

SUPERPURE



6 720 641 801-00.1RS

KBR 120-3

KBR 160-3

KBR 200-3

KBR 240-3

KBR 280-3

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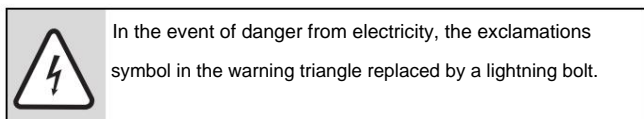
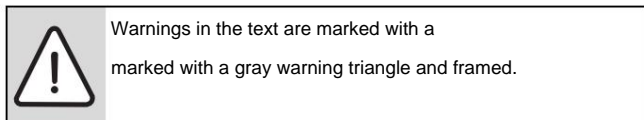
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1 Explanation of symbols and safety instructions

1.1 Explanation of symbols

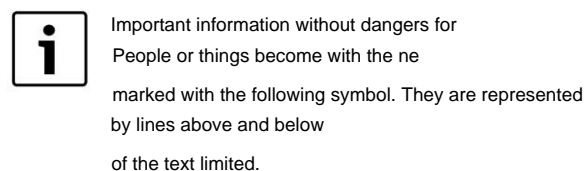
Warnings



Signal words at the beginning of a warning indicate the type and severity of the consequences if the measures to prevent the danger are not followed.

- **NOTICE** means that property damage can occur to.
- **CAUTION** means mild to moderate Personal injury can occur.
- **WARNING** indicates that serious personal injury can occur.
- **DANGER** means that life-threatening people damage can occur.

Important information



More symbols

symbol	meaning
B	action step
Æ	Cross-reference to other places in document or to other documents
•	Enumeration/list entry
–	Enumeration/list entry (2nd level)

Table 1

1.2 Safety Instructions

Risk of explosion if you smell gas

- B Close the gas tap (Æ page 50).
- B Open windows and doors.
- B Do not operate electrical switches, pull plugs, use telephones or ring bells.

B Extinguish open flames. Do not smoke. No fire light stuff.

B Warn residents **from outside**, but don't ring. Call the gas supply company and approved specialist company.

B If you hear it escaping, leave the building immediately. Prevent entry by third parties, inform the police and fire brigade from outside the building mix

Danger if you smell exhaust gas

B Shut down the heating system (Æ page 50).

B Open windows and doors.

B Notify an authorized specialist company.

Danger of poisoning. Insufficient air supply can lead to dangerous exhaust emissions

B Make sure that the supply and exhaust air openings are not are reduced or closed.

B If the defect is not remedied immediately, the boiler must not be operated.

B Inform the system operator of the defect and the danger in writing.

Danger from explosion of flammable gases

B Only allow work on gas-carrying components to be carried out by an approved specialist company.

Danger from electric current when the boiler is open

B Before opening the boiler:

Switch off the power to the heating system with the heating emergency switch or disconnect the heating system from the mains using the corresponding house fuse.

It is not enough to switch off the controller.

B Heating system against unintentional reactivation switch secure.

Danger from explosive and highly flammable materials

B Easily flammable materials (paper, thinner voltage, colors, etc.) should not be used or stored near the boiler.

Danger from not paying attention to your own safety in emergencies, e.g. B. in case of fire

B Never endanger your life. the personal safety always comes first.

risk of scalding

B Allow the boiler to cool down before inspection and maintenance. Temperatures in excess of 60 °C can occur in the heating system.

Installation, conversion:**Caution system damage**

B Do not close or reduce the size of the ventilation openings in doors, windows and walls in **room air-dependent operation** . When installing gap-tight windows, ensure the supply of combustion air.

B If the defect is not remedied immediately, the boiler must not be operated.

B DHW tank for heating only use of hot water.

B Never close the safety valves

During heating, water can escape from the safety valve of the hot water storage tank.

B Do not modify exhaust-carrying parts.

Working on the boiler

B Installation, commissioning, inspection and Any repair work should only be carried out by an authorized specialist company. In front Observe the writings (Æ chapter 3, page 15).

Instruction of the customer

B Inform customers about how the boiler works and show them how to operate it.

B The operator is responsible for safety and environmental protection tolerability of the heating system (Federal Immission Control Act).

B customers indicate that he has no changes or carry out repairs.

B Maintenance and repairs may only be carried out by authorized specialist companies.

B Only use original spare parts.

B Other combinations, accessories and wearing parts only use if they are intended for this application.

2 Product information

2.1 About this manual

These installation and maintenance instructions contain important information on the safe and proper installation, commissioning and maintenance of the gas condensing boiler.

These installation and maintenance instructions are aimed at tradesmen who – due to their professional training and experience – have knowledge of how to work with heating systems and gas installations.

The following documents are available for the boiler:

- Operation manual
- Installation and maintenance manual
- Planning document
- Spare Parts Catalog
- Water quality log

The documents mentioned above are also available via Junkers on the Internet.

If you have any suggestions for improving the above documents or if you discover any irregularities, please contact us. You will find the address details and Internet address on the back of this document.

2.2 EC Declaration of Conformity

The design and operating behavior of this product comply with the European directives and the supplementary national requirements. Conformity is proven with the CE marking.

You can request the product's declaration of conformity. To do this, contact the address on the back of this guide.



Observe the information on the type plate of the boiler.

According to § 7, paragraph 2.1 of the ordinances for the revision of the first and amendment of the fourth ordinance for the implementation of the Federal Immission Control Act, the nitrogen oxide content in the exhaust gas determined under test conditions according to DIN 4702, Part 8, March 1990 edition, is below 80 mg/kWh.

The boiler is tested according to EN 677.

2.3 Intended use

Only use the boiler for its intended purpose and in compliance with the installation and maintenance instructions.

Use the boiler exclusively for heating water for heating systems and/or for indirect heating of drinking water, e.g. B. Use hot water tank. Any other use is not intended.

2.4 Naming the boiler

The designation of the boiler consists of the following parts together:

SUPERPURE:	type name
KBR	Gas condensing boiler
• 120 • 160 • 200 • 240 • 280	Maximum heating power in kW
-3	3rd generation of controllers

Table 2

2.5 Scope of Delivery

component	piece of packaging	
Boiler fully assembled with casing	1	1 carton palette
Technical documentation to	1	1 foil pack
Foot screw set	1	1 foil pack

Tab. 3 Scope of delivery

Accessories

The following components are available as accessories.

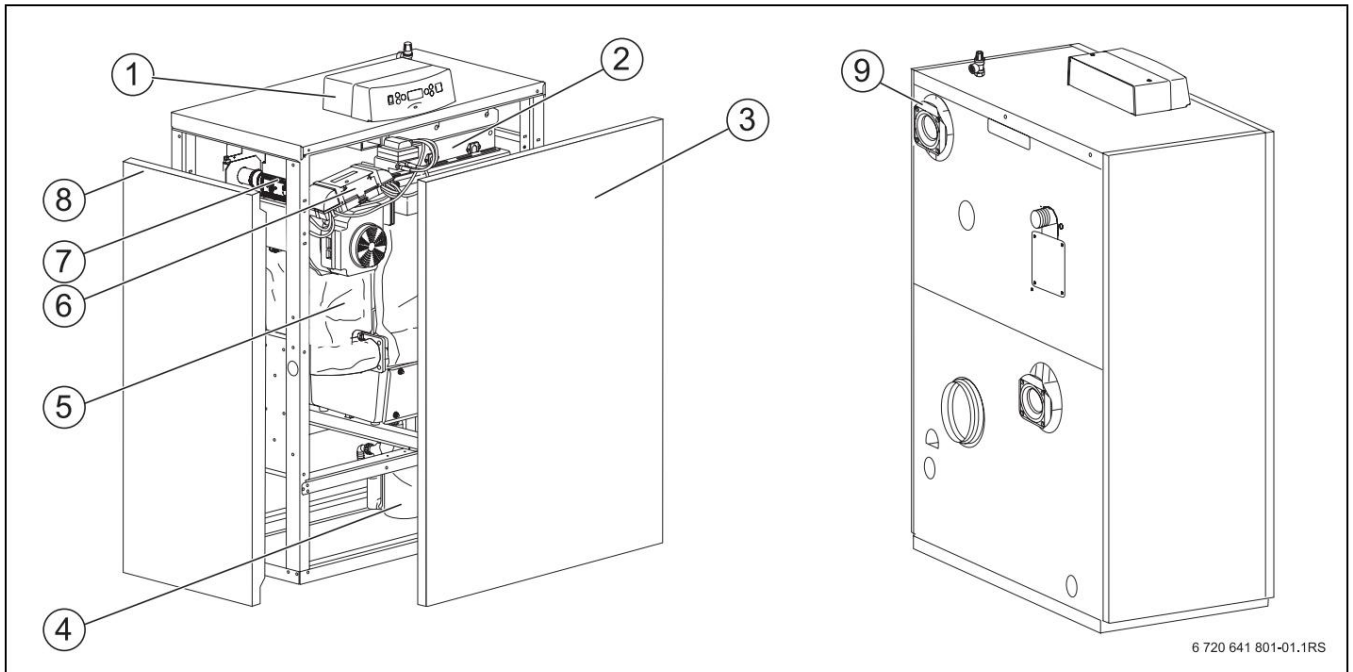
component	piece	
safety valve or security Group 1)	R1" (at 120 kW) R1½" (at 160 to 240 kW)	1
Boiler connection elbow		1
boiler connector		1

Tab. 4 Required accessories

- 1) Safety valve or safety group are for the Function and security required.

2.6 Product Overview

The boiler is a gas condensing boiler with aluminum
nium heat exchanger.



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Figure 1 Product overview

- | | |
|---|--|
| 1 | Main circuit board with operating unit |
| 2 | gas burner |
| 3 | boiler front wall |
| 4 | siphon |
| 5 | Boiler block with thermal protection |
| 6 | burner machine |
| 7 | gas fitting |
| 8 | boiler casing |
| 9 | check valve |

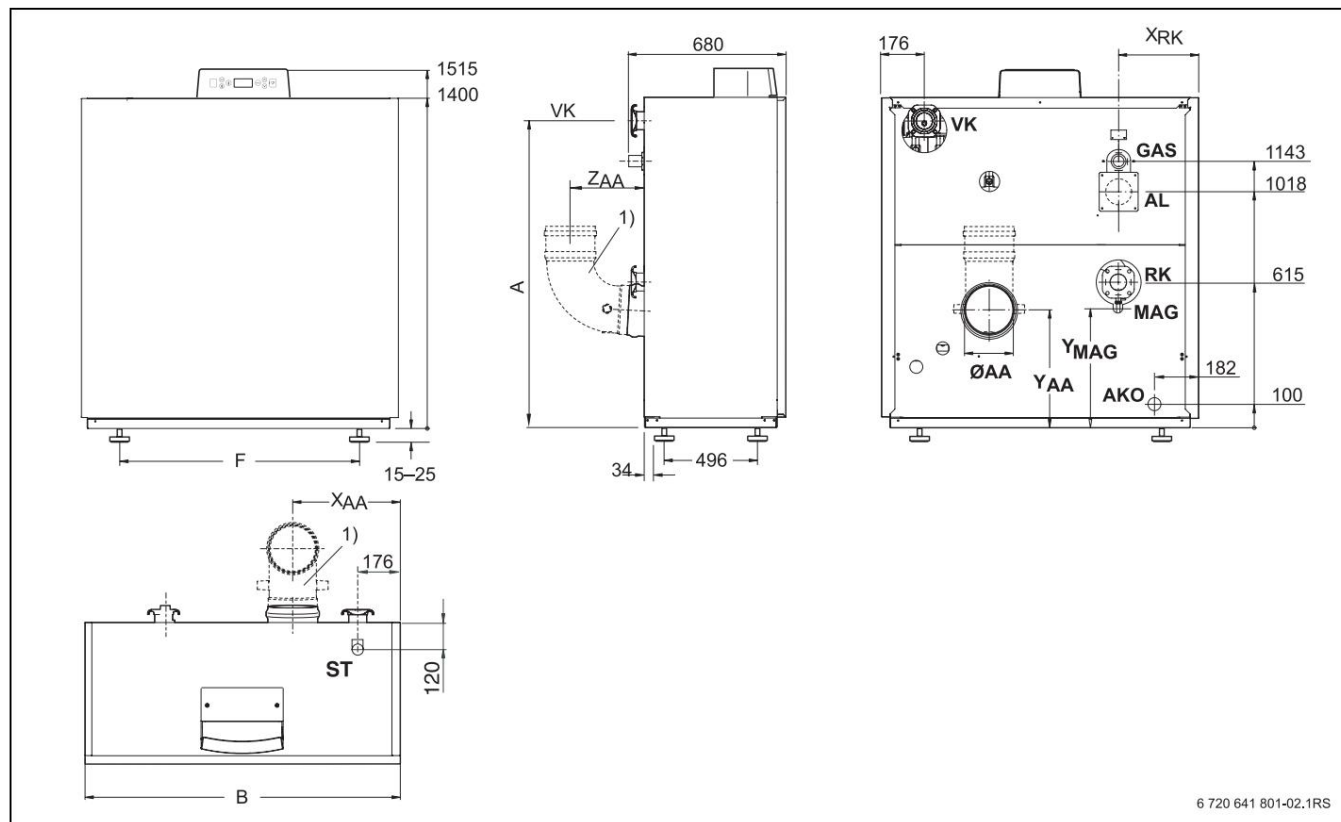
The boiler consists of:

- Main circuit board with operating unit
- Equipment frame with casing
- Boiler block with thermal protection
- Gas burner

The controller monitors and controls all electrical components of the boiler.

The boiler block transfers the heat generated by the burner to the heating water. The thermal protection reduced the energy loss.

2.7 Dimensions and Connections



picture 2

1) Not included in the delivery

connections			
aa	Connection flue gas	AKO	condensate outlet
AL	Combustion air line connection (only for room air-independent operation)	GAS	gas connection
VK	Boiler flow	ST	Connection safety valve or safety group
MAG	connection diaphragm expansion tank	RK	boiler return

Table 5 Connections

Boiler size (power in kW)		120	160	200	240	280
number of members		4	5	6	7	8 th
Width B	mm	916	1124	1124	1332	1332
Dimension XAA	mm	293	345	397	449	501
Dimension XRK (= XAL = XGAS)	mm	231	335	231	335	231
dimension F	mm	800	1008	1008	1216	1216
Dimension A	mm	1308	1300	1300	1300	1300
Diameter exhaust pipe Ø AA	DN (mm)	160	160	200	200	200
Dimension YAA	mm	470	470	495	495	495
Dimension YMAG	mm	522	514	514	514	514
Dimension ZAA	mm	145	145	310	310	310
Combustion air line diameter AL (only balanced flue)	DN (mm)	110	110	110	110	110
Connection VK and RK		rp 2" (DN 50)		PN6 standard flange (DN 65)		
Connection ST		R 1"		R 1¼"		
Ø GAS		R ¾"		R 1½"		

Tab. 6 Dimensions and connection dimensions

Product details

2.8 Specifications

Boiler size (power in kW)		120	160	200	240	280
number of members		4	5	6	7	8th
rated heat output Temperature pairing 50/30 °C	Full load kW 120		160	200	240	280
	part load kW	31	42	62	75.2	87.2
rated heat output Temperature pairing 80/60 °C	Full load kW 113		150	187	225	263
	part load kW	28	38	56.2	67.6	79.2
nominal heat load	Rated load kW 115.9		155	193	232	271
	part load kW	29	38.8	57.9	69.6	81.3
Exhaust mass flow 50/30 °C	full load g/s	53.8	70.2	87.8	106.0	125.9
	part load g/s	10.1	12.9	21.5	23.0	28.4
Exhaust mass flow 80/60 °C	full load g/s	53.7	70.2	89.3	107.4	125.4
	part load g/s	11.1	14.1	21.6	25.0	33.4
CO2 content of natural gas	full load %			9.1		
	part load %			9.3		
Minimum exhaust gas temperature 50/30 °C	full load °C	56	54	55	55	57
	part load °C	32	31	34	33	34
Minimum exhaust gas temperature 80/60 °C	full load °C	< 75	< 75	< 75	< 75	< 75
	part load °C	57	56	59	58	59
Available delivery pressure of the exhaust system	father			100		
gas						
fan				G1G 170		
gas fitting			Honeywell		Kromschroeder	
			VR 4615V	VR 415VE	CG 20 CG 25	CG 25
gas throttle diameter						
natural gas H (G20), Wobbe index 14.9 kWh/m3		mm 15.7		gas throttle Not available the	14.2	13.6
natural gas L (Germany), Wobbe index 12.8 kWh/m3		mm 15.0				12.6
Design (according to DVGW regulations)				B23, B23P, (C63(x)) room air dependent and room air independent operation		
heating water circuit						
Boiler water content		l	16	20	24	27
Pressure loss on the heating water side		mbar	see diagram, page 77			
Maximum flow temperature		°C	85			

Tab. 7 Technical data

Boiler size (power in kW)		120	160	200	240	280
STB protection temperature	°C	100				
Permissible operating pressure	bar	4				
electrical data						
Degree of protection		IPX0D				
power connection	V/Hz	230/50				
power consumption	Full load W	150	190	230	270	330
	Part load W	40	45	50	50	50
Device dimensions and weight						
delivery dimensions width x depth x height	mm	851x	1059x	1059x	1267x	1267x
		612x	612x	612x	612x	612x
		1400	1400	1400	1400	1400
weight	kg	205	240	265	300	330

Tab. 7 Technical data

2.9 Gas Flow

boiler size	gas throughput	
	natural gas H (G20)	Natural gas L (DE)
	Wobbe index 14.9	Wobbe index 12.8
	kWh/m ³	kWh/m ³
kW	m ³ /h	m ³ /hr
120	12.3	13.2
160	16.4	17.6
200	20.4	21.9
240	24.6	26.3
280	28.7	30.7

Tab. 8 Gas throughput (related to 15 °C gas temperature and 1013 mbar air pressure)

2.10 Country-specific gas categories and connection pressures

country	Mains connection pressure Pin code	gas category	Gas type specified on delivery or corresponding gas type conversion kits included placed	Set to mains connection pressure at delivery in mbar ¹⁾
	mbar			
EN	20	I2ELL	G20/G25	20
AT, CH	20	I2H	G20	20

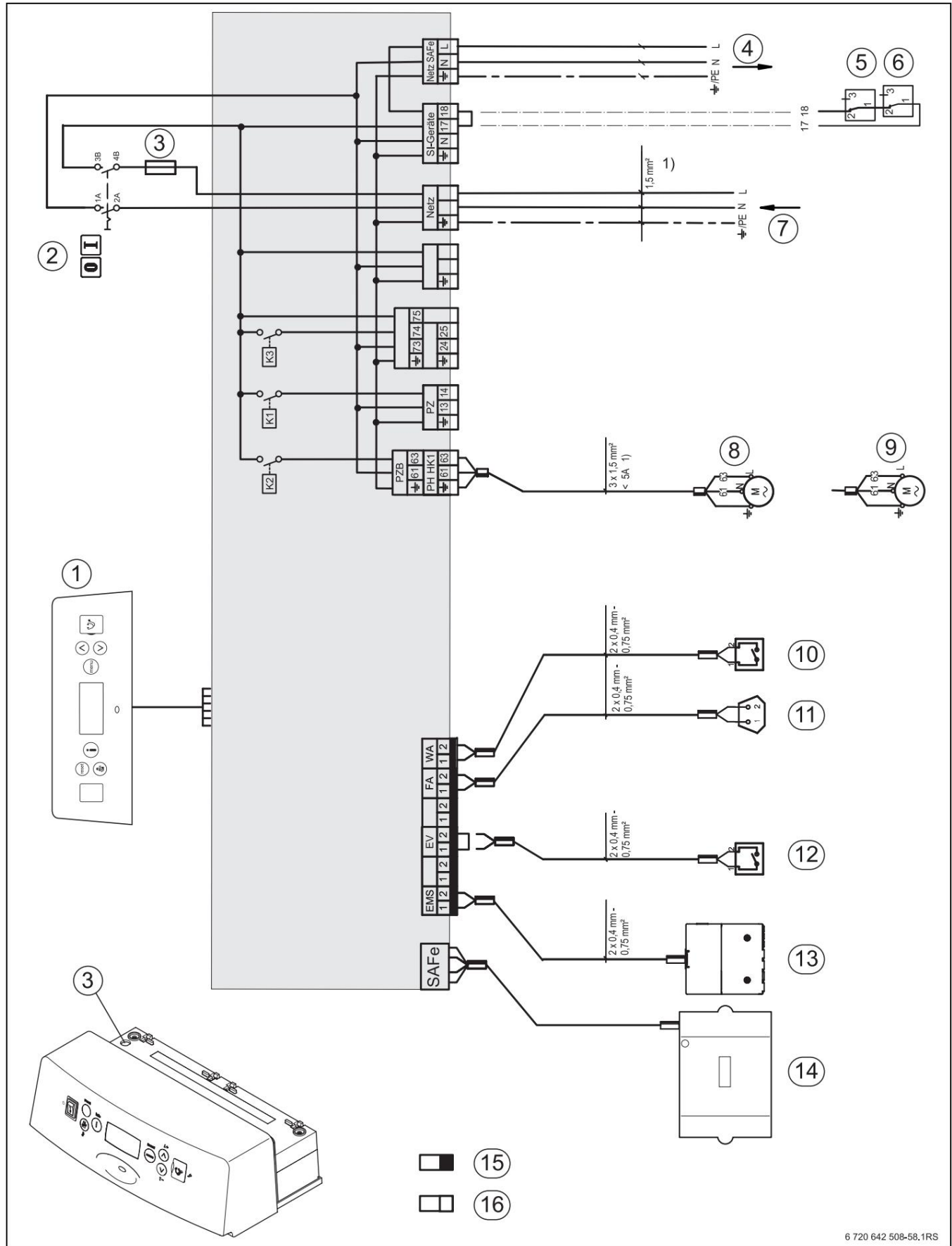
Tab. 9 Country-specific gas categories and connection pressures

1) The gas supply company must comply with the minimum and maximum pressures (according to the national regulations of the public gas supply company care).

The boiler can be supplied from the factory for:

- Natural gas H or E (G20, 20 mbar)
- Natural gas L (DE) (20 mbar)

2.11 Main circuit board connection diagram



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Figure 3 Main circuit board connection diagram

1) The total current must not exceed 6.3 A.

Legend for figure 3:

- 1 Main circuit board with operating unit
- 2 main switch
- 3 Fuse, 6.3 AF (6.3x32mm)
- 4 Mains supply burner control 230 V/50 Hz
- 5 component 1
- 6 component 2
- 7 power input
- 8th PZB feeder pump
- 9 PH-HK1 - heating pump
- 10 WA - heat request (external)
- 11 FA - outdoor temperature sensor
- 12 EV - external locking
(remove the jumper when connecting)
- 13 2-wire BUS
Connection to FW... or FR... controllers, to modules IPM...,
ISM..., ICM and others
- 14 burner control bus line,
Connection to burner controls
- 15 low voltages
- 16 control voltage 230 V~



NOTICE: System damage due to incorrect installation!

B Provide a stationary mains connection (no safety plug).

B Ensure that the mains connection is in phase ten.

B installation, fuse, on/off switch, Danger switches and protective measures according to local regulations.



DANGER: Danger to life from electric current!

B Do not use the protective conductor (green/yellow) as a control line.

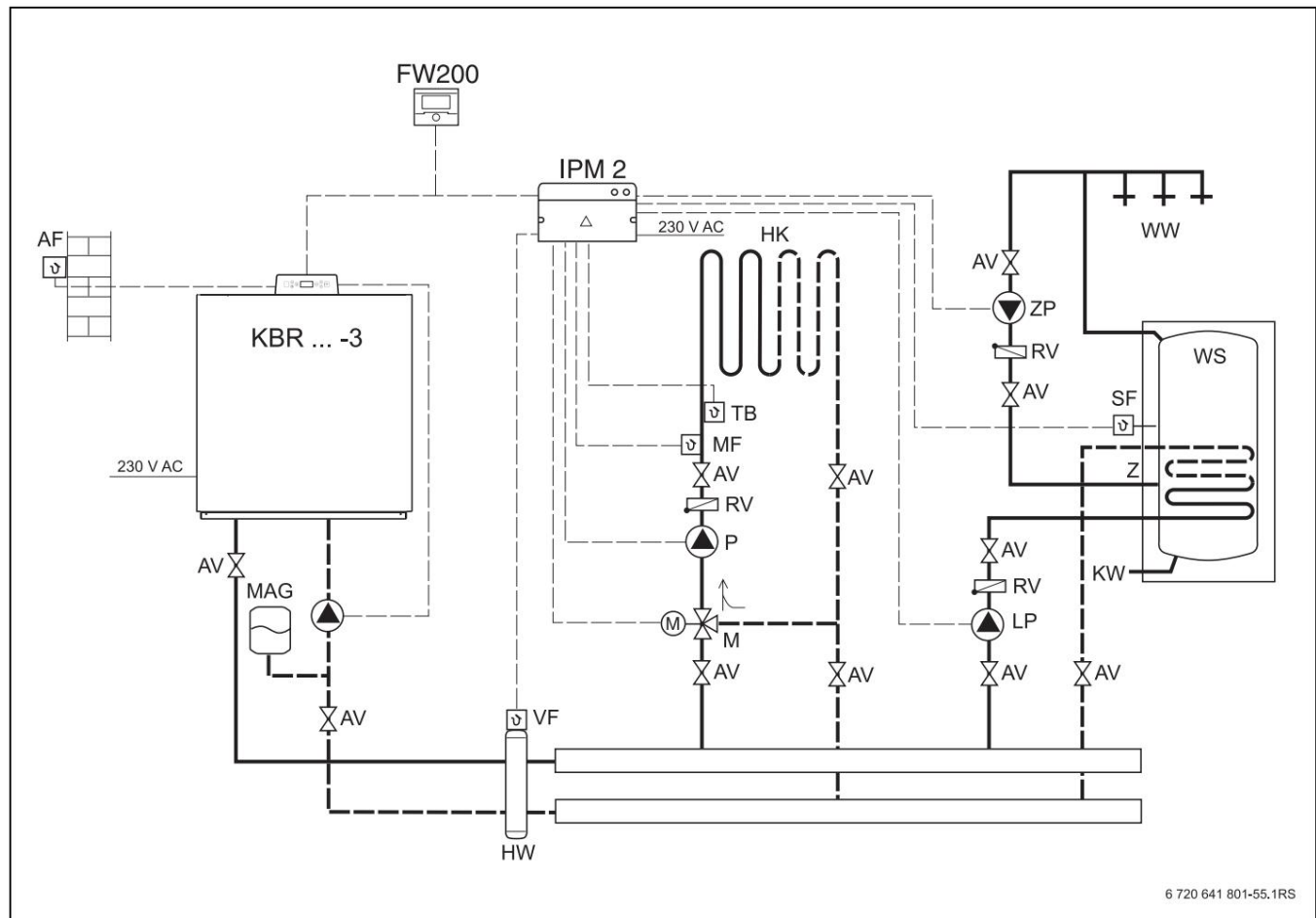


The boiler has a fuse:
Fuse 6.3 AT (6.3 x 32 mm) on the main circuit board.

