speed (NqmodMin)

**Speed design point
(884)**

It is recommended to adjust this value for heat saving of the heating plant (hydraulic balance). It corresponds to the speed step of the pump in the design point to reach the nominal volume flow. The function speed step design point is comparable to an analogue speed selection switch of an HC-pump, which has 30 speed steps available. The setting range reaches from 6 m water column to 1 m water column delivery pressure.

**Pump PWM min
(885)**

The minimum permissible pump speed (NqmodMin) of the HC-pump is set via program number 885.

This speed is sufficient to guarantee sufficient water supply in the heating circuit. It is entered in percent of the maximum speed step.

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 (not used in the UK):

**Standard outside temperature
(886)**

1. Set standard outside temperature, program number 886, according to the design point of the heating plant (factory setting: - 20°C).

**Flow temperature setpoint standard OT
(887)**

2. Set flow nominal value standard outside temperature, program number 887, according to flow temperature (factory setting: 80°C).

**dT differential standard OT
(894)**

3. Set dT-spread standard outside temperature, program number 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 program number 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. program number 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. program number 885 (Nqmodmin) must be increased accordingly.

The effects of setting modifications have to be controlled.

DHW

**Nominal setpoint
(1610)**

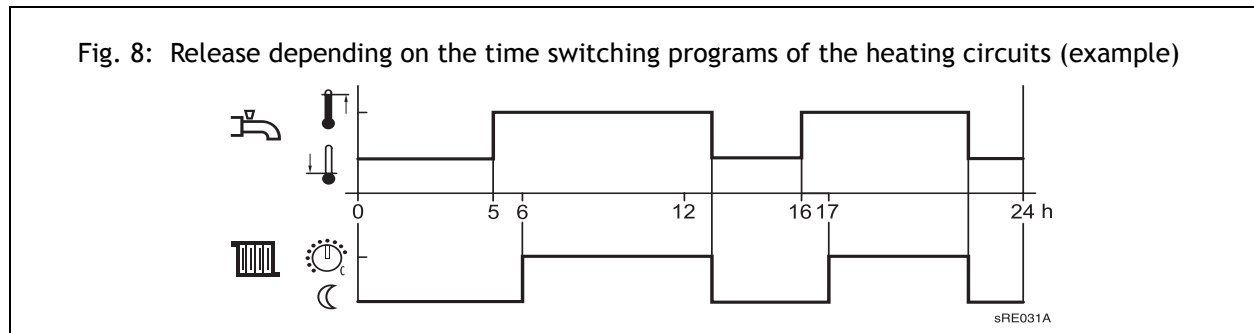
Setting the DHW nominal setpoint.

**Release
(1620)**

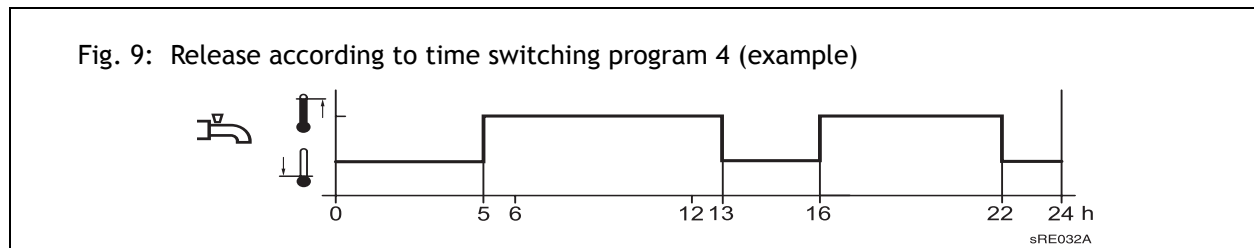
24h/day: The DHW temperature will be continuously controlled to the nominal DHW temperature value independent from the time switching programs.

Time programs HCs: The DHW temperature will be switched over between the nominal DHW temperature value and the reduced nominal DHW temperature value depending on the time switching

programs. Every time, the switching-on time will be moved forward by one hour (fig. 8).



Time program 4/DHW: The DHW temperature will be switched over between the nominal DHW temperature value and the reduced nominal DHW temperature value independent from the time switching programs of the heating circuits. In this case, the time switching program 4 will be used (fig. 9).



Primary loop pump release (1660)

Time program 3/HCP: The primary loop pump is released, depending on the time program 3 (see program numbers 540 to 556).

