



OPERATION



KWB Multifire

Type MF2 D/ZI

Contents

Foreword	7
About this manual.....	7
Explanation of the formatting.....	7
Legal.....	7
Structural measures.....	8
Boiler room requirements.....	9
Fuel storage room requirements.....	10
Calculation of storage room size.....	10
Extinguishing devices.....	10
Electrical installation.....	10
Dust-tight, pressure-resistant.....	11
Ensure correct pellet storage.....	11
Injection connector.....	11
Implementation advice.....	12
Notes on standards.....	12
Heating system installation and approval.....	13
1 Safety	14
1.1 Please note.....	14
1.1.1 Gradation of the hazard statements.....	14
1.1.2 General safety instructions.....	14
1.1.3 Comply with the safety instructions.....	15
1.1.4 Please read and follow the manual.....	15
1.2 Pictograms used.....	15
1.2.1 Additional icons/pictograms.....	17
1.3 Stickers.....	18
1.3.1 Stickers on the top part.....	19
1.3.2 Stickers on the front part.....	19
1.3.3 Stickers on the side and on the back.....	21
1.3.4 Sticker for the perforated plate.....	23
1.3.5 Stickers on the ash container.....	24
1.3.6 Sticker at the conveyor system.....	24
1.3.7 Sticker on the dust filter.....	25
1.3.8 Stickers for the storage room.....	25
1.3.9 Stickers on the injection connector.....	25
1.3.10 Type plate sticker.....	25
2 Overview	26
2.1 System components.....	26
2.2 Safety elements.....	26
2.3 Chimney requirements.....	29
2.4 Solar control.....	29
3 Operating fundamentals	31
3.1 Front control units.....	31
3.2 Exclusive control unit.....	31
3.2.1 Graphic interface.....	31
3.2.2 Using the menu.....	33

3.2.2.1	Changing values.....	35
3.3	Frequently used Comfort 4 functions.....	35
3.3.1	Setting the date/time of day.....	35
3.3.2	Display the operating state.....	35
3.3.3	On/Off → Submenus.....	36
3.3.4	Select program.....	37
3.3.5	Change heating times.....	38
3.3.6	Heat DHW 1x.....	38
3.3.7	Regulating the room temperature.....	38
3.3.8	Switch off and restart.....	39
3.3.8.1	Shutting down the system.....	39
3.3.8.2	Restarting after standstill periods.....	39
4	Regular tasks.....	40
4.1	Fuels.....	40
4.1.1	Intended fuels.....	40
4.1.2	Fuel pellets.....	40
4.1.3	Fuel wood chips.....	41
4.1.3.1	Quality requirements.....	42
4.1.3.2	Output with different water content.....	43
4.1.3.3	Fuel consumption and storage room size.....	44
4.1.4	Buying pellets.....	44
4.1.5	Having pellets delivered.....	45
4.1.6	Filling / refilling with fuel.....	45
4.1.7	Safety in the storage area.....	47
4.1.8	Storage room maintenance.....	48
4.2	Ash container.....	48
4.2.1	Removing the ash container.....	48
4.2.2	Emptying the ash container.....	49
4.2.3	Reattaching the ash container.....	49
4.2.4	Ash.....	50
4.2.4.1	What is ash?.....	50
4.2.4.2	Ash quantity.....	50
5	Basic control unit.....	51
5.1	Basic control unit operating elements.....	51
5.2	Heat DHW 1x.....	51
5.3	Select program.....	52
5.4	Selecting the room temperature.....	52
5.5	LED meanings.....	53
6	KWB Comfort 4 functions.....	54
6.1	Heating circuits.....	54
6.1.1	Room temperature.....	54
6.1.2	Heating program.....	54
6.1.3	Heating times.....	55
6.1.4	Party mode.....	56
6.1.5	Holiday program.....	56
6.1.6	Settings.....	56
6.1.6.1	Outside temperature switch-off.....	56
6.1.6.2	Operating values.....	57
6.1.7	Screed program.....	59

6.2	DHWC.....	59
6.2.1	When is the domestic hot water heated?.....	59
6.2.2	Setting the Legionella protection.....	60
6.2.3	Set and activate holiday program.....	61
6.2.4	Circulation pump.....	61
6.3	Buffer storage tank.....	61
6.3.1	When will the buffer storage tank be charged?.....	61
6.3.2	Circulation pump.....	63
6.4	Solar.....	63
6.4.1	Solar program.....	63
6.4.2	Operating values.....	64
6.4.2.1	Storage tank 1 + 2.....	64
6.4.2.2	Switchover logic.....	65
6.4.2.3	Anti-blocking protection.....	65
6.4.2.4	Energy optimization.....	65
6.5	Boiler.....	66
6.5.1	Switch on/off.....	66
6.5.2	Conveyor system.....	66
6.5.3	Chimney sweep function procedure.....	66
6.6	Operational state.....	67
6.6.1	Boiler.....	67
6.6.1.1	Boiler status.....	67
6.6.2	Heating circuits.....	69
6.6.3	DHWC.....	69
6.6.4	Buffer storage tank.....	69
6.6.5	Solar.....	70
6.6.6	Feeder pumps.....	71
6.6.7	Secondary heating sources.....	71
6.6.8	Conveyor system (hopper).....	71
6.6.9	Additional conveyor system.....	72
6.6.10	Heat quantity meter.....	72
6.7	Date/Time.....	73
6.8	Alarm system.....	73
6.9	Customer service.....	74
6.10	Expansions.....	75
6.10.1	Ethernet settings.....	75
6.10.2	Comfort Online.....	75
6.10.3	SMS settings.....	75
6.10.4	Mail settings.....	76
6.10.5	Licenses.....	76
6.10.6	ModBus settings.....	78
6.11	Expert level.....	78
7	Maintenance.....	79
7.1	Reasons for on-going, professional maintenance service.....	79
7.2	Standards for maintenance.....	79
7.2.1	Weekly visual inspection.....	79
7.2.2	Monthly inspections.....	79
7.2.3	Professional maintenance.....	80
7.2.4	Fill water.....	80
7.2.4.1	Requirements for fill water.....	81

7.2.4.2	Logs.....	81
7.2.5	Forms.....	83
7.2.5.1	System log.....	83
7.3	Required tools for maintenance work.....	86
7.4	Maintenance intervals for operators.....	86
7.5	Before you begin.....	86
7.6	Removing fly ash.....	87
7.7	Inspecting the storage room.....	87
7.8	Visual inspection of the entire system.....	88
7.9	Cleaning the surfaces.....	88
7.10	Interruption of operation.....	88
7.11	Battery change.....	88
8	Reacting to problems.....	90
8.1	Meaning of the LEDs at the Basic control unit [BGB].....	90
8.2	Calling customer service.....	90
8.3	Setting the date and time of day.....	90
8.4	Activating the emergency stop switch.....	91
8.5	General fault at the power supply.....	91
8.6	What to do after a power outage.....	91
8.7	What to do when smoke develops / exhaust smell become noticeable.....	92
8.8	What to do in the event of a system fire.....	92
8.9	Notifications.....	92
8.9.1.146	123
8.9.1.147	123
8.9.1.148	123
8.9.1.149	123
9	Dismantling and disposal.....	124
9.1	Dismantling.....	124
9.2	Disposal.....	124
10	Appendix.....	126
10.1	Declaration of Conformity.....	127
10.2	Technical data table KWB Multifire - log wood.....	129
10.3	Technical data table KWB Multifire - pellets.....	130
10.4	TDT-MF2-D-ZI_mit_Pellets_EN.....	131
	Glossary.....	133
	Keyword index.....	134

Foreword

About this manual

This manual contains all the required information for operating and controlling. The chapter sequence corresponds to the recommended workflow. For further queries please contact your sales partner or KWB Customer Service.

KWB – Kraft und Wärme aus Biomasse GmbH including its country representatives and authorised competence partners are hereinafter referred to as KWB.

Our objective is to constantly improve our products and manuals – we would therefore appreciate your feedback.

You can find all contact data on the KWB home page www.kwb.net

If you find any errors or mistakes, please let us know at: doku@kwb.at

Original manual – Subject to change. No responsibility accepted for errors and omissions!

Explanation of the formatting

Work steps	We use different symbols for the preconditions, the actual work steps and the result: <ul style="list-style-type: none">↳ Precondition⇒ Work step↪ Result
Page texts	The keywords to the left of the text column assist you in immediately recognising what the content of the text section is.
Cross references	A reference to another section of this document recognizable by the arrow and the page number in brackets. Example: About this manual [▶ 7]

Legal

Intellectual Property

© 2021 KWB – Kraft und Wärme aus Biomasse GmbH

All catalogues, brochures, illustrations, drawings, manuals and control and regulation programs etc. are protected under intellectual property law and will always remain the intellectual property of KWB. Any use, reproduction, distribution, publication, processing and/or other transfer to third parties requires KWB's prior written consent.

When operating the contractual goods, the installation, operating and other technical instructions and information from KWB must be strictly observed and complied with.

NOTE

Warranty



- ↪ The manufacturer's KWB warranty specifies proper installation and commissioning of the system as a prerequisite. Defects and damage due to improper installation, commissioning and operation are excluded from the warranty!
- ⇒ The manufacturer's instructions must be complied with to ensure proper system function. Knowledge of the manuals is a prerequisite.
- ⇒ Only original parts or parts that have been expressly approved by the manufacturer must be used.
- ⇒ If something is not clear, please look it up in this manual or contact the KWB Customer Service.

Liability / Warranty

Any change and / or modification of the contractual goods or in the operation of the contractual goods not expressly authorised by KWB in writing or their operation in conjunction with other devices or accessories the compatibility of which has not been expressly confirmed by KWB, any inappropriate operation/use (e.g. the use of fuels and/or water not in accordance with standards which do not correspond to VDI 2035 or ÖNORM H 5195-1; inappropriate and / or excessive use) leads to the exclusion of the warranty. Any liability or warranty for compatibility of the contractual goods with other products, systems, plants or parts, as well as the suitability thereof for a specific use shall be excluded unless expressly permitted in writing.

Intended use

KWB boilers heat water for central heating systems. The application, operation and maintenance of KWB systems must, without exception, be performed as described in the instructions.

KWB dust filter separate dust.

Only the fuels specified in the Operating instructions in Section Intended fuels [► 40] may be used without exception.

Any other use shall be deemed IMPROPER. The responsibility for the resultant damage shall lie with those who operate and use the system!

Structural measures

NOTE

Establishing the constructional requirements



- ↪ Compliance with the locally applicable regulations, and proper execution of the structural measures lies solely within the system owner's sphere of responsibility and is a prerequisite for the guarantee and warranty requirement.
KWB does not accept any liability, nor does it offer any warranties for any type of constructional measures.
- ⇒ Comply with all locally applicable, legal, submission, construction and implementation regulations when creating the structural requirements! In addition, comply with KWB installation guidelines!
- ⇒ Without laying claim to an exhaustive treatment of the issue at hand and without suspension of any conditions imposed by the authorities, we recommend the Austrian preventative fire protection directive TRVB H118 and the ÖKL technical bulletin No. 56 and No. 66 in the applicable version.

Boiler room requirements

- Floor:
- Concrete, bare or tiled
 - Even, horizontal
 - Dry
 - Able to carry max. load
 - Non-flammable (Flammability classification A1 pursuant to EN 13501)

Customer-pro-
vided fire pro-
tection

Building part	Fire protection design according to EN 13501
Floor, walls	fire resistant: REI 90
Bearing walls, floors, roofs	fire resistant: REI 90
Horizontal supports and other supports	R 90
Boiler room door	fire retardant: EI ₂ 30 c opening in escape direction, closing automatically
Connecting door to the fuel storage room	fire retardant: EI ₂ 30 c; closing automatically
Heating room windows	fire retardant: E 30; not to be opened

Fire extinguish-
er

- NO storage of flammable agents in the boiler room.
- NO direct connection to rooms in which flammable gases or liquids are stored (Garage, store-room etc).
- Place a portable fire extinguisher of the specified size (at least 6 kg fill weight EN 3) outside of the boiler room next to the boiler room door.

Lighting, elec-
trical system

- Make sure that permanently installed lighting and an electrical supply line to the heating system are available.
- Place the light switch and the **labelled** emergency stop switch ("Stop Escape" as per TRVB H118) of the heating system at an easily accessible location outside of the boiler room next to the boiler room door.
- Leave sufficient reserve cable in the boiler room in case you wish to connect the boiler with other bus participants.

Ventilation

- Two air vents must be installed; one close to the ground and one close to the ceiling; the air intake opening must lead directly into the open. If other rooms must be crossed to do this, this air duct must have an envelope according to EI 90 (EN 13501)!
- The size of the non-closing opening is dependent on the rated power of the heating system: Calculate the opening with 5 cm² per kW, but no less than 400 cm².
- Fit a protective grille with a non-flammable mesh width <5 mm on the outside of ventilation openings into the open.
- When installing the openings and air ducts, you must ensure that no outside and weather-related influences (leaves, snow, ...) impair the air flow.
- Do not use any chlorine-containing cleaning or operating agents (e.g. chlorine gas plant for swimming pools) or hydrogen halides in the boiler room.
- Keep all boiler air intake openings free of dust.
- If not specified otherwise in the applicable provisions regarding the structural equipment of the boiler room, the following standards apply for the design and dimensioning of the air ducts:

Note on stand-
ards:

ÖNORM H 5170 – Construction and fire-protection requirements

Frost protection

- Provide frost protection for all water lines and district heating pipes.

Room tempera-
ture

- Ensure a minimum temperature of 10°C in the boiler room as stipulated in EN 12831. Lower temperatures change the lubricating characteristics to an extent that the reliable operation of the drive aggregates would no longer be ensured.
- Ensure a maximum temperature of 40 °C.