2.12 Plant example



You can find a representation suitable for installation and other system examples in the planning document.



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Figure 4 Simplified system example for a mixed heating circuit with hot water

AF	outdoor temperature sensor
AV	shut-off valve
FW200	weather compensated controller
HK	heating circuit
HW	hydraulic switch
IPM 2	heating circuit module
week	cold water inlet
LP	storage charging pump
M	3-way mixer
MAG	membrane expansion tank
MF	mixer circuit temperature sensor
P	heating pump
RV	check valve
SF	storage tank temperature sensor
TB	temperature monitor
vf	flow temperature sensor
WS	shared hot water tank
WW	Hot water outlet
Z	circulation
ZP	circulation pump

3 regulations

The boiler meets the following requirements in terms of its design and operating behavior:

- EN677
- EN437, EN483
- Gas Appliances Directive 2009/142/EC
- Efficiency Directive 92/42/EEC
- EMC Directive 2004/108/EC
- Low Voltage Directive 2006/95/EC

3.1 Standards and guidelines

For installation and operation, the following country-specific Observe regulations and standards:

- the local building regulations regarding the installation conditions,
- the local building regulations for access and exhaust air devices and the chimney connection,
- the provisions for the electrical connection to the power supply,
- the technical rules of the gas supply company regarding the connection of the gas burner to the local public gas network,
- the regulations and standards on safety technical equipment of the water heating system,
- the installation guide for manufacturers of heating systems Investments.

The following also applies to **Switzerland** :

The boilers have been tested in accordance with the requirements of the Air Pollution Control Ordinance (LRV, Annex 4) and the guidelines for fire police regulations of the VKF and approved by the SVGW. During installation, the guidelines for the construction and operation of gas furnaces G3 d/f, the SVGW gas guidelines G1 and cantonal fire police regulations must be observed. Regardless of the installation room, only type B11BS (with exhaust gas monitoring) is permitted.

In **Austria** , comply with the local building regulations and the ÖVGW guideline G1 or G2 (ÖVGW TR gas or liquid gas) during installation. A conversion to liquid gas is not possible. The requirements according to the country agreement Art. 15a B-VG with regard to emissions and efficiency are met.

3.2 Authorization and information requirements

B Make sure that the installation of a gas condensing boiler is reported to and approved by the responsible gas supply company.

B Make sure that regional permits are required for the flue gas system and the condensate connection to the public sewage system.

B Contact the relevant district before starting installation
Inform the master chimney sweep and the sewage authorities.

3.3 Installation room



NOTICE: System damage due to frost!

B The heating system in a frost-proof set up a room.



DANGER: Risk of fire from flammable materials or liquids!

B No flammable materials or
Store liquids in the immediate vicinity of the boiler.



NOTE: Boiler damage due to contamination

Combustion air or contaminated air around the boiler!

B Never use a boiler in a dusty place
or chemically aggressive environment. This can
e.g. B. Paint shop
en, hairdressing salons and farms (dung).

B Never operate the boiler in places
on which trichloroethene or hydrogen halides or other
aggressive chemical agents are being worked on or
are stored there. These substances are z. B. in spray
cans, bestimm th adhesives, solvents or cleaning
agents and paints.

B In this case, always a room air-independent
choose the pending mode of operation with a separate,
hermetically sealed installation room that is provided
with a fresh air supply.

3.4 Combustion air connection

If the boiler is operated dependent on the room air, the installation room must be equipped with the necessary combustion air openings. Do not place any objects in front of these openings.

For **open flue** operation:

B Combustion air opening according to Table 10 provide.

boiler size	Ø Combustion air openings
KBR-120	290cm ²
KBR-160	370cm ²
KBR-200	450cm ²
KBR-240	530 cm ²
KBR-280	610 cm ²

Table 10

The following applies to **balanced flue** operation:

For room ventilation, the installation room must have an upper and lower opening to the outside of at least 150 cm² or lines to the outside with equivalent flow cross-sections.

B Do not place any objects in front of the combustion air openings.

B Always keep the combustion air openings clear.

3.5 Quality of heating water

Since there is no such thing as pure water for heat transfer, you need to pay attention to the water quality. One poor water quality leads to damage in heating systems due to scale formation and corrosion.



The water quality is an important one factor for increasing the economy, functional reliability, service life and operational readiness of a heating system.

ge.

B To verify the water quality, the values required in the "water quality log" must be recorded.



NOTICE: Boiler damage due to corrosion!
B boiler is not designed as a gravity system gen or open heating system.

3.7 Frost protection



NOTICE: System damage due to freezing!
B If with room temperature compensated Be a line can freeze (e.g. radiators in the garage), set the pump run-on time to 24 hours.

3.6 Quality of piping


When using plastic pipes in the heating system, e.g. B. for underfloor heating, these lines must be oxygen-tight according to DIN 4726/4729. If the plastic lines do not meet these standards, the system must be separated by heat exchangers.

3.8 Inspection/Maintenance

Heating systems require periodic maintenance for the following reasons:

- to obtain high efficiency and the
to operate the heating system sparingly,
- to achieve a high level of operational safety,
- to ensure environmentally friendly combustion on a high level
to keep level.

maintenance interval

	<p>NOTE: Boiler damage due to missing or inadequate cleaning and maintenance!</p> <p>B Inspect the heating system once a year and clean if necessary.</p> <p>B Carry out maintenance as required. Around To avoid damage to the heating system, rectify any defects immediately.</p>
---	---

3.9 Tools, Materials and Supplies

phone

The standard tools from the field of heating construction and gas and water installation are required for the installation and maintenance of the boiler.

In addition, the following is useful:


- 2 pipes (approx. R 1¼ , approx. 2 m long) for carrying or
5 pipes (approx. R 1¼ , 0.7 m long) as base for rolling the boiler.

3.10 Validity of Regulations

Changed regulations or supplements are also valid at the time of installation and must be complied with.


Transport 4 boilers

This chapter describes how to transport the boiler safely.

 **NOTE:** Boiler damage from impact
kung!
The scope of delivery of the boiler contains shock-sensitive components.

B In case of further transport, protect all components from impact.

B Transport markings on the Ver
note the packaging.

 **NOTE:** Boiler damage due to dirt
tongue!
If the boiler is not yet to be put into operation after unpacking:

B Boiler connections before ver
Protect against dirt by leaving all protective caps on the connections.

4.1 Check scope of delivery

B Packaging upon delivery for integrity check.

B Check delivery for completeness (Æ Table 3 and Table 4, page 6).

B Dispose of packaging in an environmentally friendly manner.

4.2 Lifting and carrying the boiler

When dismantled the front wall and side walls the boiler with the help of 2 pipes (R 1¼ , approx. 2 m long) to be carried to the installation site.

Dismantle the front wall and side walls

B Locking screw [3] of the front panel at the top of the
Turn out the middle of the boiler.

B Slightly lift the front panel [1] and move it forward
lose weight.

B Locking screws [3] of the side panels on the
Unscrew the front and back of the boiler.

B Raise the side panels [2] slightly and remove.

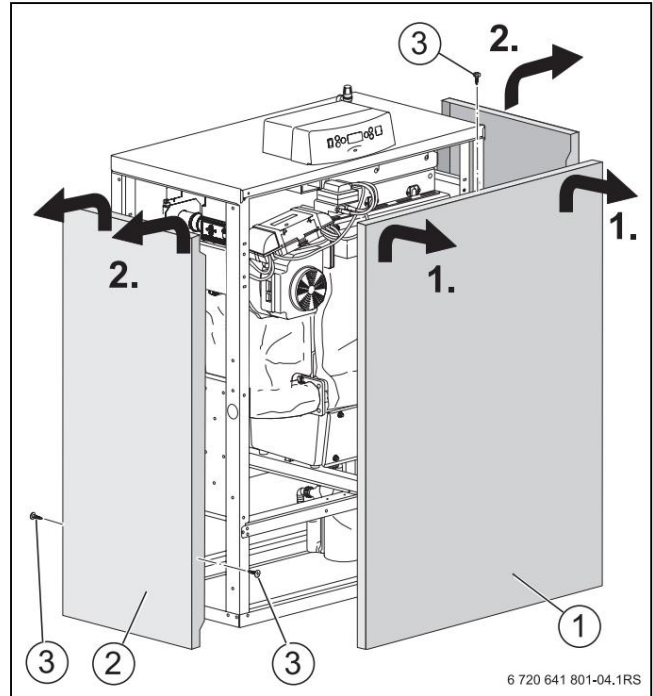


Figure 5 Dismantle the front panel and side panels

- 1 front wall
- 2 Side wall
- 3 locking screws

Lift the boiler off the pallet

B To lift the boiler off the pallet [2], the two locking screws [1] at the bottom of the boiler must be unscrewed.

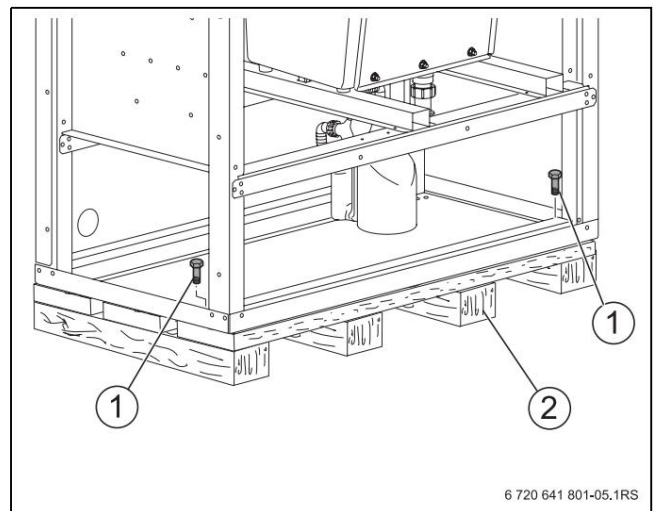


Fig. 6 Lift the boiler off the pallet

- 1 locking screws
- 2 palette

Transport the boiler with the help of pipes

WARNING: Risk of injury from incorrect lifting and carrying!

B boiler with at least 4 people

To lift and to carry.

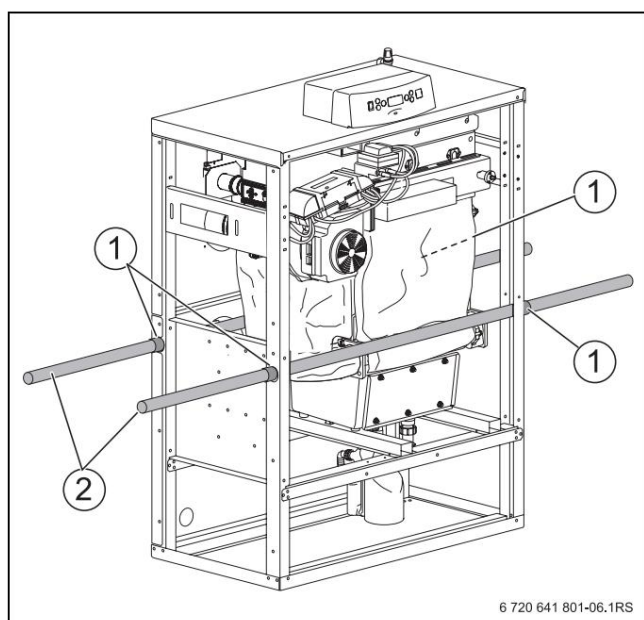
B Only lift the boiler at the designated points.

B Secure the boiler against slipping.

B Pipes through holes in the front of the boiler push through.

B Secure the pipes against slipping at the positions [1] shown in Figure 7, e.g. B. with tape.

B Carry the boiler to the installation site.



6 720 641 801-06.1RS

Fig. 7 Transporting the boiler using pipes

- 1 Position for securing the boiler against slipping
- 2 Pipe

4.3 Transport the boiler on rollers

If the path to the installation site is level, the boiler can also be rolled. To do this, use at least 5 pieces of pipe approx. 700 mm long (diameter R 1¼ ") as a base for rolling.

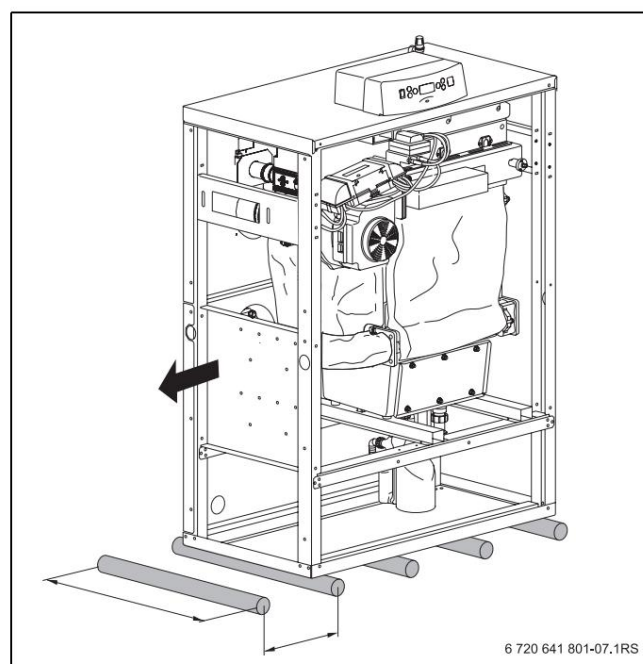
B Pieces of pipe about 400 mm apart on the floor lay.

B Lift the boiler onto the pipe sections and carefully transport to the installation site.



Commercial transport rollers can be used.

B So that the floor panel is not dented is to ensure that the load is evenly distributed on the load-bearing parts.



6 720 641 801-07.1RS


Fig. 8 Transporting the boiler on rollers (dimensions in mm)


5 installation


This chapter explains how to install the boiler. In detail these are:


- Lineup
- Exhaust connection
- Hydraulic connection
- Fuel connection

5.1 Requirements for the installation room

 **NOTICE: System damage** due to frost!
B heating system in a frost-proof set up room.

 **DANGER: Danger from explosive and highly flammable materials!**
B Do not use or store easily flammable materials (paper, curtains, clothing, thinner, paint, etc.) near the boiler.

 **NOTICE: Boiler damage due to contaminated combustion air!**
B No cleaning agents containing chlorine and Use halogenated hydrocarbons (e.g. in spray cans, solvents and cleaning agents, paints, adhesives).
B Do not store or use these substances in the boiler room.
B Avoid heavy dust accumulation (construction dust). the.

 **NOTICE: Boiler damage due to overheating!**
Impermissible ambient temperatures can damage the heating system ren.
B Ambient temperatures greater than 0 °C and less than 35 °C.

B With a sensitive boiler environment (e.g. housing construction) Use the sound insulation measures offered by the manufacturer (exhaust silencers, compensators).

5.2 Wall clearances

Install the boiler with the recommended wall clearances. If the distances are reduced to the minimum, access to the boiler is difficult.

The installation surface or foundation must be level and be level.



Any additionally required wall bracket states of other components, such as e.g. B. Hot water tanks, pipe connections, exhaust silencers or other components on the exhaust side, etc., must be taken into account.

measure	Wall distance (mm)	
	minimal	recommended
A	500	700
B	550	700
C	100	500
D	500	700

Tab. 11 Recommended and minimum wall distances (dimensions in mm).

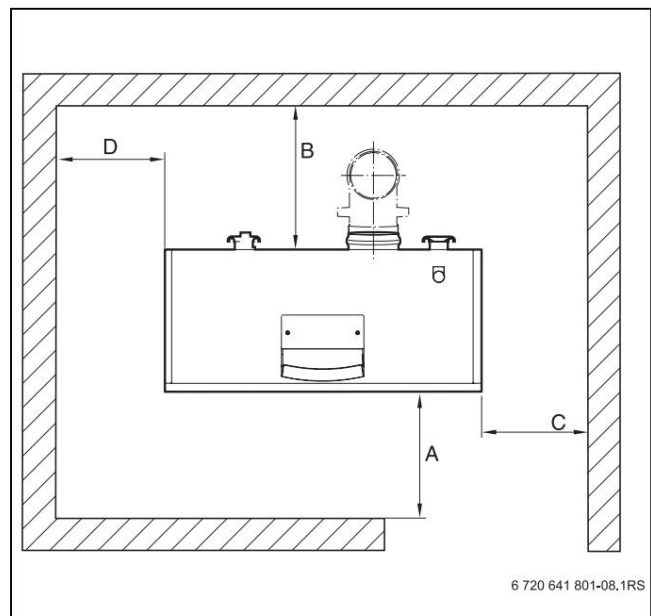



Figure 9 Wall clearances in the installation room (boiler positioned on the left or right)

5.3 Aligning the boiler

So that no air can collect in the boiler and the condensate drains unhindered from the condensate pan, the boiler must be leveled.



NOTE: Boiler damage due to insufficient load capacity of the installation area or due to unsuitable subsoil!

B Ensure that the installation surface has sufficient load-bearing capacity.

B Place the boiler in its final position.

B Align the boiler horizontally using the foot screws [1] and a spirit level [2].

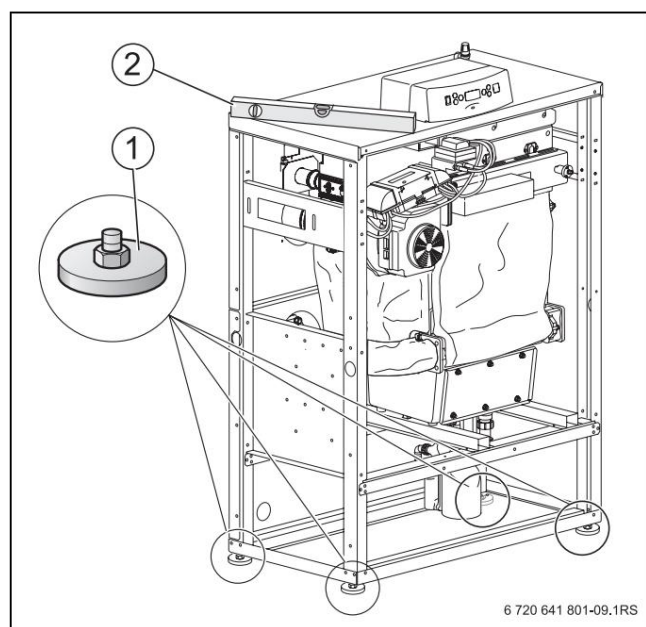


Fig. 10 Aligning the boiler


- 1 foot screws
2 spirit level

5.4 Flue gas and air supply connection

5.4.1 Make the exhaust gas connection

When installing the flue gas connection, note the following:

- Country-specific regulations.
- The cross-section of the flue gas pipe must correspond to the calc according to the regulations in force.
- Choose the flue gas route as short as possible.
- Lay the exhaust pipes with an incline.



DANGER: Danger to life from escaping exhaust gases in the installation room!

B Seals in the flue gas connections must be present, undamaged and correctly inserted.

B Insert the boiler connection elbow (accessory) into the flue gas connection.

B Flue gas connection according to the country-specific create cal requirements.

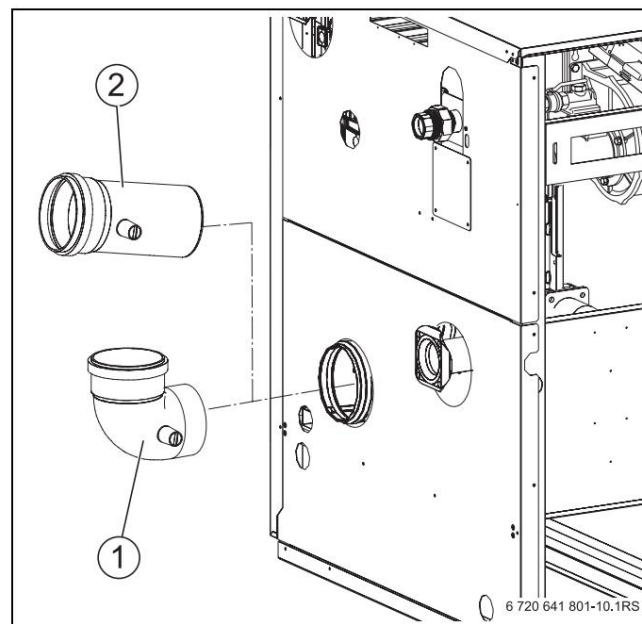


Fig. 11 Mount the exhaust gas connection

- 1 Boiler connection elbow (accessories)
2 Boiler connector (accessories)

5.4.2 Make the supply air connection (room air independent gigantic operation)

The combustion air is fed to the boiler through an external wall connection, through a duct or through a separate line in the duct.

The supply air connection bend RLU required for room air-independent operation is available as an accessory.

B If not already done, remove the side panel.

B Unscrew the cover on the rear wall.



To avoid problems when installing the gas connection, mount the connection of the supply air connection elbow RLU on the right or left.

B Supply air connection elbow RLU through the rear panel in plug in the air intake manifold.



Insulate the supply air system to avoid condensation in the supply air system.

B Make the supply air connection up to the supply air connection bend RLU with a standard supply air system in accordance with the country-specific requirements.

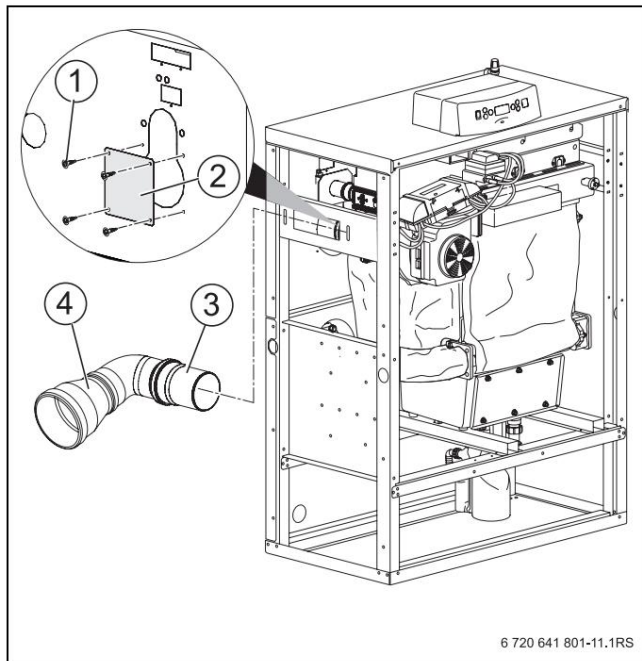


Figure 12 Supply air connection for balanced flue establish operation

- 1 screw
- 2 cover
- 3 Supply air connection elbow RLU (accessories)
- 4 expansion (accessory)

5.5 Make hydraulic connections



NOTICE: System damage due to leaking connections!

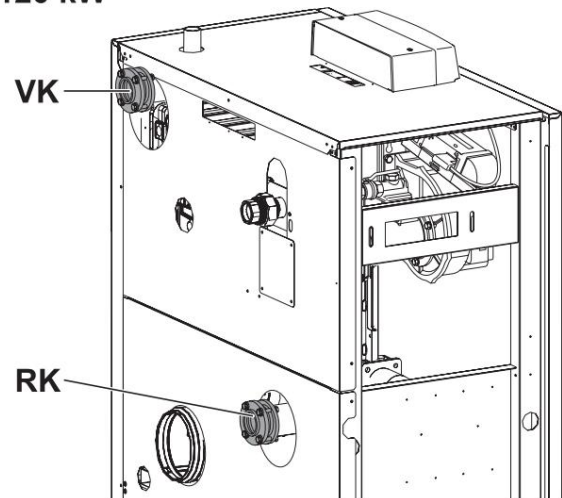
B Install the connection lines on the boiler connections without any tension.

B If screw connections are loosened again, a new seal must be used.

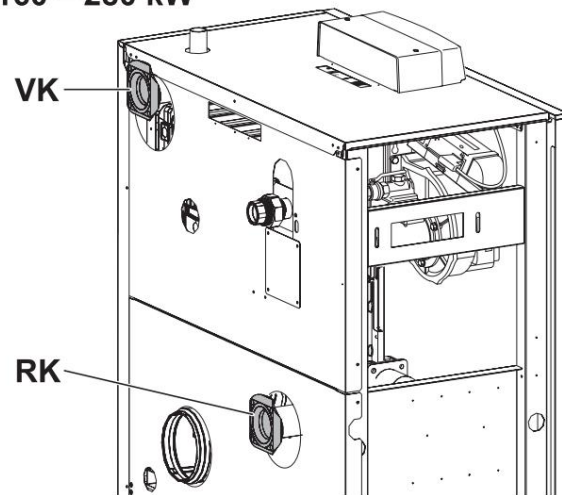
B Tighten the flanges in the heating flow and return only after the connections have been installed.

B Gaskets and connections on the boiler
Check the seal for possible damage before assembling the pipe connection.

120 kW



160 – 280 kW



picture 13

RK return
Sales advance

boiler heat tion	Boiler flow (VK)	
	Boiler return (RK)	
120kW	DN 50	bp 2
160 - 280 kW DN 65	PN6 standard flange EN1092	

Tab. 12 Dimensions of the water-side connections



To avoid contamination on the water side, we recommend installing a dirt trap (accessory) in the return on site.

5.5.1 Connecting the heating flow

B Unscrew the counterflange [3] on the flow VK.

B Attach the mating flange to the flow pipe (on site) (Æ Table 12, Page 23).