DHW release: The primary loop pump will be released, when the DHW preparation has been released.

Time program 4/DHW: The primary loop pump will be released, depending on the time program 4 of the local controller.

Primary loop pump cycling (1661)

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

Configuration

Hydraulic diagram (5701)

Setting of the code for the hydraulic system. The data of the code are included in the respective instruction of the accessories. Here, a “2” has to be entered for a pumped heating circuit.

System pump (5761)

The system pump can be used to support the heating circuits and the DHW circuit. It has been specified under program number 5761, which heat request will be supported by the system pump. In this case, the following heat requests may be selected:

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 scheme

Status output: The status output will be operated, when a command exists from the controller to the firing automaton. If there is

a disturbance, which prevents the firing automaton to operate, the message output will be switched off.

Alarm output: The output will be set, when there is a disturbance in the device, which requires manual resetting.

Status information: The output is set, when the burner operates.

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 minimise the total energy consumption of the system.

Heating circuit pump HC2: This output 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 (extension module). If the 2nd heating circuit is designed as a pumped circuit, the pump can also be controlled by the programmable output.

Primary loop pump: Function to control a drinking water circulation pump (see program number 1660).

Warm air curtain function: With this function 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 door veil function 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 (pump heating circuit).

System pump Q8: This function controls the primary loop pump.

Basic function K2: Function according to hydraulic scheme (see default).

Full DHW charging: The output is activated by this function during an active charging of the DHW layer storage.

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



Threshold analog signal RelCl: 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 available in connection with the setting of nominal value or power via the input of the clip-in module.


Flue gas damper: The exhaust gas flap control is activated with this function. In case of activated exhaust gas flap control, the burner will only start operating, when the exhaust gas flap is open.

Collector pump: The control of a circulating pump is exercised by this function, when a solar collector is used.

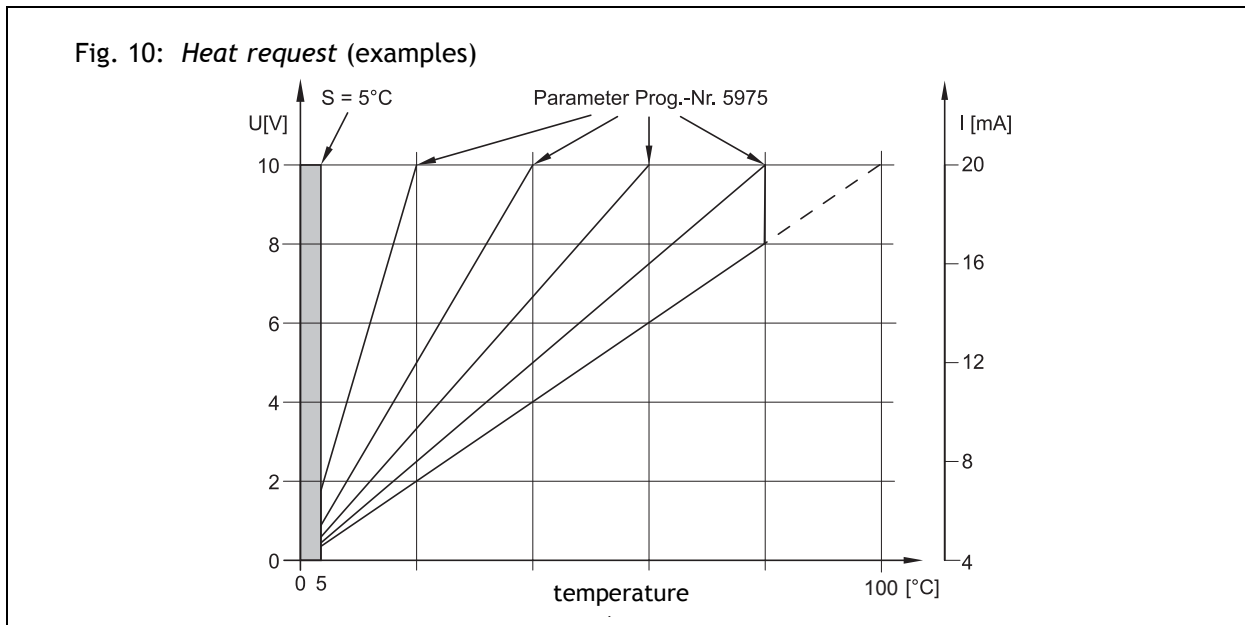
Fan shutdown: This output serves to stop a fan. The output is activated, when the fan is needed; otherwise it is not activated. The fan should be switched off as often as possible, to minimise the total energy consumption of the system.

