

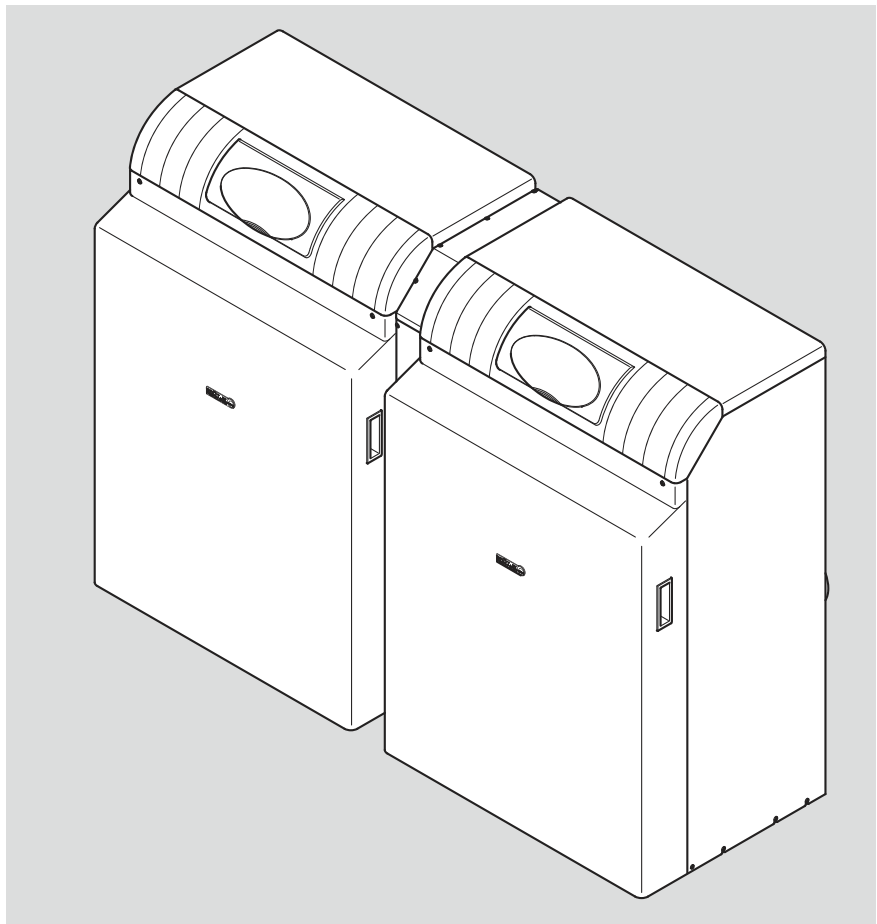
CONDENSING BOILER

**EUROCONDENSE two**

**320 - 500 kW**

Lead and slave modules  
(LMU 74 >SW1.09)

# Installation operation & maintenance manual



April 2009

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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 (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!

Documentation	Contents	Intended for
Technical information	<ul style="list-style-type: none"> <li>- Planning documents</li> <li>- Description of function</li> <li>- Technical data/circuit diagrams</li> <li>- Basic equipment and accessories</li> <li>- Application examples</li> <li>- Call-for-tender texts</li> </ul>	Planner, customer
Installation manual - Extended information	<ul style="list-style-type: none"> <li>- Designated application</li> <li>- Technical data/circuit diagram</li> <li>- Regulations, standards, CE</li> <li>- Notes for installation location</li> <li>- Application example <i>Standard application</i></li> <li>- Commissioning, operation and programming</li> <li>- Servicing</li> </ul>	Heating specialist
Operating Instructions	<ul style="list-style-type: none"> <li>- Commissioning</li> <li>- Operation</li> <li>- User settings/programming</li> <li>- Disturbance table</li> <li>- Servicing/maintenance</li> <li>- Energy saving advice</li> </ul>	Customer
Programming manual	<ul style="list-style-type: none"> <li>- Setting table including all parameters and explanations</li> </ul>	Heating specialist
Brief instruction	<ul style="list-style-type: none"> <li>- Operation in brief</li> </ul>	Customer
Servicing booklet	<ul style="list-style-type: none"> <li>- Protocol of carried out services</li> </ul>	Customer
Accessories	<ul style="list-style-type: none"> <li>- Installation</li> <li>- Operation</li> </ul>	Heating specialist, Customer

## 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.

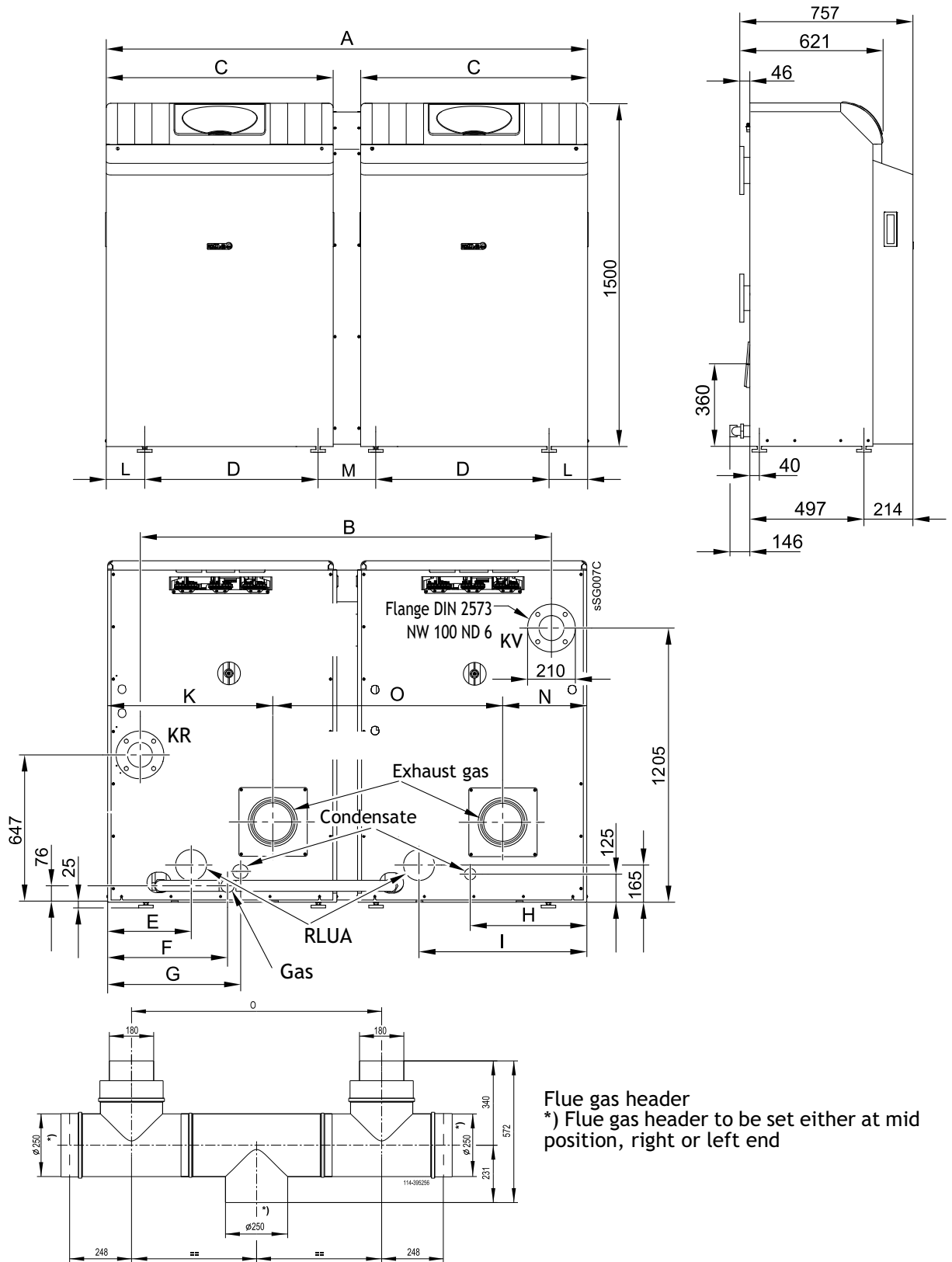
## 1.3 For whom is this manual intended?

This installation manual is intended for the heating specialist.

## 2. Technical Data

### 2.1 Dimensions and connections EUROCONDENSE two

Abb 1: Dimensions and connections



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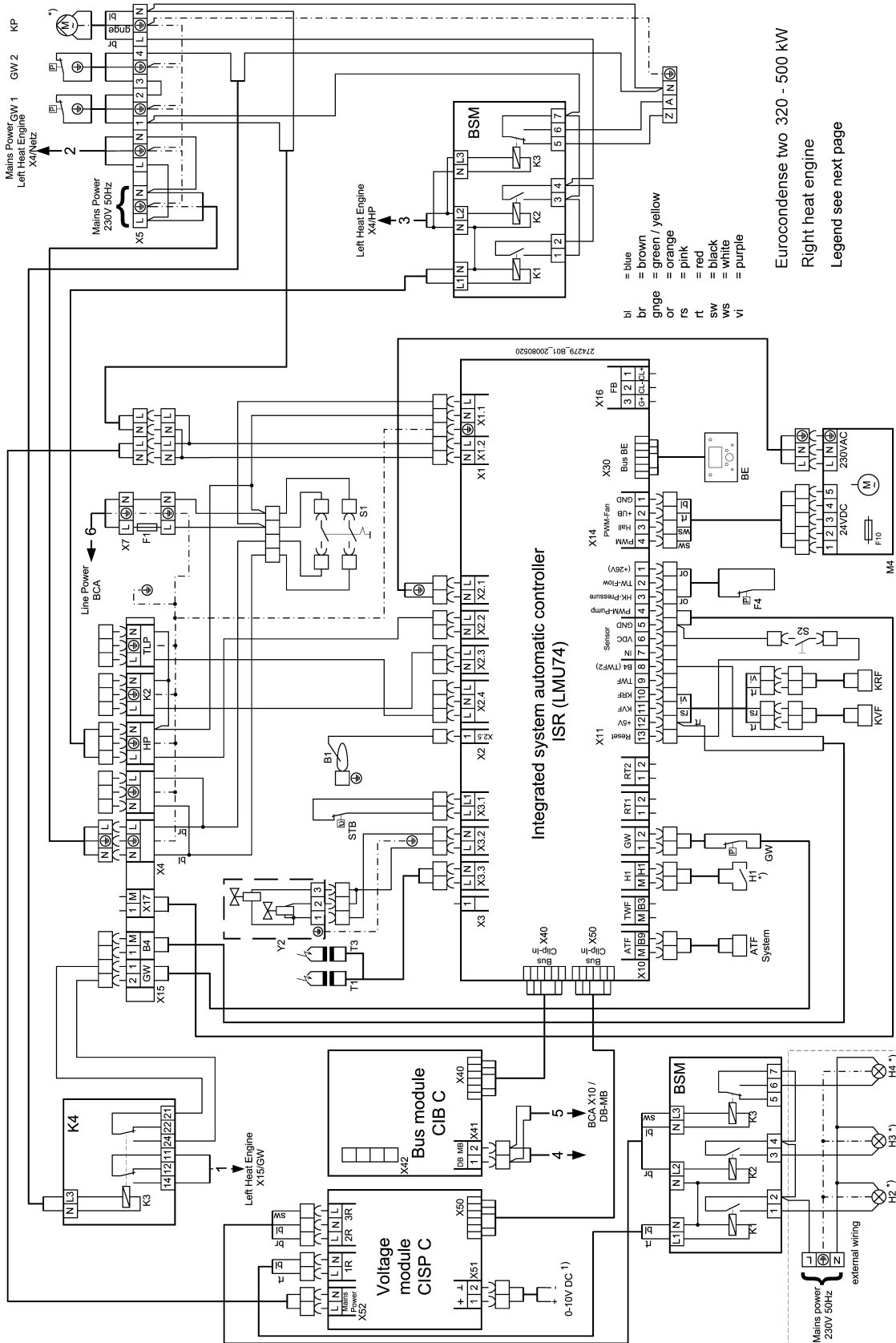
Model	Measurement in mm														Connections			
	A	B	C	D	E	F	G	H	I	K	L	M	N	O	KV	KR	Gas	RLUA
<b>EC two 320 (X)</b>	2102	1810	992	758	379	553	586	511	716	727	168	252	367	1010	DN 100, PNG		2"IG	DN160
<b>EC two 400 (X)</b>	2404	2030	1142	868	473	704	666	616	811	877	208	252	407	1120	DN 100, PNG		2"IG	DN180/200
<b>EC two 500 (X)</b>	2543	2240	1212	978	493	769	701	621	831	952	173	242	372	1220	DN 100, PNG		2"IG	DN200