Foreword

Structural measures

- Safety
- ⇒ Never store flammable materials in the boiler room outside of the heating system container or storage container or hopper. Avoid direct connections to rooms in which flammable gases or liquids (e.g. parking garage) are stored.
 - ⇒ No flammable items must be placed on the boiler for drying purposes (e.g. clothing, ...).
- Protection against rodents and other animals
- ⇒ The system must be protected against damage from and nesting of animals (rodents, ...).
- Sea level
- ⇒ Please contact the manufacturer if the boiler is to be installed at more than 2000 metres above sea level.

Fuel storage room requirements

The structural on-site requirements for the boiler room always also apply to the fuel storage room.

Calculation of storage room size

For the size of the storage room, the following rules of thumb apply for average conditions:

Rules of thumb for a single family home

Fuel		Storage space for 1 year	Consumption for 1 year
Wood chips	~25% moisture content, 30 mm, soft wood	= 3.7 m ³ x heating load in kW	= 2-2.5 m ³ x heating load in kW
Pellets	≤10% water content, 6 mm diameter	Inclined floor: = 0.9 m ³ x heating load in kW Without inclined floor: = 0.75 m ³ x heating load in kW	= 400 kg heating load in kW

Extinguishing devices

Manual extinguishing devices

[HLE] A manual extinguishing device [HLE] must be installed in fuel storages **larger than 50 m³**:

- Frost-proof
- Connected to a pressurized water line
- Piping at least 3/4" or DN 20.
- Above the conveyor channel conduit in the fuel storage
- Label the HLE armature as "Extinguishing device fuel storage room."

Automatic extinguishing devices

[SLE] **If there is a firewall to the living quarters**, an automatic extinguishing device [SLE] is required. In this case, please contact KWB.

Electrical installation



- ⇒ Electrical installations are only permitted in the fuel storage room in explosion-protected versions - recognizable by the "Ex" label (see left).

The structural on-site requirements for the boiler room always also apply to the fuel storage room.

 **DANGER**



Dust explosion due to open electrical installation

- ↪ To avoid ignition sources, do NOT install switches, outlets or junction boxes in the fuel storage room.
- ⇒ Always avoid electrical installations in the fuel storage room.
- ⇒ If this is not possible, these must be designed with explosion protection.

Dust-tight, pressure-resistant

If a pumping truck is used to fill the fuel storage room with wood chips or pellets, it is necessary to seal the fuel storage such that it is dust-tight: Mount the hose couplings and pipelines supplied by KWB which must be earthed.

The pumped-in air is extracted via a second pipeline, which is also earthed. The walls, windows and doors must withstand the overpressure created during the filling process.

Ensure correct pellet storage

Protect the pellets	<p>An optimal storage room ensures that the pellets are protected during storage.</p> <ul style="list-style-type: none"> ▪ NEVER install the filling pipelines with 90° bends as pellets may break due to the quick change in direction. ▪ An ricochet protection mat across from the injection connectors slows the flight of the pellets. ▪ Protection against water and humidity, dust-tight
Fire protection	<ul style="list-style-type: none"> ▪ ÖNORM M 7137, among other things, prescribes fire-resistant walls of the type EI 90: Wall thickness must be at least 12 cm (or 17 cm hollow blocks) plastered on both sides or 10 cm concrete.
Inject pellets	<ul style="list-style-type: none"> ▪ Access road must be >3m wide and 4 m high, permissible total weight 24 t ▪ Conveyance height <6 m ▪ Filling line <30 m ▪ Injection connector near outer wall and easily accessible

Injection connector

The term "injection connector" comprises both injector as well as extractor nozzles.

Placement of injection connector

- ⇒ Place the injection connector in the middle of the room
- ⇒ Place the extraction connector in at least 50 cm distance from the injection connector.
- ⇒ Place both connectors ≥ 50 cm from the side walls and ≥ 20 cm from the ceiling.
- ⇒ The injection and extraction connectors must be earthed!
- ⇒ Shorten the extraction connector in the storage room as much as possible. The injection connector should clearly project into the room.

Injection connector with storage room ventilation

ÖNORM M 7137 requires ventilation of fuel storage rooms to prevent hazardous carbon monoxide concentrations.

- ⇒ Ask your pellet supplier to carry out the following inspections:
 - Inspect the seals of the covers: Do they function properly?

- The cover should only be fastened with suitable special tools: Turn to the stop (=torque approximately 10 Nm).
Only four key notches ensure even pressure is exerted on the seal - if there are only two key notches, leaks may occur due to uneven pressure on the seal!

Version A (recommended!): Injection connectors lead to the outside

⇒ Use a sufficient number of KWB injection connectors with ventilation opening (20 cm² each).

Required conditions		Number of injection connectors
Ventilation line ≤ 2 m	Storage volume ≤ 10 t	2
Ventilation line ≤ 2 m	Storage volume > 10 t	3
Ventilation line > 2 m		3

Version B (not recommended!): The injection connectors lead to the interior of the building

- ⇒ Seal the ventilation openings of the injector connection caps: No CO gases should reach the building's interior!
- ⇒ Ensure air extraction to the outside via a separate ventilation opening.
- ⇒ Please note that this ventilation opening must be dust-tight and pressure-resistant during filling, but that a subsequent ventilation must be possible.

Implementation advice

Notes on standards

The installation and commissioning of the system must be carried out in accordance with fire protection and building-code regulations. If not regulated otherwise on a national level, the following standards and regulations apply in their most recent version:

General standards for heating systems

EN 303-5	Heating boilers for solid fuels, manually and automatically stoked boilers, nominal heat output up to 500 kW
EN 12828	Heating systems in buildings - Design for water-based heating systems
EN 13384-1	Chimneys - Thermal and fluid dynamic calculation methods Part 1: Chimneys serving one heating appliance
ÖNORM H 5151	Design of central hot water heating system with or without hot water generation
ÖNORM M 7510-1	Directives for the inspection of central heating systems Part 1: General requirements and one-time inspections
ÖNORM M 7510-4	Directives for the inspection of central heating systems Part 4: Simple inspection of boiler systems for solid fuels

Standards for building code-related installations and safety-related equipment

ÖNORM H 5170	Heating system - Requirements to building and safety technology as well as fire and environmental protection
Switzerland	Compliance with Swiss Fire Protection Regulations (BSV 2015) of the Association of Canton Fire Insurances (VKF)
Germany	Compliance with the Firing Director and Fuel Storage of the German Federal States in accordance with the Ordinance on Firing Installations (FeuVO)

Standards for heating water generation

ÖNORM H 5195-1	Prevention of damage from corrosion and lime-scale formation in hot water heating systems with operating temperatures of up to 100°C (Austria)
VDI 2035	Prevention of damage in hot-water heating systems (Germany)
SWKI BT 102-01	Water quality for heating, steam, cooling and a/c systems (Switzerland)
UNI 8065	Technical standard regulating hot water generation. DM 26/06/2015 (Ministerial order with minimum requirements) Comply with provisions of the standard and the respective amendments.

Regulations and standards for permissible fuels

1st BImSchV	First ordinance of the German Federal Government for the execution of the German Federal Emission Protection Regulation (BImSchV) (Ordinance on Small and Medium Combustion Plants) – as promulgated on 26 January 2010, Federal Law Gazette (BGBl.) year 2010 part I no. 4
EN ISO 17225-3	Solid biofuels, fuel specifications and classes Part 3: Wood briquettes for non-industrial use
EN ISO 17225-5	Solid biofuels, fuel specifications and classes Part 5: Wood briquettes for non-industrial use

Heating system installation and approval

The boiler must be operated in a closed heating system. The installation is based on the following standards:

Note on standards EN 12828 – Heating systems in buildings

Note: Every heating system must be approved!

The installation or conversion of a heating system must be reported to the supervisory authority (monitoring authority) and must be approved by the building authority:

- **Austria:** report to the building authority of the municipality / magistrate
- **Germany:** report to the chimney sweep/building authority

1 Safety

1.1 Please note

1.1.1 Gradation of the hazard statements

In this documentation, we will use warnings with the following hazard levels to indicate direct dangers and important safety regulations:

NOTE



General information

We use this representation to indicate and describe **important information**.

CAUTION



Incipient hazard

We use this symbol to indicate and describe **incipient hazards**. If the stated risks are **ignored, injuries, property damage and environmental damage** may result.

WARNING



Medium hazard

We use this representation to indicate and describe hazards. If this warning is **ignored, serious or fatal injuries** may result.

DANGER



Serious hazard

We use this representation to indicate and describe **serious hazards**. **If this warning is ignored, serious or fatal injuries result!**

1.1.2 General safety instructions

- **Do not alter the system in any way!**
- Close all provided covers before you place the system into operation!
- Unplug the connector before you perform any service or open the control!
- Always disconnect the power supply to the boiler and conveyor system (main switch) before you enter the fuel storage room.
- Notify KWB customer service if the emergency fire extinguisher has been activated!

NOTE

Proper installation by specialists



- ➔ The entire installation, integration and commissioning of the heating system may only be carried out by expert specialists of KWB or their partners.
- ➔ All the work must conform to the specifications stated in the KWB manuals and local regulations.
 - ⇒ Only then are you eligible for any warranty claims.

1.1.3 Comply with the safety instructions

NOTE

Comply with the safety instructions



Your system has been tested for safety and satisfies the applicable standards, guidelines and regulations.

Failure to comply with the safety instructions or improper use poses the risk of material damage. In addition, you risk your health or your life!

1.1.4 Please read and follow the manual

NOTE

Please read the instructions carefully before installation or commissioning!



Compliance with the instructions and proper installation or commissioning is a prerequisite for a warranty provided by KWB.

➔ If you are unsure about anything, please refer to the instructions or contact the KWB customer service.

➔ You will find all instructions for our heating systems in the KWB PartnerNet:
<http://partnet.kwb.net/>

1.2 Pictograms used

The following command, prohibition and warning signs are used in the documentation and/or at the boiler.

According to the Machine Directive, signs attached directly at the danger location of the boiler warn of direct dangers or signal safety-relevant behaviours. These stickers must not be removed or covered up.

Command sign (safety colour blue)

	General command sign		Use mask
	Follow the instructions		Use a welding mask
	Use hearing protection		Disconnect from mains before maintenance and repair
	Use eye protection		Check barrier
	Earth before use		Keep closed

Command sign (safety colour blue)

	Disconnect plug from the mains		Use gas detector
	Use foot protection		Continuous ventilation to the outside is required
	Use hand protection		Ventilation is required
	Use protective clothing		Entry only with a second person outside! In the event of an accident first call for help!
	Use face guard		Only certified technicians
	Use head protection		Only certified electricians

Prohibition sign (safety colour red)

	General prohibition signs		No access for persons with pace-makers or implanted defibrillators
	Unauthorized access prohibited		Reaching in prohibited
	Smoking is prohibited		Stepping on the surface is prohibited
	No open flames; fire, open ignition sources and smoking are prohibited		

Warning signs (safety colour yellow)

	General warning sign		Warning of automatic start-up
	Warning of explosive substances		Warning of danger of crushing
	Warning of obstructions on the ground		Warning of flammable substances

Warning signs (safety colour yellow)			
	Warning of danger of falling		Warning of sharp object
	Warning of low temperature / frost		Warning of hand injuries
	Warning of danger of slipping		Warning of rollers running in opposite direction
	Warning of electrical voltage		Warning of optical radiation
	Warning of suspended load		Warning of flammable materials
	Warning of hot surface		Warning of suffocation risk

1.2.1 Additional icons/pictograms

General symbol legend			
	Scope of delivery		Heat-resistant aluminium adhesive tape
	Fuel supply from the left		High-temperature silicone
	Fuel supply from the right		Small leaks permissible
	Adhesive tape		Wrench opening
	Loosen screw or nut		Tighten screw or nut
	Torx screw(s)		Bend tab 15° to the outside

1.3 Stickers

NOTE

Hazard due to missing safety sticker

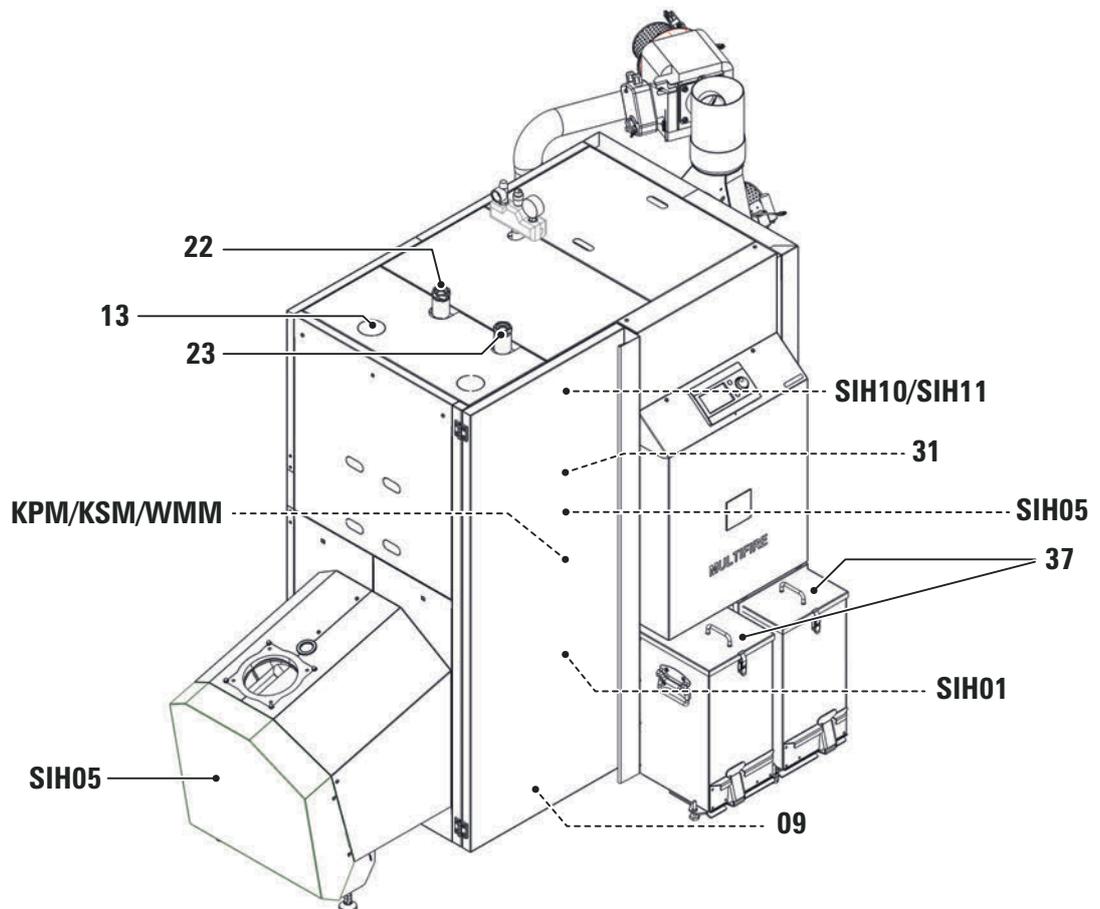


- Safety stickers save lives! They protect you against injuries and prevent damage to property and equipment!
- Ensure the correct use of the heating system: Attach ALL stickers as indicated in the instructions!
- Give the unused stickers to the operator of the heating system and instruct the operator regarding the possible hazards and/or consequences!
- Order any missing or incorrect stickers from KWB.