None: No function.

Function input H1
(5950)

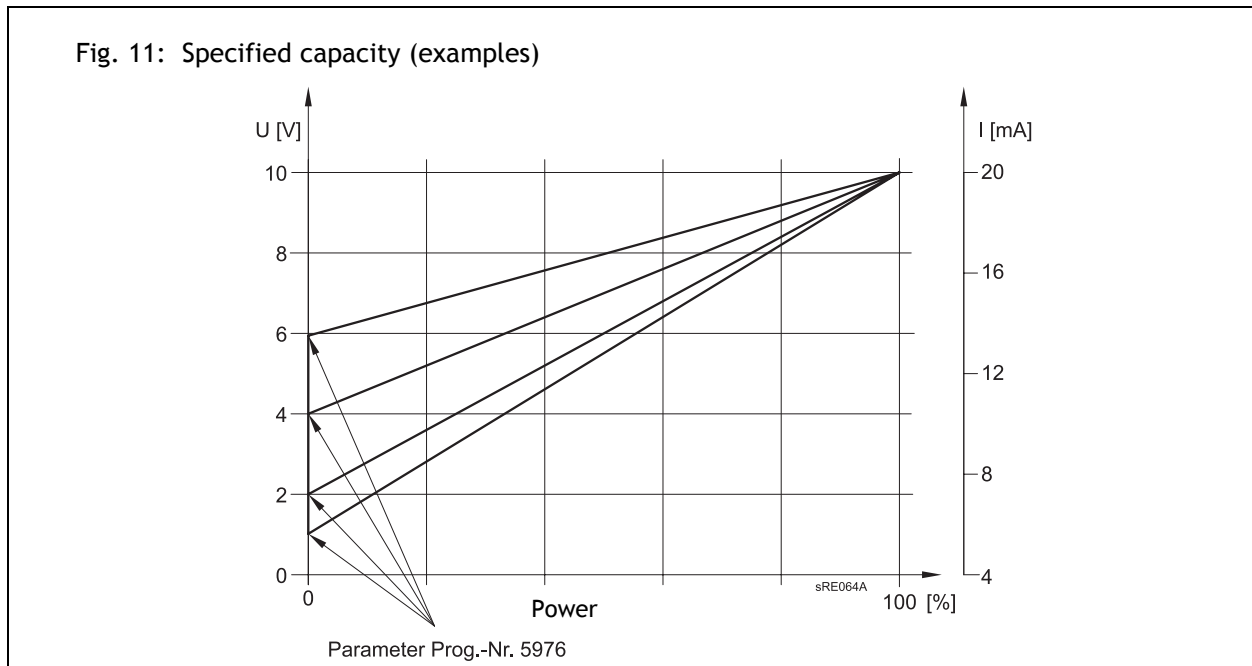
	<p><i>Modem</i>: The modem function serves to centrally switch off and over the heating plant into stand-by or reduced operation (telephone remote switch). The modem function is activated when the contact is open.</p> <p><i>Modem inverse</i>: The modem function is activated when the contact is closed.</p> <p><i>Warm air curtain</i>: The programmable output is activated by this function, when the input for the warm air curtain function has been set. If this input is not set, the output is also set back. The warm air curtain function enables to reach the maximum nominal boiler temperature. Also, a heat request is set for the heating circuit 1.</p> <p><i>Check sign flue gas damper</i>: Feed-back via the input H1 in case of activated exhaust gas flap control</p> <p><i>Heat generator lock</i>: The generator lock is needed to lock the burner in case of integrating alternative energies (e.g. solar energy). The generator lock is activated, when the contact is open.</p> <p><i>Heat generator lock inverse</i>: The generator lock is activated, when the contact is closed.</p> <p><i>Opt mode change HCs + DHW</i>: Switching the operation modes for heating circuit and DHW via the telephone remote switches.</p> <p><i>Opt mode change over HCs</i>: Switching over the operation modes of the heating circuit (1, 2) via telephone remote switch.</p>
<p>Modem function (5957)</p>	
<p>Configuration room thermostat 1/2 (5970, 5971)</p>	<p><i>None</i>: Switching the input has no effect.</p> <p><i>Room thermostat</i>: The switching status of the contact decides in this function, if a heat request has to be generated.</p> <p>It applies: Input open: Heat request locked Input closed: Heat request released</p> <p>If no room thermostat is connected, the heat request remains locked.</p>
	<p><i>Time switch room level</i>: This function switches the nominal room value over.</p> <p>It applies: Input open: Nominal room value = Reduced nominal value Input closed: Nominal room value = Nominal comfort value</p> <p><i>Time switch request</i>: See function <i>room thermostat</i>.</p> <p><i>Time switch DHW level</i>: This function switches the nominal DHW value over.</p> <p>It applies: Input open: Nominal DHW value = Reduced nominal value Input closed: Nominal DHW value = Nominal value</p>
<p>Function input RelCI (5973)</p>	<p><i>None</i>: No function</p> <p><i>Modem</i>: See program number 5950.</p> <p><i>Modem inverse</i>: See program number 5950.</p> <p><i>Warm air curtain</i>: See program number 5920.</p> <p><i>Preselected setpoint</i>: The existing voltage signal or current signal will be converted into a temperature value and used as a nominal</p>