## 2.2 Technical Data EUROCONDENSE two

Model			EC two 320	EC two 400	EC two 500
Product-ID-No.	CE-0085BN0577				
VDE-Reg.-No.	5568				
Nominal heat input range	natural gas or LPG	kW	40,0 - 320,0	50,0 - 400,0	62,5 - 500,0
Nominal heat output range	80/60 °C	kW	38,6 - 306,0	48,1 - 380,4	59,4 - 474,0
	50/30 °C	kW	42,2 - 327,0	52,6 - 410,0	66,1 - 504,6
Exhaust gas temperature (full load)	80/60 °C	°C	71	73	74
	50/30 °C	°C	48	50	53
Exhaust gas mass flow	80/60 °C	g/s	157	196	246
	50/30 °C	g/s	152	188	237
Supply pressure	Natural gas	mbar	min. 18 - max. 25		
CO <sub>2</sub> -Content	Natural gas	%	8,7 - 9,3		
Supply Pressure	LPG	mbar	min. 42.5 - max. 57.5		
CO <sub>2</sub> -Content	LPG	%	10,5 - 11,0		
Max. delivery pressure at exhaust gas outlet		mbar	0,5 - 1,0		
Exhaust gas connection		mm	2 x 180		
Connected loads					
Electrical connection		V/Hz	230 / 50		
max. electr. power consumption		W	350	400	560
Max. water pressure		bar	6,0		
Max. operating temperature (protection)		°C	110		
Max. achievable flow temperature		°C	88		
Boiler weight		kg	570	620	680
Boiler water content		l	50	60	70

## 2.3 Wiring Diagrams

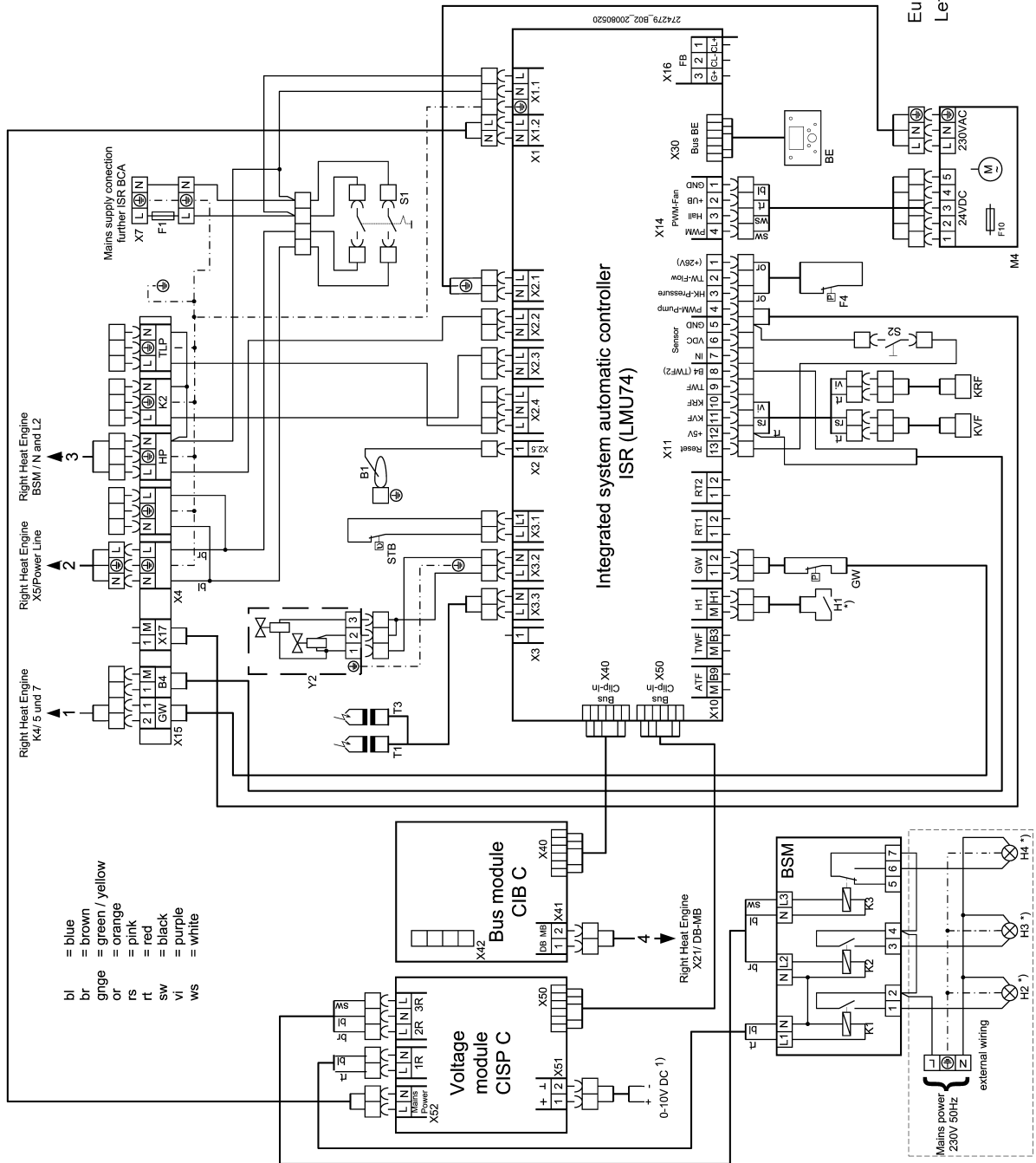
### Wiring diagram-right heat engine



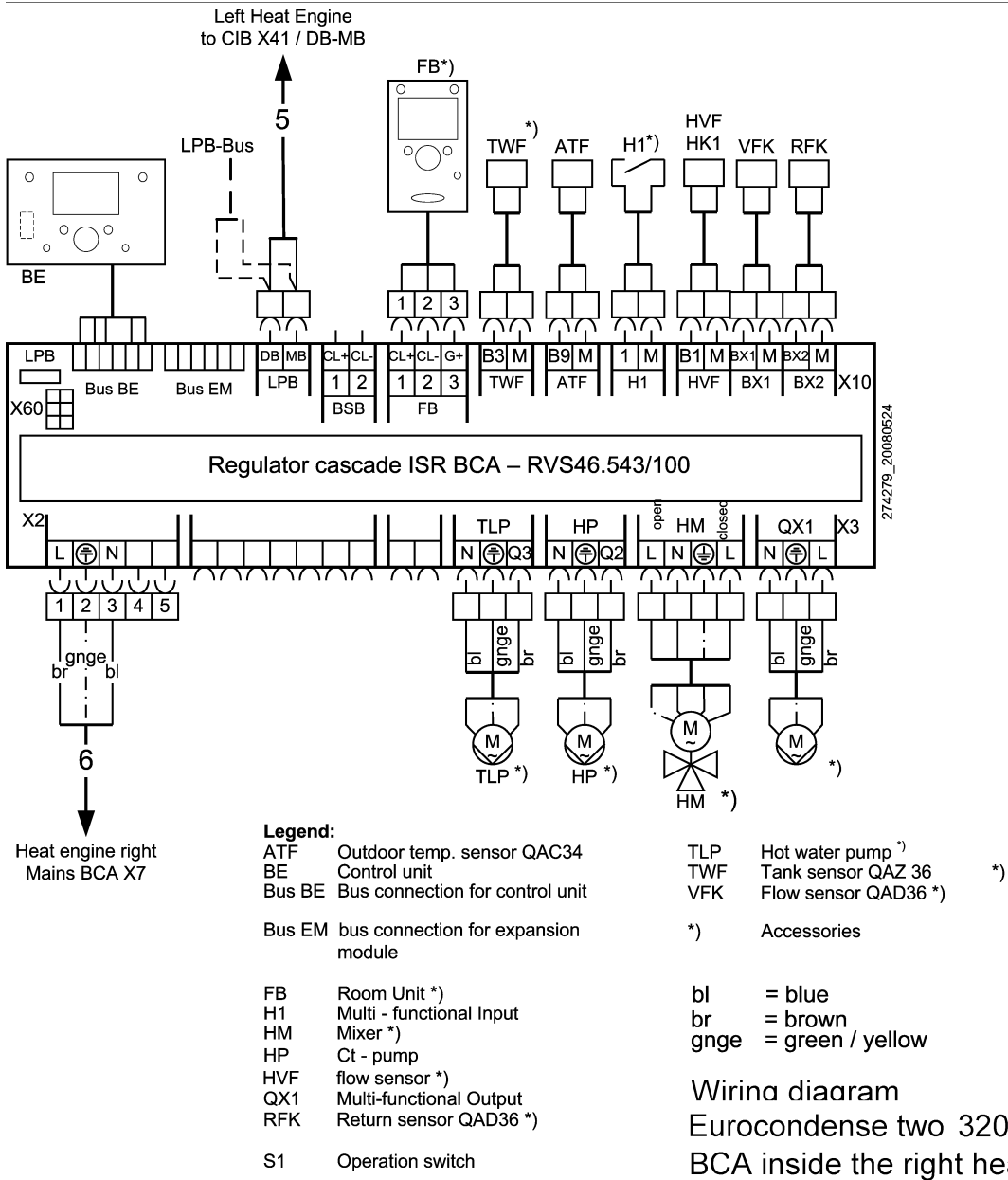


### Wiring diagram-left heat engine

- Legend:**
- ATF Outdoor temp. sensor QAC 34
  - B1 Ionization electrode
  - B4 Tank sensor \*)
  - BE Bus connection for control unit
  - BSM Fault connector (Voltage free)
  - GW Gas pressure monitor
  - GW1/2 Fuse(water shortage), Condensation drain device
  - H1 Multi - functional Input
  - HP C1 - pump
  - KRF Boiler return sensor QAL 36
  - M4 Boiler flow sensor QAK 36.670
  - K2 Fan
  - STB Multi - functional output
  - TLP Limit Thermostat
  - TLP Hot water pump \*)
  - TWF Tank sensor QAZ 36 \*)
  - Y2 Gas solenoid valve
  - X1...X4 Terminal strip Line Power
  - X10...X17 Terminal strip Low Voltage available optional extra
  - S1 Operation switch
  - S2 Reset button
  - T1 Ignation transformer
  - T3 Ignation transformer
  - H2 Heat demant output \*)
  - H3 external fault message \*)
  - H4 external operation message \*)



Eurocondense two 320 - 500 kW  
Left heat engine



### 3. Safety



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

#### 3.1 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).

#### 3.2 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 CO<sub>2</sub> emissions and ultra low NO<sub>x</sub>. 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 mo-

dulation and that constant CO<sub>2</sub> 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 % CO<sub>2</sub>). The EUROCONDENSE two is designed as a hot water heating boiler. It fulfils EN 483 and EN 677.

### 3.3 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 trained in manual handling techniques and if necessary use suitable lifting equipment to reduce the risk of injury to themselves or other people.

### 3.4 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.

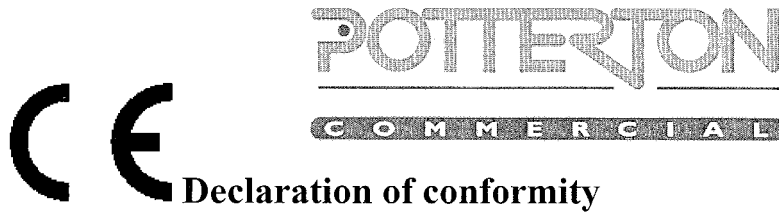
IGE/UP/2 - Gas Installation Pipe work, Boosters and Compressors for Industrial Commercial Premises.

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

### 3.5 C.E. Approvals

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

### 3.6 Conformity declaration



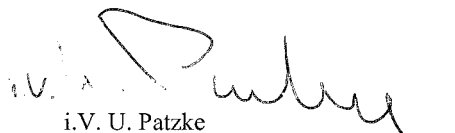
Product	Condensing gas boiler
Trade mark	EuroCondense
Product ID Number	CE-0085 BN 0577
Type, Model	EuroCondense <i>two</i> 90, 120, 160, 200, 250, 320, 400, 500
EU directives	90/396/EWG, 92/42/EWG 89/336/EWG, 73/23/EWG
Standards	DIN VDE 0722 DIN EN 50081-1, DIN EN 50082-2 DIN EN 50165, DIN EN 60335-1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

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

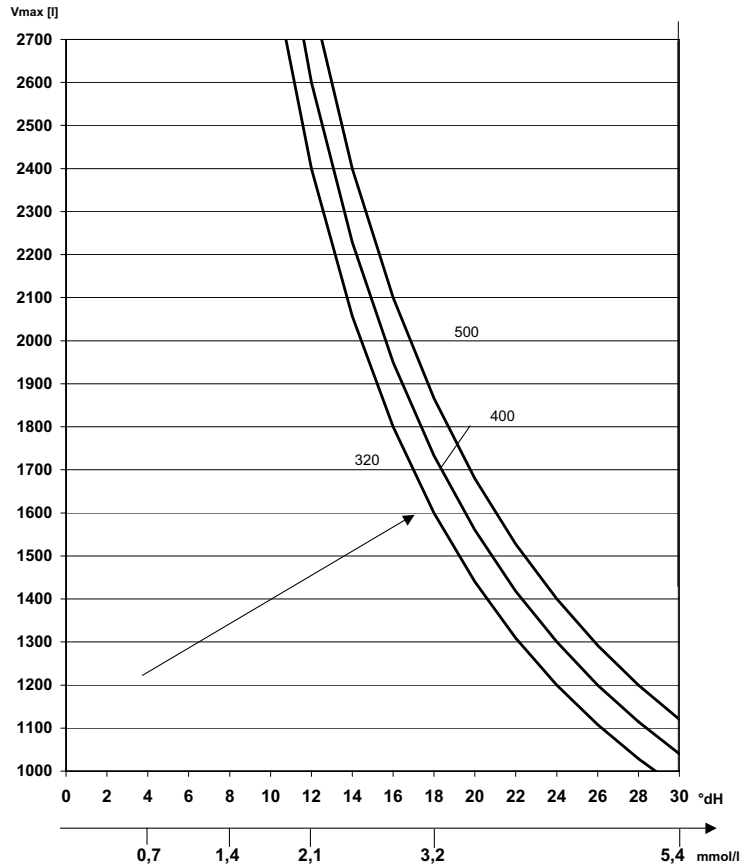
### 4.3 Requirements for heating circuit water

Tap water of drinking water quality is sufficient to fill the heating water circuit. Partial softening of the tap water or an additive of hardness stabilising agents is recommended. In case of water from a hardness range of 12° dH, as well as, heating plants with large water volumes.