- ⇒ Make sure that the following stickers are placed at their respective spots.
- ⇒ Order missing stickers using the respectively required article number:

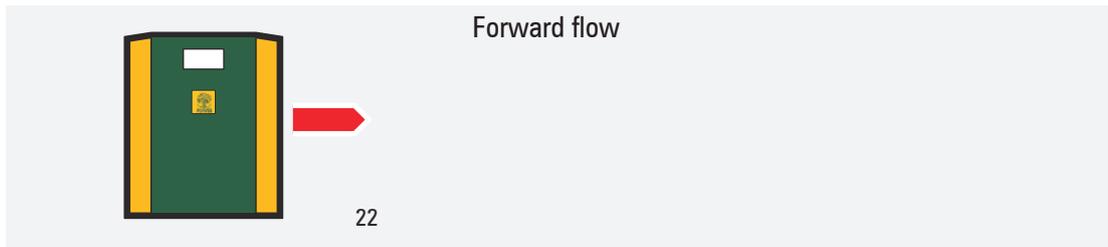
27-2000232 – Languages: DE | EN | FR

27-2000233 – Languages: ES | IT | SL

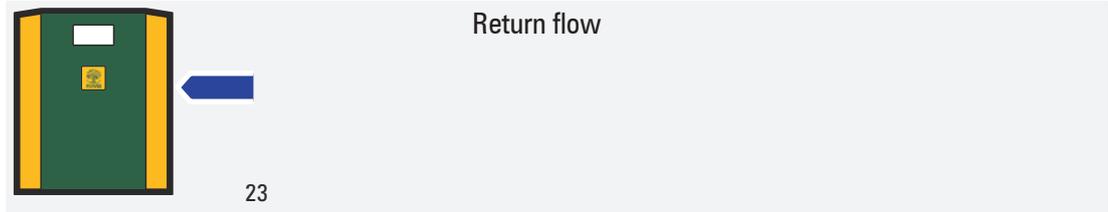


1.3.1 Stickers on the top part

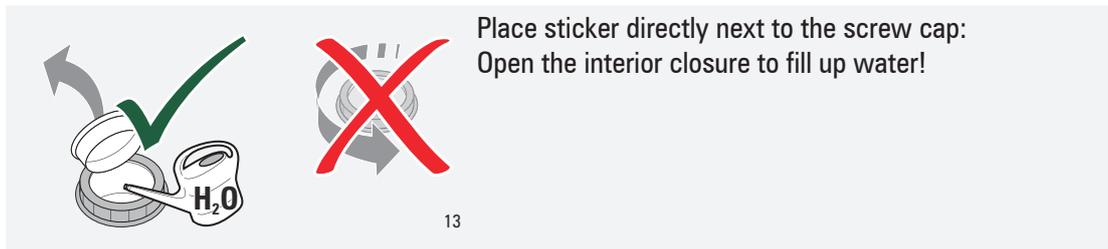
Forward flow
(22)



Return flow
(23)



Fire-extinguishing system (only ZI)
(13)



1.3.2 Stickers on the front part

Maintenance opening
(SIH01)



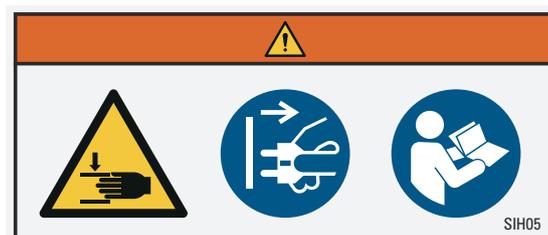
Warning! Close maintenance opening and missing casing parts before starting operation!

Warning of flammable substances! Risk of burnback!

Close all combustion room doors and maintenance openings before switching on the system.

Follow the instructions!

Cellular wheel sluice / fire shutter
(SIH05)



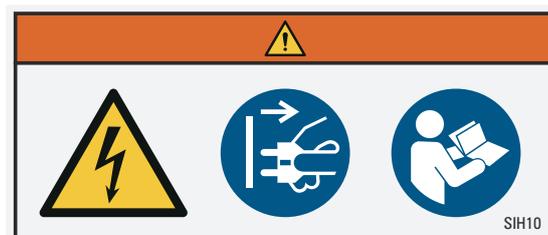
Warning of hand injuries!

Warning of unexpectedly starting up cellular wheel sluice or unexpectedly closing fire shutter

Disconnect plug from the mains!

Follow the instructions!

Dangerous electrical voltage!
(SIH10)



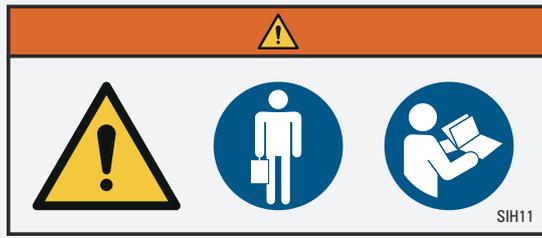
Warning of electrical voltage!

Disconnect plug from the mains!

Follow the instructions!

Disconnect plug from the mains before opening and follow the instructions!

Expert knowledge (SIH11)

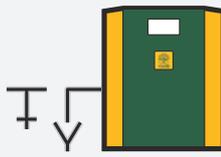


Expert knowledge

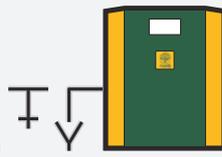
Only to be performed by respectively qualified certified experts!
Follow the instructions!

Filling & emptying (09)

1x at the heat exchanger



1x at the combustion chamber



Positions of connections for 2 emptying processes:

At both long sides, close to the ground.
Depending on the system, 2 of 4 connections are used, the two other connections remain closed!

Return flow boost (31)



Sticker position: On the inside of the door
Read the instructions with the information regarding the external return flow boost!

Follow the instructions!

Table 1: Only necessary in case of an external return flow boost:

Check whether the two stickers showing the plug assignment of the KWB Comfort 4 have been attached to the inside of the door so that they are easy to see:

Stecker Kessel-Power-Modul [KPM]

Plug, boiler power module [KPM]
Fiche module d'alimentation de chaudière [KPM]

100	Versorgung 230/400 VAc / Power supply 230/400 VAc / Alimentation 230/400 Vca
101	Abgehende Versorgung Zusatzplatine / Outgoing power supply additional board / Sortie alimentation carte supplémentaire
102	Saugturbine / Suction turbine / Turbine d'aspiration
103	Hauptantrieb / Main drive / Entraînement principal
105	Fördermotor / Conveyor motor / Moteur d'extraction
107	Zündung / Ignition / Allumage
	Mischer/Ventil RLA (Pin 1, 2, 4, 7) & Kesselpumpe (Pin 3, 6, 9) f. vorkonfekt. RLA / Mixer/valve RFB (pin 1, 2, 4, 7) & boiler pump (pin 3, 6, 9) f. pre-assembly. RFB / Vanne mélangeuse/vanne MTR (broches 1, 2, 4, 7) et pompe de la chaudière (broches 3, 6, 9) pour MTR préconf.
109	Rezi-/Bypassklappe (Pin 1, 3, 4) (Pin optional) / Recirc./bypass shutter (pin 1, 3, 4) (pin optional) / Clapet de recirculation/dérivation (broches 1, 3, 4) (broches facultatives)
110	Reserve/Reinigungsmotor Staubfilter / Reserve/cleaning motor dust filter / Réserve/moteur de nettoyage filtre anti-poussière
111	STB od. zusätz. Abgriff Versorgung Staubfilter / STL or additional supply tapping dust filter / LTS or prise suppl. alimentation filtre anti-poussière
112	Brandschutzklappe / Fire shutter / Clapet coupe-feu
113	Wärmetauscher-Reinigung (Pin 1-2-3) & Saugzug (Pin 4-5-6) / Heat exchanger cleaning (pin 1-2-3) & induced draught (pin 4-5-6) / Nettoyage de l'échangeur thermique (broches 1-2-3) et tirage (broches 4-5-6)
114	Rezi Gebläse / Recirculation fan / Ventilateur de recirculation
115	Gebläse Primärluft (Pin 1, 2, 3) / Sekundärluft (Pin 4, 5, 6) / Fan primary air (pin 1, 2, 3) / secondary air (4, 5, 6) / Ventilateur air primaire (broches 1, 2, 3) / Ventilateur air secondaire (broches 4, 5, 6)
120	Mischer RLA / Mixer return flow boost / Mélange, MTR
121	Kessel- od. Pufferladepumpe / Boiler or buffer charging pump / Pompe d'alimentation de chaudière ou de ballontampon
122	Wie #109, aber Klemme / As #109, but clamp / Comme #109, mais borne
123	Zubringer- od. Ladepumpe Puffer 0 / Supply or charge pump Buffer 0 / Pompe d'alimentation ou de charge ballontampon 0
124	Multifunktionsausgang 3 / Multi-function output 3 / Sortie multifonctions 3
125	Multifunktionsausgang 1 / Multi-function output 1 / Sortie multifonctions 1
126	Multifunktionsausgang 4 / Multi-function output 4 / Sortie multifonctions 4
127	Multifunktionsausgang 2 / Multi-function output 2 / Sortie multifonctions 2
128	Reserve Sicherheits-Eingang / Reserve safety input / Réserve entrée de sécurité
129	Not-Halt / Emergency stop / Arrêt d'urgence

130	Schalter Aschebehälter entfernt (Pin 1-3) / Ash container switch removed (pin 1-3) / Commutateur bac à cendres retiré (broches 1-3)
131	Sensor Überfüllschutz-Deckel Förderkanal / Sensor, overflow protection cover conveyor channel / Capteur couvercle de protection de trop-plein conduite d'alimentation
132	TÜB Lagerraum (gebügelt oder verwendet) / TMFS storage room (bridged or used) / CTC local de stockage (shuntée ou utilisée)
133	Reserve Sicherheits-Eingang: Endschalter Aschelade Staubfilter / Reserve safety input: limit switch ash tray dust filter / Réserve entrée de sécurité: interrupteur de fin de course bac à cendres filtre anti-poussière
134	Hausbus [OUT] / House bus [OUT] / Bus domestique [OUT]
135	Kesselbus [OUT] + 24 Vdc Schrittmotor / Boiler bus [OUT] + 24 Vdc multi-phase motor / Bus chaudière [OUT] + 24 Vdc moteur pas-à-pas
136	Abgehende Busverbindung Zusatzplatine / Outgoing bus connection additional board / Sortie liaison bus carte supplémentaire
137	Kessel BGE 24 Vdc / Boiler BGE 24 Vdc / Chaudière MCE 24 Vdc

Stecker Kessel-Signal-Modul [KSM]

Plug, boiler signal module [KSM]
Fiche module de signaux de la chaudière [KSM]