flow value. The maximum value will be set under program number 5975



Preselected output: 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 program number 5976 (External capacity procedure threshold). 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 program number 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 boiler will be switched off.



Sensor pressureless header: This function enables a control of the boiler at flow temperature after the hydraulic bypass. For this, a sensor is connected at the input, which must be installed in the flow behind the hydraulic bypass.

Check sign flue gas damper: See program numbers 5920 and 5950.

Heat generator lock: See program number 5950.

Heat generator lock inverse: See program number 5950.

Heat generator 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.

Ext flow temp setpoint max (5975)

See program number 5973.

Ext preselected output threshold (5976)

See program number 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

Fault

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

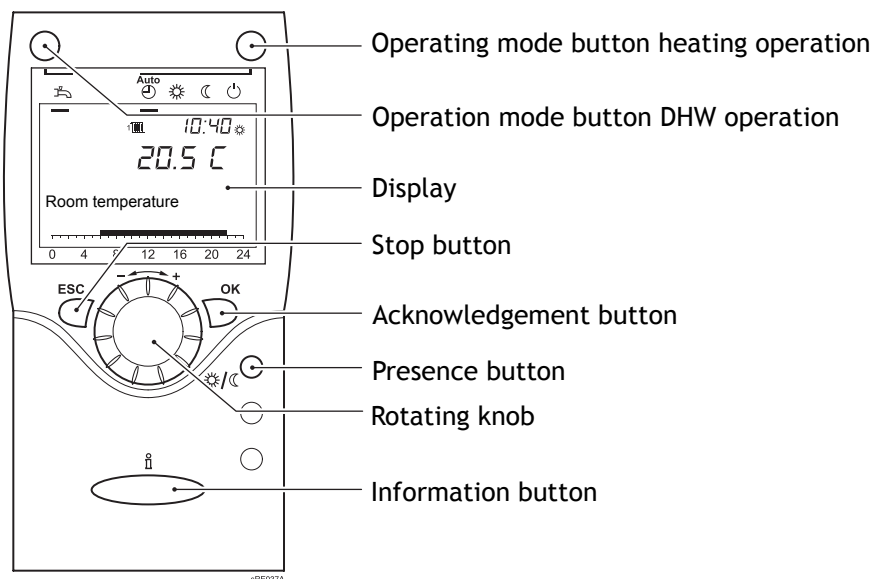
SW Diagnostics code (6705)	In case of a disturbance, the display <i>Disturbance</i> is on permanently. In addition, the diagnosis code is issued via the display (see <i>chapter Maintenance, fault code table</i>).
Burner ctrl phase lock-out pos	Phase, in which the fault occurred, which led to the disturbance.
Diagnosis generator/consumer (8310 to 8832)	Diagnosis generator/consumer Displays of different nominal and actual values, relay switching statuses and counter statuses for diagnosis purposes.

9. General

9.1 Room device RGT

Remote setting of all adjustable control functions of the basic device is possible when using the room unit RGT (accessorie). The connection of the room unit RGT is connected to the control unit by electric wires.