NOTICE: System damage due to incorrect or non-installed non-return valve!

B Non-return valve with flow direction from
Mount the boiler away (note the arrow on the non-return valve - the non-return valve locks in the opposite direction of the arrow).

B Gasket [8] between counterflange [3] and rear
Insert flap [4].

B Insert the seal between the flange on the boiler and the non-return valve.

B Screw on the flange connection hand-tight with four screws [1] and nuts [7] (each with washers).

B Centrally align the non-return valve with the assembly aid [5], while tightening the screws.

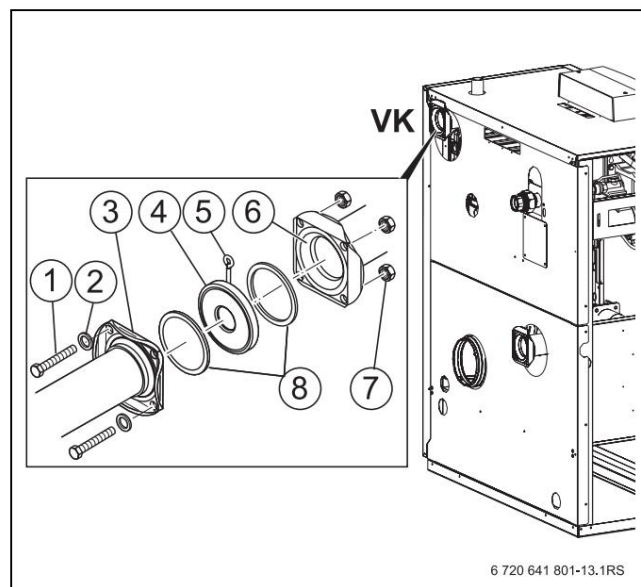


Fig. 14 Mount the flow

- 1 Screw (x4)
- 2 Washer (x4)
- 3 counterflange
- 4 non-return valve
- 5 assembly aid
- 6 Flange on the boiler flow
- 7 Nuts with washers (4x)
- 8 gasket (2x)

5.5.2 Connect heating return

B Unscrew the counterflange [3] on the RK return.

B Attach the counterflange to the return pipe (on site) (AE Table 12, Page 23).

B Insert the seal [8] between the flange on the boiler and the counterflange.

B Screw the flange connection with four screws [1] and nuts [7] (each with washers).

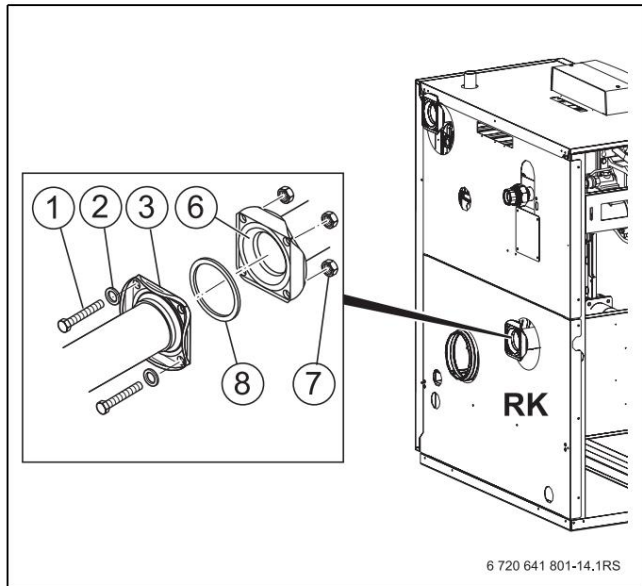


Fig. 15 Mount the return

- 1 Screw (x4)
- 2 Washer (x4)
- 3 counterflange
- 6 Boiler return flange
- 7 Nuts with washers (4x)
- 8 seal

5.5.3 Install hot water tank

You can also use one on the VK and RK connectors

Install hot water tank. The hot water storage tank is controlled via an optional heating controller + module. The storage tank charging pump is connected to the module.

5.5.4 Safety valve and automatic air vent

or mount safety group (on site).



NOTICE: System damage due to incorrect installation!

B safety valve and automatic Ent

Mount the fan or safety group on the safety connection on the flow.

B Blow-off line on the safety valve installed on site ly.

The following automatic air vents can be used in combination with the safety valve:

- Air vent with shut-off
- Taco-Hy-Vent float vent

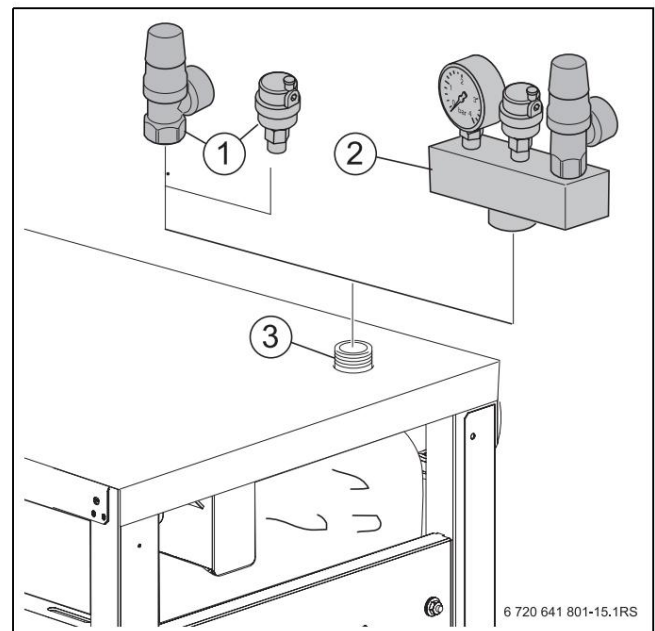


Fig. 16 Mount the safety valve

- 1 Safety valve and automatic air vent (connection on site; required accessories)
- 2 Safety group (required accessory)
- 3 safety connector
R 1" (at 120 kW)
R 1¼" (at 160 to 280 kW)

5.5.5 Install condensate drain



DANGER: Danger to life from exhaust gases!

If the siphon is not filled with water, escaping exhaust gas can endanger people's lives.

B Fill the siphon with water.

B Make sure that the siphon and flue gas connections are sealed.

B Make sure that the sealing disc with the seal is seated in the sealing cap.

B Dismantle the siphon [5].

B Unscrew the cap [4] and drain the siphon with approx. Fill 2 liters of water.

B Mount the siphon.

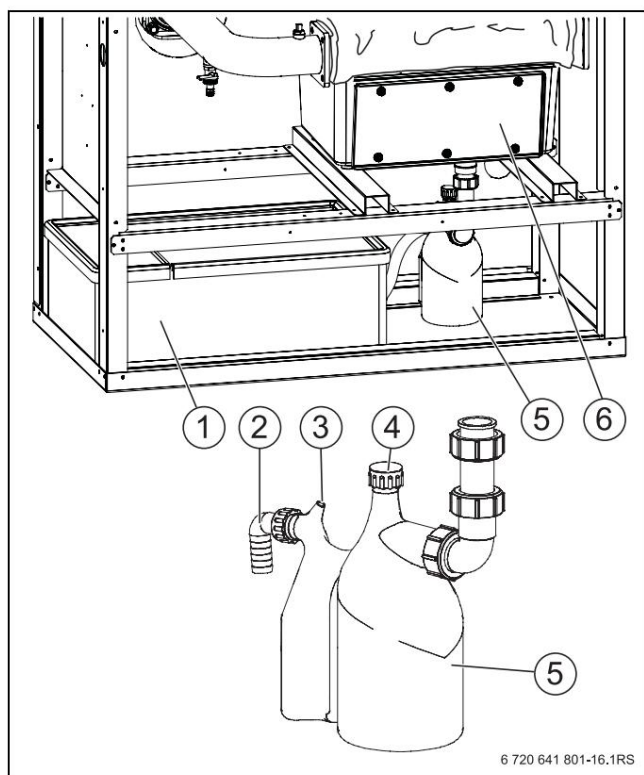


Fig. 17 Installing the condensate hose

- 1 Neutralization device (accessories)
- 2 outlet of the siphon to the neutralization device and sewage
- 3 Ventilation opening on the siphon
- 4 sealing cap
- 5 siphon
- 6 condensate pan



Condensate may escape through the ventilation opening on the siphon [3]!

B Lay the condensate drain from the siphon with a gradient.



Observe when draining the condensate.

B Drain off accumulating condensate according to regulations.

B Introducing condensate into public

Carry out waste water systems according to country-specific regulations.

B Observe regional regulations.



Neutralization devices are available as accessories available that can be integrated into the boiler casing.

B Neutralization device (accessory)

install according to the assembly instructions

B Mount the supplied siphon on the drain of the condensate pan.



DANGER: Danger to life from exhaust gases!

B If the boiler-internal siphon is not used, drain the condensate from the flue gas system via a separate siphon.

5.5.6 Mount the connection for the diaphragm expansion tank

For the installation of a membrane expansion vessel (accessory), also attach a T-piece [2] and a double nipple [1] to the return on site.

B Dismantle the drain cock [3] on the return.

B Double nipple on site instead of the drain cock seal and screw.

B Seal in the T-piece (on site) and screw onto the double nipple with the opening facing the rear wall.

B Screw the drain cock into the T-piece.

B Install the line to the membrane expansion tank on site through the connection in the rear wall.

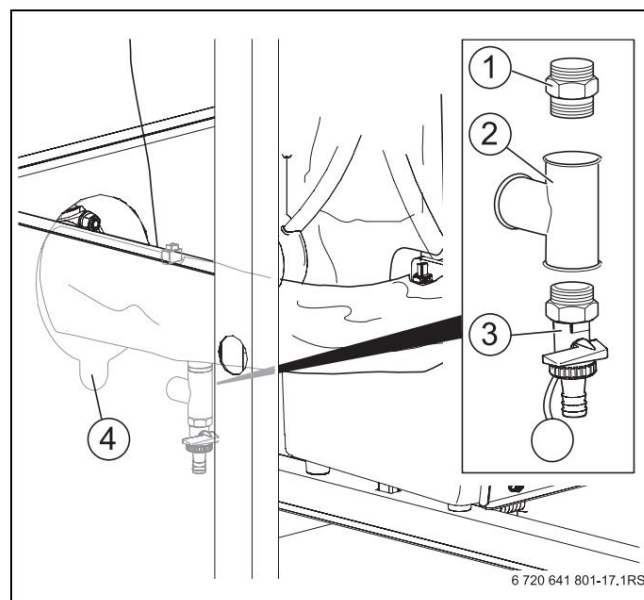


Fig. 18 Diaphragm expansion tank connection

- 1 double nipple
- 2 tee
- 3 drain tap
- 4 Cut-out for the membrane expansion vessel connection (in the rear wall)


5.6 Fill the heating system and check for leaks

So no leaks during operation


occur, check the heating system for leaks before commissioning.

B To ensure good ventilation, before

Fill all heating circuits and open thermostatic valves.


 **NOTICE: System damage** due to boiler scale formation!

B Water quality in accordance with the "Water Quality Log".
pay attention to the amount of water and enter condition.

 **NOTICE: System damage** due to overpressure during the leak test!

Pressure control or safety devices can be damaged if the pressure is high.


B After filling, test the heating system with the pressure that corresponds to the response pressure of the safety valve.

 **NOTICE: System damage !**

If the heating system is filled when warm, temperature stresses can cause stress cracks. The boiler is leaking.

B Only fill the heating system when it is cold (the flow temperature must not exceed 40 °C).

B **Do not drain the heating system via the fill and drain valve during operation boiler, but only through the filling tap in the pipe system (return) of the heating system.**

 **CAUTION:** Health hazard due to contamination of the drinking water!

B Observe country-specific regulations and standards for avoiding contamination of the drinking water.

B Observe EN 1717 for Europe.

B Open the protective cap on all automatic air vents.

B Connect the hose to the tap. With water

filled hose onto the hose nozzle of the filling and

Attach the drain tap and use a hose clamp

to back up.

B Open the fill and drain cock.

Fill the heating system slowly. Observe the pressure display (manometer).

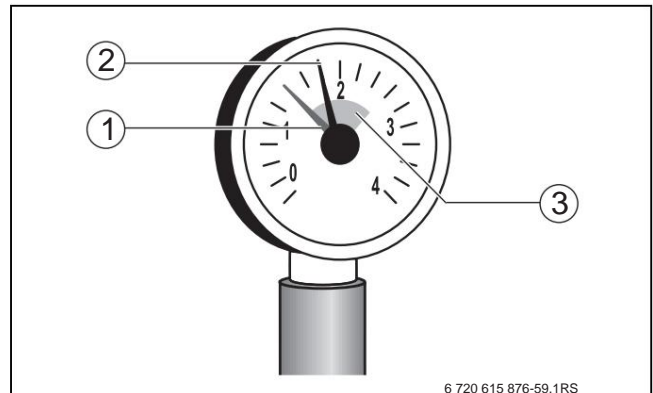


Fig. 19 Manometer for closed systems

- 1 Red pointer
- 2 gauge pointer
- 3 Green marker

B When the required test pressure has been reached, close the water tap and the fill and drain tap.

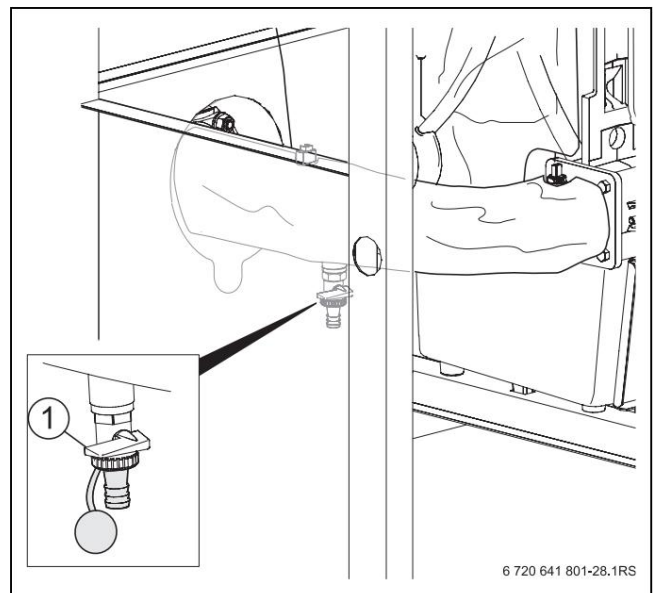


Fig. 20 Fill and drain tap on the return

- 1 Fill and drain cock

B Carry out a leak test in accordance with local regulations.

B Check connections and pipes for leaks.


B Bleed the heating system via the bleed valves on the radiators.

B If the test pressure drops as a result of venting, must water to be refilled.


B Detach the hose from the fill and drain valve.

B If the heating system has been checked for leaks and there are no leaks, set the correct operating pressure.

5.7 Establish fuel supply

	<p>DANGER: Danger to life from explosion of flammable gases!</p> <p>B Only approved specialist companies may carry out work on gas-carrying components ren.</p> <p>B Local regulations for the gas connection note.</p> <p>B Gas connections with approved seal seal medium.</p>
---	---

B Install the gas cock in the gas line. Secure the gas line in the boiler against twisting.

	<p>According to local regulations, the Ein construction of a thermal shut-off device (TAE).</p>
---	---

We also recommend installing a gas filter and compensator in the gas line in accordance with local regulations.

B Connect the compensator (recommended) to the gas tap.

B Gas line free of tension at the gas connection or at the Connect compensator.

B Fasten the gas line on site using brackets so that the gas connection is not stressed.

B Close the gas valve.

5.8 Establish electrical connection

The boiler is only fully functional when the control unit is installed.

When connecting electrical components, also observe the connection diagram (Æ Chapter 2.11, Page 12) and the instructions for the respective product.



Make sure that there is a standard-compliant isolating device (contact gap > 3 mm) for all-pole disconnection of the boiler from the power supply.

B If separator is not installed, install separator.



NOTICE: System damage due to improper installation!

Observe the following points for the electrical connection:

B Only electrical work inside of the heating system if you have the appropriate qualification for this work.

B If you do not have the relevant qualifications, have the electrical connection carried out by an approved specialist company.

B Observe local regulations!



DANGER: Danger to life from electric current when the device is open!

B Before opening the boiler:

Switch off the heating system with the heating emergency switch and the Hei

disconnect the system from the mains using the corresponding house fuse.

It is not enough to switch off the controller.

B heating system against accidental Secure restart.

5.8.1 Make the mains connection

A permanent mains connection according to local regulations make fonts.

B Two screws on the cover of the controller loosen and remove the cover.



DANGER: Danger to life from electric shock!

Incorrectly connected cables can cause faulty operation with potentially dangerous consequences.

B When making the electrical connections the wiring diagram of the main circuit board (Æ chapter 2.11, page 12) and the assembly instructions for the main circuit board (included in the scope of delivery of the controller).

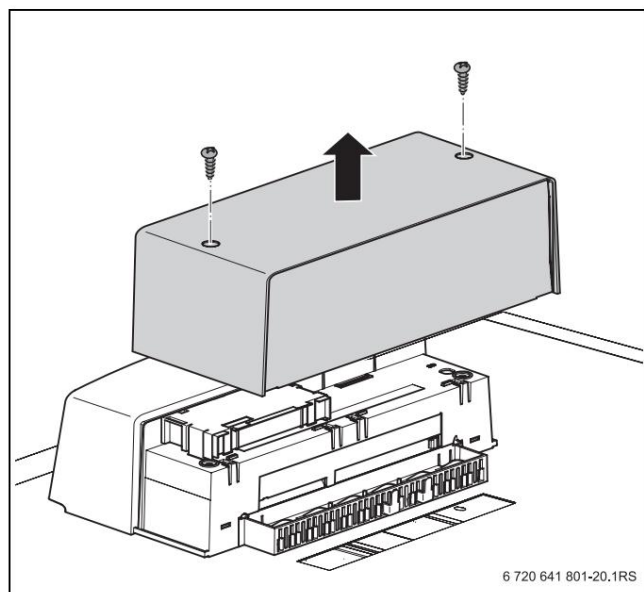


Fig. 21 Remove the cover



DANGER: Risk of fire from hot boiler parts!

Hot boiler parts can damage the electrical damage lines.

B Make sure that all cables are routed in the cable ducts provided or on the thermal insulation of the boiler ver
lays are.



NOTICE: System damage due to incorrect control!

B Lay low and extra-low voltage separately in the cable ducts.

B Lay lines that lead to the rear via the cable duct.



NOTICE: Malfunction due to power failure!

B When connecting external components to the main circuit board, make sure that these components do not exceed a maximum total current consumption of 5 A step.

B Route all lines through the cable duct to the control unit and connect according to the wiring diagram.

B Secure all lines with cable clamps (delivery catch).

1. Cable clamp with the line from above into the slots of the clamp frame.
2. Slide down the cable clamp.
3. Backpress.
4. Flip the lever up.

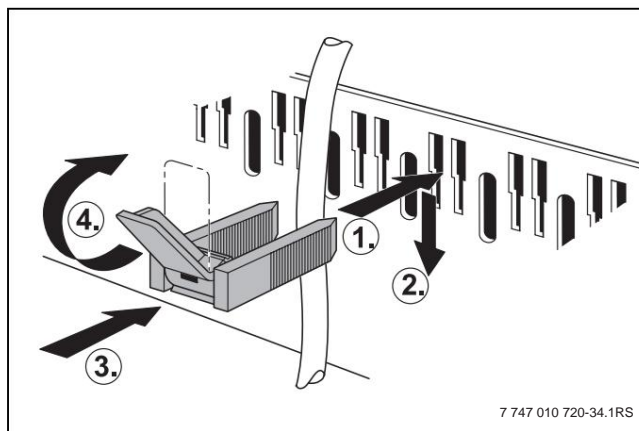


Fig. 22 Secure lines with cable clamps

5.8.2 Connect the heating controller and modules (accessories).



The IUM1 in connection with this heater don't use sel.

The following modules and heating controllers can be connected to the boiler:

- FR.../FW... heating controller/ FB... remote control
- Cascade Module - ICM
- Solar module (in combination with the heating controllers FR.../FW...):
ISM1/ISM2
- IPM1/IPM2 heating circuit module

Follow the installation and operating instructions for the respective product.

B Mount the module on the wall.

B module via the 2-wire BUS on the terminal block

connect the terminal strip in the controller.

B Prepare a sufficiently long 2-wire BUS connection.

To do this, use a 2-core power cable of 0.4 to 0.75 mm² each and the connector supplied with the module.

Only use plugs that match the color of the module connector.

B If several modules are used, the

2-wire BUS connection of the second module from the first

th module can be branched off. To do this, use the cable supplied with the module.

B Connect a free 230 VAC power cord to the module.

If several modules are used, the 230 VAC supply of the second module can be branched off from the first module.

B 230 VAC power cord of the first module to the fol

connect the module.

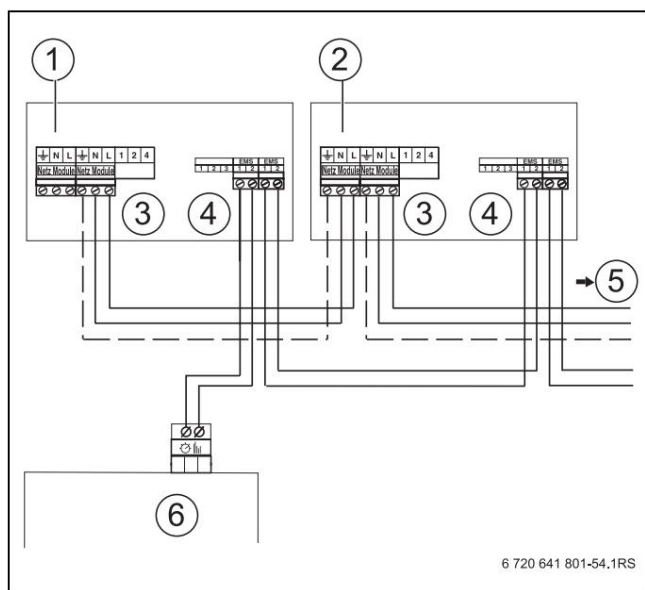


Figure 23 Connecting multiple modules

- 1 module 1
- 2 module 2
- 3 Mains connection ON (left) and OFF (right)
- 4 2-wire bus connection
- 5 more modules
- 6 Boiler connection terminals

B After completing the electrical installation

Mount the cover hood.



When the IPM flashes:

B Check the function of the heating controller.

5.8.3 Connecting and installing external heating controllers



It is not possible to connect more than one heating controller directly to the boiler at the same time.

B Heating controller FR as ... install in the reference room,

described in the relevant installation and operating instructions.

B Heating controller FW... as outdoor temperature compensated

Install the controller as described in the respective installation and operating instructions.

B FR.../FW... heating controller to the appropriate one

Connect clamp. To do this, use a two-core power cable of 0.4 to 0.75 mm² each.

5.8.4 Establish the mains connection

B Connect the mains connection to the controller (Æ

chapter 2.11, page 12).

5.8.5 Mount the cover hood

B Guide the cover of the controller down in the guide rails.

B Control unit cover with 2 screws

to back up.

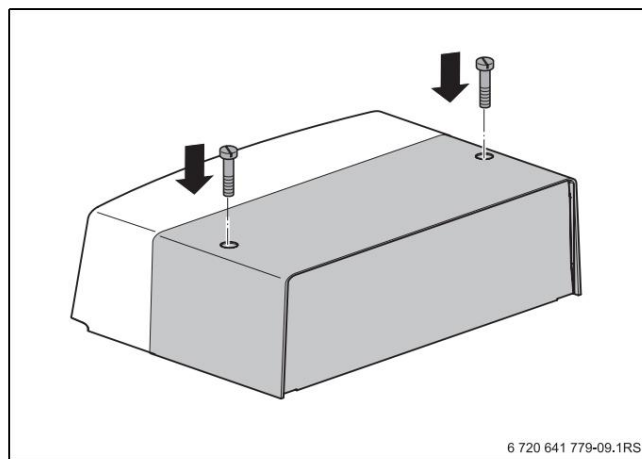


Fig. 24 Mount the cover

5.9 Align the boiler vertically

So that the side walls and the boiler front wall
the boiler must be aligned vertically.

B Loosen the nuts [2].

B To turn the boiler vertically using a

To align the spirit level [3], turn the screws [1] in or out as
required.

B After alignment, tighten nuts.

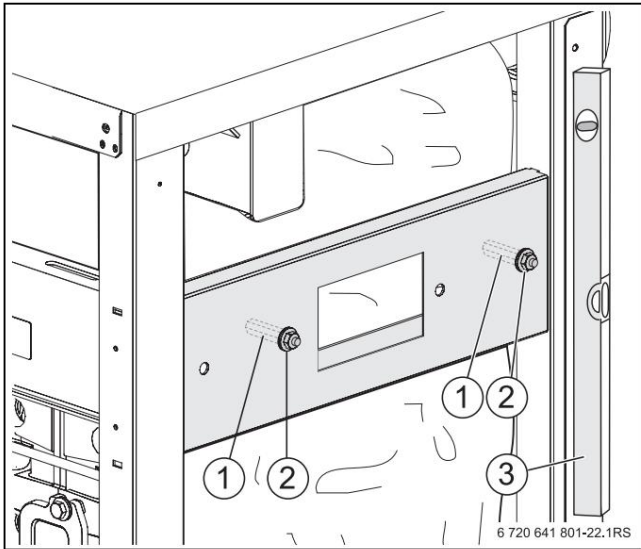


Fig. 25 Align the boiler vertically

- 1 screws
- 2 nuts
- 3 spirit level

6 operation

The boiler is equipped with the main circuit board and the control panel. Additional operating elements (accessories) can be attached on site (e.g.

FR.../FW... heating controller or FB... remote control).

For operation, see the enclosed technical documentation for the boiler.

6.1 Overview of the operating elements

The operating unit enables basic operation of the heating system or boiler.



If the heating system consists of several boilers (cascade system), the settings for each boiler must be made on the relevant programming unit.