200	Lambdasonde / Lambda probe / Sonde lambda
202	Positionsrückmeldung Bypass od. Füllstand 1 (Pin 2, 5, 8) / Position feedback bypass or fill level 1 (pin 2, 5, 8) / Feedback position clapet dérivation oniveau de remplissage 1 (broches 2, 5, 8)
203	Temp.schutzschalter Fördersystem (Pin 2-7) od. Trommelposition (Pin 2-7) / Temp. protection switch conveyor system (pin 2-7) or drum position (pin 2-7) / Interrupteur de protection contre la surchauffe du système d'alimentation (broches 2-7) ou position du tambour (broches 2-7)
204	Taste Messbetrieb / Switch, measuring mode / Touche d'activation de la mesure
205	Schwimmerschalter / Floating switch / Interrupteur à flotteur
206	Rezi- od. Bypassklappe offen (Pin 1, 2) (optional) / Recirc. or bypass shutter open (pin 1, 2) (optional) / Clapet de recirculation ou de dérivation ouvert (broches 1, 2) (option)
207	Aschebehälter Füllstand 90 % / Ash container, fill level 90% / Bac à cendres rempli à 90 %
208	Induktiver Sensor Aufschubklappe / Inductive sensor upward transfer unit flap / Capteur inductif clapet de poussée
210	Primär- (Pin 1, 2, 3) & Sekundärluft UPM (Pin 4, 5, 6) / Primary air (pin 1, 2, 3) & secondary air rpm (4, 5, 6) / Air primaire (broches 1, 2, 3) et secondaire tr/min (broches 4, 5, 6) / Air primaire (broches 1, 2, 3) et secondaire tr/min (broches 4, 5, 6)
211	Rezi-Gebläse UPM (Pin 1, 2, 3) / Saugzug UPM (Pin 4, 5, 6) / Recirc. fan rpm (pin 1, 2, 3) / induced draught rpm (4, 5, 6) / Tr/min ventilateur de recirculation (broches 1, 2, 3)/tr/min tirage (broches 4, 5, 6)
214	Füllstand Zwischenbehälter / Fill level hopper / Niveau de remplissage du réservoir intermédiaire

215	Unterdruck-Messdose 0-5 Vdc / Negative pressure sensor 0-5 Vdc / Boîte dynamométrique de dépressurisation 0-5 Vdc
216	Asche-Temp. / Ash temp. / Temp. cendres
217	Rücklauf-Temp. / Return flow temp. / Temp. de retour
218	Kesselvorlauf-Temp. / Boiler forward flow temp. / Temp. de départ de la chaudière
219	Stoker-Temp. / Stoker temp. / Temp. dispositif d'alimentation
220	Flamm-Temp. / Flame temp. / Temp. flamme
221	Abbrand-Temp. / Combustion temp. / Temp. combustion complète
230	Freigabe Verbrennung (Ext. 1) (gebügelt ausgeliefert) / Release combustion (ext.1) (is delivered bridged) / Activation combustion (Ext. 1) (livré shunté)
231	Multifunktionaler Eingang (Ext. 2) z.B. Heizen auf SollTemp. 2 / Multi-function input (ext. 2) e.g. heating to setpoint 2 / Entrée multifonction (Ext. 2) par ex. le chauffage à la temp. référence 2
232	Freigabe Rauchsauger / Release smoke extractor / Activation aspirateur de fumée
234	Externe Vorgabe SOLL-Kessel-Temp. od. Brennerleistung / External specification SETPOINT boiler temp. or burner output / Consigne externe temp. de CONSIGNE chaudière ou puissance du brûleur
237	Außen-Temp. / Outside temp. / Temp. extérieure
238	Puffer-Temp. 1 / Buffer temp. 1 / Temp. ballon tampon 1
239	Puffer-Temp. 2 / Buffer temp. 2 / Temp. ballon tampon 2
240	Puffer-Temp. 3 / Buffer temp. 3 / Temp. ballon tampon 3
241	Puffer-Temp. 4 / Buffer temp. 4 / Temp. ballon tampon 4
242	Puffer-Temp. 5 / Buffer temp. 5 / Temp. ballon tampon 5
243	Versorgung 24 Vdc GSM-Modul / Power supply 24 Vdc GSM module / Alimentation 24 Vdc module GSM
244	Schrittmotor Raupenbrenner / Multi-phase motor, crawler burner / Moteur pas-à-pas du brûleur sur chenille
245	Schrittmotor Rostasche / Multi-phase motor, grate ash / Moteur pas-à-pas cendres de grille
246	Schrittmotor Flugasche / Multi-phase motor, fly ash / Moteur pas-à-pas cendres volantes
247	Kesselbus [IN] KPM #135 / Boiler bus [IN] KPM #135 / Bus chaudière [IN] KPM #135
248	Kesselbus [OUT] / Boiler bus [OUT] / Bus chaudière [OUT]
250	RS232 GSM-Modul / RS232 GSM module / Module GSM RS232

xxx ... Interne Anschlüsse / internal connections / Raccordements internes
xxx ... Externe Anschlüsse / external connections / Raccordements externes

**Stecker Wärmemanagement-Modul [WMM]
Plug, heat management module [WMM]
Connecteur module de gestion thermique [WMM]**

300	Versorgung 230 V _{AC} / Supply 230 V _{AC} / Alimentation 230 V _{CA}
301	Pumpe/Ventil Zweitwärmequelle / Pump/valve for secondary heating source / Pompe/vanne seconde source de chaleur
302	Solarpumpe 2 / Umschaltventil / Solar pump 2 / switchover valve / Pompe solaire 2/vanne de commutation
303	Solarpumpe / Solar pump / Pompe solaire
304	Zirkulationspumpe / Circulation pump / Pompe de circulation
305	Brauchwasserpumpe / DHW pump / Pompe du chauffe-eau
306	Zubringer- od. Pufferladepumpe / Supply or buffer charging pump / Pompe d'alimentation ou de charge
307	Mischer HK 2 / Mixer HC 2 / Mélangeur CC 2
308	Pumpe HK 2 / Pump HC 2 / Pompe CC 2
309	Mischer HK 1 / Mixer HC 1 / Mélangeur CC 1
310	Pumpe HK 1 / Pump HC 1 / Pompe CC 1
311	Anforderung Zweitwärmequelle / Secondary heating source request / Demande seconde source de chaleur
320	Zirkulation Taster / Circulation, push button / Touche circulation
322	Freigabe HK 1 / Release HC 1 / Activation CC 1
323	Freigabe HK 2 / Release HC 2 / Activation CC 2
327	Temp. Außen / Temp. outside / Temp. extérieur

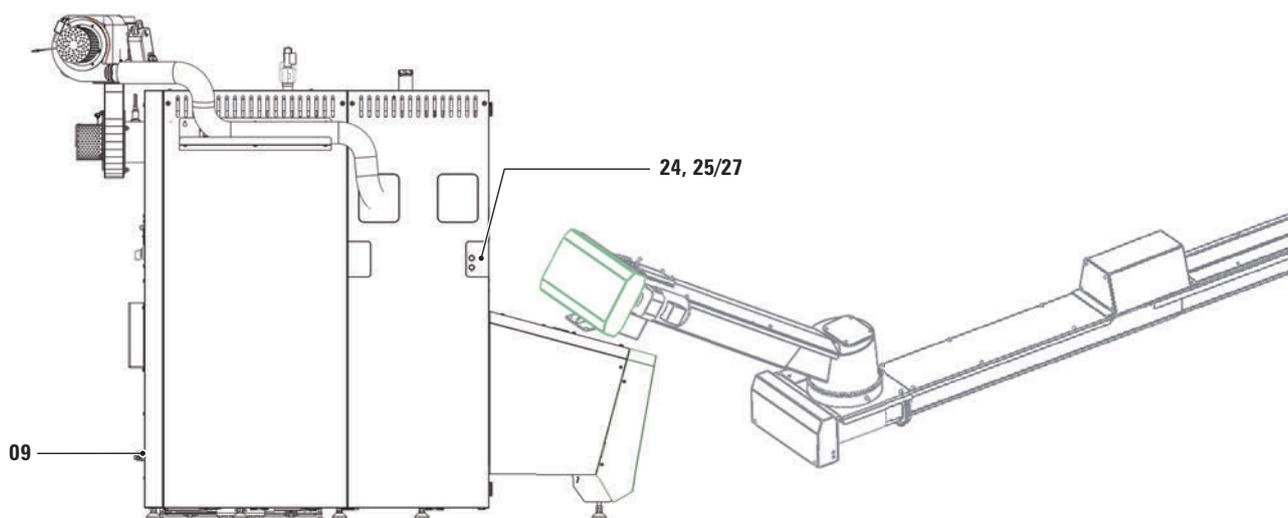
328	Temp. Brauchwasserspeicher 1 / Temp. DHWC 1 / Temp. chauffe-eau 1
329	Temp. Zirkulation / Temp. circulation / Temp. circulation
330	Temp. Puffer 1 / Temp. buffer 1 / Temp. ballon tampon 1
331	Temp. Puffer 2 / Temp. buffer 2 / Temp. ballon tampon 2
332	Temp. Puffer 3 / Temp. buffer 3 / Temp. ballon tampon 3
333	Temp. Puffer 4 / Temp. buffer 4 / Temp. ballon tampon 4
334	Temp. Puffer 5 / Temp. buffer 5 / Temp. ballon tampon 5
335	Temp. Raum HK 1 analog / Temp. room HC 1 analogue / Temp. ambiante CC 1 analogique
336	Temp. Raum HK 2 analog / Temp. room HC 2 analogue / Temp. ambiante CC 2 analogique
337	Temp. Vorlauf HK 1 / Temp. forward flow HC 1 / Temp. départ CC 1
338	Temp. Vorlauf HK 2 / Temp. forward flow HC 2 / Temp. départ CC 2
339	Temp. Kollektor / Temp. collector / Temp. capteur
340	Temp. Vorlauf Solar / Temp. forward flow solar / Temp. départ solaire
341	Temp. Brauchwasserspeicher 2 / Temp. DHWC 2 / Temp. chauffe-eau 2
342	Temp. Zweitwärmequelle / Temp. secondary heating source / Temp. seconde source de chaleur
	Solar Durchfluss- & Temperatursensor (Vortex) /
345	Solar flow & temperature sensor (vortex) / Capteur de température et de débit solaire (Vortex)

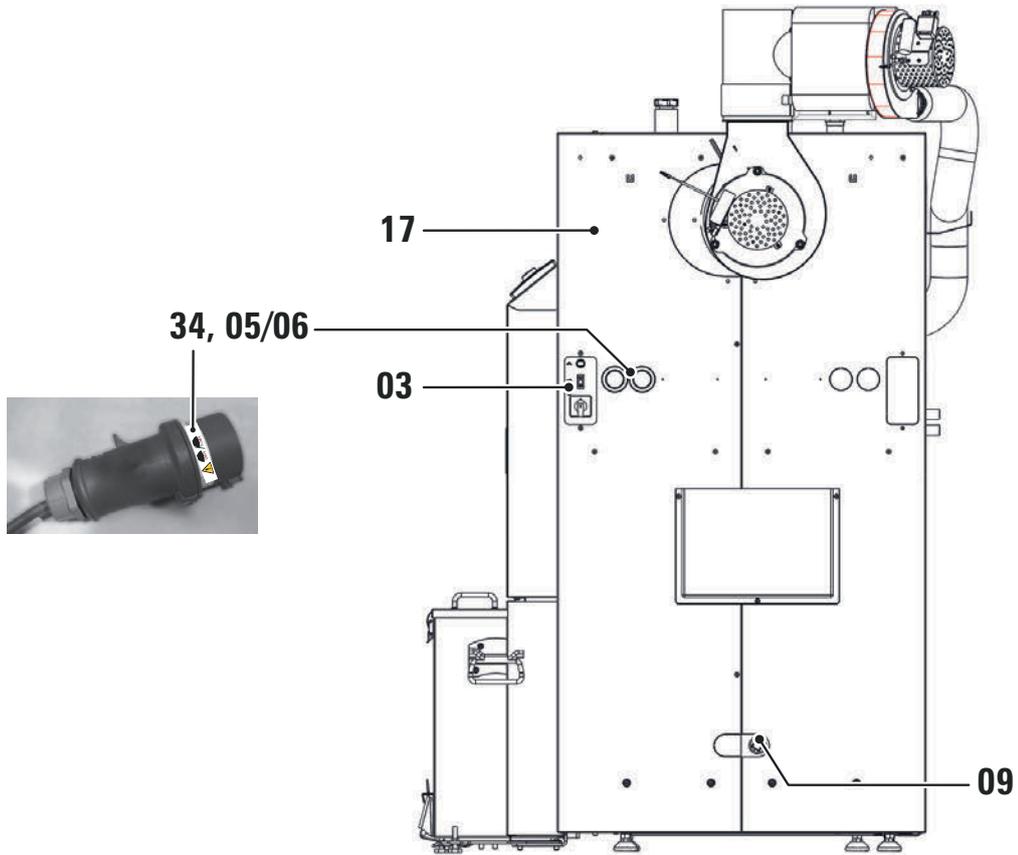
349	Solar PWM Signal Pumpe 1 / Solar PWM signal pump 1 / Signal MLI solaire pompe 1
350	Solar PWM Signal Pumpe 2 / Solar PWM signal pump 2 / Signal MLI solaire pompe 2
360	Hausbus [IN] – bleibt frei, wenn im Kessel verbaut / House bus [IN] – remains open if installed in the boiler / Bus domestique [IN] – reste libre si monté dans la chaudière
	Hausbus [OUT] – Terminiert (120 Ω) ausgeliefert. Bei Bus-Weiterführung entfernen! / House bus [OUT] – delivered terminated (120 Ω). Remove in case of bus extension! / Bus domestique [OUT] – livré avec terminaison (120 Ω). Retirer en cas de continuation du bus!
361	
362	Bediengerät 1 / Control unit 1 / Module de commande 1
363	Bediengerät 2 – gebügelt ausgeliefert / Control unit 2 – is delivered bridged / Module de commande 2 – livré shunté
	Bediengerät 3 – direkt im Multifunktionsgehäuse! / Control unit 3 – directly in the multi-function enclosure! / Module de commande 3 – directement dans le boîtier multifonctions!
365	Verbindung zur LED-Reihe / Connection to the LED row / Connexion à la rangée de LED
	Eingehende Busverbindung vom KPM (#136) / Incoming bus connection from KPM (#136) / Liaison bus entrante en provenance du KPM (#136)
366	
367	RS232-Schnittstelle / RS232 interface / Interface RS232
368	Versorgung 24 V _{DC} / Supply 24 V _{DC} / Alimentation 24 V _{CC}

WMM MF2±

Fig. 2: Plug list WMM – KWB Comfort 4 (symbol display)

1.3.3 Stickers on the side and on the back





STL
(03)

Button for the safety temperature limiter [STL] at the switch bracket



03

Power supply
230 V
(05)

Voltage supply 230 V



05

Voltage supply
400 V
(06 / 34)

Voltage supply 400 V



06

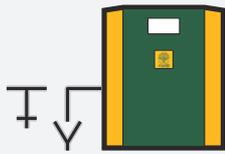
Power supply always with N-conductor!