Fig. 12: Operating interface of the room units 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 programmes. The valve switched over too stays active until the next time program.

10. Servicing



Danger of electric shock! Before removing parts of the cover, the boiler has to be isolated.

Work under voltage (removed cover) must only be carried out by an electrician!



Cleaning of the heating surfaces and burner has to be carried out by an approved gas installer. Before the start of work, the gas and water isolation valves should be closed.

10.1 Maintenance work

Maintenance work includes among others:

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

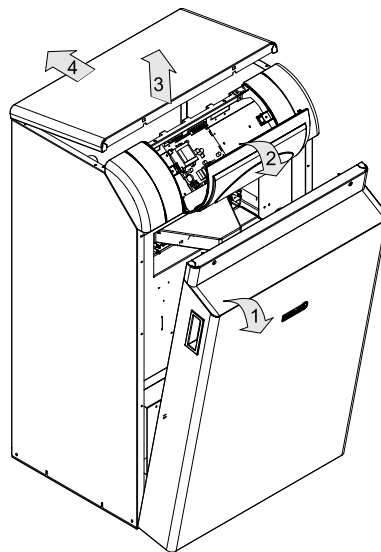
It is recommended to carry out maintenance and cleaning of the EUROCONDENSE two annually.

The burner has to be checked for contamination and, possibly, be cleaned and serviced.

Removing Casing

- Loosen quick fastening screws, hinge down and remove front casing (see fig. 13, 1).
- Loosen quick fastening screws on the boiler control panel and hinge forward (2).
- Lightly lift top panel (3), push it backwards (4) and remove.

Fig. 13: Removing front casing and top panel



Cleaning of the heat-exchanger and the condensate sump:

- Remove the cleaning cover on the condensate sump.
- Clean with a plastic or stainless steel brush and water, with a common cleaning agent (for instance dishwashing agent) has been added. After this, rinse off with soft water jet.
- Fit the cleaning cover back on.
- Mount the burner back after finishing the cleaning work.
- Check the nominal heat load and flue gas values.

10.2 Condensate syphon

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



At the same time, the flue gas collector should be checked for soiling and if required should be cleaned (rinsed).

10.3 Removing gas burner

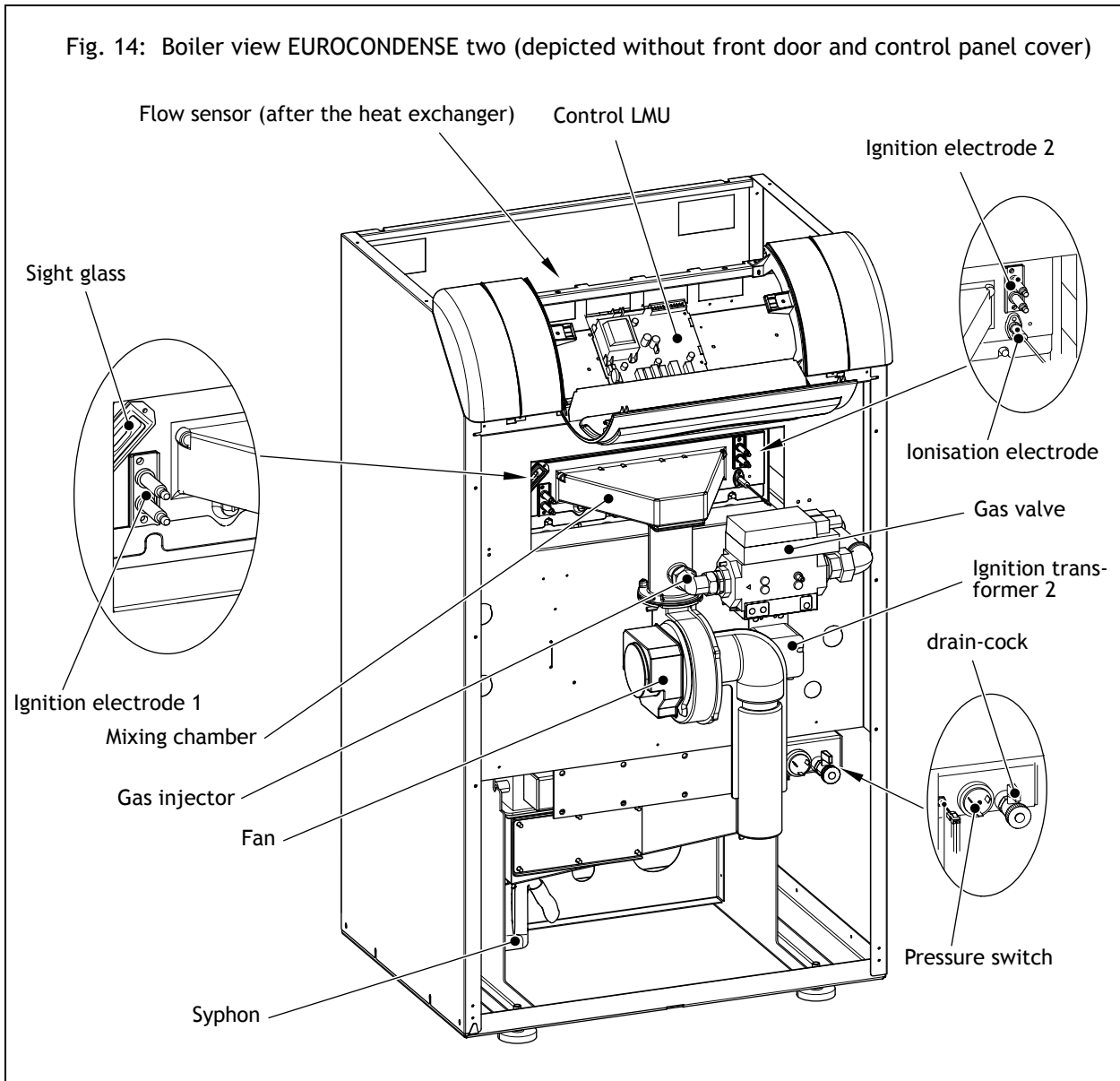
Disassemble the gas burner before cleaning the heating surfaces. For this, disconnect the electrical connection cables to the fan at the coupler, pull off air hose from the fan and pull the connector from the electrodes.