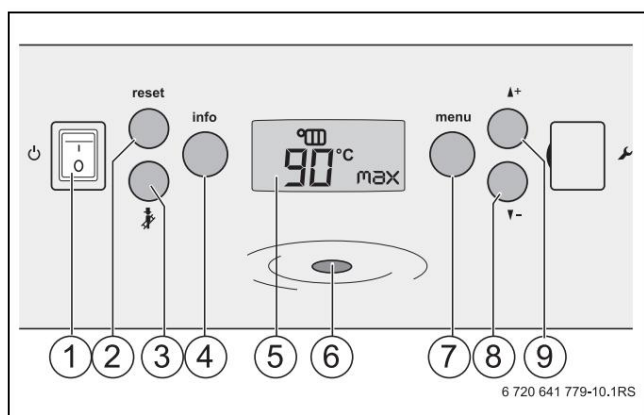


Figure 26 Controls

- 1 Main switch (on/off)
- 2 reset button (reset button)
- 3 Chimney sweep button info
- 4 button
- 5 screen
- 6 operating light
- 7 menu button
- 8 down button
- 9 up button

The operating unit is equipped with the following elements:

reset button

Restart the boiler in the event of a fault with the reset button [2] (Æ Chapter 11.4.1, page 66).



Chimney sweep button (service mode)

The boiler can be put into chimney sweep mode (service mode) with the chimney sweep button [3] (Æ chapter 6.2.5).

info button

The info button [4] can be used to open the "Information" menu (Æ chapter 6.2.2) and the "Fault history" menu (Æ chapter 6.2.3).

screen

The display [5] shows the status of the heating system or the set values. If there is a fault, the display shows the fault directly in the form of a fault code. About the meaning of the display symbols (Æ chapter 11, page 65 ff.)

menu button

The "Settings" menu can be opened with the menu button [7] (Æ Chapter 6.2.4).

▲+ high and ▼- down button

The two buttons [8, 9] are required to scroll in the "Settings" and "Information" menu programs and to make or read boiler settings.

operating light

Operating lamp lights up while the boiler is in operation.

6.2 Menu Structure

The following menus are available for operating the boiler:

- Status display (Æ Chapter 6.2.1)
- "Information" menu (Æ Chapter 6.2.2)
- "Fault history" menu (Æ Chapter 6.2.3)
- "Settings" menu (Æ chapter 6.2.4)

Only the data can be read in the "Information" menu.

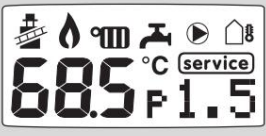








Settings can be changed as required in the "Settings" menu.

The "Fault history" menu shows the last 3 latching fault displays.

6.2.1 Status display

When the boiler is switched on, all symbols appear briefly on the display.

The boiler status display then appears.

status indicator		
Display when switching on the boiler		
	20.0	Current flow temperature in °C
	p1.5	System pressure in bar (the display flashes if the system pressure is too low)
		Chimney sweep company (service company)
		burner in operation
		pump in operation
		In operation for heating
		Without function
		Display of the outside temperature
		A locking fault has occurred or the boiler requires service.
Example display in normal operation		
		

Tab. 13 Indications on the display during normal operation

6.2.2 "Information" menu

The following table shows the structure of the "Information" menu. It contains information about the current settings and the operating status. Settings can only be read and not changed here.

B Press the info button to open the information menu. First the word "info" appears for 1 second. If the info button is pressed longer, the "Fault history" menu opens.

B With the ▲+ or ▼- Keys can be the values read one after the other on the display.

B Press the info button again to open the menu to let. If no button is pressed for 10 minutes, the "Information" menu closes automatically.

button	display	meaning
info Button"		When you open the menu, "info" appears briefly on the display.
Set flow temperature heating		
after 1 second		Set maximum flow temperature in °C.
		Boiler is switched off.
hot water temperature		
		Without function.
Service indicators (displayed with a code)		
		If the boiler requires service, this service message appears. Otherwise, continue with the next menu step (operating and fault displays). (For a complete overview of the display codes and their meanings Æ chapter 11, page 65 ff.)
Operating and fault indicators (displayed with a code)		
		An operation code is displayed here during normal operation. In the event of a fault, a fault code appears here. (For the complete overview of the display codes and their meanings Æ chapter 11 page 65 ff.)
system pressure		
		Currently measured system pressure in bar.
Current flow temperature (boiler temperature)		
		Currently measured flow temperature °C.

Tab. 14 "Information" menu

button	display	meaning
Calculated maximum temperature		
		Calculated flow temperature (setpoint) in °C for heating and chimney sweep operation or frost protection. The flow temperature is always recalculated depending on the heat query.
Outside temperature (only visible with weather-compensated control)		
		Outside temperature in °C 3 dashes indicate a shorted outdoor temperature sensor.
ionization current		
		Currently measured ionization current in µA. Once the burner is operational, a flame icon will appear.
Current heat output		
		Current heat output in % during heating or chimney sweep operation [Range on KBR 120-3: 25 - 100%], [Range on KBR 160-3: 25 - 100%], [Range for KBR 200-3: 30 - 100%], [Range for KBR 240-3: 30 - 100%], [Range on KBR 280-3: 30 - 100%]

Tab. 14 "Information" menu

6.2.3 "Fault history" menu

In this menu, the last 3 locking fault displays are displayed in the form of fault codes.

B Press and hold the info button to open the "Fault history".

B With the or Keys the last 3 faults be shown on the display. The fault displays are marked chronologically with "Log1" to "Log3".

More information about the meaning of the fault codes (*Æ* chapter 11, page 65 ff.).

B Press the info button again to open the menu to let. If no button is pressed for 10 minutes, the "Settings" menu closes automatically and the status display appears again.

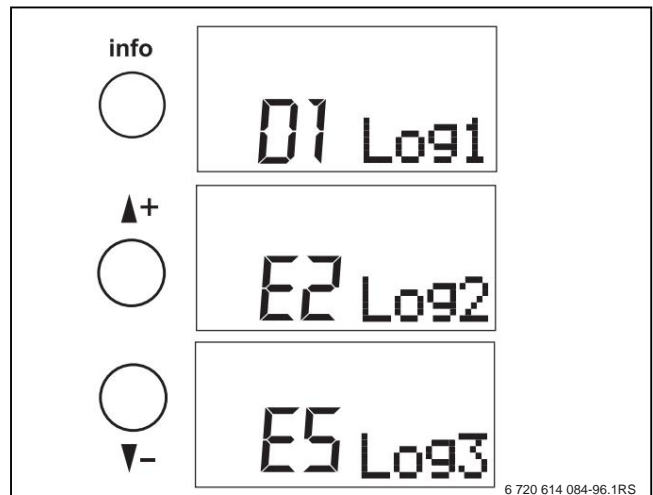


Figure 27 Fault history

6 720 614 084-96.1RS

6.2.4 "Settings" menu

The following table shows the structure of the "Settings" menu. Settings can be changed here as follows:

Press the B menu button to open the "Settings" menu. First, the word "menu" appears briefly.

B With the ▲+ or ▼- buttons to the one you want change setting.

B Press the menu button for 2 seconds to to change value. This value flashes in the display and can now be changed.

B With the ▲+ or ▼- buttons to the one you want Set value up or down.

Press the B menu button again to save the value chern.

B Press the menu button again to open the menu leaving. If no button is pressed for 25 seconds, the "Settings" menu closes automatically.









NOTICE: System damage due to overheating of the floor when using underfloor heating!

B Limit the maximum flow temperature in the "Settings" menu (usually 40 °C).

button	display	meaning
menu button		When you open the menu, "menu" appears briefly on the display.
1 heating mode		
1.1 On/off heating mode		
after 1 second		On: The heating operation is on. When a heat query occurs, the burner starts. Off: No heating operation [Default is On]
1.2 Maximum flow temperature		
		Maximum flow temperature in °C [Setting range: 30 – 85 °C] [Default is 85°C].
1.3 Maximum heating capacity		
		First, the maximum heating output is displayed in kW. (Example KBR 120-3)
after 3 seconds		After 3 seconds, the maximum released heating output appears in % Setting range: [Range on KBR 120-3: 25 - 100%], [Range on KBR 160-3: 25 - 100%] [Range for KBR 200-3: 30 - 100%], [Range for KBR 240-3: 30 - 100%], [Range on KBR 280-3: 30 - 100%] [Default is 100%].

Tab. 15 "Settings" menu

button	display	meaning
2 fan setting		
2.1 Minimum fan modulation		
		Speed adjustment for the lowest degree of modulation. Increase of the lowest degree of modulation on starting load: Input range: - 9 to + 9 Can be changed to - 9 (no transfer).
2.2 Maximum fan modulation		
		Speed increase for the maximum burner load. Compensation downstream exhaust system: Input range: - 9 to + 9 Can be changed to - 9 (no transfer).
3 pump run-on time		
		The pump run-on time is specified in minutes ("Min") or hours ("Hour"). [Setting range: 1 - 60 minutes or 1-24 hours] [Default is 5 minutes]


Tab. 15 "Settings" menu



6.2.5 Chimney sweep operation (service operation)

The chimney sweep company (service company) is required for commissioning and maintenance.

In chimney sweep mode (service mode), the boiler runs for up to 30 minutes at the set heat output. Meanwhile, no hot water treatment is possible.

B Ensure heat consumption.

B  Keep the button pressed until the chimney appears on the display stone sweeper symbol appears and the heat output (bottom right) flashes.

B With the  or  Use the buttons to set the desired heat output (between minimum and maximum heating load) (Æ Tab. 15, Page 35).

B Disable with the  button or 30 minutes was ten.

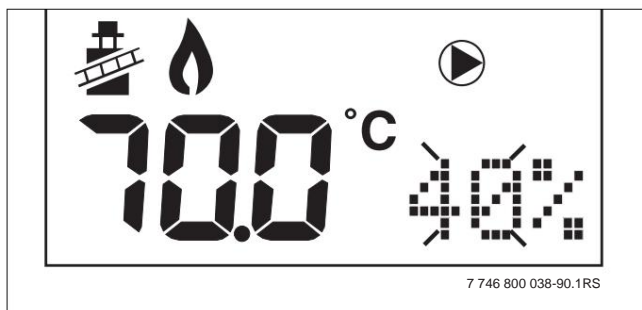




Fig. 28 Display - chimney sweep operation

6.2.6 Key lock

All functions on the operating unit can be locked with the key lock. Only the info button and the reset button are active.

B  and  Press the buttons simultaneously until the button lock is activated.

"Lock" appears in the display .

Deactivate the key lock by pressing the and keys again.

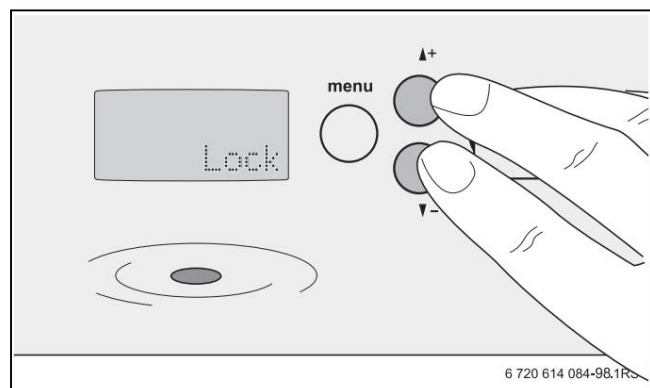



Figure 29 Display

7 Commissioning


This chapter describes the commissioning with the basic module of the controller.

B Fill out the commissioning report while carrying out the work described below (Æ Chapter 7.21).

 **NOTICE:** Boiler damage due to excessive dust and dirt in room air-dependent operation!

Strong exposure to dust and dirt can e.g. B. by construction measures in the erection space occur.

B Boiler during construction operate independently of room air.

 **NOTICE:** Boiler damage due to contaminated combustion air!

B Do not use cleaning agents containing chlorine or halogenated hydrocarbons (e.g. in spray cans, solvents and cleaning agents, paints, adhesives).


B Do not store or use these substances in the boiler room.

B Avoid heavy dust accumulation (construction dust) the.


B A burner fouled by construction work must be cleaned before use.

B Check the flue gas and combustion air line (for room air-independent operation) and the openings for the combustion air supply and ventilation (Æ Chapter 3.4, page 16).

7.1 Check operating pressure

 Open heating systems are not possible with this boiler.

B Before commissioning, water-side operation
Check the pressure of the heating system and adjust if necessary.

 **NOTICE: System damage** due to boiler scale formation!

B Observe the information in the "Water Quality Log".

B Set the red pointer [1] of the pressure gauge to the required set an operating pressure of at least 1 bar .

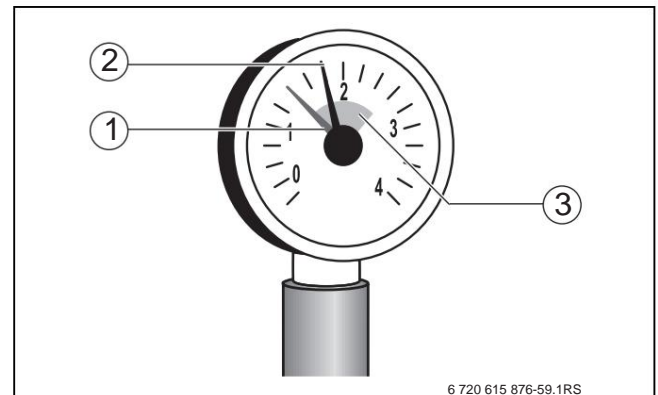



Fig. 30 Manometer for closed systems

- 1 Red pointer
- 2 gauge pointer
- 3 Green mark

 **CAUTION:** Health hazard due to contamination of the drinking water!

B Country-specific regulations and
Observe standards for avoiding contamination of drinking water.

B Observe EN 1717 for Europe.

B Top up the heating water or use the on-site instal
Fill and drain valve [1] until the desired operating pressure is reached.

B Bleed the heating system during the filling process using the bleed valves on the radiators.

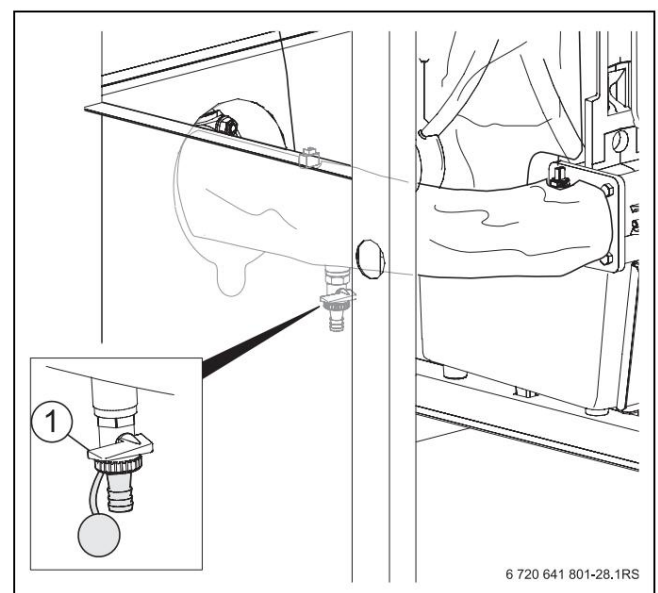


Fig. 31 Top up the heating water or use the fill and
Drain the drain cock

- 1 Fill and drain cock

Installation**7.2 Note the gas characteristics**

Obtain characteristic gas values (Wobbe index and calorific value) from the responsible gas supply company (GVU) and note them in the commissioning report (Æ Chapter 7.21).

7.3 Check device equipment

Upon delivery, the burner is set ready for operation with natural gas H or L.



Only operate the burner with the correct gas nozzles.

B Responsible gas supply company according to the ask for the type of gas supplied.

B Check whether the actual gas type is identical to that on the type plate.

country	gas type	Factory settings
AT, CH	Natural gas H or E (G20)	<p>Set ready for operation on delivery. The gas fitting is adjusted and sealed.</p> <p>Wobbe index for 15 °C, 1013 mbar:</p> <ul style="list-style-type: none"> • Set to 14.1 kWh/m³ • Can be used from 11.4 to 15.2 kWh/m³ <p>Wobbe index for 0 °C, 1013 mbar:</p> <ul style="list-style-type: none"> • Set to 14.9 kWh/m³ • Can be used from 12.0 to 16.1 kWh/m³
EN	natural gas L	<p>Set ready for use on delivery. The gas fitting is adjusted and sealed.</p> <p>Wobbe index for 15 °C, 1013 mbar:</p> <ul style="list-style-type: none"> • Set to 12.1 kWh/m³ • Can be used from 11.4 to 12.4 kWh/m³ <p>Wobbe index for 0 °C, 1013 mbar:</p> <ul style="list-style-type: none"> • Set to 12.8 kWh/m³ • Can be used from 12.0 to 13.1 kWh/m³

Tab. 16 Factory settings

7.4 Check tightness

Before initial commissioning, all new gas line sections must be checked for external leaks.

DANGER: Risk of explosion!
If there are leaks in the gas lines and gas connections, there is a risk of explosion.

B Proper leak detection with foam carry out funds.

NOTICE: System damage !
B Before searching for leaks, cover the endangered areas, e.g. B. the water interior pressure sensor and the Return temperature sensor on the boiler return.

B Leak detector not on cable guides, Plug or electrical connecting cable spray or drip.

B Check the new line section up to the sealing point for external leaks directly at the gas fitting.
The test pressure at the inlet of the gas fitting may not exceed 150 mbar.

i If a leak is detected during the leak test, a leak test must be carried out on all connections using a foaming agent. The agent must be approved as a gas leak test agent.

B means not to electrical connection lines apply.

B Carrying out the leak test during commissioning Confirm measurement log (Æ chapter 7.21).

7.5 Gas type conversion

If it is found that the boiler was ordered for the wrong type of gas, the gas type must be changed and the type plate updated.

7.5.1 Conversion for boiler size 120 kW

Changing to a different type of gas is done by replacing the gas throttle.

i Only use the gas throttles listed in Table 17.

boiler size	gas type	gas throttle diameter
120kW	natural gas H (Wobbe index 14.9 kWh/m ³)	15.7
	Natural gas L-DE (Wobbe index 12.8 kWh/m ³)	15.0

Table 17

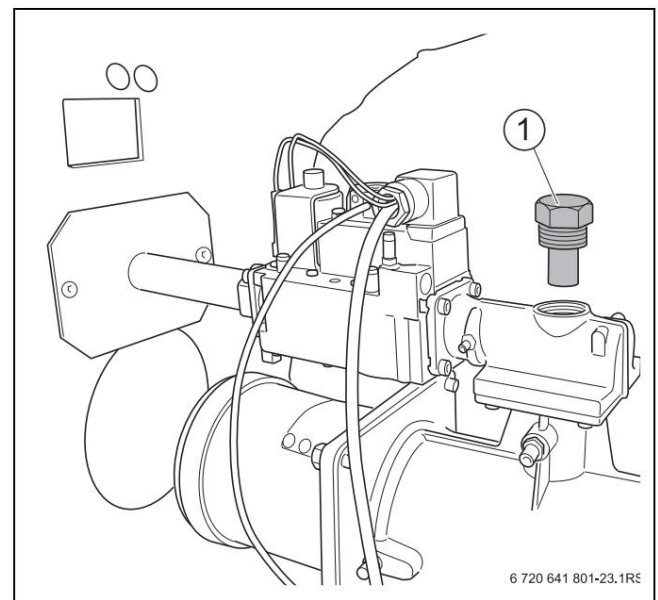


Fig. 32 Replacing the gas throttle (boiler size 120 kW)

1 gas throttle

Installation

7.5.2 Conversion for the boiler size 160 kW

As the 160 kW boiler does not have a gas throttle, the change is made using the high-fire rate adjustment screw.

Conversion from gas type H to gas type L:

B Unscrew the high-load adjusting screw [1] counterclockwise by half a turn.

Conversion from gas type L to gas type H:

B Screw in the high-load adjusting screw [1] clockwise by half a turn.

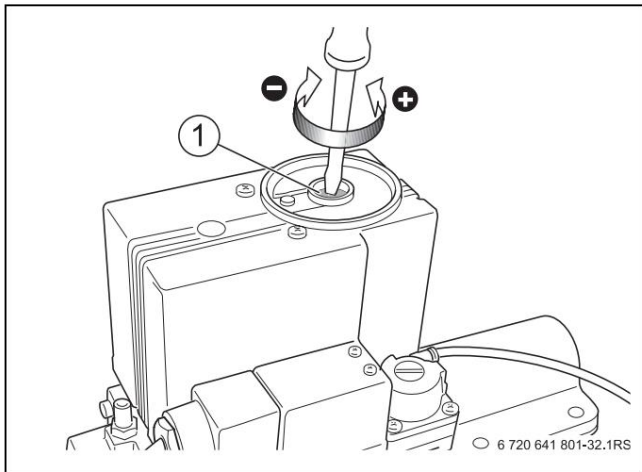


Fig. 33 Conversion to a different type of gas (boiler size 160kW)

1 High load adjustment screw

7.5.3 Conversion for boiler sizes from 200 to 280 kW

Conversion from gas type H to gas type L:

B value of the adjusting screw V (Æ Fig. 34, [2]) by 0.5 increase, e.g. B. set a setting of 1.1 to 1.6.

Conversion from gas type L to gas type H:

B value of the adjusting screw V (Æ Fig. 34, [2]) by 0.5 reduce, e.g. B. at a setting of 1.6 to 1.1.

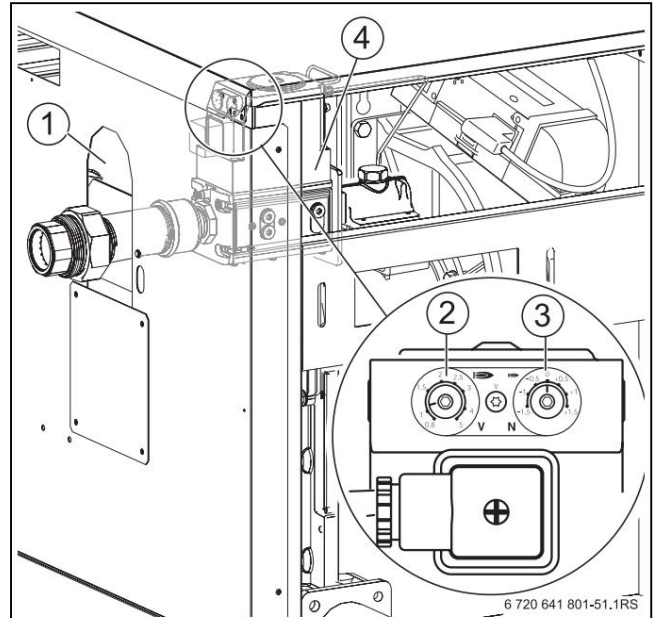


Fig. 34 Conversion to a different type of gas (boiler size 200 to 280 kW)

- 1 Openings for adjusting the gas valve
- 2 Adjustment screw V (sealed)
- 3 Adjustment screw N (sealed)
- 4 gas fitting

7.5.4 Update nameplate

B Stick the label [2] (supplied with the boiler) over the type plate [1] (on the side wall) in the appropriate area.

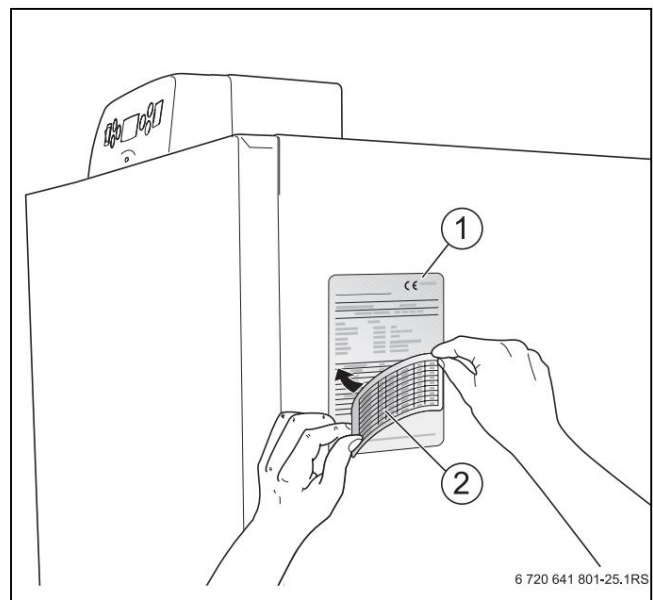


Figure 35 Updating the nameplate

- 1 nameplate
- 2 sticker (gas values)

7.6 Bleed the gas line

B Plug of the gas pressure measuring nipple

Loosen the connection flow pressure and ventilation (Æ Fig. 36, 37, 38 [1]) by two turns and attach the hose.

B Slowly open the gas tap.

B Flare off escaping gas using a water seal. When no more air escapes, pull off the hose and tighten the screw plug.

B Close the gas valve.