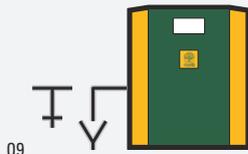
34

Filling & emptying (09)

1x at the heat exchanger



1x at the combustion chamber



Positions of connections for 2 emptying processes:

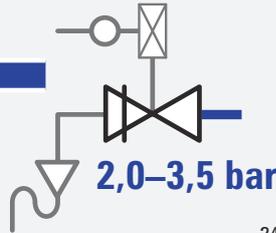
At both long sides, close to the ground.

Depending on the system, 2 of 4 connections are used, the two other connections remain closed!

Thermal discharge safety valve

Sticker on both thermal discharge safety valve pipes:

Inlet, thermal discharge safety valve (24)

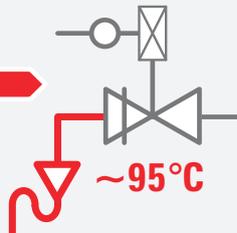


Inlet, thermal discharge safety valve

The thermal discharge safety valve presupposes a cold-water pressure of 2-3.5 bar!

24

Outlet, thermal discharge safety valve (25)

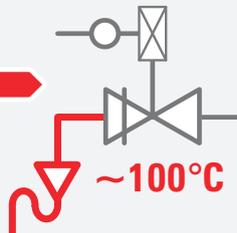


Outlet, thermal discharge safety valve (90 °C at forward flow)

The thermal discharge safety valve triggers at a boiler temperature of 95 °C!

25

Outlet, thermal discharge safety valve (27)



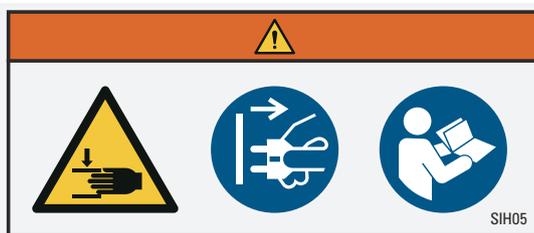
Outlet, thermal discharge safety valve (95 °C at forward flow)

The thermal discharge safety valve triggers at a boiler temperature of 100 °C!

27

1.3.4 Sticker for the perforated plate

Risk of injury due to open gearing (SIH05)



Warning of hand injuries!

Disconnect plug from the mains!

Follow the instructions!

Danger due to unexpectedly operating heat exchanger cleaning: The gearing of the opposed levers may lead to serious injury!

1.3.5 Stickers on the ash container

Heavy load
(37)



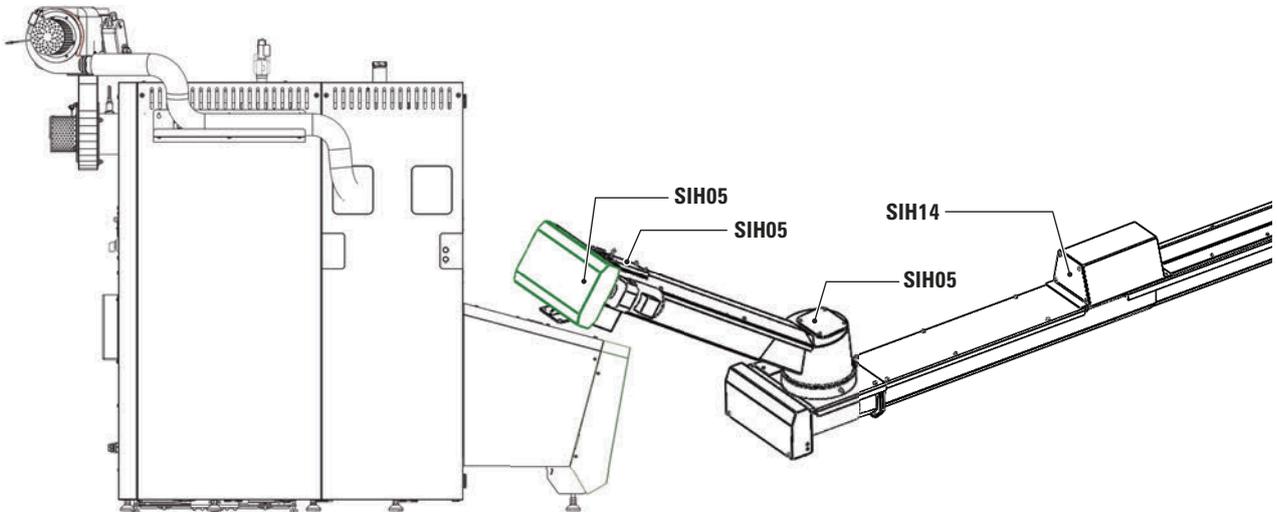
36 kg

37

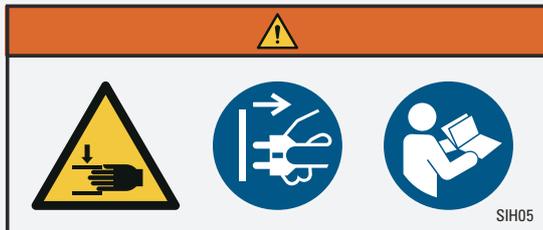
Mind the weight of the filled ash container before moving the ash container! 2 x 36kg

Sticker at the conveyor system

1.3.6



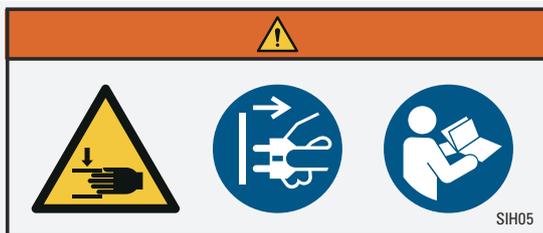
Cellular wheel
sluice / fire
shutter
(SIH05)



Warning of hand injuries!

Warning of unexpectedly starting up cellular wheel sluice or closing fire shutter!
Disconnect plug from the mains!
Follow the instructions!

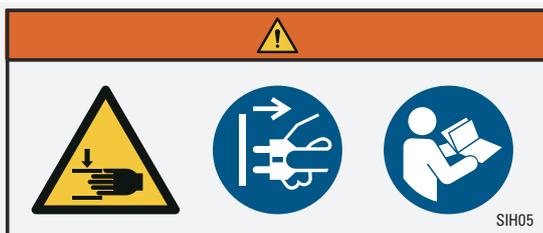
Conveyor chan-
nel
(SIH05)



Warning of hand injuries!

Warning of unexpectedly starting up conveyor screw.
Disconnect plug from the mains!
Follow the instructions!

Overfill protec-
tion cover
(SIH05)



Warning of hand injuries!

Warning of unexpectedly starting up conveyor screw.
Disconnect plug from the mains!
Follow the instructions!

Maintenance cover (SIH14)



Warning of hand injuries!

Reaching into the conveyor channel is prohibited!
Disconnect plug from the mains!
Follow the instructions!

1.3.7 Sticker on the dust filter

Hazardous electrical voltage! (SIH06)

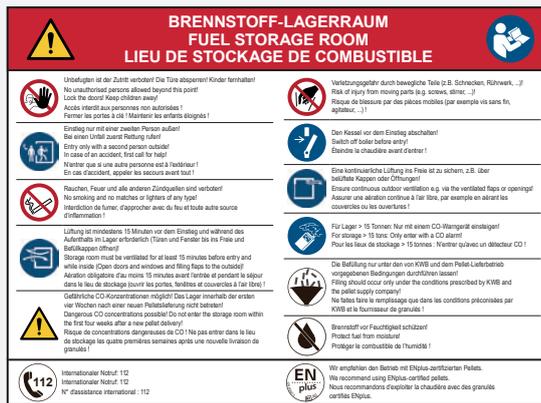


Warning of electrical voltage!

No access for persons with pacemakers or implanted defibrillators!
Follow the instructions!
When working on the dust filter, the dust filter and KWB boiler must be de-energised and secured against being switched on again.

1.3.8 Stickers for the storage room

⇒ Always ensure that the storage room warnings are attached to the door of the storage room!



Sticker storage room pellets

Stickers on the door to the pellet storage room (example representation)

1.3.9 Stickers on the injection connector

⇒ Please ensure that the following warning sticker is applied to the injection connector:

1.3.10 Type plate sticker

You will find the type plate with the instructions attached to one of the cover sheets.

⇒ Attach the type plate to the boiler casing in a **visible location**.

This sticker is absolutely required for the operating permit!

2 Overview

2.1 System components

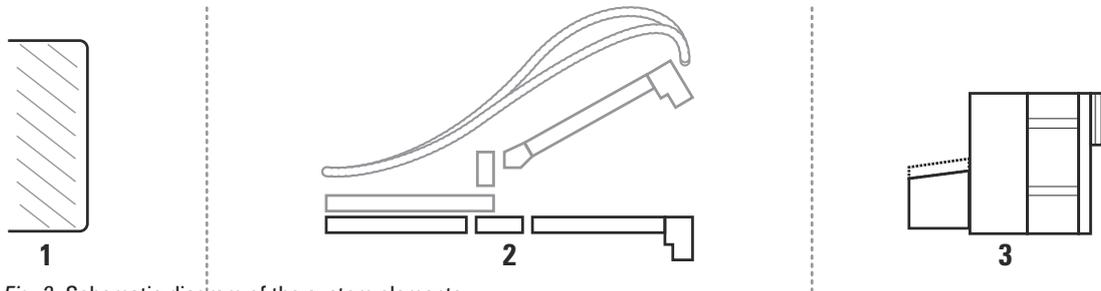


Fig. 3: Schematic diagram of the system elements

1	Fuel storage room	3	Boiler with heat exchanger, control and ash container; for type MF2 ZI also with hopper
2	Conveyor system		

You will find detailed information regarding available conveyor systems in the KWB "Technology & Planning" brochure.

2.2 Safety elements

We have taken the following measures in order to maximize the safety of our systems.

Burnback protection

A fire shutter or a cellular wheel sluice is installed in the KWB Multifire, depending on the model. Cellular wheel sluice

Multifire Type MF2 D	Multifire Type MF2 ZI
Cellular wheel sluice	Fire shutter

Fire shutter

The stoker channel and the hopper are sealed tightly up to the fire shutter. This ensures that any burnback is extinguished due to lack of air. The fire shutter has been tested as a burnback protection device (BPD) as specified by TRVB H118 (Fire Protection Policy).

A servomotor opens and closes the shutter. Fuel conveyance only starts when the shutter is completely open. In case of faults or power failure, the shutter closes automatically. In the case of an error, the following messages are displayed 07.15 The fire shutter does not open! [▶ 104] or 07.16 The fire shutter does not close! [▶ 104] (only KWB Multifire with Comfort 4 and hopper).

Cellular wheel sluice

The cellular wheel sluice, developed by KWB as burnback protection device (in accordance with TRVB H118), prevents fire from being able to spread back to the fuel feed from the combustion chamber.

Stoker channel temperature sensor

When in operation, the control system prevents burnback in the stoker channel by feeding fuel. In addition, a sensor monitors the temperature in the stoker channel area. In the case of an error, the following message is displayed 07.09 The temperature in the stoker channel is too high! [▶ 103] (KWB Comfort 4).

The continuous monitoring and control ensures negative pressure in the combustion chamber.

In case of a fault, the following messages appear: Alarm 240 – The negative pressure in the combustion chamber cannot be regulated! (Comfort 3) or 02.10 The negative pressure in the combustion chamber cannot be regulated! [► 95] (Comfort 4).

Safety temperature limiter [STL]



This system shuts down the heating system if the boiler temperature should rise to $>95^{\circ}\text{C}$ (optionally $>100^{\circ}\text{C}$).

↳ What happens?

- ⇒ Depending on the system: The fuel conveyor will be switched off.
- ⇒ Depending on the system: The fire shutter locks automatically.
- ⇒ The fans are switched off.
- ⇒ The pumps continue to run.
- ⇒ This alarm will be displayed on the boiler control unit:
KWB Comfort 4: 02.00 Safety thermostat! Boiler overheating! [► 93]

Emergency fire extinguisher

Note: This is standard in type MF2 ZI (installed at the factory) and can be retrofitted in type MF2 D.

An emergency fire extinguisher at the stoker screw channel is the last recourse in special situations (e.g. power failure). It consists of a temperature sensor which opens a valve at 95°C . The temperature sensor is mounted to the screw channel in a thermally conductive position. The valve normally blocks the hose connection between a 10-litre water container and the screw channel (KWB Multifire and KWB Pelletfire Plus have models with 20 litres).

In the event of a backfire, the channel is flooded and the embers are extinguished in this way. As an additional safety feature, the KWB systems have a float switch in the water container. The float switch shuts the system down if the water level falls under a certain level (minimum level).

KWB Comfort 3: Alarm 19 – The water tank of the emergency fire extinguisher is empty. Observe the operating manual.