To avoid damage due to forming of boiler scale in the boiler, figure 2 has to be observed fig. 2.

Fig. 2: Diagram water hardness

**Description:**  
 The boiler type, the water hardness and the water volume must be known.  
 If the volume is above the curve, a partial softening of the tap water or addition of hardness stabiliser are required.  
**Example:**  
 EC two 320; water hardness 12 °dH;  
 2400 l water volume  
 => No additive required  
 The usual refill volume of the plant has been taken into account.





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

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

The instructions of the additive manufacturer have to be observed.

##### Released additives

Currently, the following agents have been approved by BROETJE:

- „Heizungsvollschutz“ from Fernox
- “Sentinel 100“ from GE Betz
- „Heizungsvollschutz“ from Jenaqua
- „Vollschutz Genosafe A“ from Grünbeck

If additives are needed for mixed application (e.g. hardness stabilising, frost protection, sealing agent) it has to be observed that agents from the same manufacturer are purchased and their interaction has been balanced.

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 8.5.

##### To be observed!

As a matter of principle, the specifications according to VDI-Guidelines 2035 T1/ T2 and the BDH-Data Sheet no. 8 apply for all boiler sizes. The under-floor heating circuit has to be treated separately. The information of the additive manufacturer or pipe supplier has to be observed!

##### Maintenance instruction

The water hardness of the heating water has to be checked within the scope of the recommended maintenance of the boiler (every year) 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

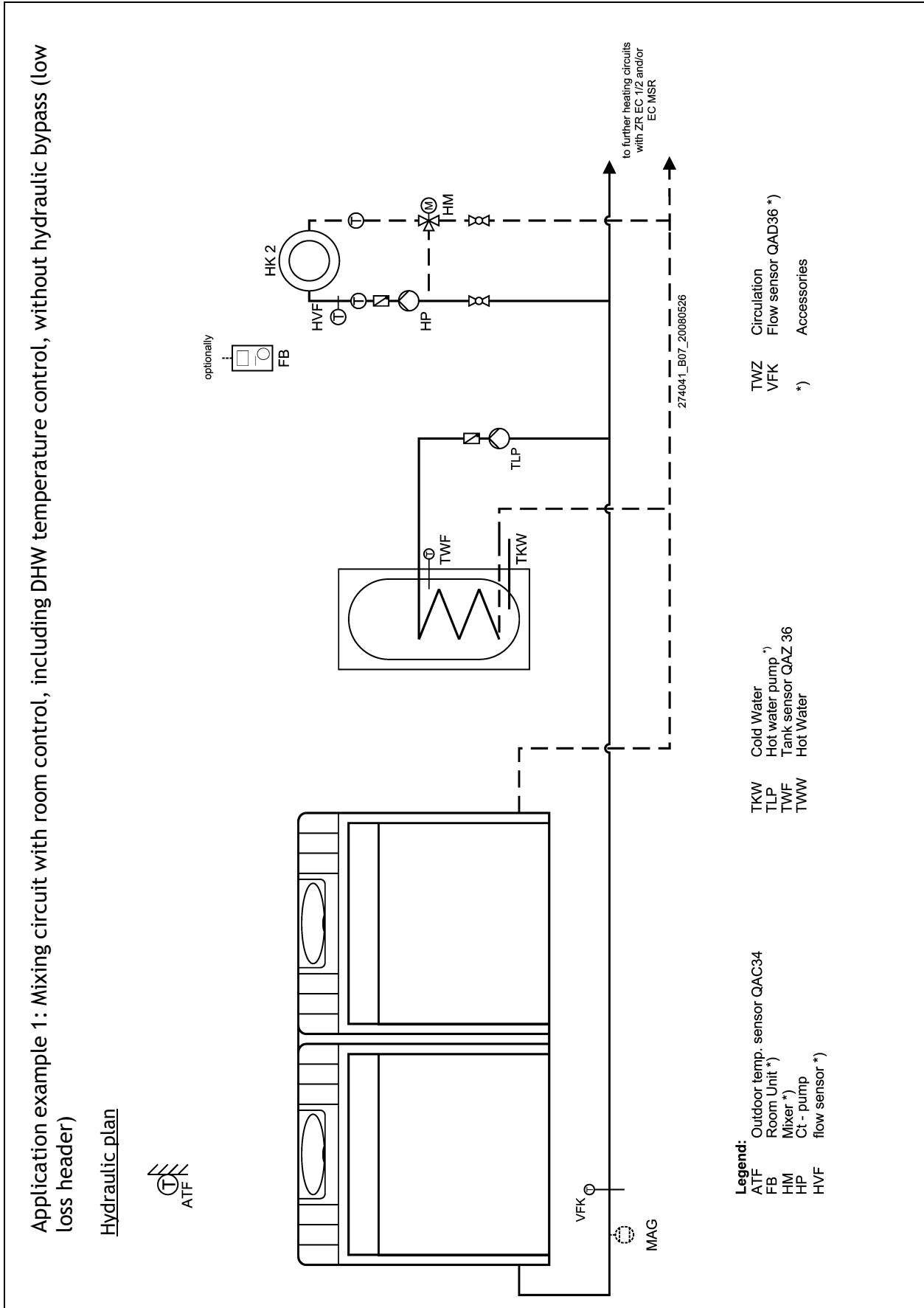
Top: 500 mm

Rear: 500 mm

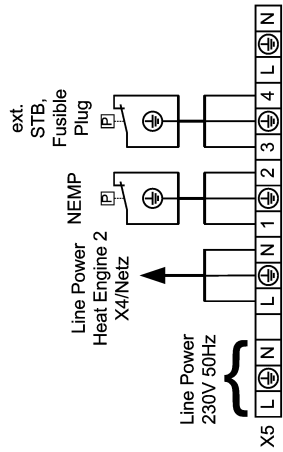
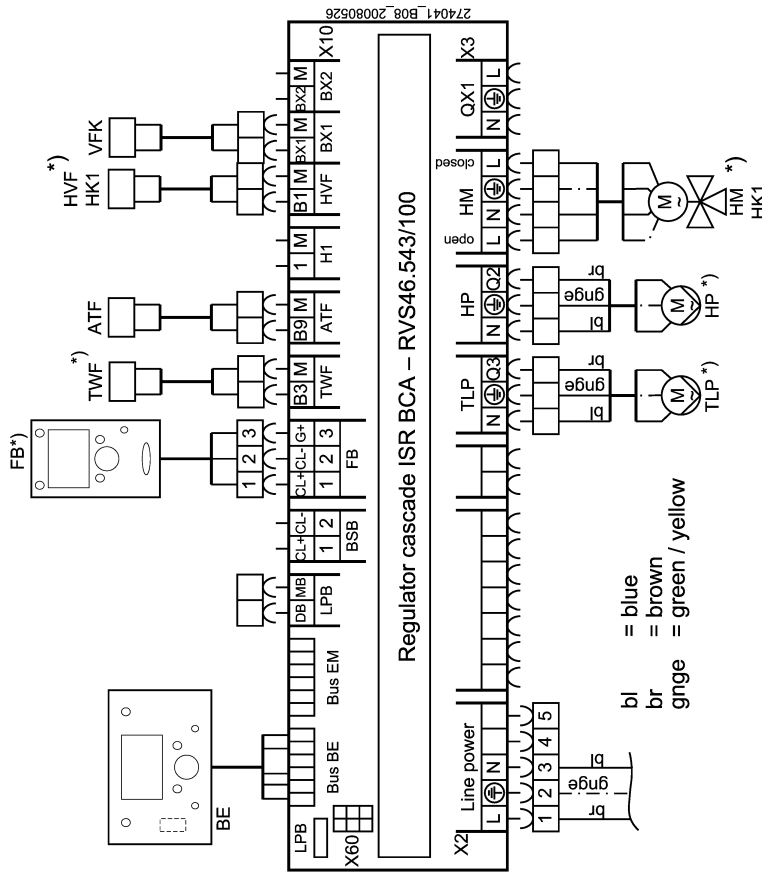
Sides: 300 mm



### 4.7 Application Examples



Connection plan



Parameters to set:

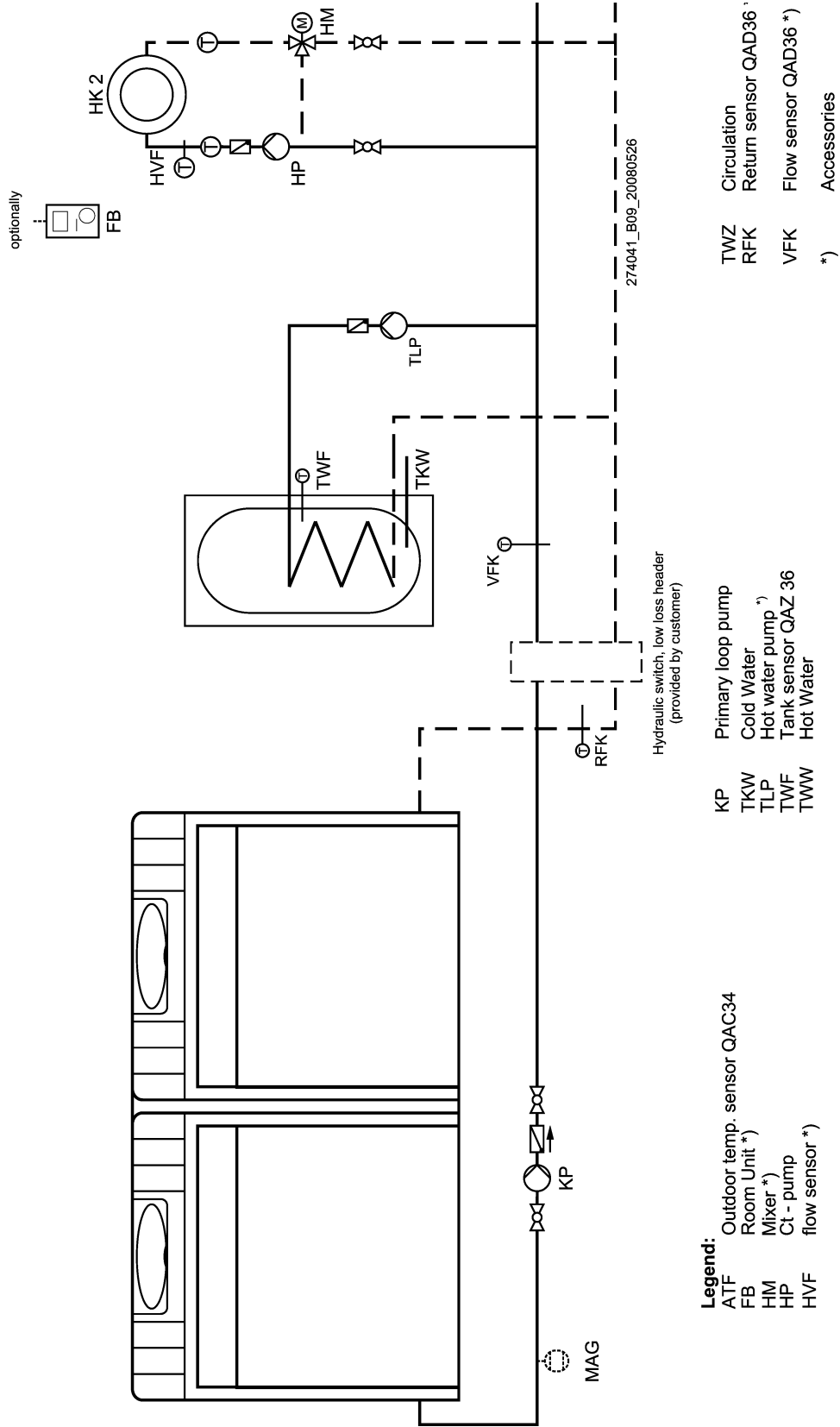
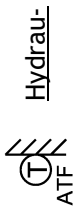
Menu item	Function	Settings
-	-	-