- Disconnect the screw connections of the gas connecting pipe in front of the gas valve. Remove electrical cables or connectors from the gas valve, the gas pressure monitor, the ignition electrodes, as well as the ionisation electrode.
- Loosen securing nuts of the burner and pull out the burner complete with mixing chamber, fan and gas valve forwards.
- Clean burners with soft brush.
- When re-fitting, new gaskets should be used, particularly for the the gas connecting pipe.
- The screws for fastening the burner have to be tightened to **10 Nm**.
- After finishing the cleaning work re-install the burner. Fit gas line with new seal of the armature and check for tightness.
- Check the nominal heat load and flue gas values.

**Protection against contact**

Danger of electrical 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!

10.4 Boiler view EUROCONDENSE two



10.5 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. 15.

Ionisation electrode

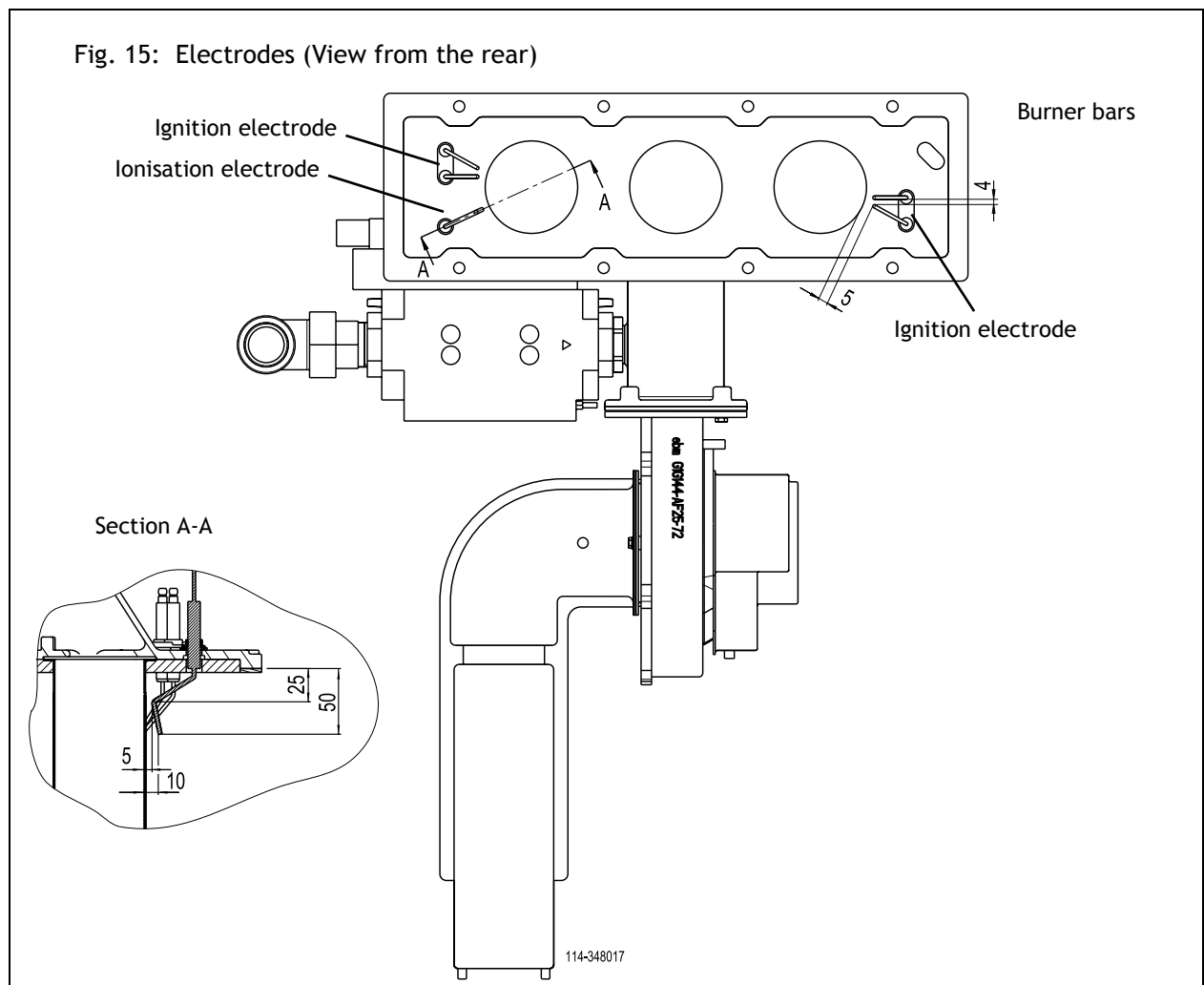
The ionisation electrode must always be in contact with the flame. During burner operation, the measured ionisation flow must not be less than.

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



For measurement, remove plug from the ionisation electrode and connect amperemeter between plug and electrode.

Attention! Do not touch plug contacts during the ignition process!



10.6 Control and regulating centre LMU

Description of function

Control and monitoring of the burner with control 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 operating display shows the individual operating or programme statuses by means of digits (see fault code table).

Reset

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

10.7 Fault switch-off

Safety switch-off in case of flame failure during the operation. After every safety stop, a new ignition 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 disturbances (bell symbol in the display), the digit in the display on the operating panel indicates the cause of the disturbance (see fault code table).