KWB Comfort 4: 07.29 The water container of the emergency fire extinguishing system is empty! [► 106]

The fire extinguishing device is a backfire-impeding device (RHE) according to TRVB H 118 which also functions if the power fails. It is not considered an independent fire extinguishing device (SLE). Under certain installation conditions, an independent fire extinguishing device may be required. These situations are listed in the TRVB H 118 or in our planning brochure. Please contact KWB in such a case.

Thermal discharge safety valve

The thermal discharge safety valve is an integrated safety device against an overheating of the boiler as required by EN 303-5:2012. The connection must be installed according to the hydraulic diagram.

If the temperature rises

- at a maximum forward flow temperature of 90°C → the thermal discharge safety valve triggers at a boiler temperature of 95°C .
- **OPTIONAL** at a maximum forward flow temperature of 95°C → the thermal discharge safety valve triggers at a boiler temperature of 100°C .

The thermal discharge safety valve opens and cold water is introduced into the safety heat exchanger.

The discharge safety valve must be connected to a pressurized water supply network through an **unblockable connection**. If the cold water pressure is greater than 3.5 bar, installation of a pressure reducer valve is required. The minimum cold water pressure is 2 bar.

Possible triggers: sudden shutdown, boiler circuit pump failure, black-out, faulty boiler temperature sensor.

Safety valve

When the boiler pressure reaches 3 bar, the safety valve opens and discharges hot (!) heating system water!

You must comply with EN ISO 4126-1:2013 requirements, diameter according to EN 12828 or national standard.

Among other things, the safety valve must be installed at the boiler or in direct vicinity to the boiler to make sure it is accessible and that there are NO shut-off devices between the boiler and the safety valve!

Temperature monitor in the fuel storage [TMFS]

A temperature monitor ([TMFS] pursuant to TRVB H 118) was installed at the point of entry of the conveyor channel from the fuel storage room into the boiler room. The TMFS sends off a fault message when a temperature of 70°C is exceeded and shuts down the boiler.

KWB Comfort 4: 02.05 The temperature in the fuel storage is too high! [► 94]

Overfill protection

If the conveyor system is overfilled, which will cause the maintenance cover to lift, the overfill protection shuts down the system.

KWB Comfort 3: Alarm 24 – Overfill trip switch of fuel extractor 1 is open

KWB Comfort 4: 07.01 The overfill protection switch of the conveyor system 1 is open! [► 101]

Lambda probe

The broadband lambda probe adapts the combustion to various fuel qualities.

Limit switch for the ash containers

If the ash container is removed, a switch immediately triggers the following reaction:

- The fuel conveyor is stopped and the combustion is shut down.
- The alarm is displayed. 02.02 The ash container was incorrectly installed [► 94]

Additional safety elements

You must also comply with local regulations and DIN 18896 regarding the operation of a "fire-place".

Main switch

This switches the power supply of the system on and off. All components are de-energized as a result.

NOTE



Overheating due to an uncontrolled shutdown

If the system is shut down abruptly, the boiler can no longer dissipate the heat and could overheat. This would first trigger the safety temperature limiter and subsequently the thermal discharge safety valve.

Please also see

- 📖 07.29 The water container of the emergency fire extinguishing system is empty! [▶ 106]
- 📖 02.00 Safety thermostat! Boiler overheating! [▶ 93]

2.3 Chimney requirements

Switzerland: Systems in Switzerland: Low-emission operation according to VHe homologation is only guaranteed when the system can be operated at low exhaust gas temperatures of the smallest thermal output (30% of nominal output). Usually, this requires a condensation-resistant chimney. If you have any questions about this, please contact your installation company.

Due to the high boiler efficiency rate, the chimney design should be executed so that it is resistant to moisture. A moisture-resistant chimney design means that there will be no moisture penetration or damage to the brickwork, even though the temperature level in the exhaust gas path remains permanently below the exhaust gas dewpoint (see EN 13384 / DIN 18160).

2.4 Solar control

NOTE

**Follow the manufacturer's instructions!**

- ➔ Follow the manufacturer's instructions with respect to the installation and commissioning of the solar system.
- ➔ Follow the manufacturer's hazard and safety instructions.

Flushing and filling of the solar system

For safety reasons, filling must be carried out exclusively during times without sunlight or with covered collectors. Particularly in areas which experience frost, a 42% antifreeze-water mixture must be used. To protect the materials from excessive thermal loads, the filling and commissioning of the system should occur within a short time, but at most after 4 weeks. If this is not possible, the flat seals should be renewed before commissioning to prevent leaks.

Attention: If the antifreeze is not pre-mixed, it must be mixed with water before filling!

You must use the manufacturer-recommended antifreeze!

It is possible that collectors that have once been filled cannot be fully emptied. For this reason, collectors may even for pressure and function tests only be filled with the water/antifreeze mix when there is danger of frost. Alternatively, the pressure test can be performed with compressed air and leak locator spray.

Operating pressure

Observe the manufacturer-recommended maximum operating pressure.

Bleeding

The system must be bled:

- During commissioning (after filling)
- 4 weeks after commissioning
- If required (e.g. during faults)

⚠ WARNING**Risk of scalding from steam or hot heat transfer fluid!**

- ➔ Only activate the bleed valve if the temperature of the heat transfer fluid $< 60\text{ °C}$. The collectors must not be hot when the system is emptied!
- ➔ Cover the collectors and, if possible, empty the system in the morning.

Check the heat transfer fluid

The heat transfer fluid must be checked every 2 years for frost protection and pH value.

- Check the frost protection with the antifreeze tester and replace or refill, if necessary! Setpoint approx. -25 °C to -30 °C depending on the climatic conditions.
- Check the pH-value with an indicator stick (setpoint approx. pH 7.5):
Replace the heat transfer fluid if the limit ph-value of $\leq \text{pH } 7$ is undershot.

Collector maintenance

Warranty claims only in connection with the supplier's original antifreeze and properly performed installation, commissioning and maintenance. Installation by a certified technician in strict adherence to the instruction description is required to justify the claim.

Mass flow rate

A specific flow rate of $30\text{ l/m}^2\text{h}$ must be selected up to a collector field size of approx. 25 m^2 to ensure good collector performance.

3 Operating fundamentals

Please read through the entire instruction manual before operating the system. If you are unsure about anything, please contact KWB customer service or your personal KWB partner!

3.1 Front control units

⚠ WARNING



Unforeseeable consequences (personal injury and property damage) due to incorrect commissioning

- ➔ The initial commissioning requires comprehensive specialised knowledge: Only qualified and certified technicians are permitted commission the system!

⚠ WARNING



Risk of suffocation due to opened combustion chamber door

- ➔ Ensure that the combustion chamber door of the heating system is closed tightly before putting the system into operation.

[HS] Main switch:

This switches the system's power supply on or off.

[STB] Safety temperature limiter:

If this safety element has triggered, you must wait until the boiler temperature falls below 75°C. Unscrew its cap and unlock the safety temperature limiter by pressing, e.g., a screw driver on it.

3.2 Exclusive control unit

3.2.1 Graphic interface

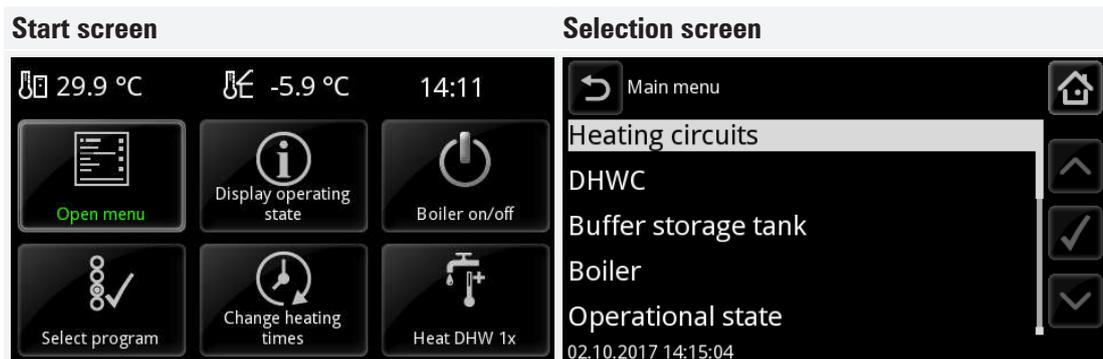
This section describes the operation of the KWB Comfort 4 using a Exclusive control unit. For the Basic control unit [► 51], please see the section Basic control unit.

Depending on the situation, KWB Comfort offers different views:

- The **buttons** to quickly call up frequently used functions;
- The **menu** for a detailed configuration, and
- The **overview** as standard screen in the living quarters.

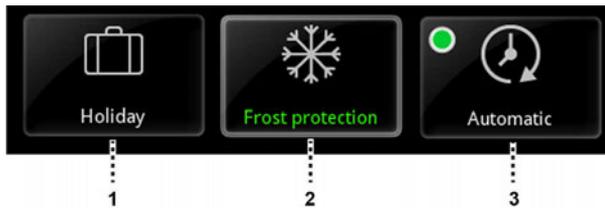
The "buttons" view

After the control starts up, it shows a screen with 6 shortcut buttons. You can access frequently used functions via these buttons, but you can also access the menu or switch off the boiler.



	Outside temperature		"One level up" or "back to the previous screen"
	Inside temperature		Title of the current screen
	Boiler temperature		Back to the start screen

- The Exclusive control unit [BGE] in the living quarters shows the room temperature , the outside temperature  and the time at the top screen edge.
- The Exclusive control unit [BGE] at the boiler shows the boiler temperature (!), the outside temperature  and the time at the top screen edge.



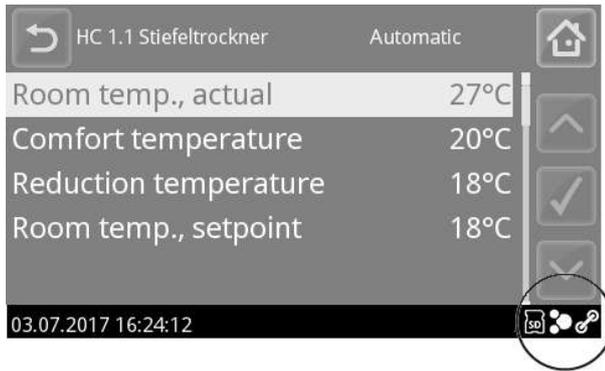
- 1 Button without special status
- 2 Selected button or last selected button using the dial
- 3 The green circle shows that this function is active.

"Menu" display

In a text-based list, you will find all functions and settings for the KWB Comfort 4. The menus are structured, meaning that the available "sub-menus" will contain related functions.

Navigation	Functions and settings	
 Main menu  Heating circuits DHWC Buffer storage tank Boiler Operational state 02.10.2017 14:43:05	 HC 1.1 Stieftrockner Automatic  Room temp., actual 27°C Comfort temperature 20°C Reduction temperature 18°C Room temp., setpoint 18°C 02.10.2017 14:39:12	
	Moves the menu bar up one line.	Function name or setting
	Access the sub-menu for a function . Start the value change for a setting .	Current setting value
	Moves the menu bar down one line.	The scroll bar indicates that the list is longer than what is shown on the screen and shows the current position within the entire list.

Footer



White: SD card inserted and recognised
Red: Error!
(Card not ready yet, error during integration, error when ejecting the card)



KWB Comfort Online (Option)
White: Connection has been established
Green: Data exchange is underway
Red: No connection



Shows the bus connection when using the Exclusive control unit [BGE] outside of the boiler.
White: bus connection OK
Red: bus connection interrupted

3.2.2 Using the menu

All commands of the KWB Comfort 4 are combined at multiple levels – you will thus not be required to run through endless lists to access the desired setting.

NOTE



Protect your heating system

- False settings prevent fault-free operation with minimum emissions and low fuel usage.
- Please read the entire operating instructions carefully.
- If you have any questions, please contact the KWB customer service.

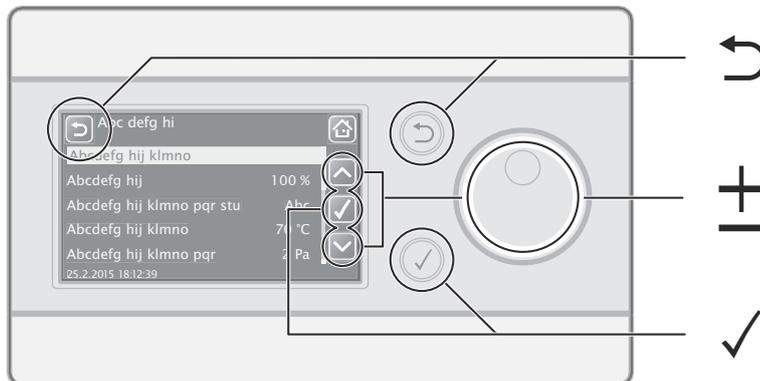
Shortcut button "menu"



This shortcut button will lead you to the "menu" screen, via which you will be able to access all settings in a hierarchical menu structure with sub-menus, if any.

The "dual control" of the KWB Comfort 4 gives you at any time the choice to work with the dial and the two buttons, ↶ and ✓, or with the touch buttons, ⏪ and ⏩, on the screen – you can also mix both options!

Buttons of equal value



Menu navigation

Navigating with buttons and dial	Touch screen navigation
⇒ Turn the dial to the left or right.	⇒ Touch one of the touch arrow buttons  and  at the right touch screen edge.
In the menu, the menu bar (highlights the currently selected menu bar) moves down or up.	
⇒ Turn the dial until the desired sub-menu is highlighted.	⇒ Touch the desired sub-menu.
⇒ Press the button  .	⇒ Touch one of the touch buttons  at the right screen edge.
This will confirm the selected sub-menu and take you one level further down.	

Change settings

When you have navigated to the setting the value of which you would like to change, as described above, and have confirmed your selection with  or  then ...