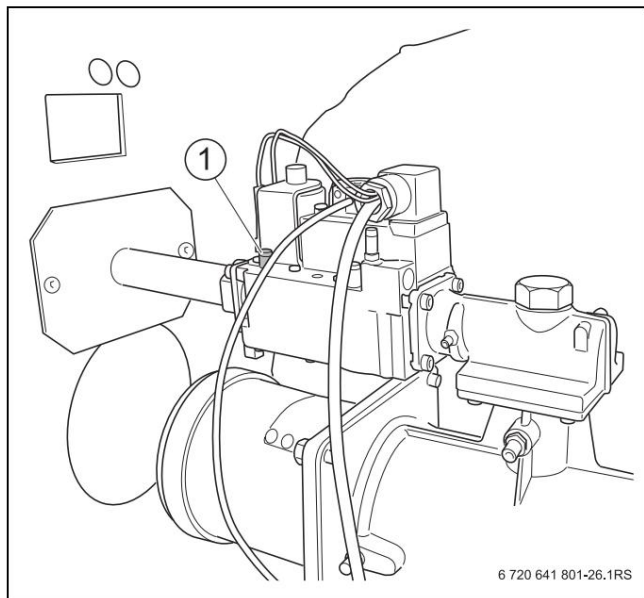


Fig. 36 Venting the gas line (boiler size 120 kW)

- 1 Pressure measuring nipple for measuring the gas connection flow pressure and for venting

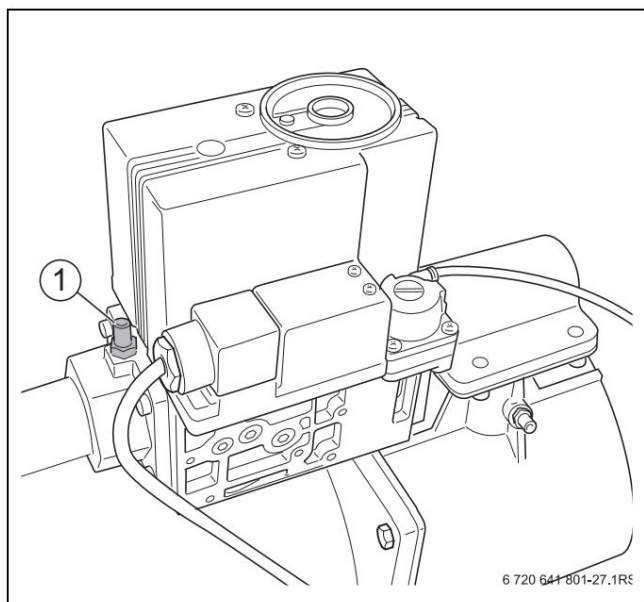


Fig. 37 Venting the gas line (boiler size 160 kW)

- 1 Pressure measuring nipple for measuring the gas connection flow pressure and for venting

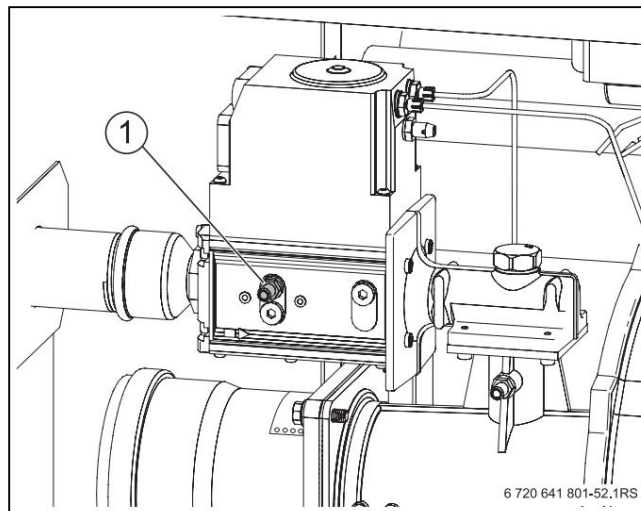


Fig. 38 Bleed the gas line (boiler size 200 to 280 kW)

- 1 Pressure measuring nipple for measuring the gas connection flow pressure and for venting

7.7 supply and exhaust air openings and the Check flue gas connection

B Check whether the supply air and exhaust air openings comply with local regulations and gas installation regulations th. Have defects rectified immediately.



DANGER: Danger to life through poisoning!

Inadequate air supply can lead to dangerous exhaust emissions.

B Make sure that the intake and exhaust air openings are not reduced or closed.

B If the defect is not immediately lifted, the boiler must not be operated.

B plant operators on the shortage and the Report danger in writing.

B Check whether the flue gas connection complies with the applicable regulations (Æ Chapter 3.4, page 16).

B Have any defects rectified immediately.

7.8 Check supply air membrane

- B Check whether the supply air membrane [1] is present on the air intake port [2] and is in contact with the pipe.
- B Check whether the supply air membrane on the air intake connection can be moved and is not sticking to the pipe.

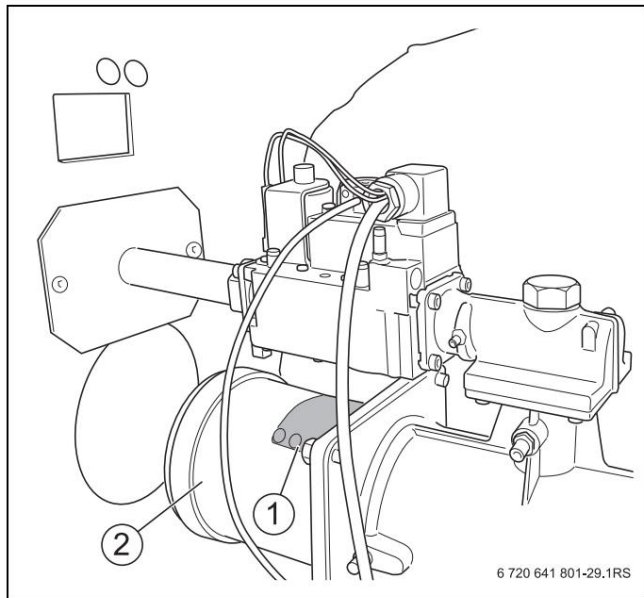


Fig. 39 Check the supply air membrane

- 1 supply air membrane
- 2 air intake manifold

7.9 Prepare the heating system for operation

- B Open the main shut-off valve or gas valve.
- B Switch on the heating emergency switch (if present) and/or the corresponding house fuse.

7.10 Heating system on the control unit turn on

- B Set the main switch on the control unit to "I".

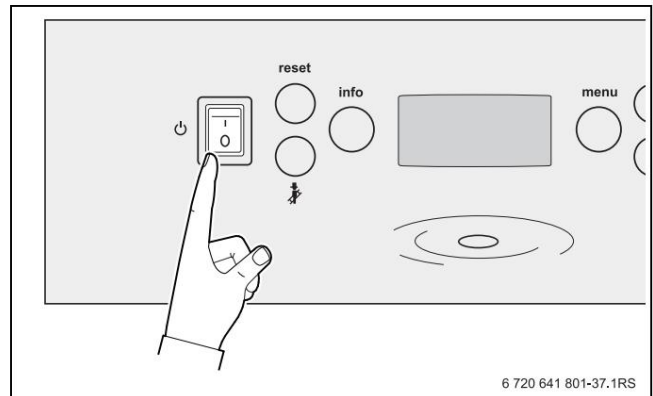


Fig. 40 Switch on the heating system

The entire heating system is switched on. All symbols appear in the display for 1 second before the display for the status of the heating system appears.

status indicator		
Display when switching on the boiler		
	20.0	Current flow temperature in °C
	p1.5	System pressure in bar (the display flashes if the system pressure is too low)
		Chimney sweep company (service company)
		burner in operation
		pump in operation
		In operation for heating
		Without function
		Display of the outside temperature
	A locking fault has occurred or the boiler requires service.	
Example display in normal operation		


Tab. 18 Displays during normal operation

7.11 Chimney sweep operation (service operation)

The chimney sweep company (service company) is required for commissioning and maintenance.

In chimney sweep mode (service mode), the boiler runs for up to 30 minutes at the set heat output. Meanwhile, no hot water treatment is possible.

B Ensure heat consumption.

B  Keep the button pressed until the chimney appears on the display stone sweeper symbol appears and the heat output (bottom right) flashes.

B Use the buttons to set the desired heat output (between minimum and maximum heating load) (Æ Tab. 15, Page 35).

B Disable with the  button or 30 minutes was ten.

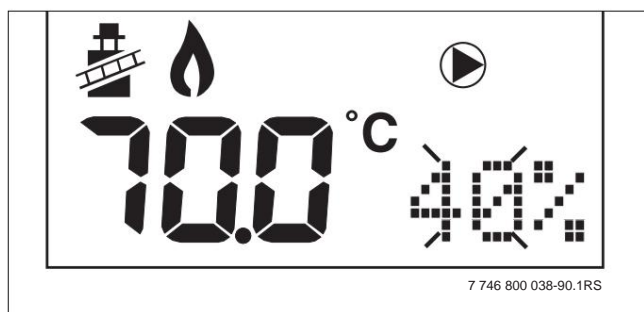


Fig. 41 Display - chimney sweep operation

7.12 Display and change operating statuses/settings.

In the "Information" menu you can call up the current operating status and settings (Æ Chapter 6.2.2, page 33).

You can change data in the "Settings" menu (Æ Chapter 6.2.4, page 35).

7.13 Check and adjust the CO2 setting at full load



Check or correct the CO2 content only from a burner capacity $\geq 70\%$.

B Activate the chimney sweep mode and set the heating load (Æ Chapter 7.11).

B Wait until the burner output has reached 70%.

Gas valve boiler size 120 kW

B Check the CO2 content.

Hold the sensor through the measuring opening in the exhaust pipe into the core flow.

B Replacing the gas restrictor at CO2 values below 8.5% (Æ Figure 32, Page 39).

wobbe index [kW/m ³]	Gas type Ø Gas throttle im delivery Status [mm]	Ø Gas throttle for lower wobbe index [mm]
12.0 - 16.1	Natural Gas H 15.7	
12.0 - 13.1	natural gas L - EN 15.0	
10.0 - 12.2	natural gas L - EN 14.5	

Table 19

Gas valve boiler size 160 kW

B Check the CO2 content.

Hold the sensor through the measuring opening in the exhaust pipe into the core flow.

B If the CO2 values are below 8.5%, set the setting on the high-fire adjusting screw [1] to 9%.

– Turning clockwise leads to the Minde
tion of the CO2 content.

– Turning to the left leads to an increase in the CO2 content.

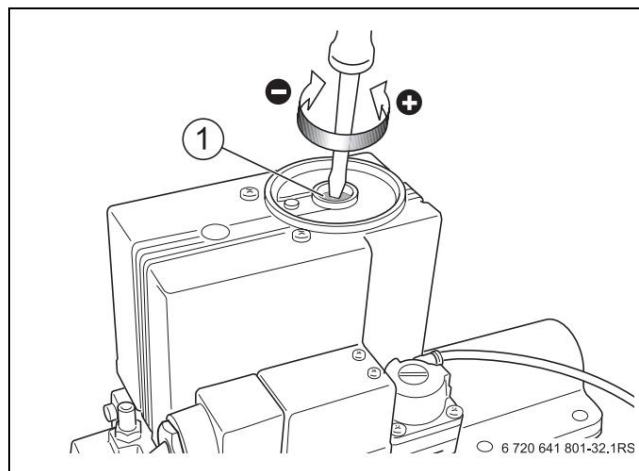


Fig. 42 Correcting the CO2 content at full load (boiler size 160 kW)

1 High load adjustment screw

B Check the CO2 content again and enter the value in the commissioning report, chap. Enter 7.21.

Gas valve boiler size 200 to 280 kW

B Check the CO₂ content.

If the value is less than 8.5% or more than 9.4%, correct the setting using the setting screw V

B Set the CO₂ value to 9.0%.

- Turning it clockwise leads to an increase of the CO₂ content.
- Turning to the left leads to a reduction in the CO₂ content tes.

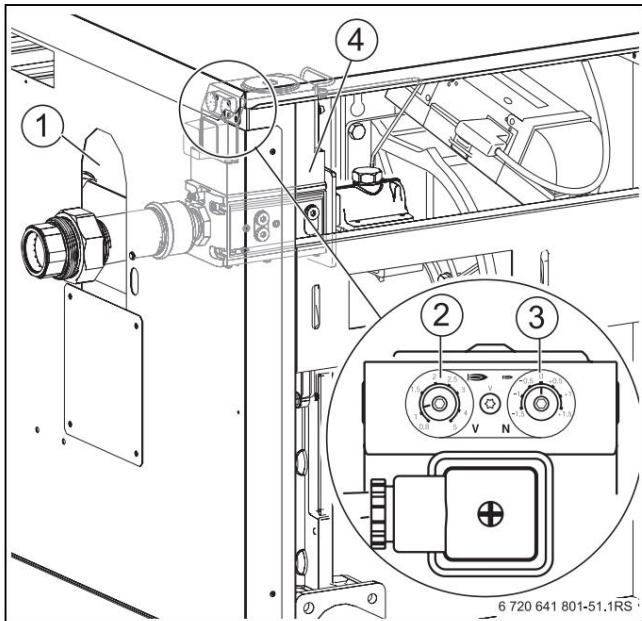


Fig. 43 Correcting the CO₂ content at full load (boiler size 200 to 280kW)

- 1 Openings for adjusting the gas valve
- 2 Adjustment screw V (sealed)
- 3 Adjusting screw N (sealed)
- 4 gas fitting

7.14 Check and adjust CO₂ setting at partial load

B Activate the chimney sweep mode and set the heating load (Æ Chapter 7.11).

Gas valve boiler size 120 kW

B Wait until the burner output has reached 25%.

B Check the CO₂ content.

Hold the sensor through the measuring opening in the exhaust pipe into the core flow.

B If the CO₂ values are below 9.0% or more than 9.6%, set the setting on the low-fire adjusting screw [1] to 9.3%.

- Turning it clockwise leads to an increase of the CO₂ content.
- Turning to the left leads to a reduction in the CO₂ content tes.

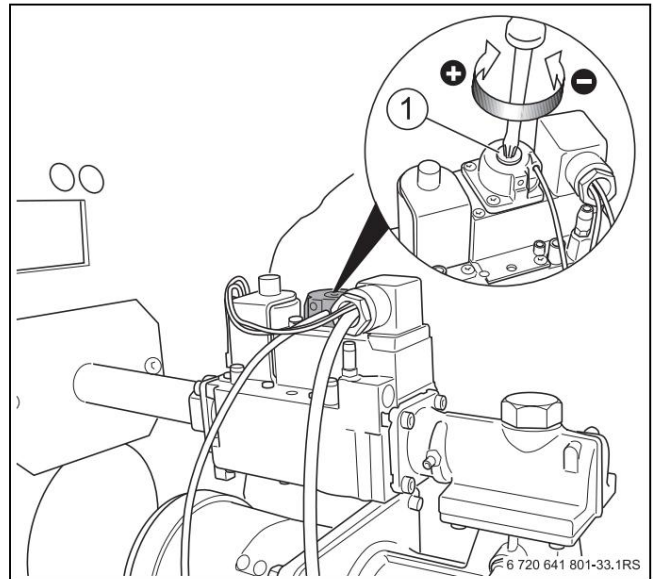


Fig. 44 Correcting the CO₂ content at partial load (boiler size 120 kW)

- 1 Low load adjustment screw

B Check the CO₂ content again and enter the value in the commissioning report, chap. Enter 7.21.

Gas valve boiler size 160 kW

B Wait until the burner output has reached 25%.

B Check the CO₂ content.

Hold the sensor through the measuring opening in the exhaust pipe into the core flow.

B If the CO₂ values are below 9.0% or more than 9.6%, set the setting on the low-fire adjusting screw [1] to 9.3%.

- Turning it clockwise leads to an increase of the CO₂ content.
- Turning to the left leads to a reduction in the CO₂ content tes.

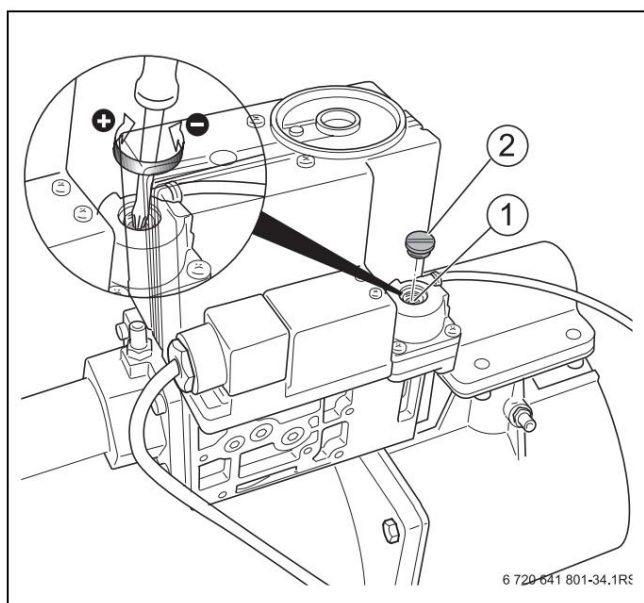


Fig. 45 Correcting the CO₂ content at partial load (boiler size 160 kW)

- 1 Low load adjustment screw
- 2 cover screw

B Check the CO₂ content again and enter the value in the commissioning report, chap. Enter 7.21.

Gas valve boiler size 200 to 280 kW

B Wait until 30% burner capacity is reached.

B Check the CO₂ content.

Hold the sensor through the measuring opening in the exhaust pipe into the core flow.

B If the CO₂ values are below 9.0% or more than 9.6%, set the setting on the adjusting screw N [3] to 9.3%.

- Turning it clockwise leads to an increase of the CO₂ content.
- Turning to the left leads to a reduction in the CO₂ content tes.

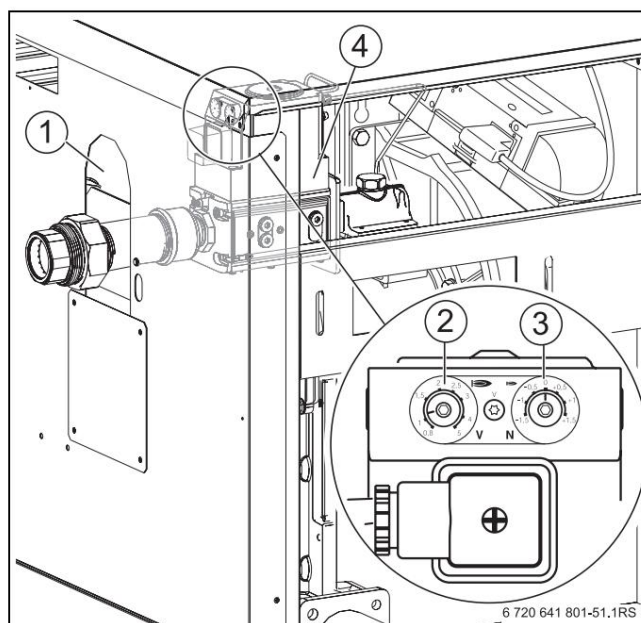


Fig. 46 Correcting the CO₂ content at partial load (boiler size 200 to 280kW)

- 1 Openings for adjusting the gas valve
- 2 Adjustment screw V (sealed)
- 3 Adjusting screw N (sealed)
- 4 gas fitting

B Check the CO₂ content again and enter the value in the commissioning report, chap. Enter 7.21.

7.15 Recording measured values

B Carry out the following measurements at a measuring point in the boiler connection piece and enter them in the commissioning log (Æ Chapter 7.21):

- discharge pressure
- flue gas temperature tA
- air temperature tL
- Net flue gas temperature tA - tL
- Carbon dioxide content (CO₂)
or oxygen content (O₂)
- CO value

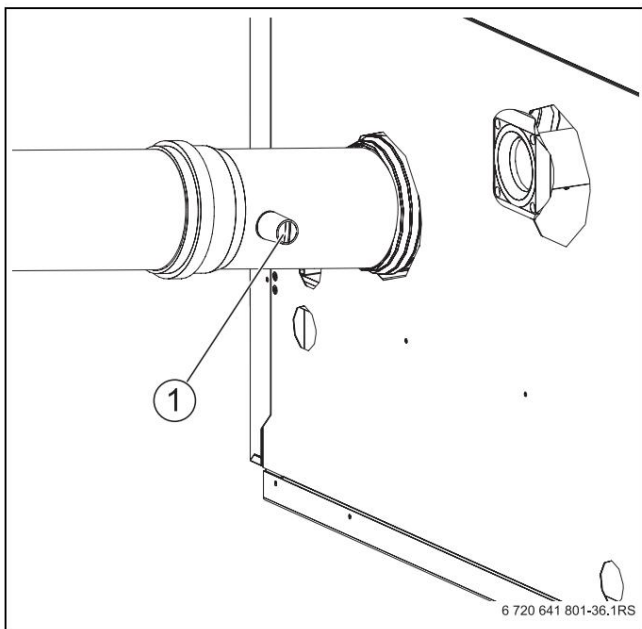



Fig. 47 Recording measured values

1 Position of the measuring point in the exhaust pipe

7.15.1 Delivery pressure

The required delivery pressure of the installed exhaust air supply system must not be greater than 100 Pa (1.0 mbar).

	<p>DANGER: Danger to life through poisoning from escaping exhaust gases.</p> <p>B Boilers with only chimneys or Operate exhaust systems (Æ Tab. 7, Page 10).</p>
---	---

7.15.2 CO value

CO levels in an air-free state must be below 400 ppm or 0.04% by volume.

Values above 100 ppm indicate faulty burner settings, incorrect device settings, contamination on the Burners or heat exchangers or defects in the burner down

B Identify and eliminate cause.

7.16 Functional Tests

During commissioning and the annual inspection, you must check that all regulation, control and safety devices are working properly and, where adjustments are possible, that they are correctly set.

7.16.1 Measure ionization current

B Set the main switch on the control unit to "I".

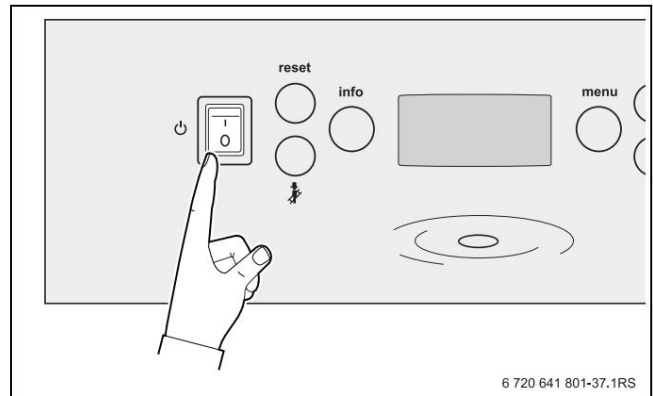





Fig. 48 Switch on the heating system

B button  Press and hold down until the chimney sweep symbol appears in the display.

B With the button  the burner  to the lowest partial load

[Range on KBR 120-3: 25 - 100%],

[Range on KBR 160-3: 25 - 100%]


[Range for KBR 200-3: 30 - 100%],

[Range for KBR 240-3: 30 - 100%],

Set [range for KBR 280-3: 30 - 100%].

B Note the displayed power value.

B Press info button.

B  Press the button until the display for the ionisation current appears (Æ Table 14, page 33 ff.).

B Measure ionization current.

7.17 Measure gas connection flow pressure

B Loosen the locking screw of the pressure measuring nipple for the gas connection flow pressure and ventilation (AE Fig. 49, 50, 51 [1]) by 2 turns.

B Attach the measuring hose of the pressure gauge to the pressure measuring nipple [1].

B Gas connection flow pressure with the burner running (full load) and note the value in the commissioning log (AE Chapter 7.21).

B If the gas connection flow pressure outside the values from table 20, page 48, switch off the boiler and inform the gas supply company.



If the burner is switched off from full load and there is a gas connection flow pressure > 50 mbar, switch off the boiler and inform the gas supply company (do not carry out commissioning).

B Pull off the measuring hose.

B Carefully tighten the screw plug of the pressure measuring nipple for the gas connection pressure.

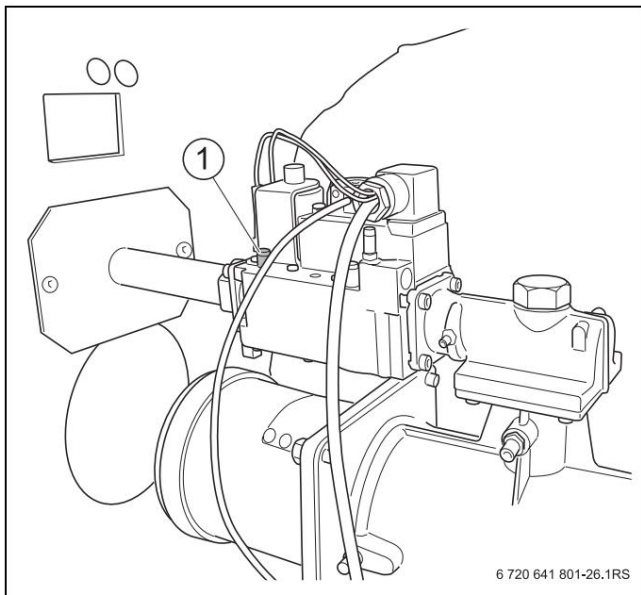


Fig. 49 Measuring the gas connection flow pressure (boiler size 120 kW)

- 1 Pressure measuring nipple for measuring the gas connection pressure and for venting

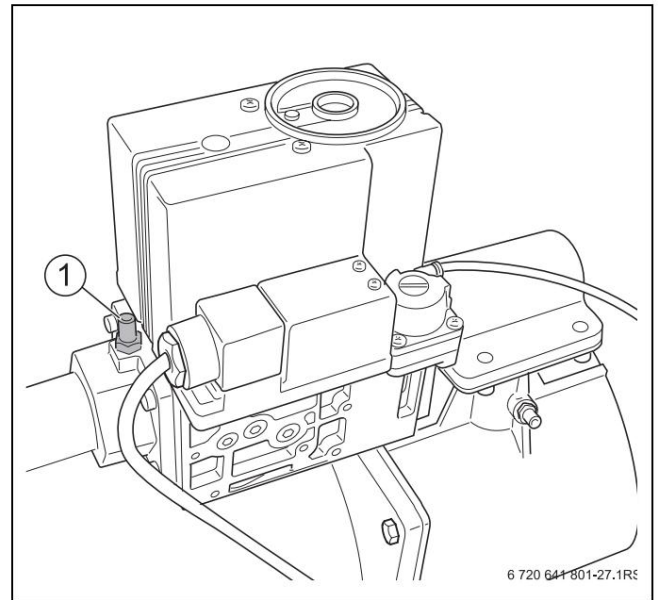


Fig. 50 Measuring the gas connection flow pressure (boiler size 160 kW)

- 1 Pressure measuring nipple for measuring the gas connection flow pressure and for venting

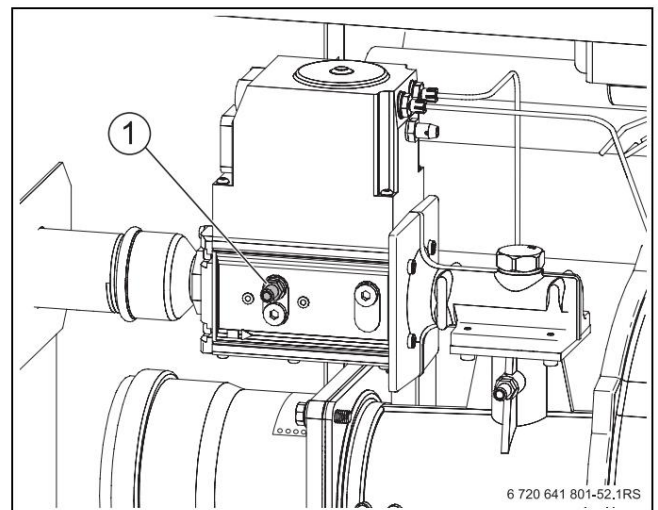


Fig. 51 Measuring the gas connection flow pressure (boiler size 200 to 280 kW)

- 1 Pressure measuring nipple for measuring the gas connection flow pressure and for venting

country	gas type	Connection pressure ¹⁾ [mbar]		
		Min	Rated	Max.
AT, CH, DE	natural gas H (G20) or Natural gas L (G25 only DE)	17	20	25

Tab. 20 Gas types and connection pressures

1) The gas supply company must ensure the minimum and maximum pressures (according to national regulations of the public gas supply).