Burner does not start:


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

Burner goes into disturbance status:

Without flame formation:

No ignition, ionisation electrode has ground connection, no gas.

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

10.8 Fault code table LMU

Fault code	Fault description	Explanations/causes
10	Outside temperature sensor fault	Connection or AT-sensor, emergency operation
20	Boiler temperature sensor fault	Check connection, inform heating specialist ¹⁾
32	Flow temperature sensor fault	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	Disturbance 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 detailed 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 F7 opened, external temperature monitor
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⁾
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 boltage at the output transformer (programme 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

10.9 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
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, <i>see fault code table</i>

10.10 Fault code table BCA 2

Fault code	Fault description	Fault code	Fault description
10	Outdoor temperature sensor fault	82	Address collision on LPB-bus
26	Flow sensor cascade B10 fault	86	Short circuit in PPS bus
46	Return cascade sensor B70 fault	100	Two time masters system fault
50	Tank sensor B3 fault	145	Wrong room device or EC connected
58	Tank controller fault	146	Impermissible system configuration
61	Disturbance room device	147	NO LMU control connected
62	Wrong room device connected	150	General LMU control error (collective error message)
70	Buffer tank sensor B4 fault	175	No communication between control centre for condensing boiler and bus board
81	Short circuit on LPB-bus or no bus feed		

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Publication Number: M/EURO2/0906