Navigating with buttons and dial	Touch screen navigation
⇒ Turn the dial until the desired value is displayed.	⇒ Enter the desired value using the displayed keyboard or touch one of the arrow buttons to change the value in a targeted manner.

Confirm your entry

When you see the desired value displayed then ...

Navigating with buttons and dial	Touch screen navigation
⇒ Press the button  .	⇒ Touch the touch button  at the right screen edge to confirm the new value.
The control will immediately start to distribute this change in the network. Several seconds can pass until the new value has reached all control units, depending on the size of the network and number of control units.	

Cancel entry

When you notice during the entry of a setting that the previous setting should be kept then ...

Navigating with buttons and dial	Touch screen navigation
⇒ Press the button  .	⇒ Touch the touch button  in the top left corner or the touch button  in the top right corner of the screen.
The control will then continue to work with the previous value.	

One level up

To move up a level in the menu ...

Navigating with buttons and dial	Touch screen navigation
⇒ Press the button  .	⇒ Touch the touch button  in the top left corner of the screen.
The higher level menu is displayed.	

To the top menu

To switch to the start menu ("Main menu") ...

Navigating with buttons and dial	Touch screen navigation
⇒ Press the button  several times.	⇒ Touch the touch button  in the top right corner of the screen.
The top level menu is displayed.	

3.2.2.1 Changing values

You will be able to change values as follows

Changes by using buttons and dial	Changes by using the touch screen
⇒ Turn the dial to the left or right.	⇒ Touch one of the touch arrow buttons at the right touch screen edge. Tip: If you touch the touch arrow buttons for more than 2 seconds, the change will occur much quicker.

Confirming your change

Confirm by using buttons and dial	Confirm by using the touch screen
⇒ Press the ✓ button.	⇒ Touch the button ✓ at the right screen edge.

Cancelling the change

Confirm by using buttons and dial	Confirm by using the touch screen
⇒ Press the ↶ button.	⇒ Touch the button ↶ in the top left corner of the screen.

This will quit the change without saving the new value.

3.3 Frequently used Comfort 4 functions

3.3.1 Setting the date/time of day

The switchover to summer/winter time occurs automatically!

⇒ Open the display "menu" at the Exclusive control unit and navigate to the menu "date/time".

Navigating with buttons and dial	Touch screen navigation
⇒ The dial will bring you to the next entry value. Set the desired date and confirm by pressing ✓.	⇒ On the touch screen, select the value that you wish to change.
⇒ You have completed setting the date after you have confirmed the last value with ✓.	⇒ Define the desired values using the dial and confirm by pressing  .

You will find the full explanation in section Date/Time [▶ 73].

3.3.2 Display the operating state

It is important that all components function properly in a heating system. The function "operating state" shows you a large number of readings and settings.

⇒ Select the shortcut button "display operating state".



On the next screen, select which component of your heating system you would like to check.

If you operate several heating circuits, buffer tanks or DHWCs, you will be initially shown a list of available components: Select the component that you would like to see.

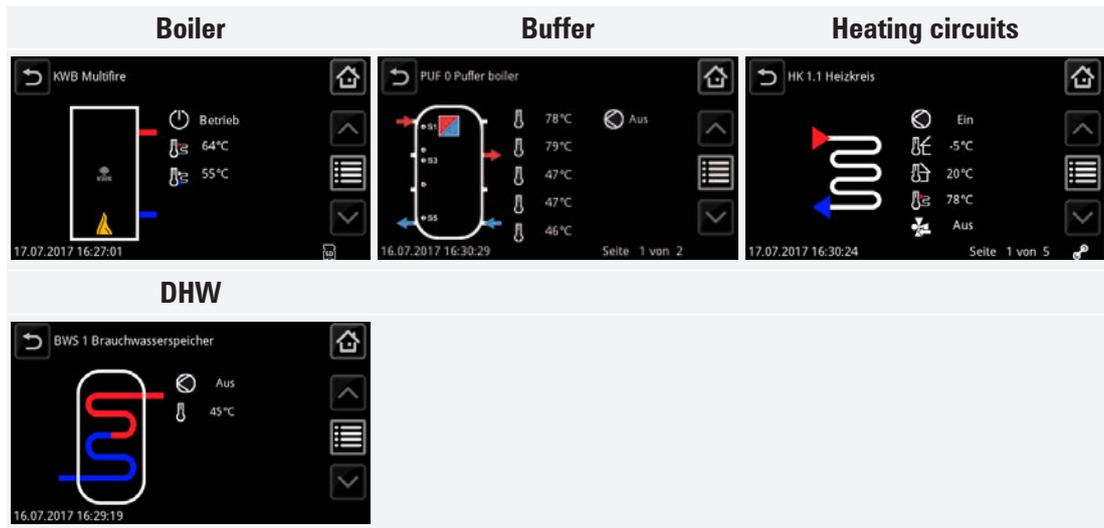


Table 2: Graphic illustration of the heating system components

Select the touch button  to receive more information on the respective component.

3.3.3 On/Off → Submenus



The shortcut button On | Off brings you to a **submenu** where you can select additional frequently used settings (depending on the boiler type).

Select program ⇒ Select the shortcut button On | Off to get to the submenu.

The following submenus are available



With the shortcut button Boiler On | Off, you can define whether the boiler should be operating or not.



Measuring mode

The system is in measuring mode after you press the shortcut button measuring mode. All consumers run with maximum heat consumption. The system can be run in nominal load or partial load, see menu item Chimney sweep function procedure [▶ 66].



Heat exchanger cleaning

This function permits activation of the heat exchanger cleaning. The cleaning process is automatically switched off after the cleaning time has elapsed.



Manually fill the conveyor system (MF2 ZI)

Shortcut button Manually fill the conveyor system: This button activates the stirrer in systems with hopper in order to fill the hopper with fuel, see menu item Conveyor system [▶ 66].



Dust filter cleaning

With an activated dust filter, this function allows activation of the filter cleaning. The cleaning process is automatically switched off after the cleaning time has elapsed.

Please also see

 Conveyor system [▶ 66]

☰ Filling / refilling with fuel [▶ 45]

☰ Filling / refilling with fuel [▶ 47]

3.3.4 Select program



⇒ Select the shortcut button "select program".

⇒ You will see a list with the available heating circuits only if you operate several heating circuits: Select the heating circuit that you would like to change.

Select program

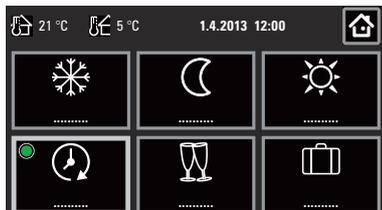


Fig. 4: The green circle shows the currently active program.



Frost protection

⇒ Select this program to protect the heating system from frost damage.

☞ The control keeps the room temperature at temperatures above 8°C (factory setting).



Reduct

⇒ Select this program to heat to the set reduction temperature all day. (For example during a longer absence.)



Comfort

⇒ Select this program to heat your living quarters to the comfort temperature all day.



Automatic

⇒ Select this program to heat during the specified times based on your personal needs: This way, it will be as warm as you want it to be, and you can reduce the energy expenditures when nobody is home.

Please note that an outside temperature switch-off which is set too low may prevent the system from switching to the comfort temperature or reduction temperature!

Additional programs

The two following programs supplement the 4 already described programs. After their execution, the control switches back to the previously selected program.

Party



Select party mode when you want to keep the room temperature at the comfort temperature for longer as an exception. This works in all KWB Comfort 4 programs.

If the party mode is active, the green circle appears in the touch button.

After the period specified in heating up to, the KWB Comfort 4 switches back to the previously selected program.

Holiday



Activate the holiday program if the heating should maintain a specific room temperature (temperature) for a certain period of time. First, define the end and subsequently the start of the holiday program.

The control remains in the current program until the specified start date has been reached. Only then, the green circle appears in the touch button.

After the specified end of the holiday program, the control switches back to the previously selected program (at 00:00 midnight).

If you want to **prematurely** end the holiday program, switch the function to Off.

3.3.5 Change heating times



Heating times

- ⇒ Select the shortcut button "Change heating times" if you want to change the behaviour of the heating system in the "automatic" program.
- ⇒ You will see a list with the available heating circuits only if you operate several heating circuits: Select the heating circuit that you would like to change.
- ⇒ If you want to change the displayed times, select the button Change times and decide to which time period the change should apply:
 - For all working days: Monday – Friday
 - For every day of the week: Monday – Sunday
 - For each individual day: Mon Tue Wed Thu Fri Sat Sun
- ⇒ Only then you can define a maximum of 3 time periods in which the control is to heat to the comfort temperature. Confirm the new time periods by selecting the button transfer values.
- ⇒ If you do not want to use a specific time period, set the values for On and Off to the same time: The KWB Comfort 4 will then detect this time period as an empty entry.

3.3.6 Heat DHW 1x



Related functions

The shortcut button "Heat DHW 1x" tells the control to immediately and only once heat the DHWC to the setpoint temperature.

If your heating system has several DHWCs in several heating circuits, you will only be able to access this setting in section DHWC [► 59].

- ⇒ Select this function if you have the impression that the DHW is getting colder or if you expect that the existing quantity of hot water will not last until the next scheduled heating process.
- ⇒ A green circle on the touch button displays this function.

Once the setpoint temperature has been reached, the control switches back to the previously active operating mode. The green circle on the touch button disappears.

If you have to activate this function too frequently, either the minimum temperature [► 59] of the DHWC is set too low or the charging times do not correspond to your DHW use.

3.3.7 Regulating the room temperature

You have several possibilities to change the room temperature.

Changing the setpoint temperature at the Basic control unit



Turn the dial of the Basic control unit to the right to increase the temperature by up to 5°C or to the left to reduce it by up to -5°C.

Change the room temperature one time

- ⇒ Shortcut button "select program" >> *Select heating circuit* >> Party >> Party operation to On



Select party mode when you want to keep the room temperature at the comfort temperature for longer as an exception. This works in all KWB Comfort 4 programs.

If the party mode is active, the green circle appears in the touch button.

After the period specified in heating up to, the KWB Comfort 4 switches back to the previously selected program.

Generally change the room setpoint temperature

Reduce or increase the room setpoint temperature if it is **always** too warm or too cold.

- ⇒ Change to the "menu" display.
- ⇒ Correct the room temperature setting in menu Heating circuits [▶ 54] (Heating circuits >> *Select heating circuit* >> Room temperature).

Generally change heating times

If the radiators or the floor heating are not warm enough or too warm during certain times, you can change the heating times in the menu Heating circuits [▶ 54].

The control does not react to your entries?

If the control does not react to your corrections at all, check the boiler's operating status [▶ 67]: Does it heat at all or is there something that prevents the heating operations? The reason could be an outside temperature switch-off set too high.

3.3.8 Switch off and restart

3.3.8.1 Shutting down the system

NOTE



Overheating due to an uncontrolled shutdown

If the system is shut down abruptly, the boiler can no longer dissipate the heat and could overheat. This would first trigger the safety temperature limiter and subsequently the thermal discharge safety valve.

Full shutdown (at the end of the heating season, in the event of faults)

Tip: Disconnect the mains plug outside of the heating season to avoid lightning damage.

3.3.8.2 Restarting after standstill periods

- ⇒ Switch the system on at the main switch.
- ⇒ If the battery is flat, you will need to reset the date and time of day (section Date/Time [▶ 73]).
- ⇒ Use the "System On / Off" function (Switch on/off [▶ 66]) to switch the system on.
 - ⇒ The fuel supply to the burner starts (operating mode "Ignition filling"). This procedure can take up to 30 minutes if the conveyor system is empty.
 - ⇒ Fuel is conveyed to the crawler burner (operating mode "Ignition feeding") and ignited (operating mode "Ignition heating"). If the stoker screw was empty, several ignition attempts may be necessary until a ember bed forms (operating state "Ignition heating").
 - ⇒ The system switches to the operating state "Operating", heats the boiler and supplies the consumers when there is a heat request.
 - ⇒ If the setpoint temperature is reached, the system switches to standby (operating state "Ready (+Req)").

4 Regular tasks

4.1 Fuels

4.1.1 Intended fuels

DANGER

Life-threatening danger due to toxic combustion gases



- When burning rubbish, toxic gases are emitted that may destroy the boiler: these include chipboards and other glued laminated wood products, plastic materials, rubber, PVC, varnish, etc.
- ⇒ Only burn fuels intended for this system!

CAUTION

Explosions through ignition aids



- ⇒ NEVER ignite and heat the boiler with liquid fuels, such as gasoline!

Reliable fuels

The following fuels, which have to meet the respective standards, are exclusively permitted for system operation:

- Wood pellets according to ISO 17225-2 with "ENplus A1" certificate and A2
- Wood chips P16S according to ISO 17225-4 with max. 45% moisture content
- Wood chips P31S according to ISO 17225-4 with max. 45% moisture content

They must not contain any foreign objects (stones, plastic materials)!

4.1.2 Fuel pellets

Low-quality pellets

Inferior fuels lead to increased emissions and to a sintering of the boiler. Only high-quality pellets ensure a reliable and clean operation of your system and thus low operating costs. Please note the corresponding certificate of your supply company.

Standardised pellets

ISO 17225

ISO 17225 replaces the national regulations: The respective "ENplus" certificate simplifies the complex choices available to consumers **and** also regulates the professional handling of the pellets in retail (gentle transportation, optimal filling of the pellet storage, etc.).