- Legend:**
- ATF Outdoor temp. sensor QAC34
  - FB Room Unit \*)
  - HM Mixer \*)
  - HP Ct - pump
  - HVF Ct - flow sensor \*)
  - NEMP Neutralization system \*)
  - STB Limit Thermostat
  - TKW Cold Water
  - TLP Hot water pump \*)
  - TWF Tank sensor QAZ 36

- TWW Hot Water
- TWZ Circulation
- VFK Flow sensor QAD36 \*)
- \*) Accessories

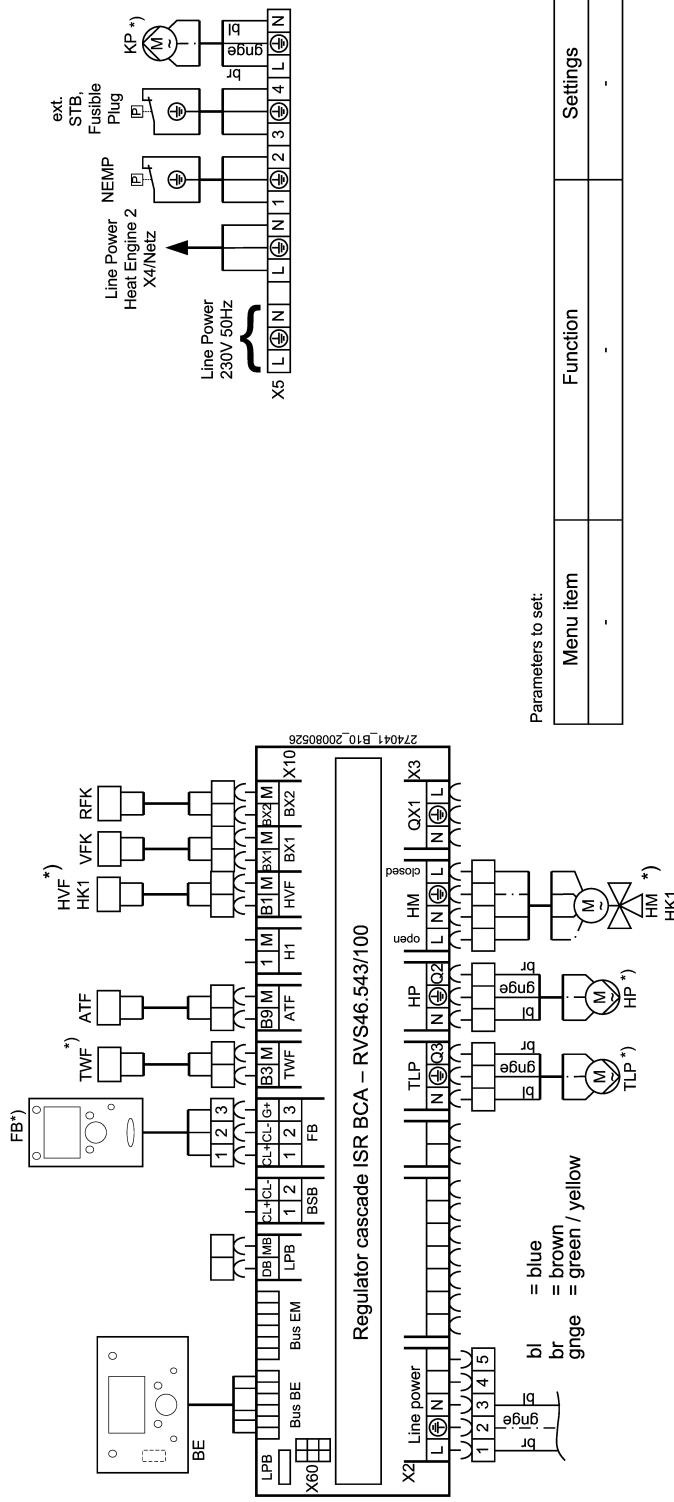
**Eurocondense two**  
**320 - 500 kW**  
**Right Heat Engine**

Application example 2: mixing circuit with room control, including DHW temperature control, with hydraulic bypass (low loss header)



- Legend:**
- ATF Outdoor temp. sensor QAC34
  - FB Room Unit \*
  - HM Mixer \*
  - HP Ct - pump
  - HVF flow sensor \*
  - KP Primary loop pump
  - TKW Cold Water
  - TLP Hot water pump \*)
  - TWF Tank sensor QAZ 36
  - TWW Hot Water
  - TWZ Circulation
  - RFK Return sensor QAD36 \*
  - VFK Flow sensor QAD36 \*)
  - \*) Accessories

**Connection plan**



TWW Hot Water  
 TWZ Circulation  
 VFK Flow sensor QAD36 \*)  
 \*) Accessories

Eurocondense two  
 320 - 500 kW  
 Right Heat Engine



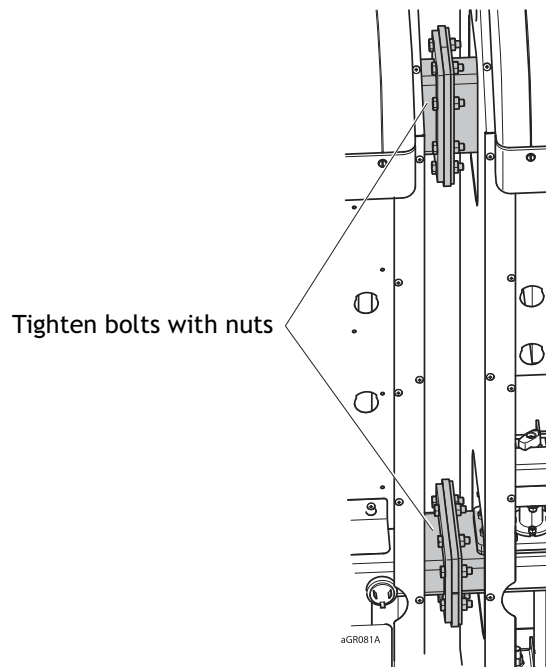
You can find further application examples in the *programming and hydraulics manual for wall hung controllers*.

## 5. Assembly of EUROCONDENSE two

### 5.1 Bolting the flanges of the heat-exchanger

- Bring both boiler halves to the installation location and precisely align them side by side.
- Remove the two lining covers and hoods from the EUROCONDENSE two.
- Insert the accompanying rubber seals between the two flanges (flow and return) of the heat exchanger before they are finally pushed together.
- Bolt the two flanges together hand-tight with 8 screws and nuts. When both flanges are completely bolted, eventually, tighten the screws crosswise (siehe *Abb. 3*).

Abb 3: Assembly of the flanges



**Check for leaks!**

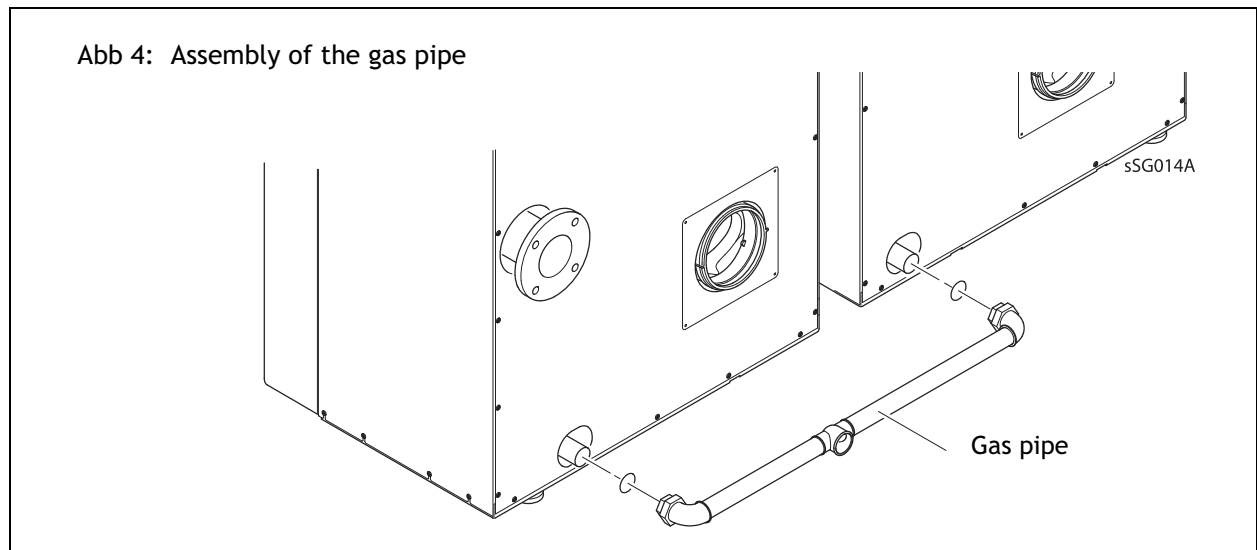
Close the flow and return with counterflanges and check the EUROCONDENSE two for leaks.

- Place the accompanying insulation under the return flange.
- Install cover sheets between the boilers.



## 5.2 Fit gas pipe

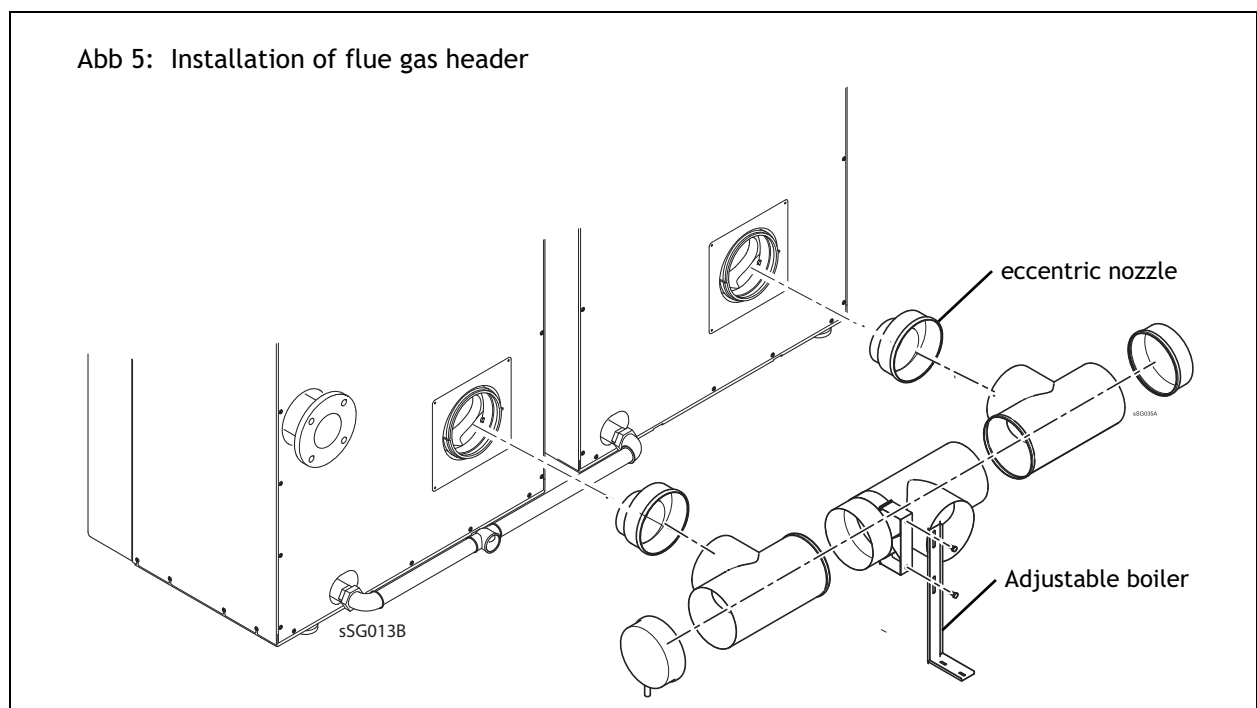
- Fit the accompanying gas pipe with seals to the rear of the EUROCONDENSE.



## 5.3 Fit exhaust gas pipe on the EUROCONDENSE two

- Apply lubricant on gaskets.
- Fit the eccentric nozzles to the exhaust gas nozzles of the EUROCONDENSE two. Assemble the exhaust header in such a way that an of slope of 1% exists at the end of the pipeline. For further information see section *Kondenswasseranschluss*.
- Mount adjustable boiler feet at right position .

If the equipment has to be operated in ventilation independent operation werden, the POTTERTON-accessory RLUA (possibly even WAS) should be used.



## 6. Installation

### 6.1 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.

### 6.2 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.

### 6.3 Filling of the heating system

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

### 6.4 Requirements

#### Standards and Regulations

Besides the general technical rules, the following should be particularly observed:

- Regulations of the accompanying certificate of approval
- Installation in accordance with BS6644
- Building regulations

## 6.5 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.

Table 1: Maximum length for room sealed operation

Boiler	Size		Max. length	
	Flue (mm)	Air (mm)	Flue (m)	Air (m)
<b>EC two 320</b>	250	2 x 180	50	40
	250	2 x 200	50	50
<b>EC two 400</b>	250	2 x 180	20	20
	250	2 x 200	40	30
<b>EC two 500</b>	250	2 x 200	40	30

If these lengths are used the boiler may have up to 5% output reduction. The length include one bend 87° on both air inlet and flue side. Each additional bend is equivalent to 5 m.