7.18 Check tightness during operation

B With the burner running, check all sealing points in the entire gas path of the burner with a foaming agent, e.g. e.g.:

- Pressure measuring nipple
- Screw plug for the gas connection flow pressure
- Screw connections (also on the gas connection), etc.

The agent must be approved as a gas leak test agent.

CAUTION: System damage due to short circuit!

B Endangered areas before leak detection cover, e.g. B. the Wasserinnendruckfühler and the return temperature sensor on the return of the boiler.

B Leak detector not on cable entry spray genes, plugs or electrical connection lines. Don't drip on it either.

B To avoid corrosion, carefully wipe off the leak detection agent.

7.19 Assembling the paneling parts

If the side walls or the front wall cannot be mounted correctly, Align the boiler vertically (Æ chapter 5.9, page 30)

B Hook in the side panels [2] at the bottom first, then slightly lift and hang up.

B Secure the side panels with locking screws [3] at the front and rear of the boiler.

B Hook in the front panel [1] at the bottom first, then slightly lift and hang up.

B Front panel with locking screw [3] on top
Secure the boiler.

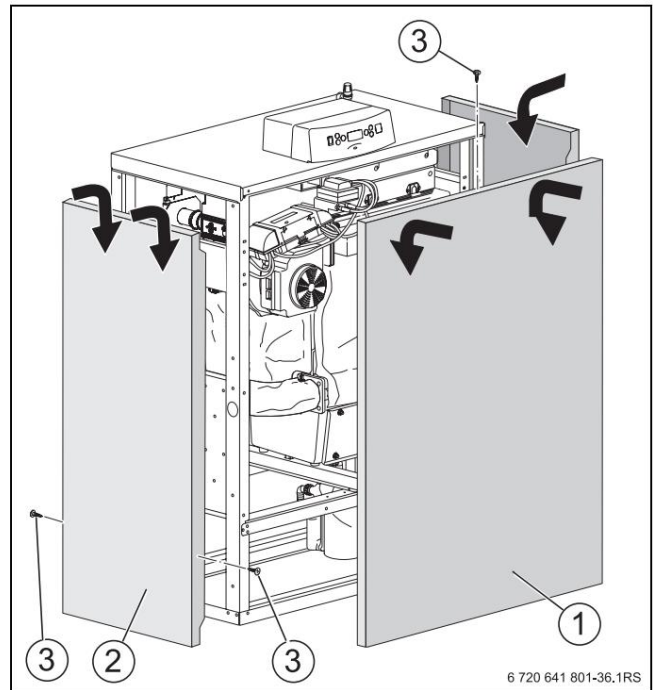


Figure 52 Assembling the fairing parts

- 1 front wall
- 2 Side wall
- 3 locking screws

B Transparent pocket with the technical documents visible bar on a side wall of the boiler.

7.20 Inform operator, hand over technical documents

B Familiarize the operator with the heating system and the operation of the boiler.

B Confirm commissioning in the log (Æ Chapter 7.21).
gene.

B A shutdown together with the operator and carry out commissioning.

B Using the operating instructions, instruct the customer how to behave in an emergency, e.g. B. explain in a fire.

B Hand over the technical documents to the operator.

7.21 Commissioning report

B Confirm and sign the commissioning work that has been carried out and enter the date.

commissioning work	Measurements page	Remarks
1. Fill the heating system and check for leaks	26	<input type="checkbox"/>
2. Was the information regarding the water quality in the company book noticed?		Yes: <input type="checkbox"/>
- Concentration of additives		Additives: Concentration:
3. Check operating pressure	37	<input type="checkbox"/>
4. Note the gas characteristics: Wobbe index, calorific value	38	_____ kW/m ³ _____ kW/m ³
5. Check device equipment	38	<input type="checkbox"/>
6. Check the gas line for leaks	39	<input type="checkbox"/>
7. Change the gas type if necessary	39 ff.	
8. Bleed the gas line	41	<input type="checkbox"/>
9. Check air inlet and outlet openings and flue gas connection	41	<input type="checkbox"/>
10. Check supply air membrane	42	<input type="checkbox"/>
11. Switch on the heating system	42	<input type="checkbox"/>
12. record readings,	46	full load part load
- discharge pressure		_____ Pa _____ Pa
- Gross exhaust gas temperature tA		_____ °C _____ °C
- Air temperature tL		_____ °C _____ °C
- exhaust gas temperature net tA - tL		_____ °C _____ °C
- Carbon dioxide content (CO ₂) or oxygen content (O ₂)		_____ % _____ %
- Flue gas losses qA		_____ % _____ %
CO value, free of air		_____ ppm _____ ppm
13. Measure gas connection flow pressure	47	_____ mbar
14. Functional Tests	46	
- Check the ionization current		_____ μA
15. Check for leaks during operation	48	<input type="checkbox"/>
16. Mount the fairing parts	48	<input type="checkbox"/>
17. Inform operator, hand over technical documents	48	<input type="checkbox"/>
18. Professional commissioning by the installing specialist drove		Signature: _____
19. Signature operator		Signature: _____

Tab. 21 Commissioning report

8 Shut down the heating system

8.1 Shut down the heating system on the control unit

Shut down the heating system on the control unit. The burner switches itself off automatically.

More information on operating the control unit (see chapter 6, page 31 ff.).

- B Set the main switch on the operating unit to "0" (off) position.

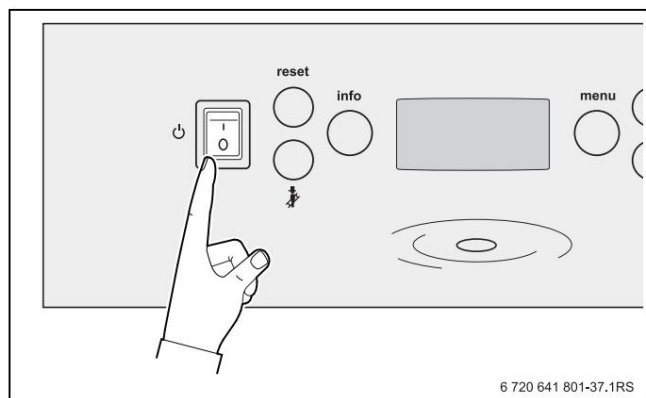


Fig. 53 Switch off the heating system

- B Close the main shut-off valve or gas valve.

NOTICE: System damage due to frost!

The heating system can freeze after a long period of time (e.g. in the event of a power failure, switching off the supply voltage, faulty gas supply, boiler malfunction, etc.).

B Make sure that the heating system is in constant operation (especially if there is a risk of frost).

If the heating system is taken out of service for a longer period of time when there is a risk of frost, the heating system must also be drained.

- B Automatic air vent at the highest point of the heating system to open the system.

- B The heating water at the lowest point of the heating system using the fill and drain valve or the radiator bleed valve to be let off.

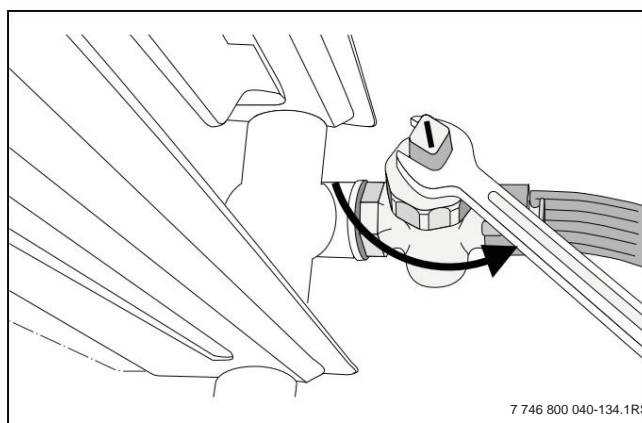


Fig. 54 Drain the heating system if there is a risk of frost

disposal

- B Heating system components that are no longer required should be disposed of in an environmentally friendly manner.

8.2 heating system in case of emergency except put into operation

Explain to your customer what to do in an emergency, e.g. B. in case of fire.

8.2.1 Behavior in an emergency

- B Never endanger your life. the personal safety always comes first.

- B Close the main shut-off valve or gas valve.

- B Heating system via the heating emergency switch or de-energize the corresponding house fuse.

9 Environmental Protection/Disposal

Environmental protection is a corporate principle of the Bosch Group.

The quality of the products, profitability and environmental protection are goals of equal importance to us. Laws and regulations on environmental protection are strictly observed.

To protect the environment, we take into account

best possible technology and materials from an economic point of view.

Packaging

When it comes to packaging, we participate in the country-specific recycling systems that ensure optimum recycling.

All packaging materials used are environmentally friendly and recyclable.

legacy device

Old devices contain valuable materials that must be recycled.

The assemblies are easy to separate and the plastics are marked. In this way, the various assemblies can be sorted and sent for recycling or disposal.

10 Inspection and Maintenance

Heating systems require periodic maintenance for the following reasons:

- to obtain high efficiency and the operate the heating system sparingly (low fuel consumption),
- to achieve a high level of operational safety,
- to ensure environmentally friendly combustion on a high level to keep level
- to ensure reliable operation and a long to ensure service life.

Only approved specialist companies may carry out maintenance work.

Only use original spare parts. Maintenance must be carried out once a year. Enter the results of the inspection continuously in the inspection and maintenance log.

Offer your customer an annual inspection and needs-based maintenance contract. You can read about which activities must be included in a contract in the inspection and maintenance logs (Æ Chapter 10.12).



Request spare parts using the spare parts catalogue.

10.1 Prepare boiler for inspection



DANGER: Danger to life from electric current!

B Before opening the boiler:

De-energize all poles of the mains voltage and secure against unintentional switching on again.

B Shut down the heating system

(Æ. Chapter 8.1, page 50).

B Locking screw [2] of the front panel at the top of the

Unscrew the center of the boiler.

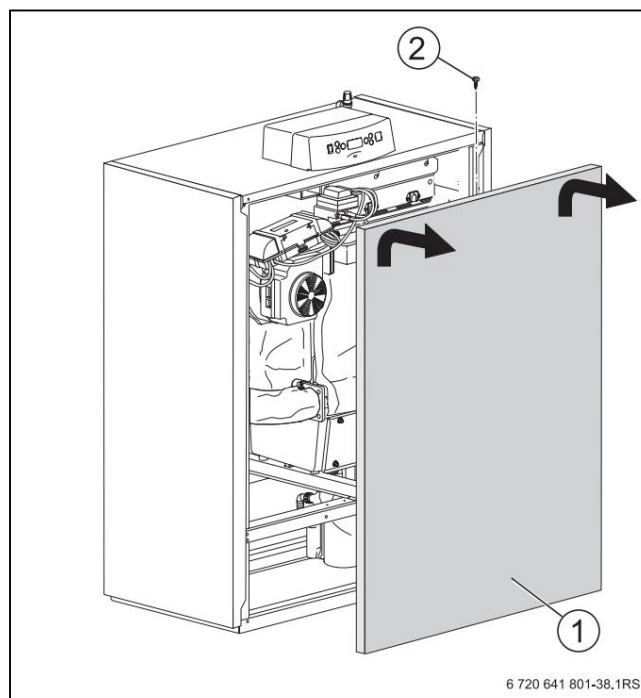
B Slightly lift the front panel [1] and move it forward

lose weight.



DANGER: Danger to life from explosion of flammable gases!

B Only approved specialist companies may carry out work on gas-carrying lines (observe local regulations).



6 720 641 801-38.1RS

Fig. 55 Remove the front panel

- 1 front wall
- 2 locking screw

10.2 General Works

The following work is not described in detail in this document. They must still be carried out:

- B Check the general condition of the heating system.
- B Visual and functional check of the heating system execute.
- B Supply air and flue gas routing for function and safety check.
- B Check all gas and water-carrying pipes for signs of corrosion.
- B Replace any corroded lines.
- B Check the inlet pressure of the diaphragm expansion vessel ly.
- B The concentration of any antifreeze used
Check the chemicals/additives in the system fill water annually.

10.3 Internal leak test

10.3.1 Determine test volume

$$V_{\text{test}} = V_{\text{ges.}} = V_{\text{tube}} + V_{\text{gas fitting}}$$

B Determine the length of the pipeline up to the main fuel shut-off device.

B Determine gas valve volume ($V_{\text{gas valve}}$) using Tab.

B Pipe volume (V_{pipe}) based on Tab. 23 and Tab. 24 determine.

B Test volume (V_{test}) calculated according to the above equation to.

Gas fitting volume (approximate values)	
Gas fitting volume up to 50 kW	0.1 liters
Gas fitting volume > 50 kW	0.2 liters

Tab. 22 Gas fitting volume ($V_{\text{gas fitting}}$)

pipe length in meters	Pipe volume (V_{pipe}) in litres					
	Pipe diameter in inches					
	½	¾	1	1¼	1½	2
1	0.2	0.4	0.6	1.0	1.4	2.2
2	0.4	0.7	1.2	2.0	2.7	4.4
3	0.6	1.1	1.7	3.0	4.1	6.6
4	0.8	1.5	2.3	4.0	5.5	8.8
5	1.0	1.8	2.9	5.1	6.9	-
6	1.2	2.2	3.5	6.1	8.2	-
7	1.4	2.5	4.1	7.1	9.6	-
8 th	1.6	2.9	4.6	8.1	-	-
9	1.8	3.3	5.2	9.1	-	-
10	2.0	3.6	5.8	10.1	-	-

Tab. 23 Pipe volume (V_{pipe}) depending on the pipe length and the pipe diameter

pipe length in meters	Pipe volume (V_{pipe}) in litres					
	Pipe diameter in mm (copper pipe)					
	15 x 1	18x1	22x1	28x1.5	35x1.5	45x1.5
1	0.1	0.2	0.3	0.5	0.8	1.4
2	0.3	0.4	0.6	1.0	1.6	2.8
3	0.4	0.6	0.9	1.5	2.4	4.2
4	0.5	0.8	1.3	2.0	3.2	5.5
5	0.7	1.0	1.6	2.5	4.0	6.9
6	0.8	1.2	1.9	2.9	4.8	8.3
7	0.9	1.4	2.2	3.4	5.6	9.7
8 th	1.1	1.6	2.5	3.9	6.4	-
9	1.2	1.8	2.8	4.4	7.2	-
10	1.3	2.0	3.1	4.9	8.0	-

Tab. 24 Pipe volume (V_{pipe}) depending on the pipe length and the pipe diameter

10.3.2 Carry out a leak test

B Close the main shut-off valve or gas valve.

B Loosen the locking screw of the pressure measuring nipple by two turns.

B measuring hose of the U-tube pressure gauge to the pressure attach measuring nipple.

B Open the main shut-off valve or gas tap, release the pressure read and note.

B Close the main shut-off valve or gas tap and check read the pressure again after one minute.

B Determining the pressure drop per minute by calculating the difference tell

With the determined pressure drop per minute and the test volume (V_{test}) using the following diagram (Æ Fig. 59, Page 55) read off whether the gas fitting can still be used.

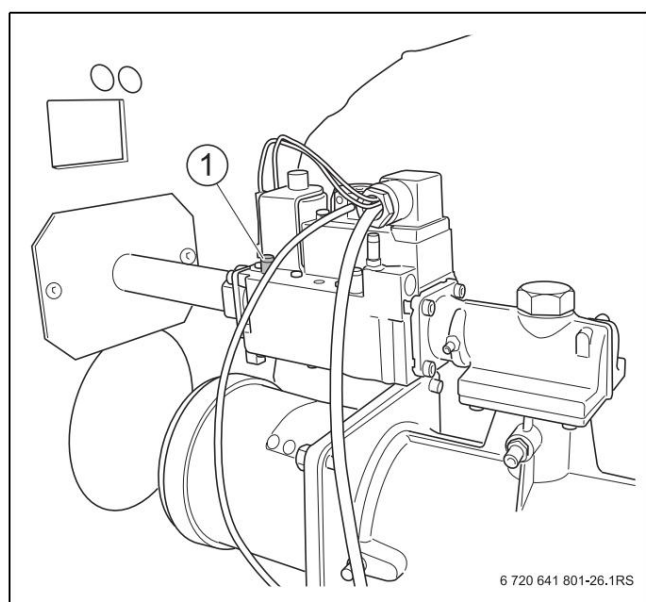


Fig. 56 Checking the internal tightness (boiler size 120 kW)

1 pressure measuring nipple

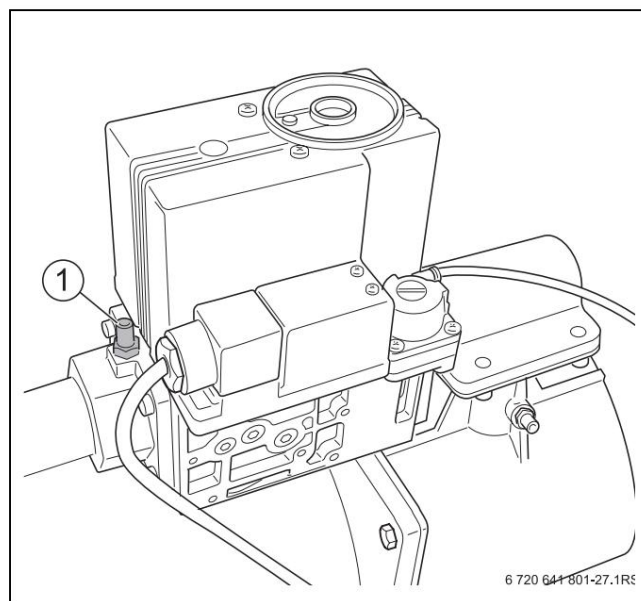


Fig. 57 Checking the internal tightness (boiler size 160 kW)

1 pressure measuring nipple

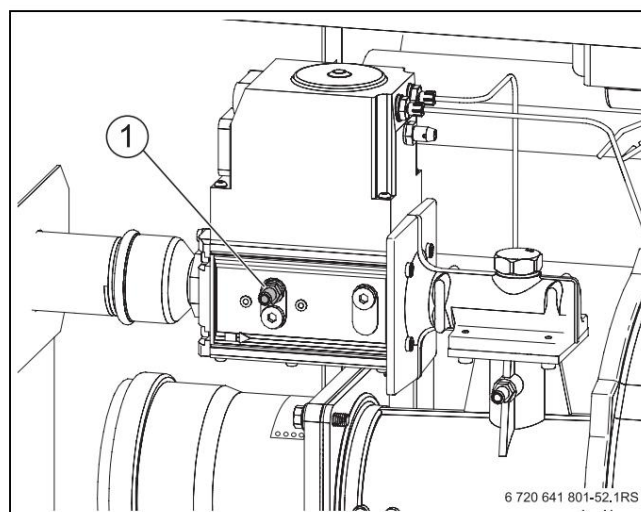


Fig. 58 Checking the internal tightness (boiler sizes 200 to 280 kW)

1 pressure measuring nipple

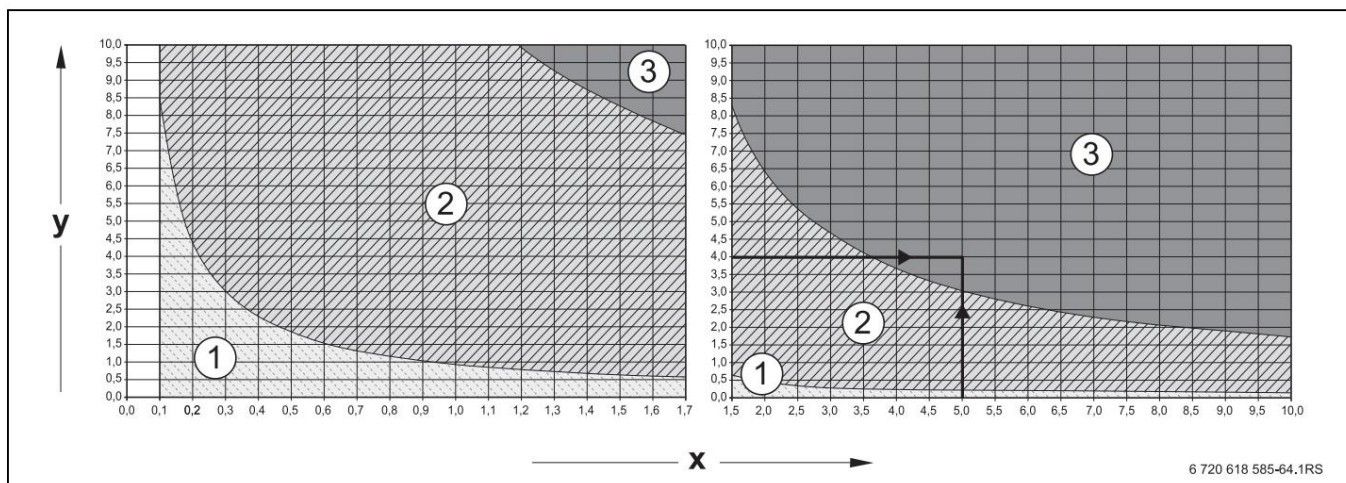


Figure 59 Permissible pressure drop per minute during the internal leak test with gas pressure present

- x** Test volume in liters
y Test volume in mbar within one minute
1 "Fitting tight" area = applies to new installations
2 "Fitting sufficiently tight" area = fitting can be used without restrictions
3 "Fitting leaking" area = fitting cannot be used
 >> Carry out the test as described below
- Reading example:** test volume (V_{test}) 5 liters and pressure loss 4 mbar/min = area 3 "valve leaking" = valve cannot be used
 >> carry out the test as described below

B If no leakage is detected, gas valve exchange.

Complete the leak test

- B Pull off the hose.
 B After completing the measurement work, screw in the Tighten the pressure measuring nipple.
 B Check the pressure measuring nipple for leaks.



If you are at a test volume (V_{test}) of < 1 liter a strong drop in pressure > 10 mbar/minute, you must increase the test volume (V_{test}). To do this, include the pipeline up to the next shut-off in the leak test and repeat the test with a new test volume (V_{test}).

If the reading of the test volume (V_{test}) and pressure drop per minute is in the "valve leaking" range (see reading example), you must carry out the test described below.



NOTICE: System damage !

- B Do not apply leak detector to cable guides, plugs or electrical connection lines spray or drip.
 B Endangered areas before leak detection cover.

B Check all sealing points of the tested pipe section with a foaming leak detector.

B If necessary, seal the leak and repeat the test len.

10.4 Check the operating pressure of the heating system



NOTICE: System damage due to boiler scale formation!

B Water quality in accordance with the "Water Quality Log".

pay attention to the amount of water and enter condition.



NOTICE: System damage !

If the heating system is filled when warm, temperature stresses can cause stress cracks. The boiler is leaking.

B Only fill the heating system when it is cold (the flow temperature must not exceed 40 °C).

B Do not drain the heating system via the fill and drain valve during operation boiler, but only through the filling tap in the pipe system (return) of the heating system.



NOTICE: System damage due to frequent refilling!

If water has to be topped up frequently, the heating system can be damaged by corrosion and scaling, depending on the water quality (observe the water quality log book).

B Heating system during filling bleed immediately.

B Check the heating system for leaks.

B Expansion tank on working order check capability.

In the case of closed systems, the manometer pointer must be within the green marking.

The red pointer on the pressure gauge must be set to the required operating pressure.



An operating pressure of at least 1 bar manufacture.

B Check the operating pressure of the heating system.

If the pressure gauge pointer falls below the green mark, the operating pressure is too low. Water needs to be refilled.

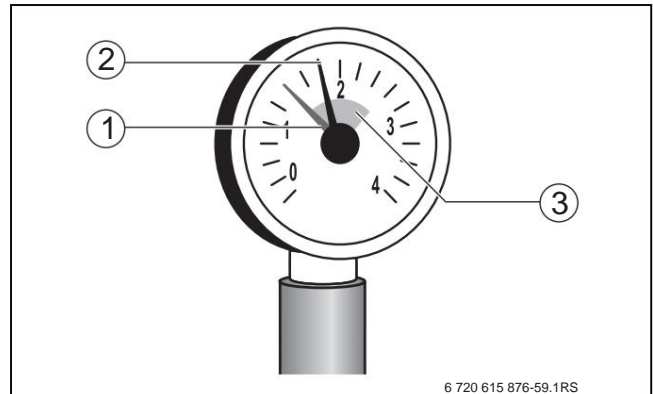


Fig. 60 Manometer for closed systems

- 1 Red pointer
- 2 gauge pointer
- 3 Green marker



CAUTION: Health hazard due to contamination of the drinking water!

B Country-specific regulations and Observe standards for avoiding contamination of drinking water.

B Observe EN 1717 for Europe.

B Water via the on-site installed fill and drain refill empty tap.

B Bleed the heating system via the bleed valves on the radiators.

B Check operating pressure again.



The operating pressure can also be set at the oper unit can be read via the "Info menu" (e.g. display "P1.4" corresponds to 1.4 bar).

B Top-up water quantity in the "Water log" texture".

10.5 Measure CO₂ content

B Hold the sensor through the measuring opening in the flue gas pipe into the core flow.

B Note the exhaust gas values.

If the CO₂ content deviates from the target value (Æ Table 7, Page 10) by more than 0.5%, adjust the burner as described from Chapter 7.13 and 7.14, Page 43 ff.

10.6 Determine the degree of contamination on the burner and heat exchanger

Burners and heat exchangers can be wet cleaned
be cleaned.

Before you clean the burner and heat exchanger, you must first
check and, if necessary, carry out the following points or work steps.