## 6.6 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 data 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. 8).



### Attention!

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

The gas supplier has to be informed.

## 6.7 CO<sub>2</sub> -Content

The CO<sub>2</sub>-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 gas system. **CO<sub>2</sub>-content in operation see section 3.2 'Technical Data EUROCONDENSE two' on page 11.**

Too high CO<sub>2</sub> -values can lead to unhygienic combustion (high CO-values) and damage to the burner.

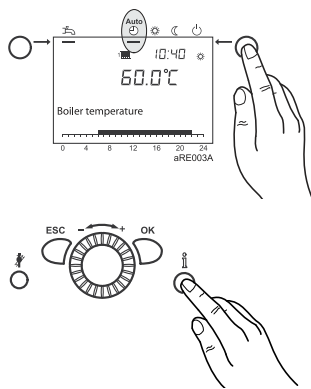
Too low CO<sub>2</sub> -values can lead to ignition problems.

The CO<sub>2</sub> -value is set at the gas valve by adjusting the gas pressure.

### Adjusting and Checking the CO<sub>2</sub> Values

Operate the EUROCONDENSE two in the controller stop mode to adjust and check the CO<sub>2</sub> 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 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.

## 6.8 Guide Values for Injector Pressure

**Guide values for gas flow, injector pressure and CO<sub>2</sub>-content**  
The listed values in table 1 are to be understood as guide values.

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

Model			EC two 320	EC two 400	EC two 500
Nominal Heat Input	Natural Gas/LPG	kW	40.0 - 320.0	56.0 - 400.0	62.5 - 500.0
Nominal Heat Output	80/60 °C	kW	38.6 - 306.0	48.1 - 380.4	59.4 - 474.0
	50/30 °C	kW	42.2 - 327.0	52.6 - 410.0	66.1 - 504.6
Injector diameter for					
Natural Gas E (G20)		mm	10,50	12,00	13,50
LPG (propane)		mm	8,00	9,20	10,00
Gas Type:			Guide Values for Injector Pressure		
- G20		mbar	11,6 - 13,2	11,1 - 12,6	12,9 - 14,5
- Propane		mbar	13,7 - 14,6	11,4 - 14,0	15,6 - 16,9
- Butane		mbar	10,3 - 11,4	9,2 - 10,1	11,9 - 12,9

\* Values in parenthesis = Wobbe Index WoN in kWh/m<sup>3</sup>

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

CO<sub>2</sub> -Content see section "Technical Data EUROCONDENSE two" on page 11.

## 6.9 Electrical Connection (general)



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

- Mains Voltage 1/N/PE
- AC 230 V +10% - 15%, 50 Hz

In Germany the VDE and local regulations and in all other countries, the pertinent regulations should be followed during installation.

The electrical connection has to be carried out unmistakably regarding terminal and terminal direction. In Germany, the connection can be carried out with an accessible, unmistakable plug-in connection or as a fixed connection. In all other countries, a fixed connection has to be carried out.

It is recommended, to install a EUROCONDENSE two main switch in front of the SOB. This should switch off all poles and have a contact opening width of at least 3 mm. The installation room must be dry, the room temperature must be between 0 °C and 45 °C.

All connected components must comply to VDE. Connecting lines have to be installed strain relieved.

### Cable lengths

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

Permissible cable lengths for all sensors:

- Cu-cable up to 20m: 0.8 mm<sup>2</sup>
- Cu-cable up to 80m: 1 mm<sup>2</sup>
- Cu-cable up to 120m: 1.5 mm<sup>2</sup>

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

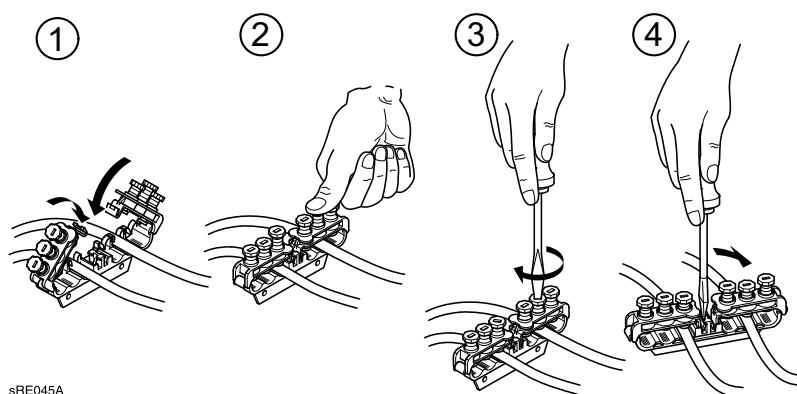
### Opening boiler switch panel

- Remove quick fastening from the front wall, fold down front wall and remove.
- Loosen quick fastening of the boiler switch panel and fold down KSF forward.

### Strain reliefs

All electrical cables have to be installed from the boiler rear wall to the boiler switch panel. Here, the cables have to be fixed into the strain reliefs of the switch panel and connected according to the circuit plan (See figure 1) *Abb. 6*

Fig. 6: 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 circuit plan!

Assemble and connect special accessories according to the enclosed instructions. Connect to mains. Check zeroing or earthing.

### Outdoor temperature sensor (included in delivery)

The outdoor temperature sensor is located in the accessory bag.

For connection see connection diagram.

### Replacing cables

All connecting cables, except for the mains connection cable, have to be replaced by BROETJE-special cables in case of replacement. When replacing the mains connection cable, only cables of the types H05VV-F have to be used.

### Protection against contact

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



### Initialising the sensors

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

## 7. Commissioning

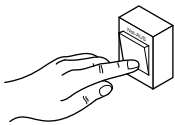


**Danger!** The commissioning must only be carried out by a heating specialist! The heating specialist checks tightness of the installation, correct function of all regulating, control and safety devices. See commissioning sheet at rear of manual!

### 7.1 Switching on



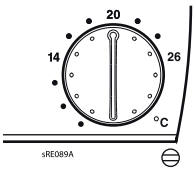
**Danger of scalding!** Hot water may exit from the blow pipe of the safety valve.



1. Switch on heating emergency switch
2. Open gas shut-off installation



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



4. Set the required room temperature on the rotating knob of the EUROCONTROL BCA 2

### 7.2 Temperatures for heating and drinking water



The information in the section *programming* for setting the temperatures for heating and drinking water. For drinking water processing a setting between 55 and 60°C is recommended.

### 7.3 Programming of necessary parameters

Normally, the parameters of the control 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*.

### 7.4 Emergency operation (Manual operation)

Setting the emergency operation of the plant >

- Press OK button of the display
- 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 operation



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.

Manual operation need to be selected in each boiler section.

## 7.5 Instruction for the customer

### Instruction

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

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

### Documents

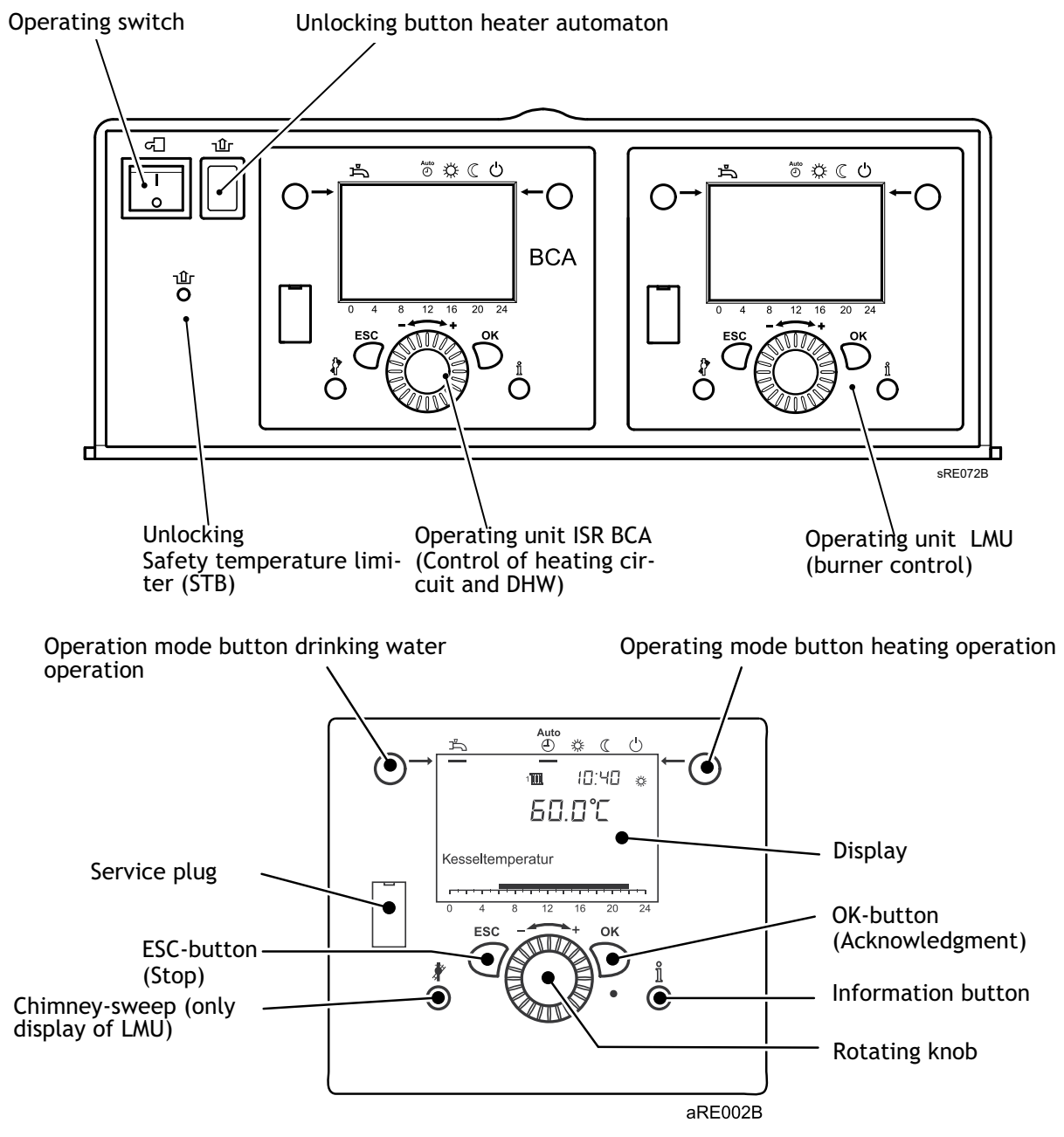
- The documents, belonging to the boiler, have to be handed over with the instructions they have to be kept in the installation room of the boiler.
- Copy the commissioning sheet with confirmation and legally binding signature to the customer. All components have been installed according to the instruction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

## 8. Operation

ISR BCA operates as master. ISR BCA takes over control of the operation and programming of the boiler sequence, the heating circuits and DHW (see also *installation manual ISR BCA*). The display of the LMU serves for diagnostics and programming of LMU (e.g. programming of input and output).

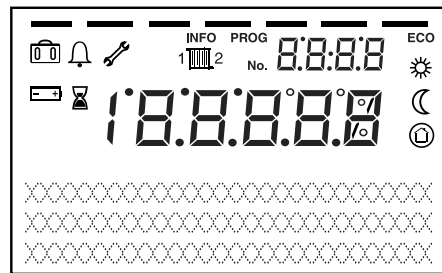
### 8.1 Operation elements

Fig. 7: Operating elements (the master module is shown, all slave modules do not have ISR BCA!),










## 8.2 Displays

Fig. 8: Symbols in the display



### Meaning of the displayed symbols

	Heating at comfort setpoint
	Heating at reduced setpoint
	Heating at frost protection setpoint
	Current process
	Holiday function activated
	Reference to heating circuit
	Fault message
<b>INFO</b>	Information level activated
<b>PROG</b>	Setting level activated
<b>ECO</b>	Heating switched off (summer/winter-change over automatic or heating limit automatic active)

### 8.3 Operation of control unit LMU

#### Display information

Different information can be called-up by pressing the information button>:

- Error messages and SW diagnostic code
- Servicing
- Setpoint manual control
- Boiler temp
- Outside temperature
- Status indic burner control

#### Operation phases of control and regulation centre LMU Press information button

Table 3: Operation phases

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>



Return to basic display from information level by operating the operation mode button ←○.

If no faults occur and no maintenance messages exist, this information will not be displayed. Other information will only be displayed in case of respective plant configuration and programmed functions.

## 8.4 Notes for setting and function



Remark: See manual of ISR BCA for adjustment of heating circuit and DHW.

### EUROCONDENSE two-Version with ISR BCA (primary boiler):

- EUROCONDENSE two is already preset in the factory for proper operation, this usually does not require any changes.
- ISR BCA operates as master and takes over control of the two boiler blocks or burners. The two burners will be switched on and off like a cascade according to the heat need.

Table 4: Factory Setting of ISR BCA EUROCONDENSE two 320-500 kW

Function	Prog.-No.	Setting level <sup>1</sup>	Standard value
<b>Cascade</b>			
Lead strategy Late on, early off   Late on, late off   Early on, late off	3510	En	Late on, late off
Release integral source seq	3530	En	50° C min
Reset integral source seq	3531	En	20° C min
Restart lock	3532	En	300 s
Switch-on delay	3533	En	5 min
Auto source seq ch'over	3540	En	- - - h <sup>2</sup>
Auto source seq exclusion None   First   Last	3541	En	None
Leading source Source 1   Source 2   Source 3   Source 4   Source 5   Source 6   Source 7   Source 8   Source 9   Source 10   Source 11   Source 12   Source 13   Source 14   Source 15   Source 16	3544	En	Source 1 <sup>2)</sup>

1. E = End user; C = Commissioning; En = Engineer

2. diese Einstellungen müssen bei Austausch der ISR BCA durch ein Ersatzteil eingestellt werden.

### Adjustment of the LMU for left and right boiler block

The factory setting of the LMU of the left and right boiler block can be taken from the *setting table* in section *programming*.



Information: The parameter settings of the two LMU are identical, only the address is different, this has to be taken from the application sample!

### EUROCONDENSE two -Version with ISR BCA and 0-10 V voltage input:

- While controlling the ISR BCA with a DDC-control with 0-10 V, the prog. no. 5950 of the ISR BCA should be set accordingly.

**EUROCONDENSE two -Versionwithout ISR BCA as follow-up boiler of design 1 (320-500 X)**

The EC two and ISR BCA operate as master and takes over control of the two heat engines. All other boilers are slave modules. Ensure there is a LPB bus communication between master and each slave module:

1st slave module	right heat engine	device address: 4
	left heat engine	device address: 5
2nd slave module	right heat engine	device address: 6
	left heat engine	device address: 7

etc.

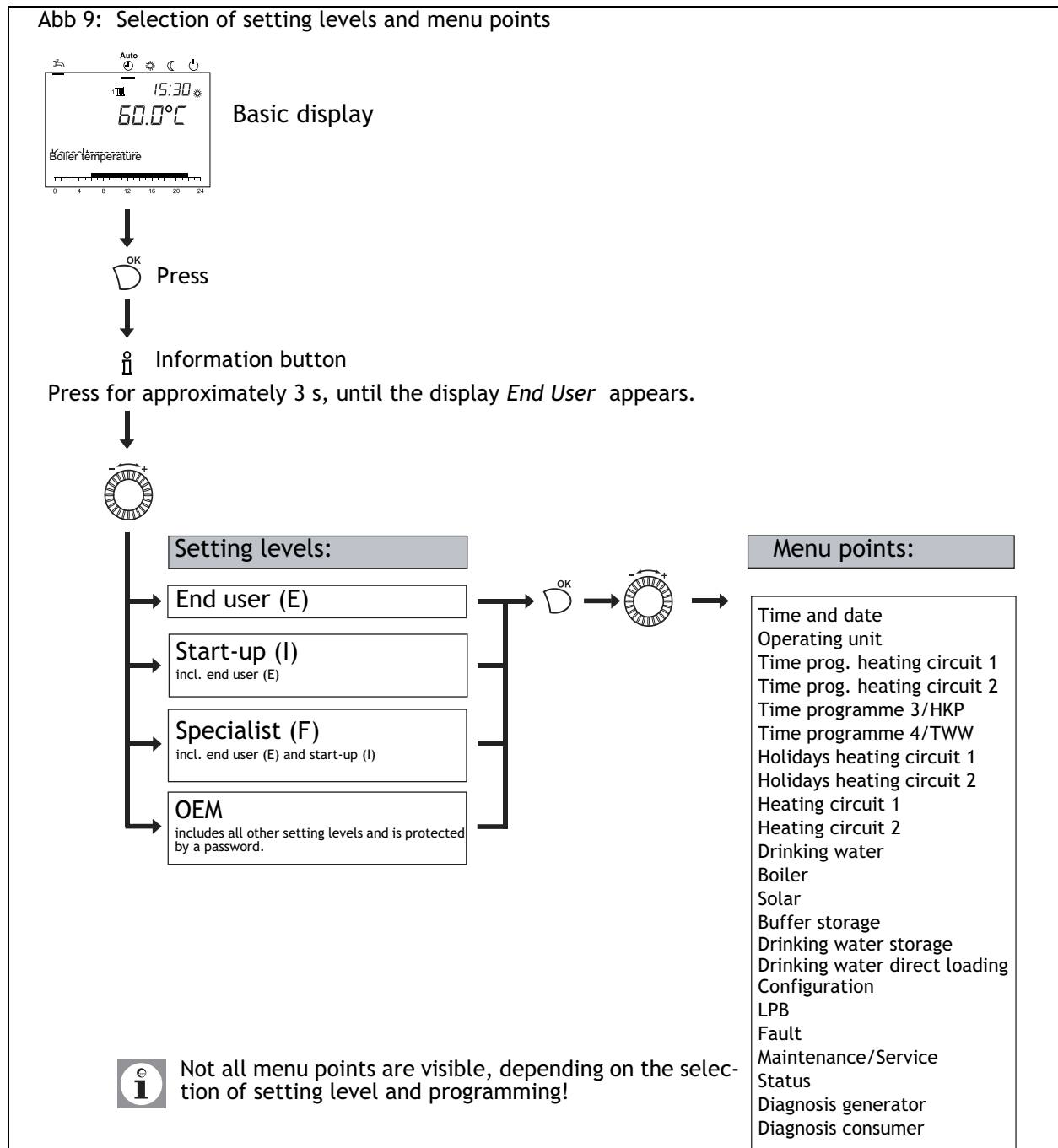
**EUROCONDENSE two Version for DCC-control with 0-10 V voltage input installed by the client (320-500 X):**

- Connecting the voltage module CISP:  
The control cable of the DDC-control should be connected to the terminal block X51 of every boiler block with the correct polarity, see connection diagram.
- *Change of wiring* of the bus module CIB:  
The 5-pole flat cable of the CIB has to be removed from the LMU!
- The DDC needs to address each heat-engine individually.

## 9. Programming

### 9.1 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:

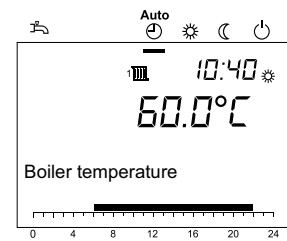


### 9.2 Modification of parameters

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

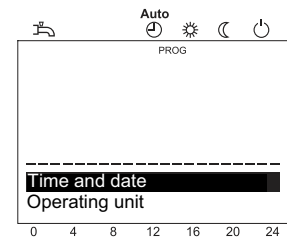
The basic programming process is depicted in the following by the setting of time and date.


Basic display:



Press .

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



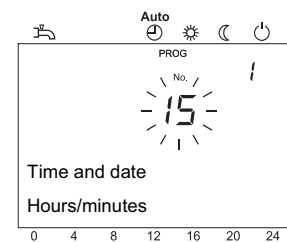
Acknowledge selection with .


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




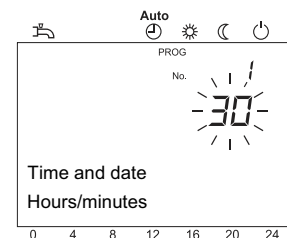
Acknowledge selection with .

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




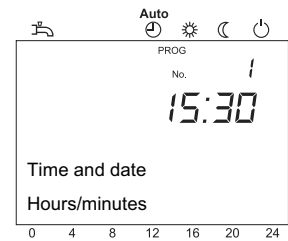
Acknowledge setting with .

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

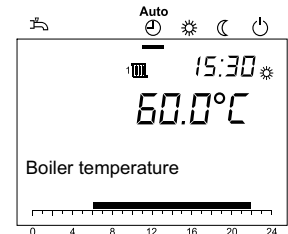
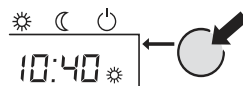




Acknowledge setting with .



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.

### 9.3 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.
- All parameters marked with \* are not relevant for the operation of EC two 320 - 500 thus they do not appear in the display, if correctly programmed.


Tabelle 5: Setting the parameters

Function	Prog.-No.	Setting level <sup>1</sup>	Standard value	Modified value
<b>Time and date</b>				
Hours/minutes	1	E	00:00 (h:min)	
Day/month	2	E	01.01 (day. month)	
Year	3	E	2004 (year)	
<b>Operating unit</b>				
Language	20	E	English	
Contrast of display	25	E	-	
Operation lock OFF   ON	26	F	Off	
Programming lock OFF   ON	27	F	Off	
Operator section save basic settings No   Yes	30	F	No	
 This parameter is only visible in the room device!				

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Function	Prog.- No.	Setting level <sup>1</sup>	Standard value	Modi- fied value
Operator section activate basic settings No   Yes	31	F	No	
Use as Room device 1   Room device 2   Operating device   Ser- vice device	40	I	Room device 1	
 This parameter is only visible in the room device!				
Attribution room device 1 Heating circuit 1   Heating circuit 1 and 2	42	I	Heating circuit 1	
 This parameter is only visible in the room device, as the operating unit in the boiler is fixed pro- grammed for the operating device!				
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	48	I	none	
 This parameter is only visible in the room device!				
Readjustment room sensor	54	F	0.0°C	
 This parameter is only visible in the room device!				
<b>Time programme heating circuit 1 *</b>				
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	
<b>Time programme heating circuit 2 *</b>  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)	
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	
<b>Time programme 3 / HCP *</b>				
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)	

Function	Prog.-No.	Setting level <sup>1</sup>	Standard value	Modified value
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	
<b>Time programme 4 / DHW *</b>				
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	
<b>Holidays heating circuit 1 *</b>				
Start	642	E	--.-- (day. month)	
Finish	643	E	--.-- (day. month)	
Operation level Frost protection   Reduced	648	E	Frost Protection	
<b>Holidays heating circuit 2 *</b>  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	
<b>Heating circuit 1 *</b>				
Comfort nominal value	710	E	20.0 °C	
Reduced nominal value	712	E	18.0 °C	
Frost protection nominal value	714	E	10.0 °C	
Nominal line gradient	720	E	3.50	
Summer/winter heating limit	730	E	30 °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   Functional/curing heating   Manual	850	F	Off	
Floor curing setp manually	851	F	25 °C	
Speed step design point	884	I	30	
Pump-PWM Minimum	885	I	28%	
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	
<b>Heating circuit 2 *</b>  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	

Function	Prog.- No.	Setting level <sup>1</sup>	Standard value	Modi- fied value
Nominal line gradient	1020	E	1.50	
Summer/winter heating limit	1030	E	30 °C	
Room influence	1050	I	- - - %	
Boost heating	1070	F	- - - °C	
Quick setback Off   Down to reduced setpoint   Down to frost prot set- point	1080	F	Down to reduced setpoint	
Mixing valve boost	1130	F	6 °C	
Floor curing function Off   Functional heating   Curing heating   Functional/ curing heating   Manual	1150	F	Off	
Floor curing setp manually	1151	F	25 °C	
<b>Domestic hot water *</b>				
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	
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	
<b>Boiler</b>				
Nominal value manual operation	2214	E	60 °C	
<b>Drinking water sto- rage</b>	 Parameter according to hydraulic diagram!			
Flow setpoint boost	5020	F	18 °C	
<b>Configuration</b>				
Hydraulic scheme	5701	I	80	
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	Alarm output	

Function	Prog.- No.	Setting level <sup>1</sup>	Standard value	Modi- fied value
Default K2 to K1 No   Yes	5921	I	No	
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	Message output	
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	Alarm output	
Relay output 3 RelCl Default   Message output   Alarm output   Omessage   External transformer   Heating circuit pump HK2   Cir- culation pump   Gate veil function   Pump hydraulic bypass   Feed pump Q8   Basic function K2   TWW-char- ging   Threshold analoguous signal RelCl   Exhaust gas flap   Collector pump   Fan switch-off   Pump Q1   DHW mixing pump Q35	5924	I	Operation message	
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	Collector pump	
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	Prog.- No.	Setting level <sup>1</sup>	Standard value	Modi- fied value
Function input RelCl No   Modem function   Modem function inverse   Gate veil function   Nominal value specification   Power speci- fication   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	
ConfigContr1.7		F	0	
<b>LPB</b>				
Equipment address	6600	I	2 (right) / 3 (left)	
<b>Fault</b>				
SW Diagnosis code	6705	E		
FA phase disturbance position		E		
<b>Maintenance / Service</b>				
Message	7001	E	0	
Acknowledgement message	7010	E	0	
Manual control OFF   ON	7140	E	Off	
<b>State</b>				
Status heating circuit 1	8000	I		
Status heating circuit 2	8001	I		
Status DHW	8003	I		
Status boiler	8005	I		
Status solar	8007	I		
<b>Diagnosis generator</b>				
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		
<b>Diagnosis consumer</b>				
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		

Function	Prog.-No.	Setting level <sup>1</sup>	Standard value	Modified value
Flow temperature 2	8773	I		
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		
<b>Information values</b>  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 = Commissioning; 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.