10.6.1 Determine the degree of contamination

B Connect the differential pressure gauge between the
measuring nipple on the burner [1] and the boiler connection
bend or boiler connection piece [2] at the end of the boiler.

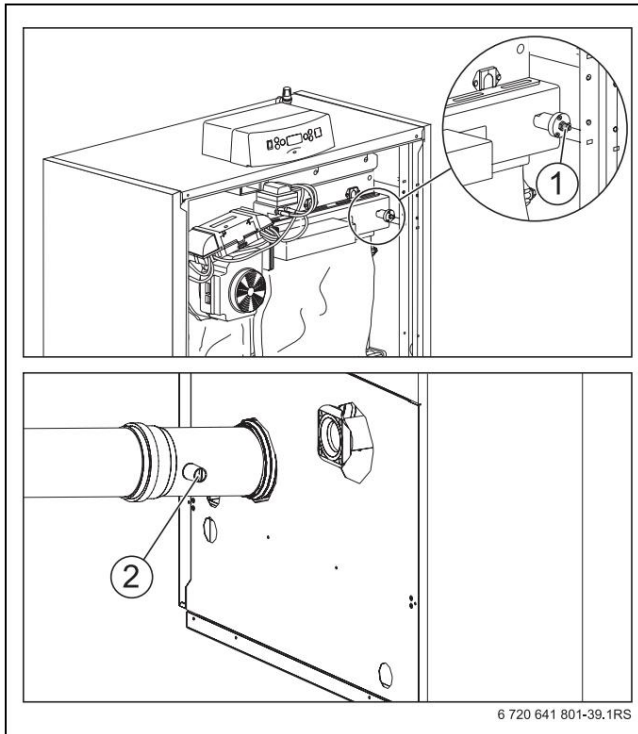


Fig. 61 Determine the degree of contamination

- 1 Measuring nipple on the burner
- 2 Measuring point on the boiler connection piece

Switch on the heating system at the control unit.

B Set the main switch on the control unit to "I".

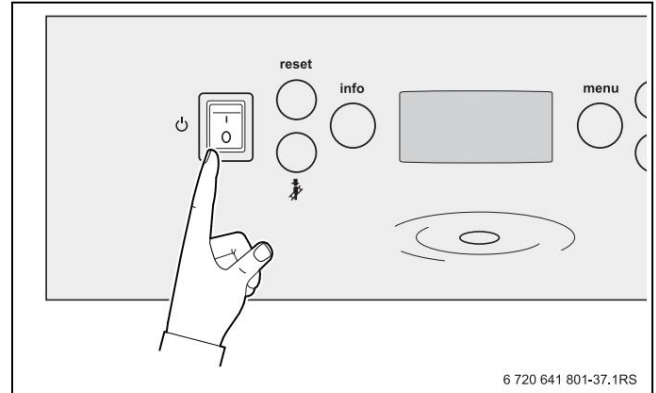


Fig. 62 Switch on the heating system


The entire heating system is switched on. All symbols appear in the
display for 1 second before the display for the status of the heating
system appears.



Activate chimney sweep mode

The chimney sweep company (service company) is required for
commissioning and maintenance.

In chimney sweep mode (service mode), the boiler runs for up to
30 minutes at the set heat output. Meanwhile, no hot water treatment is
possible.

B Ensure heat consumption.

B  Keep the button pressed until the chimney appears on the display
stone sweeper symbol appears and the heat output (bottom
right) flashes.

B With the  + or  - Use the buttons to set the desired
heat output (between minimum and maximum heating load) (Æ Tab.
15, Page 35).

B Disable with the  button or 30 minutes was
ten.

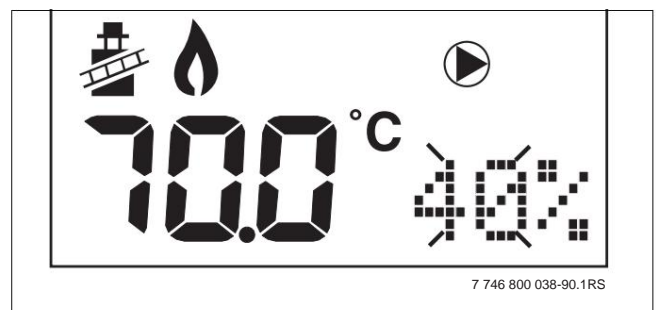


Fig. 63 Display - chimney sweep operation

Inspection and Maintenance

Call up the "Information" menu

Table 14, page 33 ff. shows the structure of the "Information" menu. It contains information about the current settings and the operating status. Settings can only be read here and not changed.

B Press the info button to open the information menu. First the word "info" appears for 1 second. If the info button is pressed longer, the "Fault history" menu opens.

B With the ▲+ or ▼- Keys can be the values read one after the other on the display.

B The ▲+ or ▼- Press the keys several times until the "Current heating output" is displayed.

B Read the "Current heating output" on the control unit sensor

B Wait until the "Current heating output" reaches 100% Has.

B Read the differential pressure on the measuring device and compare it with the value in Table 25.

If the pressure measured is higher than the value in the table, the heat exchanger must be cleaned.

boiler size				
120kW	160kW	200kW	240kW	280kW
460	550	530	540	560

Tab. 25 Cleaning threshold - differential pressure in Pa

B Press the "info" button again to open the menu leaving. If no button is pressed for 10 minutes, the "Information" menu closes automatically.

10.7 Clean burner and heat exchanger

B Shut down the heating system (Æ chapter 8.1, page 50).

B Close the main shut-off valve or gas valve.

B Allow the boiler to cool down.

B Siphon (Æ Fig. 64, [1]) on the condensate drain Remove the tub (Æ Fig. 64, [2]) and place a bucket or tub underneath.

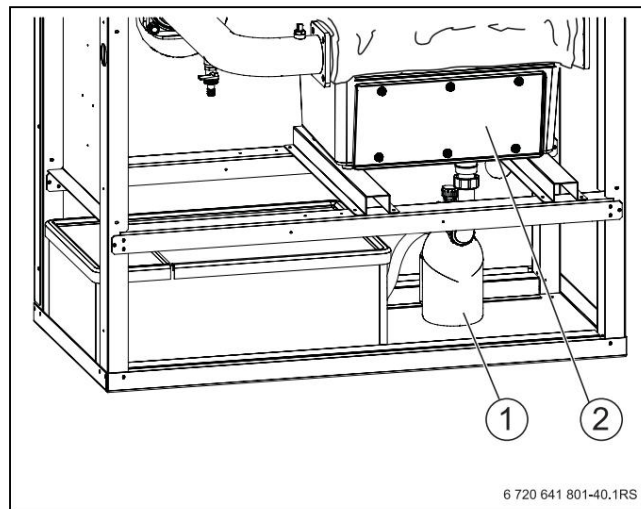


Fig. 64 Remove the siphon

- 1 siphon
- 2 condensate pan

10.7.1 Remove burner

B All electrical plug connections [1, 2] on Bren solve.

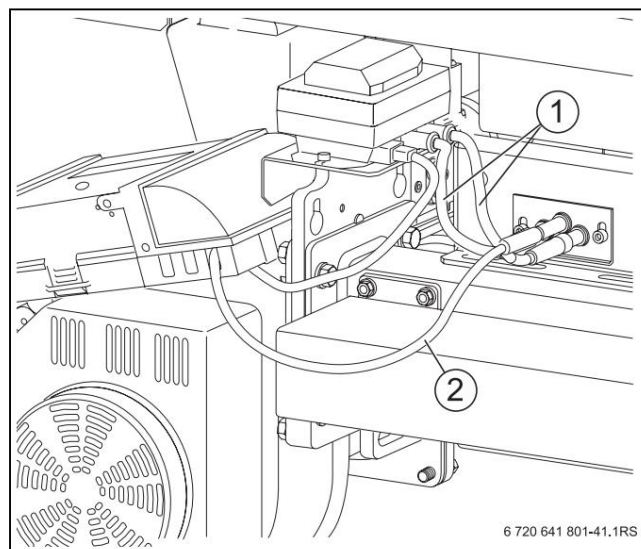


Fig. 65 Disconnect the electrical plug connections on the burner

- 1 ignition cable
- 2 monitoring cable

B Fastening nuts [3] on the burner shield at the top and unscrew below.

B Screws on fan side:

Loosen the rear 2 hexagon screws [2] by 2 turns;

Unscrew the 2 front hexagon screws [1].

B Carefully pull the burner out to the front.

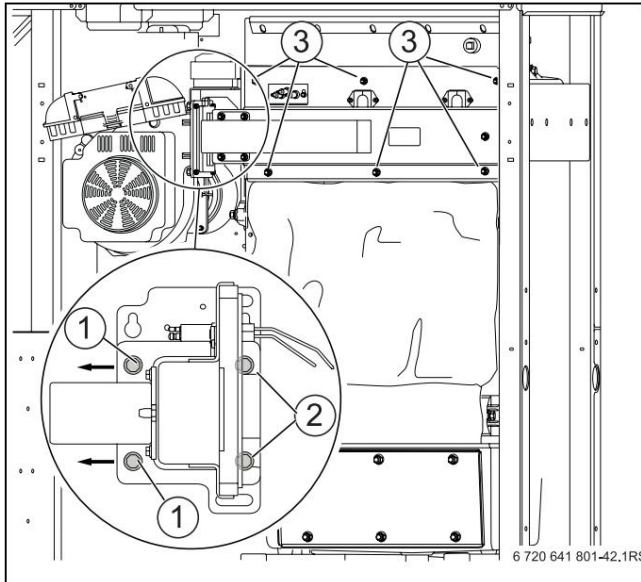


Fig. 66 Remove the burner from the heat exchanger

- 1 Front hex bolts
- 2 Rear hex bolts
- 3 mounting nuts

10.7.2 Wet clean the heat exchanger

When cleaning wet, use a cleaning agent according to the degree of soiling (sooty or encrusted). The cleaning agent must be approved for aluminum!



DANGER: Danger to life from escaping exhaust gases!

B When assembling the cleaning cover, make sure that the seals are damaged and that they are seated exactly.

B Heat exchanger with water or one for aluminum approved cleaning agent (observe the cleaning agent manufacturer's instructions for use).



Protect electrical components (blower, gas valve, etc.) from moisture and dirt during wet cleaning.

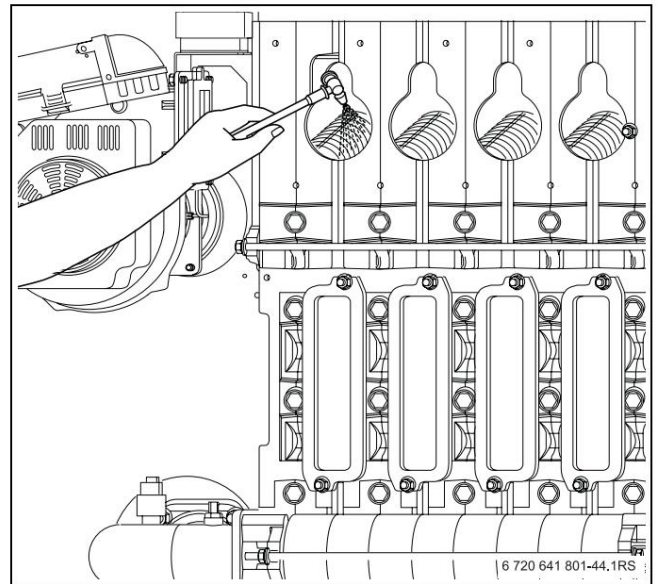


Fig. 67 Wet cleaning the heat exchanger

B Any remaining dirt residue with a Rinse hose into bucket or condensate pan.

B Clean the condensate pan with water.

B Clean the siphon with water.



DANGER: Danger to life through poisoning!

If the siphon is not filled with water, escaping exhaust gas can endanger people's lives.

B Fill the siphon with approx. 2 liters of water.

B Mount the siphon (Æ chapter 5.5.5, page 24 ff.).

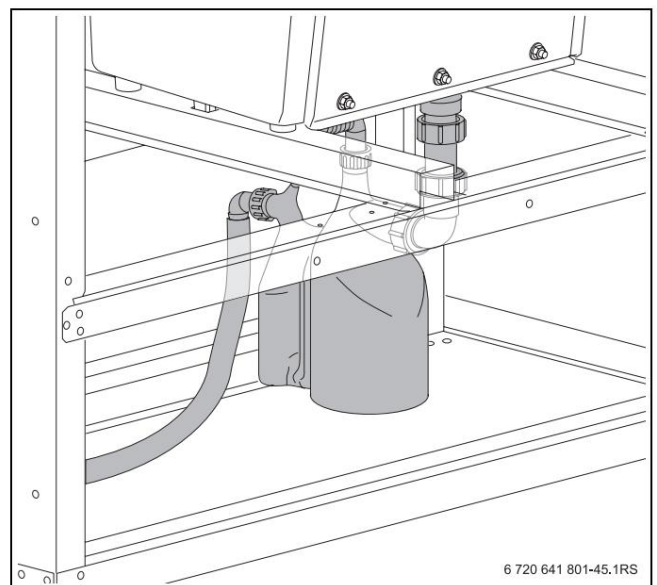


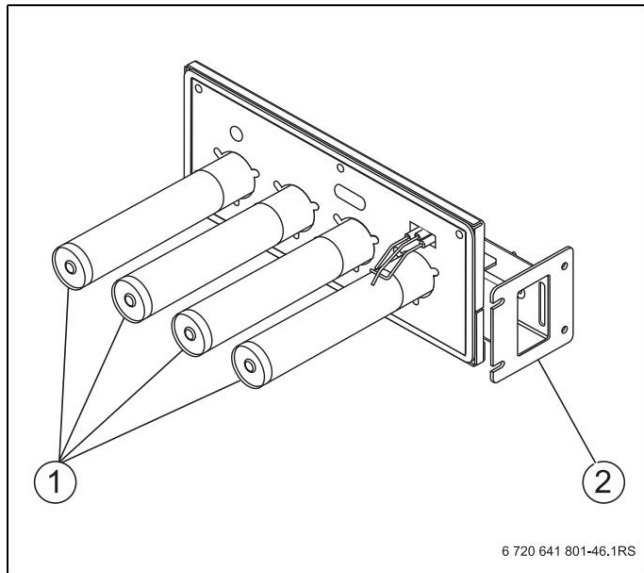
Fig. 68 Clean the siphon

B Condensate hose between boiler connection piece and check the siphon for leaks.

10.7.3 Clean burner

B Burner rods and manifold bars inside out

Blow out the outside with compressed air.



Picture 69

- 1 burner rods
- 2 distributor bar

Check and adjust electrode position

B Measure the distances between electrodes as shown in Fig. 70 and correct if necessary.

B Adjust the burner rod so that the electrode position

Figure 70 corresponds.

The electrode position is above the row of slits.

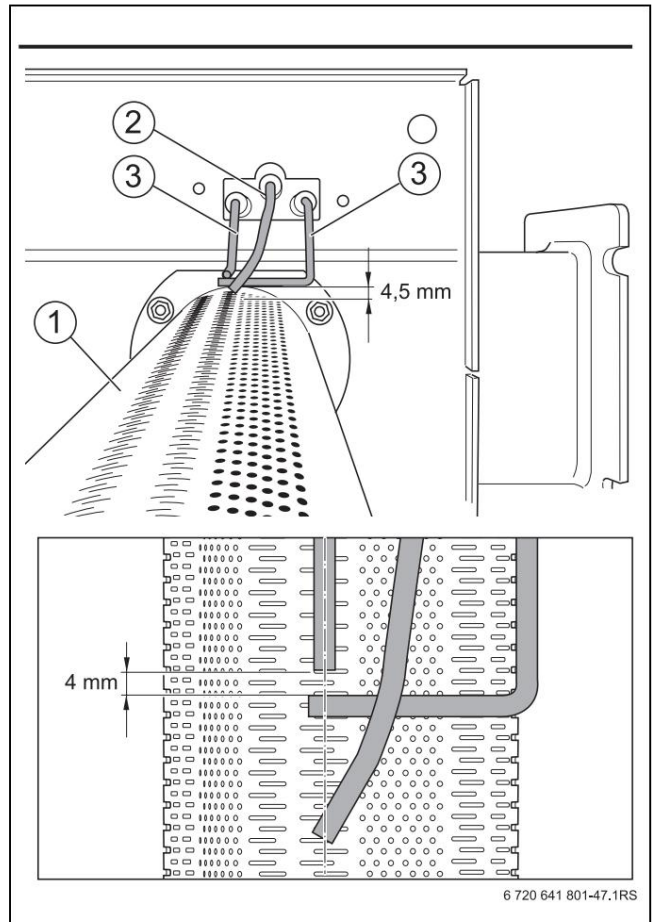


Fig. 70 Checking the electrode position (dimensions in mm)

- 1 burner rod
- 2 ionization electrode
- 3 ignition electrode

burnup

B Inspect spark plug gap (burn-off).

10.8 Assemble dismantled parts

- B All boiler parts subject to inspection or were dismantled for maintenance purposes, reassemble in reverse order.
- B Check all seals for wear and damage fen.
- B Replace seals if necessary.
- B Check the flat gasket in the flange, replace if necessary after completing the inspection and maintenance.



To check from the outside whether the seal is inserted, there is an indicator window at the top of the flange.

10.9 Check tightness during operation



NOTICE: System damage due to short circuit!

- B Cover blower and other endangered areas before searching for leaks.
- B Do not apply leak detector to the cable routing spray genes, plugs or electrical connection lines. Don't drip on it either.

- B Start up the boiler and check all the seals for leaks under full load using a leak detector.
- B Further tightness checks of the entire gas path (Æ Chapter 7.18, page 48).

10.10 Check ionization current

To ensure trouble-free operation, the ionization current must be at least 3 μ A at partial and full load (and the flame is burning).

The ionization current (flame current) can be read on the operating unit in the "Information" menu (Æ chapter 6.2.2 page 33 ff.).

10.11 Complete inspection and maintenance

10.11.1 Install fairing parts

- B Mount the cladding parts (Æ fig. 52, page 48).

10.11.2 Confirm inspection and maintenance

- B Inspection and maintenance log in this document ment (Æ Chapter 10.12).

10.12 Inspection and Maintenance Records

The inspection and maintenance logs also serve as templates for copying.

B Sign the inspection work carried out and enter the date.

inspection work	side	full load	part load	full load	part load
1. Check the general condition of the heating system (visual and functional check)			<input type="checkbox"/>		<input type="checkbox"/>
2. Check gas and water-carrying system parts for:					
- inner tightness			<input type="checkbox"/>		<input type="checkbox"/>
- visible corrosion			<input type="checkbox"/>		<input type="checkbox"/>
- Signs of aging			<input type="checkbox"/>		<input type="checkbox"/>
3. The concentration of antifreeze/additives in the heating water (manufacturer's instructions and information be noted in the operator's log).		Concentration: _____%		Concentration: _____%	
4. Check the water pressure in the heating system.	56		<input type="checkbox"/>		<input type="checkbox"/>
- Pre-pressure of the expansion tank (see assembly instructions expansion tank)					
- Operating pressure	56				
5. Check the burner and heat exchanger for dirt to do this, shut down the heating system.					
6. Check the siphon and condensate pan, plus the heater on place out of operation.					
7. Check the electrode block, except for the heating system put into operation.	60				
8. Check gas connection flow pressure	47				
9. Supply and exhaust air openings, flue gas connection and flue gas check leadership.	41		<input type="checkbox"/>		<input type="checkbox"/>
10. Take readings:	46				
- discharge pressure		_____ Pa	_____ Pa	_____ Pa	_____ Pa.
- Gross flue gas temperature tA		_____ °C	_____ °C	_____ °C	_____ °C
- Air temperature tL		_____ °C	_____ °C	_____ °C	_____ °C
- exhaust gas temperature net tA - tL		_____ °C	_____ °C	_____ °C	_____ °C
- Carbon dioxide content (CO ₂) or oxygen content (O ₂)		_____ %	_____ %	_____ %	_____ %
- CO value, air-free		_____ ppm	_____ ppm	_____ ppm	_____ ppm
11. Carry out functional tests:	46				
- Check ionization current.		_____ μA	_____ μA	_____ μA	_____ μA
12. Check for leaks during operation.	48		<input type="checkbox"/>		<input type="checkbox"/>
13. Check that the control unit settings are as required (see documents for the controller).	-		<input type="checkbox"/>		<input type="checkbox"/>
14. Final check of the inspection work	-		<input type="checkbox"/>		<input type="checkbox"/>
Confirm professional inspection					
Company stamp/date/signature					

Table 26



If the inspection reveals a condition that requires maintenance, this work must be carried out as required.

	full load	part load	full load	part load	full load	part load	full load	part load
1.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Concentration: _____%		Concentration: _____%		Concentration: _____%		Concentration: _____%	
4.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.								
6.								
7.								
8h.								
9.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.								
	_____ Pa	_____ Pa	_____ Pa	_____ Pa.	_____ Pa	_____ Pa	_____ Pa	_____ Pa.
	_____ °C	_____ °C	_____ °C	_____ °C	_____ °C	_____ °C	_____ °C	_____ °C
	_____ °C	_____ °C	_____ °C	_____ °C	_____ °C	_____ °C	_____ °C	_____ °C
	_____ °C	_____ °C	_____ °C	_____ °C	_____ °C	_____ °C	_____ °C	_____ °C
	_____ %	_____ %	_____ %	_____ %	_____ %	_____ %	_____ %	_____ %
	_____ ppm	_____ ppm	_____ ppm	_____ ppm	_____ ppm	_____ ppm	_____ ppm	_____ ppm
11.								
	_____ ŷA	_____ ŷA	_____ ŷA	_____ ŷA	_____ ŷA	_____ ŷA	_____ ŷA	_____ ŷA
12.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Table 27

Inspection and Maintenance

On-demand maintenance		Page	Date: _____	Date: _____
1.	Shut down the heating system	50	<input type="checkbox"/>	<input type="checkbox"/>
2.	Clean burner and heat exchanger.	58	<input type="checkbox"/>	<input type="checkbox"/>
3.	Change the seals for the cleaning cover on the heat exchanger	59	<input type="checkbox"/>	<input type="checkbox"/>
4.	Clean the siphon.	59	<input type="checkbox"/>	<input type="checkbox"/>
5.	Clean the condensate pan.	59	<input type="checkbox"/>	<input type="checkbox"/>
6.	Change the electrode block.	60	<input type="checkbox"/>	<input type="checkbox"/>
7.	Change mixture manifold gasket (O-ring).		<input type="checkbox"/>	<input type="checkbox"/>
8.	Carry out a function check.		<input type="checkbox"/>	<input type="checkbox"/>
Confirm professional maintenance.				
Company stamp, signature				


Table 28

	Date: _____	Date: _____	Date: _____	Date: _____	Date: _____
1.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8th.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Company stamp/ signature	Company stamp/ signature	Company stamp/ signature	Company stamp/ signature	Company stamp/ signature

Table 29


11 Service and fault displays

11.1 Safety instructions for service work

 **DANGER:** Danger to life from explosion of flammable gases!

B Only carry out work on gas-carrying components with a valid concession.

B Make sure that the flat seal is in place in the gas line. There is a risk of explosion if there is a mixture of gas and air. Check all gas lines and screw connections for gas tightness.


 **DANGER:** Danger to life through poisoning!

Inadequate air supply can lead to dangerous exhaust emissions.

B Make sure that supply and exhaust air openings openings are not reduced or closed.

B If the defect is not immediately lifted, the boiler must not be operated.


B Inform the system operator of the defect and the danger in writing.

 **DANGER:** Danger to life from electric current when the device is open!

B Before opening the boiler:

Switch off the heating system with the heating emergency switch and the Hei disconnect the system from the mains using the corresponding house fuse. It is not enough to switch off the controller.


B heating system against accidental Secure restart.

 **WARNING: Danger of scalding!**


Hot water can cause serious burns hung!

B Cool down the boiler before servicing to let. Temperatures in excess of 60 °C can occur in the heating system.

B Before working on water-carrying parts Drain boiler.

 **NOTICE: System damage** caused by water! Escaping water can damage the electronics to damage.

B Before working on water-carrying parts, cover the electronics.

 **NOTICE: System damage** due to corrosion, sludge and stone formation!

B Before filling the heating system, observe the notes on water quality (Æ Chapter 3.5, page 16).

11.2 Service and fault messages in the display

The display shows various boiler status indicators in coded form.

A distinction is made between the following displays:

- Service displays (Æ Chapter 11.3)
- Fault displays (Æ Chapter 11.4)

11.3 Service Indicators

The display shows various boiler status indicators in coded form. In the event of a service message, the "Service Symbol" appears on the status display.

In the event of a service message, the boiler remains in operation. However, a service (e.g. filling the boiler) is required on the boiler. If this is not done within a short time, the boiler can malfunction and switch off.

Call up the service codes via the "Information" menu (Æ chapter 6.2.2, page 33 ff.).

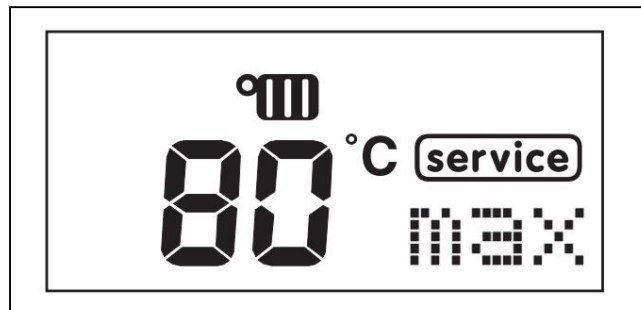


Fig. 71 Service symbol in the display

service code		meaning
H07	--	The water pressure of the heating system is too low and is less than 0.8 bar. At less than 0.4 bar, the heating output is regulated downwards. If the water pressure rises to 1 bar or more, the service code will expire.

Tab. 30 Service displays

11.4 Fault Indications

The display shows various boiler status indicators in coded form. In the event of a fault, the display code for the fault displays [1] appears next to the pressure display [2], which flashes in the event of a locking fault.