## 9.4 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 must be correctly set, so that the heating programs can operate to previously carried out programming.

## 9.5 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.

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

**Start**  
(642, 652)

### Holiday programs

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

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".

**Comfort setpoint**  
(710, 1010)

### Heating circuits

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)

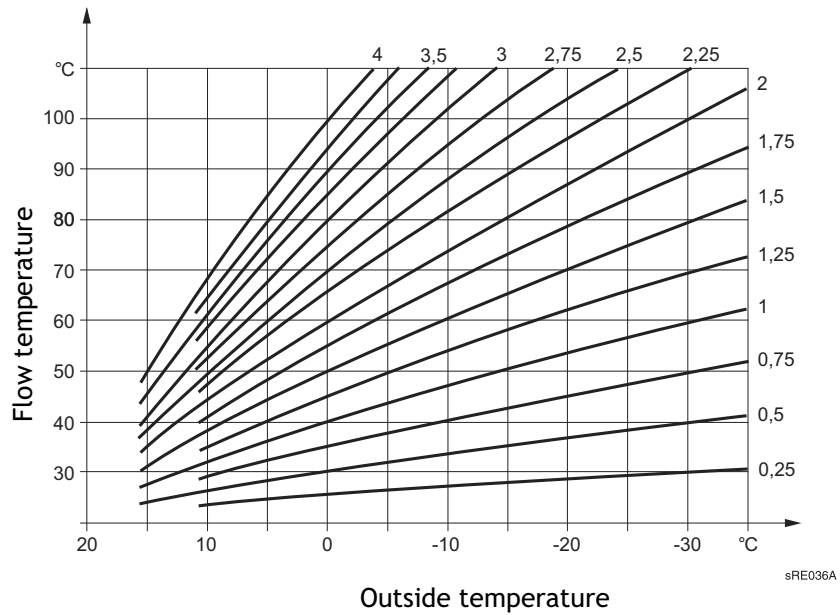
The flow temperature nominal value is formed with the help of the heating curve, which is used to control the flow temperature depending on the weather.

### Determination of the heating curve slope

Enter lowest calculated outside temperature according to climate zone into the diagram (siehe *Abb. 7*), e.g. vertical line at  $-10^{\circ}\text{C}$ . Enter maximum flow temperature of the heating circuit (e.g. horizontal line at  $60^{\circ}\text{C}$ ).

The intersecting point gives the value for the heating curve slope.

Abb 10: 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 must be between 1% and 99%. Should there be radiator valves in the leading room (assembly location of the room sensor), these have to be fully opened.

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. no. 6110) and 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.

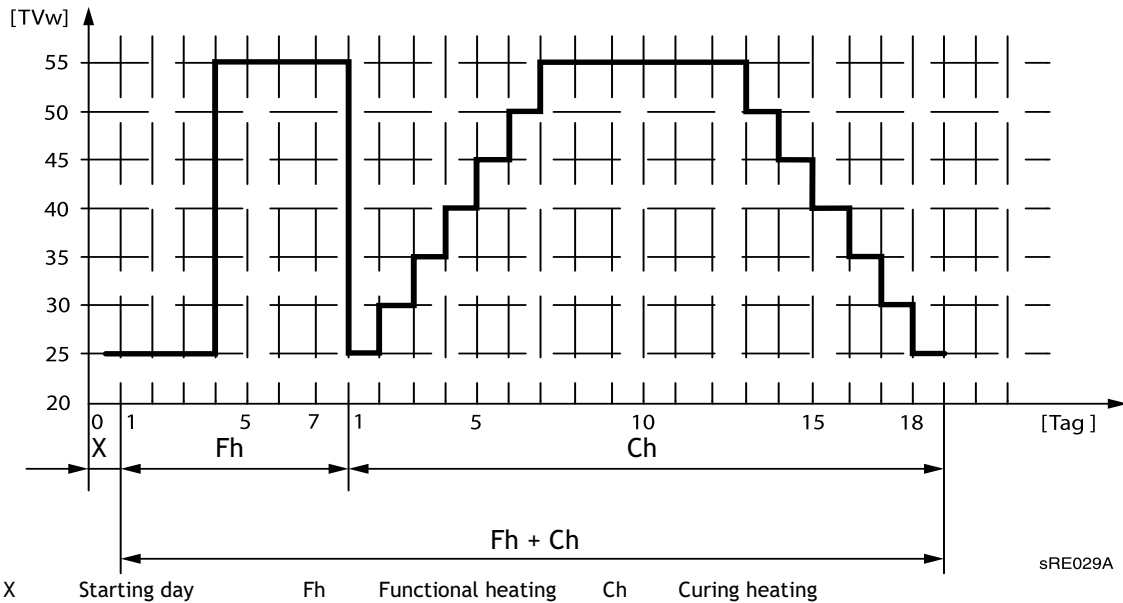
*Functional heating (Fh):* Part 1 of the temperature profile will be run through automatically.

*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.

Abb 11: 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.

**Pump PWM min (885)**

The minimum permissible 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.

### 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:

- |  |  |
|--|--|
| <b>Standard outside temp (886)</b>       | 1. Set standard outside temperature, prog. no. 886, according to the design point of the heating plant (factory setting: - 20 °C). |
| <b>Flow temp setp standard OT (887)</b>  | 2. Set flow temperature setpoint standard outside, prog. no. 887, according to flow temperature (factory setting: 75 °C).          |
| <b>dT differential standard OT (894)</b> | 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 (Nqmodmin) 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 setpoint (1610)**

Setting the DHW nominal setpoint

**Reduced setpoint (1612)**

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

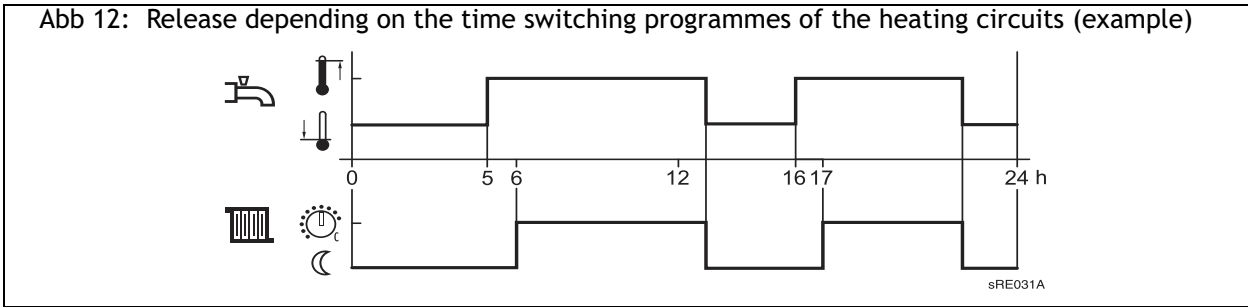
**Release (1620)**

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

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

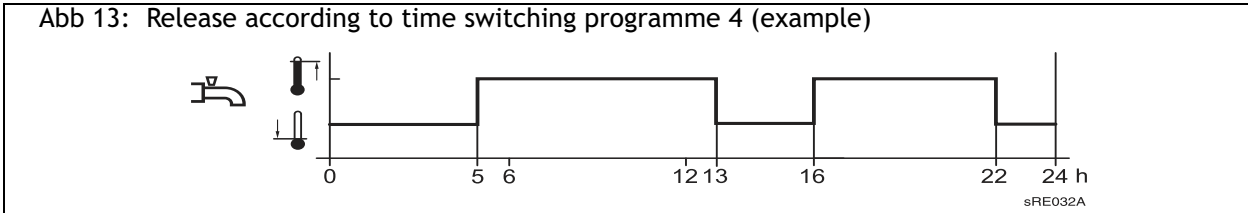
on the time switching programs. Every time, the switching-on time will be moved forward by one hour (siehe Abb. 9).

Abb 12: 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 (siehe Abb. 10).

Abb 13: 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.



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

<b>Circulating pump release (1660)</b>	duration has been set, the legionella function has been met immediately on reaching the <b>legionella function setpoint</b> .
	<i>Time program 3:</i> The circulation pump is released, depending on the time program 3 (see prog. no. 540 to 556).
	<i>DHW release:</i> The circulation pump will be released, when the DHW preparation has been released.
	<i>Time program 4/DHW:</i> The circulation pump will be released, depending on the time program 4 of the local controller.
<b>Circulation pump cycle operation (1661)</b>	The circulation pump will be switched on for 10 minutes and off for 20 minutes within the release time.
<b>Setpoint manual control (2214)</b>	<b>Boiler</b> Temperature, to which the boiler will be controlled in manual control mode (also see prog. no. 7140).
<b>Flow setpoint boost (5020)</b>	<b>DHW storage tank</b> The boiler temperature setpoint for charging the DHW storage tank consists of the DHW temperature setpoint and the flow setpoint boost.
<b>Hydraulic diagram (5701)</b>	<b>Configuration</b> Setting of the code for the hydraulic system. The data of the codes are included in the respective instructions of the accessories.
<b>Heating circuit 1/2 (5710 ad 5715)</b>	With this parameter the heating circuits can be deactivated.  This adjustment directly affects the heating circuits and has no influence on the operating unit!
	
<b>System pump (5761)</b>	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:  <i>Zones with system pump</i> <i>HC1 with system pump</i> <i>HC2 with system pump</i> <i>DHW with system pump</i>
<b>Relay outputs (5920 to 5928)</b>	<i>Default:</i> Function according to hydraulic diagram. <i>Status output:</i> 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. <i>Alarm output:</i> The output will be set, when there is a fault in the device, which requires manual unlocking. <i>Status information:</i> The output is set, when the burner operates. <i>External transformer:</i> 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 transfor-

mer should be switched off as often as possible to minimize 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 (CIM C). If the 2nd heating circuit is designed as a pumped circuit, the pump can also be controlled by the programmable output.

*Circulation pump:* Function to control a DHW circulation pump (see prog. no. 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 warm air curtain 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 (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 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 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.

*No:* No function.

*Yes:* The output signal of the relay K2 is conducted to the output K1.

Default K2 to K1  
(5921)



**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 remote 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 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 warm air curtain function 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 thermostat:* 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.

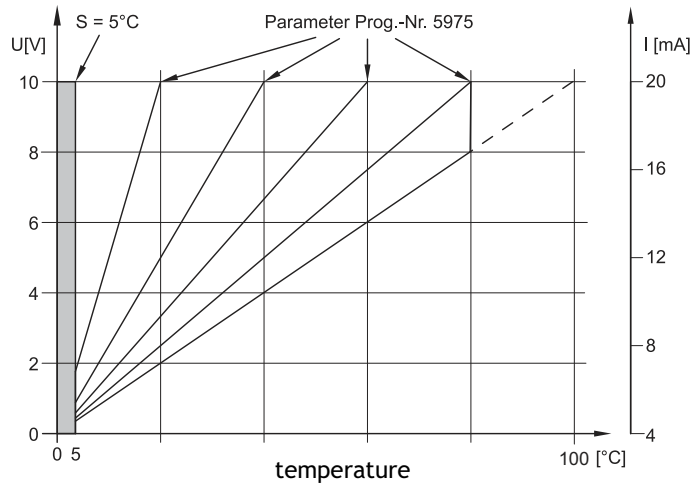
*Modem:* See prog. no. 5950.

*Modem inverse:* See prog. no. 5950.

*Warm air curtain function:* See prog no. 5920.

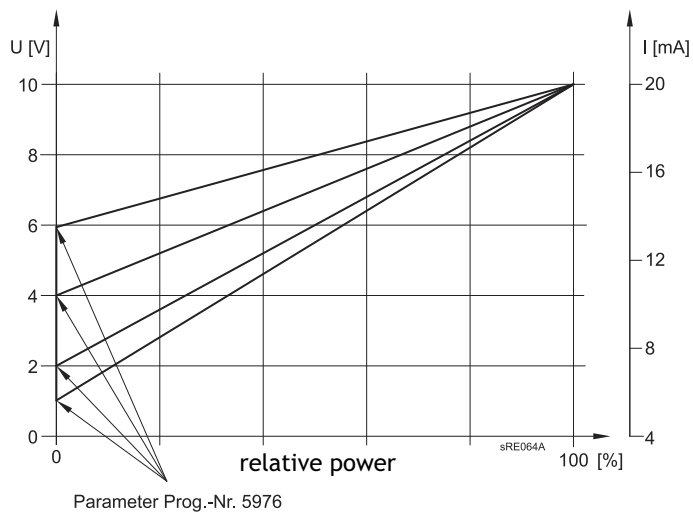
*Specified setpoints (heat request:)* The existing voltage signal or current signal will be converted into a temperature value and used as a flow setpoint. The maximum value will be set under prog. no. 5975.

Abb 14: 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.

Abb 15: Specified capacity (examples)



*Pump 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 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.

See prog no. 5973.

**External maximum nominal flow value (5975)**

**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

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*).

**SW Diagnostics code (6705)**

**Burner ctrl phase lock-out pos**

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

**Message (7001)**

**Maintenance / Service**

Messages to signal necessary maintenance work. The following causes may be the reason for the occurrence 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.

**Acknowledgment 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	Depend 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	Depend 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	

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

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

Display	Depend on
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	

**State DHW**

The following messages are possible under DHW:

Display	Depend 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	Depend 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	

## 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 valves for correct function.
- Check operating pressure and, possibly, fill with water.
- De-aerate heating plant and return gravity lock into operating position.

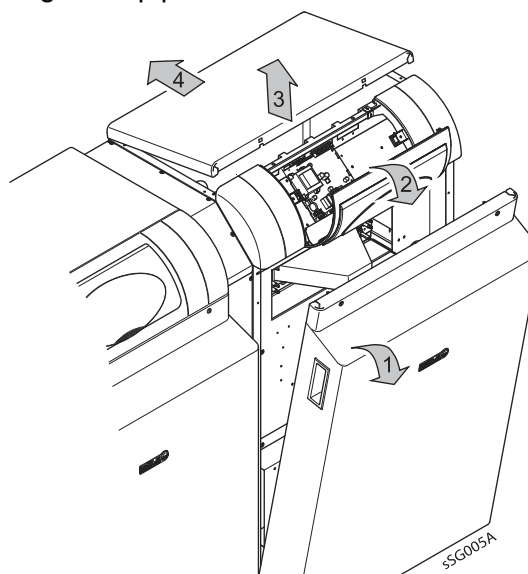
It is recommended to carry out maintenance and cleaning of the EUROCONDENSE two annually.

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

#### Removing casing

- Loosen quick fastenings, fold down and remove front casing (see figure 1, 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.

Abb 16: Removing front casing and top panel



### Cleaning of the heat-exchanger and the condensate sump:

- Remove the cleaning cover on the condensate sump.
- Cleaning with a plastic or stainless steel brush and water which 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 siphon

The condensate siphon 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 from the boiler, disassemble and rinse with clean water. Assemble the siphon in reverse order.



At the same time, the flue gas collecting tray 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 burner pipes with soft brush.
- While fitting back new gaskets should be used, particularly for the the gas connecting pipe.
- The screws for fastening the burner have to be tightened to **20 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.



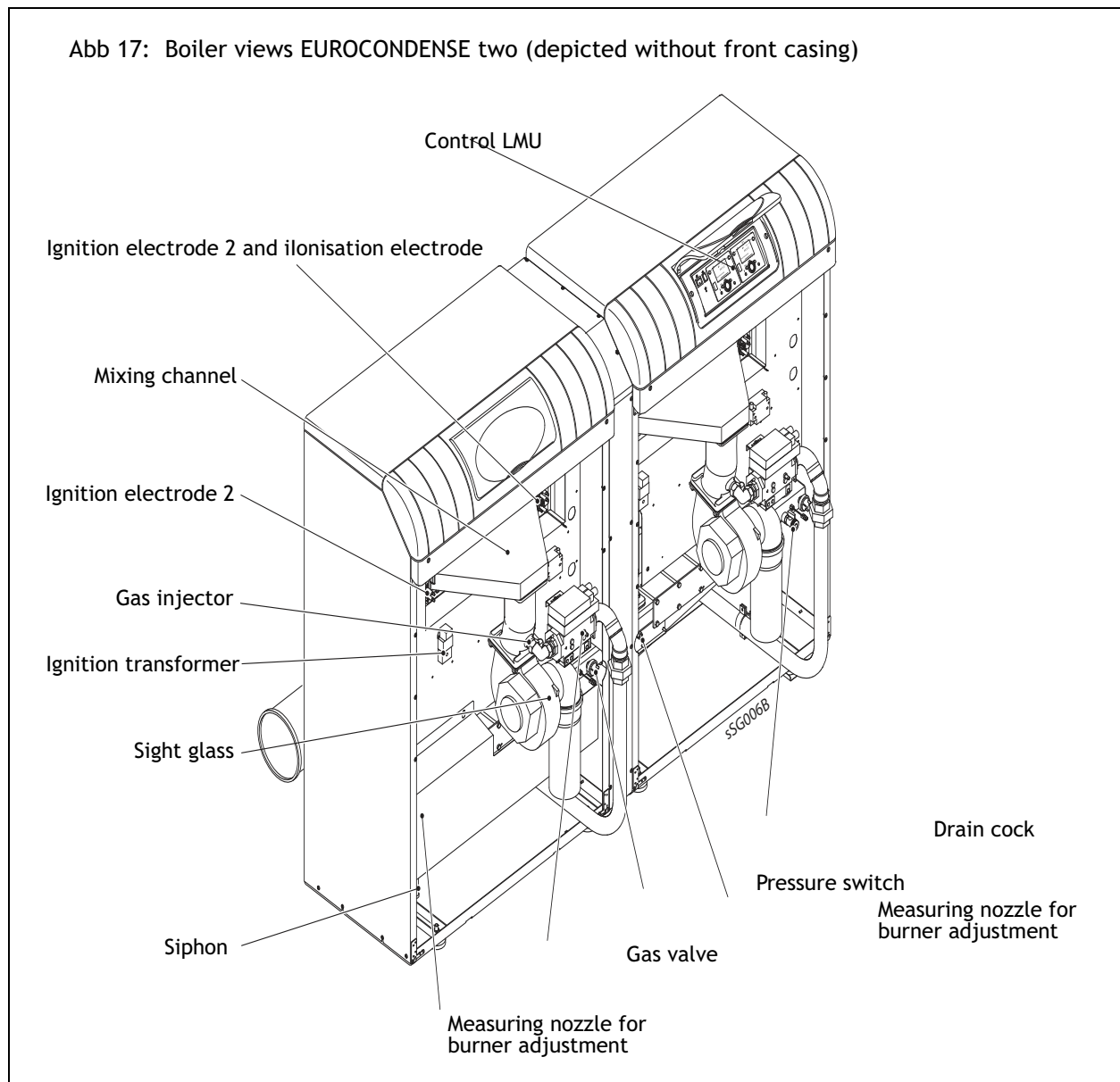
### Protection against contact



**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. 19 and 20.

**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.

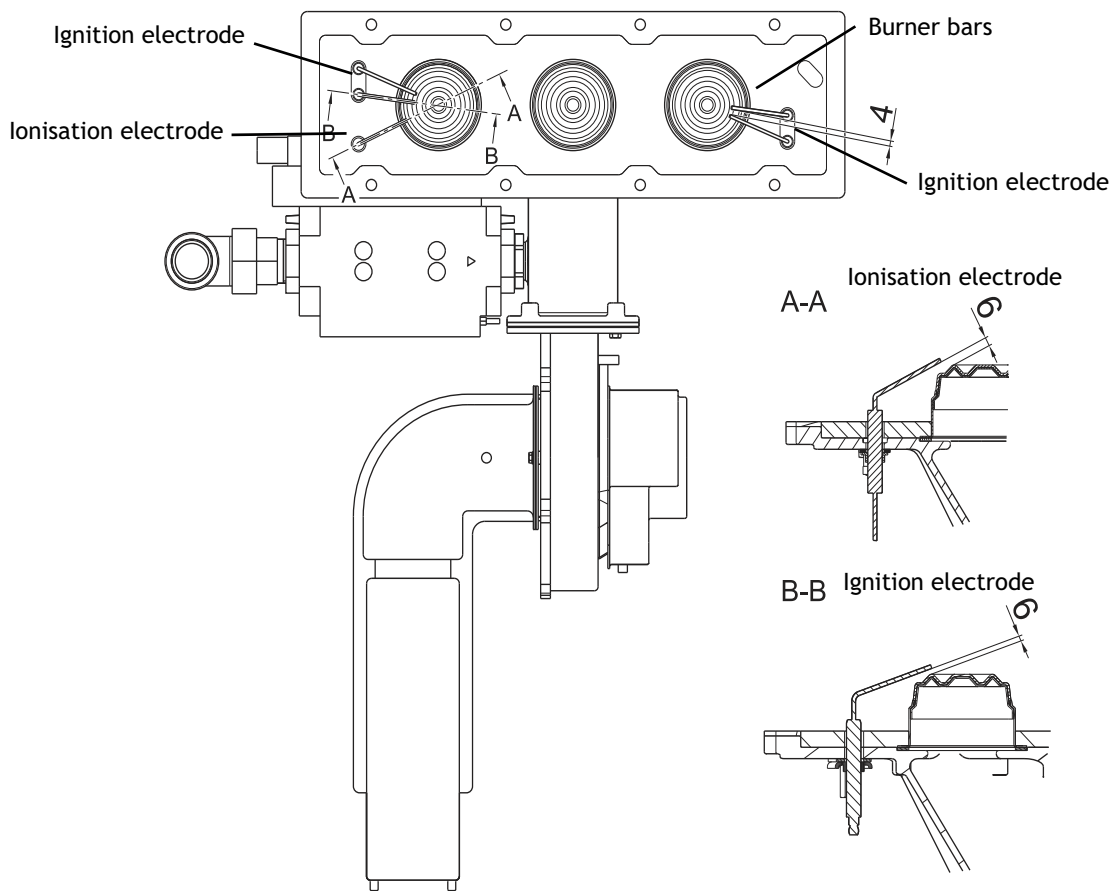
- At minimum power > 5  $\mu$ A DC (switching threshold at 0.7  $\mu$ A DC)
- At maximum power 10  $\mu$ A DC



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!

Abb 18: Electrodes (operation with natural gas and LPG)



**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.

**Reset**

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

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## 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 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 points out 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 *Tabelle*).

### **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.

### 10.8 Fault code table

Fault code	SW-Diag-nostic.	Fault description
10		Outside temperature sensor short or interruption
20		Boiler flow sensor short or interruption
32		Sensor (CITF, CIM) short or interruption
40		Boiler return sensor - short or interruption
50		WW-sensor 1 short or interruption
52		WW-sensor 2 short or interruption
61		Disturbance room device
73		Collector sensor defect or temperature too low.
77		Collector sensor short or interruption
81	518	Short circuit on LPB-bus or no bus feed
82	519	Address collision on LPB-bus
91		Data loss in EEPROM internal fault LMU
92		Hardware error in the electronics
95		Invalid time
100	520	two time masters system fault
100	539	QAA and OCI serve as time master.
105	560	Burner operating hours exceeded since the last maintenance work
105	561	Number of starts exceeded since the last maintenance
105	562	Number of month exceeded since the last maintenance
105	563	Limit of ionisation current of flame exceeded
110	17	STB interruption
110	115	STB shut-off temperature exceeded (el. STB).
110	129	Interruption (STB or intern)
110	422	STB has triggered (temperature rise)
110	470	STB has triggered (temperature rise)
111		Temperature monitor tripped (excess temperature)
119		Water pressure switch tripped
121	621	Temperature alarm heating circuit 1
122	622	Temperature alarm heating circuit 2
127		Legionair's disease germs temperature not reached
128		Flame failure during operation
129		Speed limit exceeded
132		GW-input open
133		No flame after safety time.
140	521	Impermissible LPB segment number or equipment number
148		Incompatibility between LPB interface/basic unit
151	95	Possible cause: Check value for rotational speed. Required range not being reached.
151	96	Irritating light emission (other than flame) during operation or stand-by
151	97	Irritating light emission (other than flame)
151	170	Override button constantly pressed
151	455	Hydraulic diagram does not contain heating circuit 1.
151	456	Hydraulic diagram does not contain heating circuit 2.
151	457	Hydraulic-diagram does not contain any zone.
151	458	There is no defined setpoint for DHW so it has been shut off.
151	459	There is no defined setpoint for heating circuit 1 so it has been shut off.
151	460	There is no defined setpoint for heating circuit 2 so it has been shut off.
151	461	There is no defined setpoint for heating zone so it has been shut off.
151	495	Connected LPB-ClipIn is defect.
151	516	Clip- In M is defect

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Fault code	SW-Diagnostic.	Fault description
151	552	Clip- In R is defect
151	573	Failure of control of air flap: feed-back defect
151	607	Clip-In Solar is defect
152	162	invalid AD-configuration in ConfigRg3
152	325	invalid diagram in Hydraulic diagram or internal fault
152	453	invalid configuration of reversing valve in ConfigRg4
152	483	Hydraulic-diagram does not contain any zone.
152	548	Input of Clip-In incorrectly programmed or not possible
152	550	Low loss header can not be served with this hydraulic diagram (control / pump).
153	259	Override button being applied
154	426	Boiler temperature rises faster than usual
154	433	Delta-T bigger than original expansion (+ 16K)
160	83	Permitted speed range not being reached during commissioning.
160	281, 282	Fan speed not being reached or exceeded
161	110	Maximal fan speed exceeded
180	168	Chimney sweeper function is active
181	169	Controller stop function is active
183	105	Device is in programming position (PC-Tool).
183	497	Demand for adjustment of parameters via LPB-Bus
184	602	Modem function is active
185	608	Floor curing function is activ.

Additional messages are possible

## 10.9 Maintenance code table

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

### 10.10 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>

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