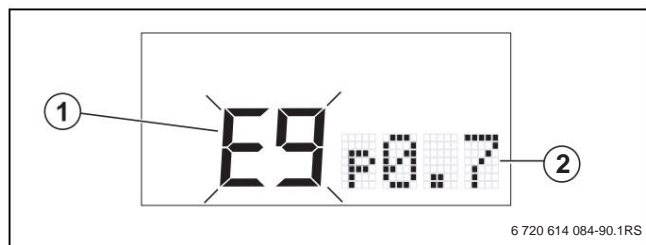


Fig. 72 Error messages on the display

- 1 Display code of the fault displays (locking fault here)
- 2 System pressure in bar

There are two types of fault displays:

- blocking fault indicators
- Latching fault indicators

Blocking fault displays: The boiler remains in operation. It is usually not a resetting of the heater
sels with the reset button required. The fault display goes out as soon as the fault has been rectified.

Locking fault displays (display flashes): The boiler switches off because there is a serious fault.

In order to minimize the risk of the heating system freezing, the pump is started up in the event of this fault and remains in continuous operation.

11.4.1 Resetting interlocking fault displays:

B Hold down the reset button [1] until the display shows "rE".

If this does not reset the fault displays:

B Identify and eliminate the cause of the fault.

B Press and hold the **reset button** again until "rE" appears on the display.

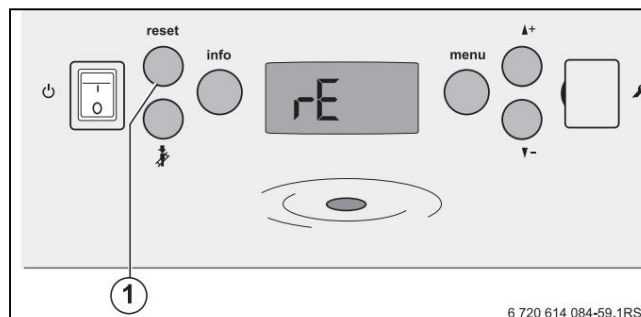


Fig. 73 Reset fault with reset button

- 1 reset button

11.4.2 Identify faults

The fault displays are made up of the display code (e.g. E9) and the fault code (e.g. 207).

More precise specifications about the type of fault are displayed via the fault code in the "Information" menu (Æ Chapter 6.2.2, page 33 ff.).

In addition, the last 3 fault displays can be found in the menu "Fault history" are displayed one after the other (Æ Chapter 6.2.3, page 34).



Figure 74 Display and fault code

- 1 display code
- 2 error code

11.4.3 Faults shown on the display

kind1)	Display code	sto rungs code	description	elimination
B	A8	542	communication with Burner machine below broken.	Check the cable connections between the burner control and the control box, replace the burner control if necessary.
		543	No communication with automatic burner.	<p>Check the plug connections of the bus line and mains line between the burner control unit and the control box.</p> <p>If there is no 230V at the "Burner control" terminals in the control box, replace the control box.</p> <p>Check the connecting cables (bus cable and mains cable) between the burner control unit and the control box and replace if necessary.</p> <p>If the green signal lamp does not light up on the automatic burner, replace the automatic burner.</p> <p>Check whether the boiler goes into emergency operation (boiler temperature 60 °C) after disconnecting the bus line between the automatic burner control and the switch box. If not, replace automatic burner.</p> <p>Wait a maximum of 30 minutes and check whether the green light on the burner control lights up again. if not, replace automatic burner.</p> <p>Check burner control and control box, replace if necessary.</p>
V	C7	537	No fan rotation number.	Check the plug connections on the blower and on the automatic burner, replace the cable if necessary.
				Check fan, replace if necessary.
V	C6	538	Blower speed too low.	Check whether the fan is dirty, clean if necessary.
				Replace fan
V	CF	568	Interruption of water pressure sensor (voltage > 3.5 volts)	Check line connection to water pressure sensor, replace if necessary
				Replace water pressure sensor.
V	CF	569	short circuit water pressure sensor (voltage < 0.5 volts)	Check line connection to water pressure sensor, replace if necessary
				Replace water pressure sensor.

Tab. 31 Fault displays

kind1)	Display code	storungscode	description	elimination
V	d1	566	Interruption, return temperature < -5 C.	Check the connection line between the burner control unit and the return temperature sensor, replace the line if necessary.
				Check the electrical connection of the connecting line on the burner control unit and eliminate the contact problem if necessary.
				Check resistance values according to table, replace temperature sensor if necessary (Æ Fig. 76, Page 76).
				Check the voltage values at the temperature sensor according to the table, replace the burner control unit if necessary (Æ Table 32, Page 75).
		567	Short circuit, return temperature > 130 C.	Check the connection line between the burner control unit and the return temperature sensor, replace the line if necessary.
				Check the electrical connection of the connecting line on the burner control unit and eliminate the contact problem if necessary.
				Check resistance values according to table, replace temperature sensor if necessary (Æ Fig. 76, Page 76).
				Check the voltage values at the temperature sensor according to the table, replace the burner control unit if necessary (Æ Table 32, Page 75).
B	d3	549	has safety chain open.	Check components for continuity, replace if necessary.
-	d4	564	Boiler temperature sensor temperature rise too quickly (>70K/minutes).	Ensure sufficient heat consumption in the heating system.
				Set pump levels or pump maps correctly and adjust to maximum performance.
				Check pump, replace pump if necessary.
				Flush/clean the heating block with approved agents on the heating water side.
B	E0	551	voltage interruption	Check power line.
B	E1	550	Undervoltage (< 195 Volt)	Check power supply.

Tab. 31 Fault displays

kind1)	Display code	storungscode	description	elimination
V	E2	521	Temperature difference between temperature sensors 1 and 2 too great (> 5K/2s).	Press the reset button on the burner control unit.
				Check the setting of the non-return valve on the storage tank charging pump and set it to automatic if necessary.
				Check flow and return connections.
				Clean the plug-in connections on the temperature sensor and burner control unit, replace if necessary (Æ Table 32, Page 75).
				Check temperature sensors 1 and 2, replace if necessary.
				Check automatic burner, replace if necessary.
		522	short circuit between Temperature sensors 1 and 2.	Check lines, replace if necessary.
				Check plug connections, replace if necessary.
				Check sensor values according to table, replace temperature sensor if necessary (Æ fig. 76, page 76).
				Check the voltage values at the temperature sensor according to the table, replace the burner control unit if necessary (Æ Table 32, Page 75).
		523	Temperature sensor interrupted.	Check sensor line, replace if necessary.
				Check plug connection, clean if necessary or replace cable/sensor.
Check sensor values according to table, replace temperature sensor if necessary (Æ fig. 76, page 76).				
Check the voltage values at the temperature sensor according to the table, replace the burner control unit if necessary (Æ Table 32, Page 75).				
524	Short circuit boiler temperature sensor (> 130 °C)	Check sensor line, replace if necessary.		
		Check plug connection, clean if necessary or replace cable/sensor.		
		Check sensor values according to table, replace temperature sensor if necessary (Æ fig. 76, page 76).		
		Check the voltage values at the temperature sensor according to the table, replace the burner control unit if necessary (Æ Table 32, Page 75).		

Tab. 31 Fault displays

kind1)	Display code	storungscode	description	elimination
V	E2	573	Interruption, flow temperature < -5 °C	Check the connecting cable between the burner control unit and the flow temperature sensor, replace the cable if necessary.
				Check the electrical connection of the connection line on the burner control unit and eliminate the contact problem if necessary.
				Check resistance values according to table, replace temperature sensor if necessary (Æ Fig. 76, Page 76).
				Check the voltage values at the temperature sensor according to the table, replace the burner control unit if necessary (Æ Table 32, Page 75).
		574	Short circuit, flow temperature > 130 °C	Check the connecting cable between the burner control unit and the flow temperature sensor, replace the cable if necessary.
				Check the electrical connection of the connection line on the burner control unit and eliminate the contact problem if necessary.
				Check resistance values according to table, replace temperature sensor if necessary (Æ Fig. 76, Page 76).
				Check the voltage values at the temperature sensor according to the table, replace the burner control unit if necessary (Æ Table 32, Page 75).
B	E9	565	Difference flow and Return temperature too high (> 40 K)	Check system hydraulics.
V	E9	575	Forward STB has responded.	Ensure sufficient flow.
				Check boiler temperature sensor/STL, replace if necessary.
		520	Forward STB has responded	Check system hydraulics.

Tab. 31 Fault displays

Service and fault displays

kind1)	Display code	storungscode	description	elimination
B	EA	514	flameout inner half the stabilization time.	New start attempt by the automatic burner.
		577	No flame inside half the safety time (ionization current < 1.1 μ A).	Check gas connection flow pressure.
				Check gas pressure regulator, inform gas supplier if necessary.
				Check the dimensioning of the gas line.
				Bleed the gas line.
				Check maximum permitted exhaust pipe length, adjust if necessary senior
				Clean ignition/ionization electrode, replace if necessary.
				Check electrode gaps and ignition/ionization electrode, replace if necessary.
				Check the connection cable between the ignition transformer and the ignition electrode, replace the cable if necessary.
				Replace automatic burner.
Replace ignition transformer.				
B	Eb	515	No ionization current. New start attempt by the automatic burner.	
V	EF	561	The burner machine was 5 times during of the burner run switched.	Unlock burner control.
				Check power supply.

Tab. 31 Fault displays

kind1)	Display code	storungscode	description	elimination
V	F0	601	Internal fault when measuring the flow temperature sensor.	Check the line to the boiler temperature sensor and replace if necessary.
				Check plug connection.
				Check sensor values according to table, replace if necessary (Æ Fig. 76, Page 76).
				Check the voltage values at the temperature sensor according to the table, replace the burner control unit if necessary (Æ Table 32, Page 75).
		612	Internal fault when measuring the return temperature sensor.	Check the line to the boiler temperature sensor and replace if necessary.
				Check plug connection.
				Check sensor values according to table, replace if necessary (Æ Fig. 76, Page 76).
				Check the voltage values at the temperature sensor according to the table, replace the burner control unit if necessary (Æ Table 32, Page 75).
		613	Impermissible measured values by the supervisor running temperature sensor.	Check resistance values according to table, replace temperature sensor if necessary (Æ Fig. 76, Page 76).
		500	Internal fault - automatic burner control.	Press "Reset" on the automatic burner, replace the automatic burner if necessary.
501				
502				
503				
V	F7	576	ionization current within the Vorb ventilation > 0.9 \ddot{A} .	Check ionization electrode and electrode gap, replace if necessary Replace ionization electrode.
V	FA	580	Solenoid valve 1 leaking.	Check gas valve for contamination, replace if necessary.
		581	Solenoid valve 2 leaking.	Check gas valve for contamination, replace if necessary.
V	Fd	570	Reset button too often pressed.	Check switch box, replace if necessary.
		571		Check automatic burner, replace if necessary.

Tab. 31 Fault displays

1) V = locking fault; B = blocking interference

11.5 Emergency Operation

If communication with the control device is interrupted, the burner control unit automatically switches to emergency mode.

In order to maintain the operation of the heating system, the burner control regulates the boiler temperature to 60 °C in emergency mode until communication is restored.

If the automatic burner is in emergency mode, the reset button flashes quickly. If the suppressor button flashes slowly, the automatic burner control is in the interlock.

Reset faults in emergency mode

In emergency mode, faults can only be reset using the reset button on the burner control unit. Resetting is only possible if there is a locking fault.

B To reset the fault, reset button [1] on
Press automatic burner.

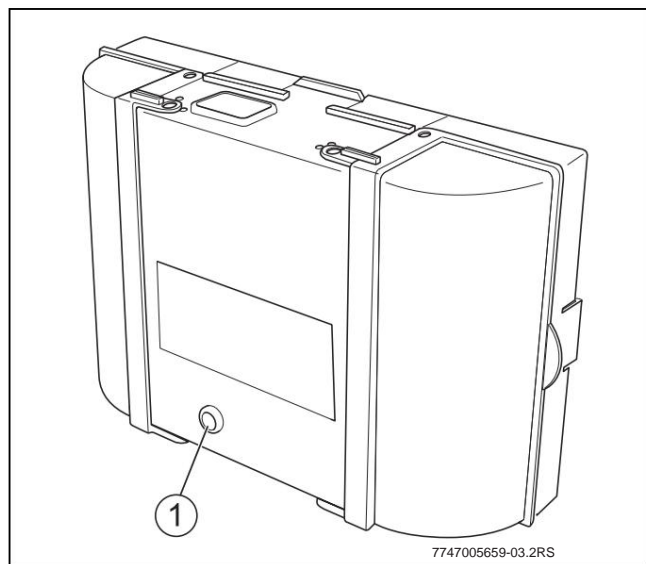


Fig. 75 Resetting faults on the burner control unit

1 reset button

12 Appendix

12.1 Voltage values for hot water, boiler, flow and return temperature sensors

temperature [°C]	Resistance [Ω]	tension [V]
5	25313	4.33
6	24100	4.30
7	22952	4.27
8	21865	4.25
9	20835	4.21
10	19860	4.18
11	18963	4.15
12	18060	4.11
13	17229	4.08
14	16441	4.04
15	15693	4.00
16	14984	3.97
17	14310	3.93
18	13671	3.89
19	13063	3.85
20	12486	3.81
21	11983	3.77
22	11416	3.73
23	10920	3.68
24	10449	3.64
25	10000	3.60
26	9573	3.55
27	9167	3.51
28	8780	3.46
29	8411	3.42
30	8060	3.37
31	7725	3.32
32	7406	3.28
33	7102	3.23
34	6812	3.18
35	6536	3.13
36	6272	3.08
37	6020	3.03
38	5779	2.99
39	5550	2.94
40	5331	2.89
41	5121	2.84
42	4921	2.79
43	4730	2.74
44	4574	2.69
45	4372	2.64
46	4205	2.59
47	4045	2.55
48	3892	2.50
49	3746	2.45
50	3605	2.40
51	3471	2.35
52	3343	2.31
53	3220	2.26
54	3102	2.92
55	2989	2:17

Table 32

temperature [°C]	Resistance [Ω]	tension [V]
56	2880	2:12
57	2776	2.08
58	2677	2.04
59	2581	1.99
60	2490	1.95
61	2402	1.91
62	2317	1.86
63	2236	1.82
64	2159	1.78
65	2084	1.74
66	2072	1.70
67	1943	1.66
68	1877	1.62
69	1814	1.59
70	1753	1.55
71	1694	1.51
72	1637	1.48
73	1583	1.44
74	1531	1.41
75	1480	1.38
76	1432	1.34
77	1385	1.31
78	1341	1.28
79	1297	1.25
80	1258	1.22
81	1216	1:19
82	1177	1:16
83	1140	1:13
84	1104	1.10
85	1070	1.08
86	1037	1.05
87	1005	1.02
88	974	1.00
89	944	0.97
90	915	0.95
91	887	0.93
92	860	0.90
93	835	0.88
94	810	0.86
95	786	0.84
96	762	0.82
97	740	0.80
98	718	0.78
99	697	0.76
100	677	0.74

Table 32

12.2 Sensor characteristics



DANGER: Danger to life from electric current.

Be heating system before each measurement current switch off

Always measure comparative temperatures (room, flow and flue gas temperature) close to the sensor. The characteristic curves are mean values and have tolerances
fraught. Measure resistance at cable ends.

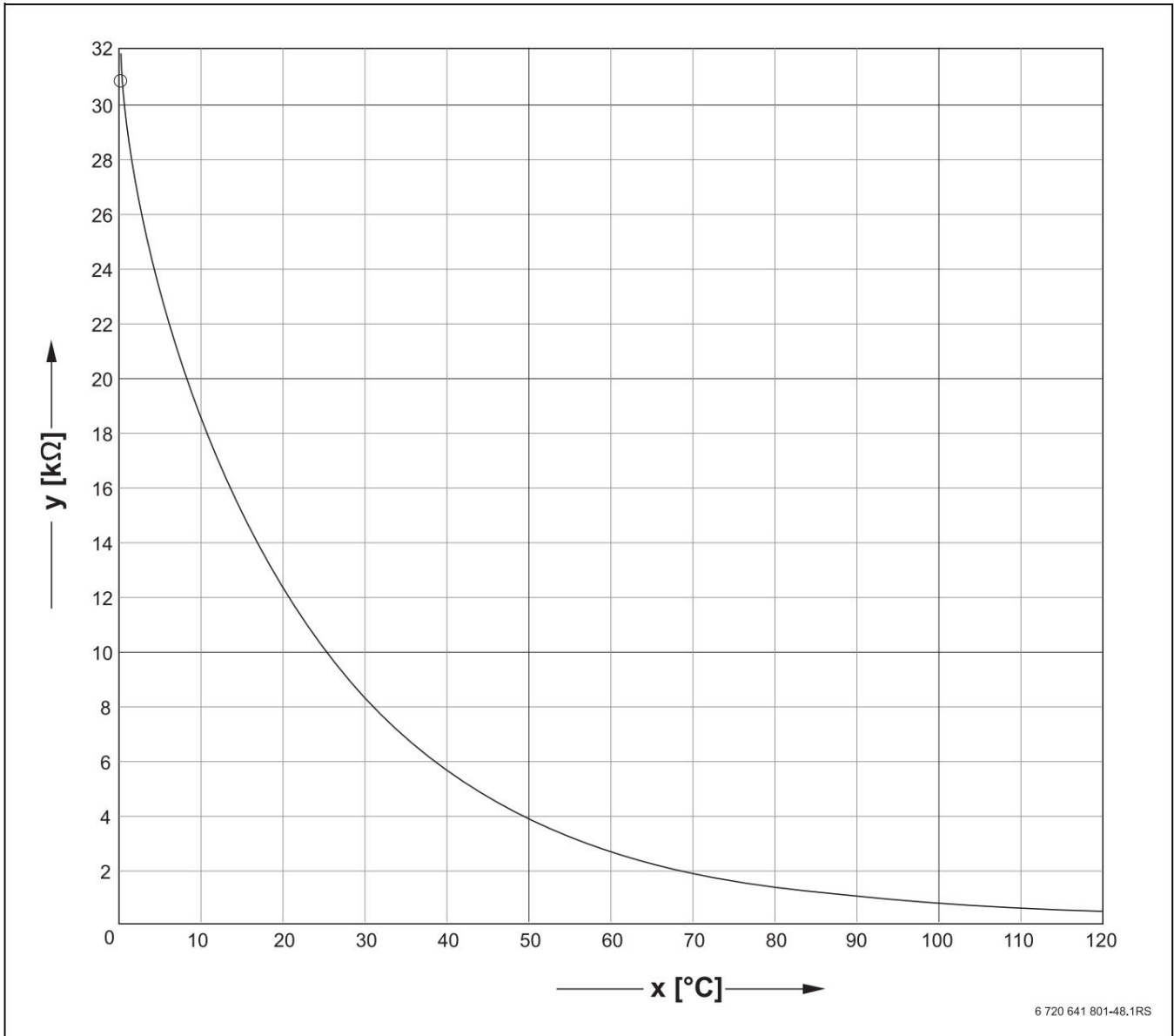


Fig. 76 Sensor characteristics: Boiler water, return and flow temperature sensor

x temperature in °C

y Resistance in kΩ



Two identical temperature sensors (double sensors) installed in a sensor housing are used as boiler temperature sensors.

12.3 Flow resistance on the heating water side

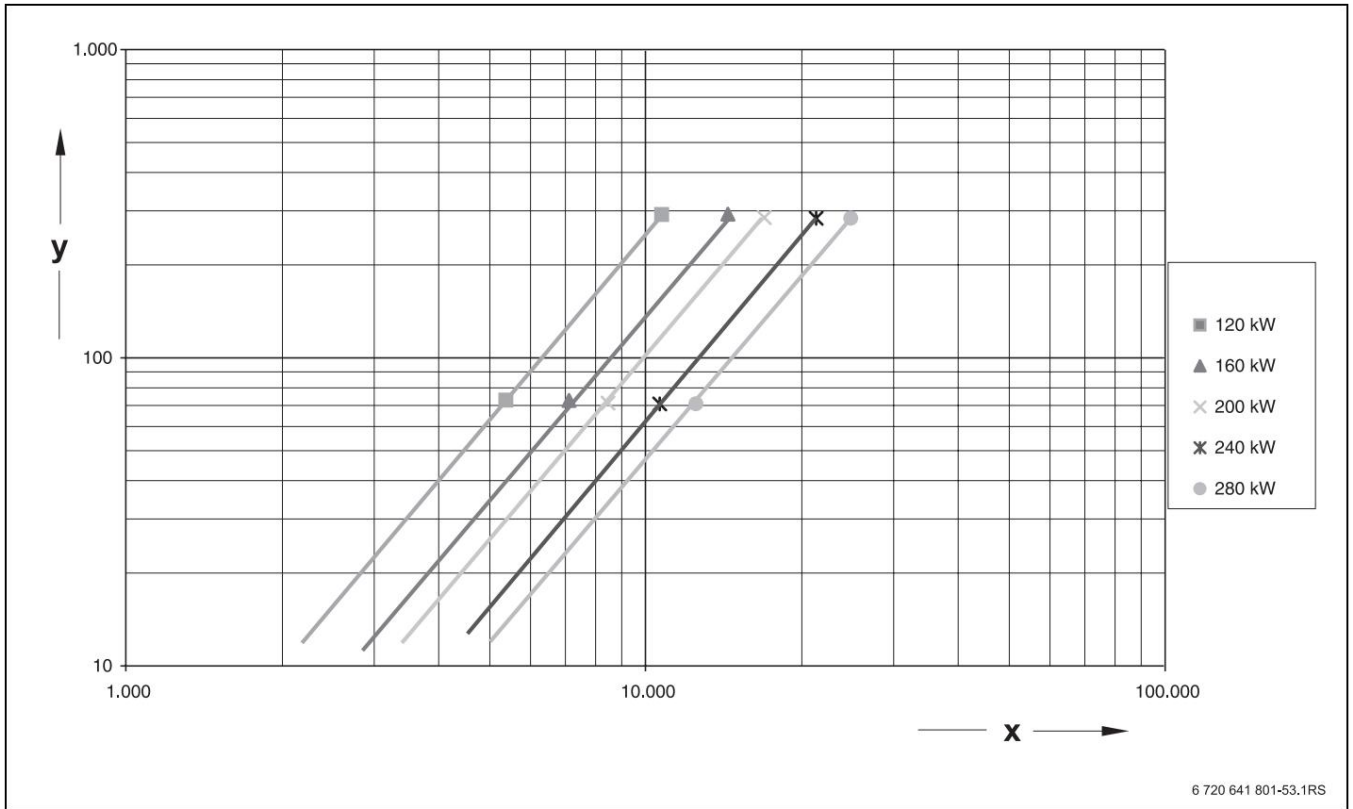


Fig. 77 Resistance on the heating water side without non-return valve

x Flow rate in l/h
y Pressure loss on the heating water side in mbar

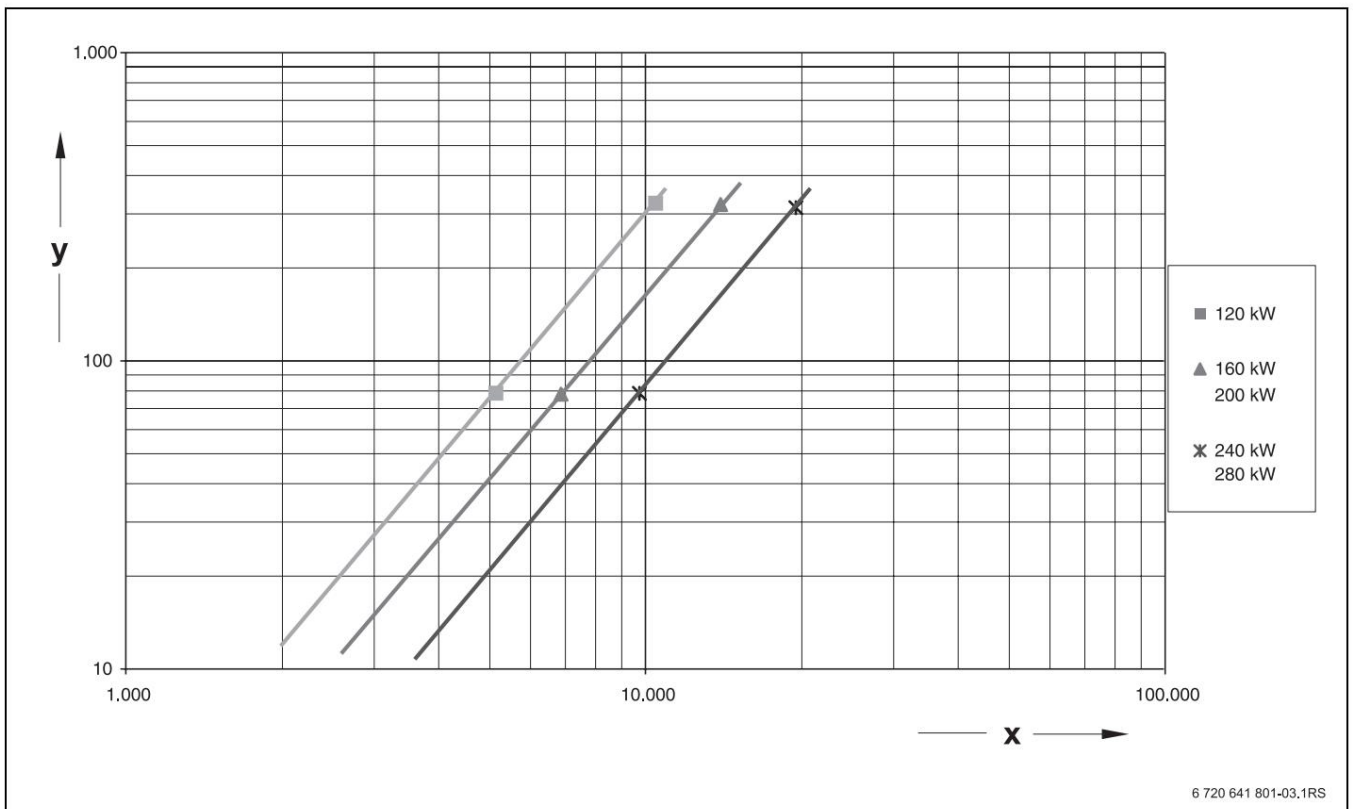


Fig. 78 Resistance on the heating water side with non-return valve (cascade)

x Flow rate in l/h
y Pressure loss on the heating water side in mbar

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