6 – 8 mm diameter

Pellet sizes of KWB conveyor system M		6 mm	8 mm
Stirrer [M] or conveyor screw [M]	with ascending channel	Yes	Yes
	without ascending channel	Yes	Yes
	Suction conveyor	Yes	No
	Downpipe	Yes	Yes
	Drop hose 100 mm	Yes	Yes



Quality level A1

A1 is the quality for consumers with pellet heating systems. It complies with strictest specifications and enables best emission values. This quality level largely corresponds to the previous standards EN 14961-2, DIN-Plus and ÖNORM M7135. The respective wood pellets should have an ash content of less than 0.5% (coniferous wood) up to 0.7% (other wood).

Bulk density	600 kg/m ³	Moisture content	≤ 10%
Diameter	6 (±1) mm	Fines content	≤ 1%
Length	3.15– 40 mm	Mechanical resistance	≥ 97.5%
Calorific value	16.5 –19 MJ/kg	Ash content	≤ 0.7%

Table 3: Source material: Trunk wood, chemically untreated wood materials
Additives: ≤ 2%; type and quantity must be specified

Quality level A2

This quality is suitable for medium and large-sized pellet heating systems that are able to process a slightly higher fuel ash content (KWB Multifire, KWB Powerfire), but only with significantly higher maintenance expenditures.

Quality level A2 according to ISO 17225

Source material: Trees without roots, trunk wood, leftovers from logging, bark, chemically untreated wood materials							
Additives: ≤ 2%; type and quantity must be specified							
Bulk density	Diameter	Length	Calorific value	Moisture content	Fine content	Mechanical resistance	Ash content
600 kg/m ³	6 (±1) mm	3.15 – 40 mm	16.3 – 19 MJ/kg	≤ 10 %	≤ 1 %	≥ 97.5%	≤ 1.5 %

4.1.3 Fuel wood chips

Wood chips intended for the system

The wood chips for your KWB heating system must comply with the ISO 17225-4 standard. **Non-compliance voids the warranty!**

Depending on the order, the stoker for P16S or P31S wood chips is installed on the KWB Multifire.

Low-quality wood chips

Unfavourable fuel components (soil, sand, rocks, rotten wood, needles, grass, leaves...) lead to higher emissions and to a sintering of the boiler. Only high-quality wood-chips ensure a reliable and clean operation of your system and low operating costs. Please note the corresponding certificates of your supply company.

Piece size

The average piece size of the wood chips should not exceed 5 cm. If this size is exceeded, the screws may jam or noise may develop. Long chips can cause faults in the fuel conveyance system and may cause a loss in performance.

Moisture content

- Dry fuels significantly increase system efficiency: We recommend a moisture content of 20 to 30% of the weight of the fresh substance.
- The KWB Multifire burns wood chips with a water content of up to 45% ("M45"; 450 g water per 1 kg of fuel). However, with a water content this high you lose approximately 55% of the energy for evaporating the water in the fuel!

Warning: Wood chips that are wet to such degree cannot be stored; mould forms and supply interruption due to frost may occur!

Provision of rated power to M30; above this level, a reduction in power dissipation occurs.

Standardised wood chips: ISO 17225-4

Normative: Dimensions [mm]				
Main portion ^a (minimum 60 m-%), mm	Fine material portion, m-% (≤ 3.15 mm)	Coarse material portion, m-% (length of a particle, mm)	Maximum length of particles ^b , mm	Maximum cross-sectional area of the coarse material portion ^c , cm ²
P16S (3.15 < P \leq 16) mm	$\leq 15\%$	$\leq 6\%$ (> 31.5 mm)	≤ 45 mm	≤ 2 cm ²
P31S (3,15 < P \leq 31,5) mm	$\leq 10\%$	$\leq 6\%$ (> 45 mm)	≤ 150 mm	≤ 4 cm ²
P45S (3,15 < P \leq 45) mm	$\leq 10\%$	$\leq 10\%$ (> 63 mm)	≤ 200 mm	≤ 6 cm ²

^a The numerical values (p class) of the measurements refer to the particle sizes that fit through the specified size of the sieve openings (ISO 17827-1). The lowest possible class of properties should be specified. For wood chips only one class must be specified.

^b Length and cross sectional area need only be specified for the particles in the coarse material portion. In a sample of around 10 l, only maximally 2 pieces may exceed the maximum length if the cross sectional area is < 0.5 cm².

^c It is recommended to use a transparent set square for measuring the cross sectional area, to arrange the particles orthogonally (perpendicular) behind the set square and to estimate the maximum cross sectional area using the cm² grid.

Table 4: Normative specifications according to ISO 17225: Dimensions

4.1.3.1 Quality requirements

Target condition of wood chips

- As dry as possible
- NO masonry or plaster particles, no foreign objects, rocks, pieces of metal, etc.
- NO larger pieces of wood,

Wood chips do not equal wood chips!

01		02	
14% water, spruce, conforming to standards, usable energy: 94%		16% water, spruce, excessive fine content (>20%), usable energy 83%	
03		04	
18% water, deciduous wood, conforming to standards, usable energy 89%		20% water, coniferous wood, shredder wood spiky (old wood), usable energy 77%	
05		06	

24% water, spruce, increased bark content (>2% ash), usable energy 78%



26% water, spruce, increased fine content (>20%), usable energy 76%



28% water, deciduous wood + pine, excessive fine content and bark, usable energy 74%



34% water, coniferous wood (spruce), conforming to standards, usable energy 68%



THIS IS NOT A FUEL!

40% water, coniferous wood (spruce), excessive fine content and bark (>20%), 40-60% of the energy is expended for evaporating water! Cannot be stored – mould growth!

THIS IS NOT A FUEL!

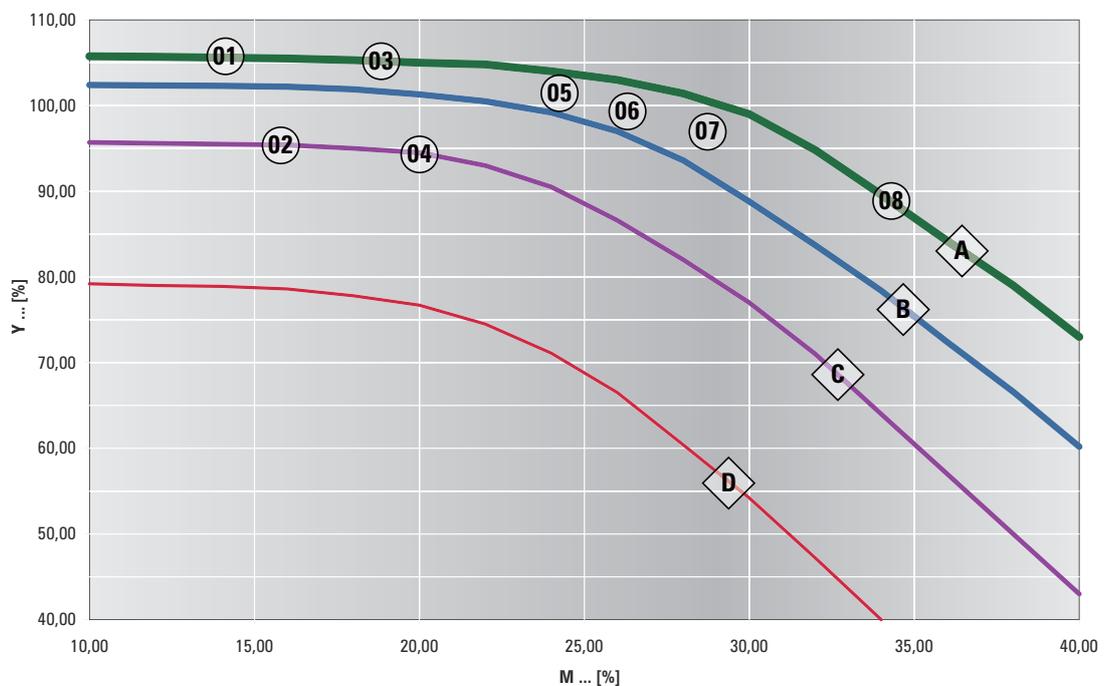
WARNING – TOXIC GASES DUE TO CONTAMINANTS!

Plastic, coated press-board panels, glued wood ...

Specified values for the samples:

1. Specification: Water content in % in the fuel, based on total mass of the wet fuel (example for sample 1: 1 ton of this fuel contains 140 l of water)
2. Specification: Wood type/quality: the energy density of deciduous woods is greater than that of coniferous woods; high proportions of bark and rotten wood have a negative effect
3. Specification: grain distribution: Proportion of small to large wood chips

4.1.3.2 Output with different water content



Y Boiler performance in %

M Water content in %

01 - 08 ... Wood chips examples as in the table above

A ... Standard wood chips EN 14961-1

B ... commonly used wood chips

C ... of medium quality

D ... low quality

4.1.3.3 Fuel consumption and storage room size

Generally, a storage room should fit the fuel of an entire heating period.

Heating load, building [kW]	Consumption per year [m ³ /a]	Storage room size for annual requirement [m ³]
20	50	74
30	75	111
40	100	148
50	125	185
60	150	222
80	200	296
100	250	370
120	300	444

Calculation basis for the table:

- The calculation is based on an annual consumption of 1,500 full load hours per year
- Usage: 2.5 m³ wood chips per kW heating load
- Storage room volume: 3.7 m³ per kW heating load
- Wood chips with 25% water content and size P16S according to EN 14961-4

Table 5: Estimated fuel consumption – estimated storage room size

Conversion factors stacked cubic meter (stere) – solid cubic meter – cubic meter of loosely poured wood chips

There are some simple rules of thumb to estimate the quantity of wood chips that accumulate after chopping. Wood chips are measured in cubic meters of loosely poured wood chips (srm).

- 1 stacked cubic meter of wood = ~1.75 srm wood chips
- 1 solid measure of timber = ~2.50 srm wood chips

Storage room height

Please observe the rule that the fill height may be no more than 1.5 times the storage room diameter. In the event of higher fill heights, the wood chips start forming bridges which may lead to failures in the fuel conveyance!

4.1.4 Buying pellets

What are the options for pellet deliveries?

Pellets are usually delivered by a silo truck that injects the pellets into the storage room. In case of low fuel consumption, the fuel maybe delivered in sacks.

How should I store pellets in sacks?

They should be dry and protected!
(This should also be guaranteed by the intermediary!)

What do I need to remember when buying pellets?

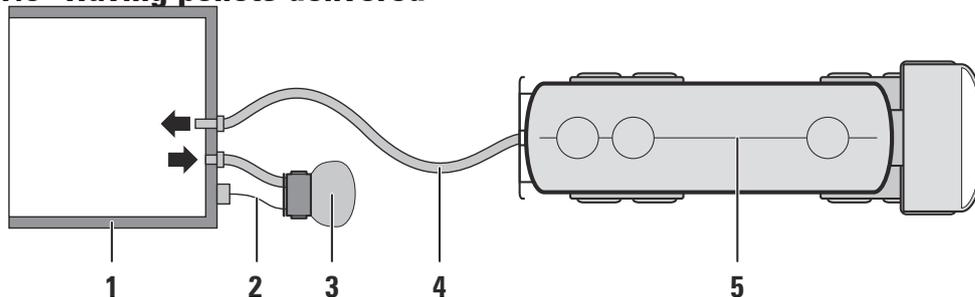
We require the use of ENplus-certified pellets. This ensures that you operate a low emission heating system and also the reliable operation of the system.

How do I recognize good quality pellets?

Good pellets are easily recognizable by their shiny and smooth surface without cracks.

All pellets should have about the same length, there should be no contamination with foreign objects or mixing with other pellet types.

4.1.5 Having pellets delivered



- | | |
|---|------------------------------------|
| 1 Storage room | 3 Dust sack |
| 2 Junction box with voltage supply 230 V / 16 A to connect the extraction unit to the dust sack (3) | 4 Injection hose, max. length 30 m |
| | 5 Pellet truck |

Which requirements apply with respect to the silo truck?

- The access road for heavy trucks must have a min. width of 3 m and a clearance height of at least 4 m.
The access road must remain accessible for heavy trucks even after heavy rainfalls!
- As a rule, the delivery truck will be equipped with hoses with a total length of 30 m. This is how close the vehicle must get to the filling nozzle.
In cases of doubt, make sure to discuss larger distances with your supplier already during the ordering process.
- Every meter of hose and every curve increases the proportion of fine particles in the storage room filling: Keep the filling hoses as short as possible (< 10-15 m), use the fewest possible number of direction changes and avoid redirecting the hoses >45°.
- There must be an easily accessible injection nozzle close to the outer wall.

Max. hose length for filling the pellet box

- The max. length for filling the pellet box is specified at 20 m.

What to do with the pellet dust?

- ↪ The dust is extracted from the pellet storage room simultaneously with the pellet injection. The extraction fan with dust sack is provided by your pellet supplier.
- ⇒ For the extraction fan power supply: Ensure that an electrical outlet (230 V AC, 16 Ampere) is located close to the filling nozzles.

KWB offers a house connection box with automatic safety shutdown of the pellet heating system (Art. No. 13-1000534).

If you operate a KWB Multifire type ZI with pellets, KWB offers a specifically adjusted house connection box with automatic safety shutdown (Art. No. 13-2000427).

4.1.6 Filling / refilling with fuel

- Check the storage room before filling:
 - Are the conveyor system components in the storage room in good condition?
 - Is the storage room dry?
- ⇒ You must comply with: Safety in the storage area [▶ 47].
- ⇒ Check the quality of the fuel (Fuel pellets [▶ 40], Fuel wood chips [▶ 41]).

Target condition pellets

Absolutely dry.

Target condition wood chips

Mostly dry and no large wood pieces.

No masonry or plaster particles. No foreign objects, rocks, pieces of metal ...

If the system is not filled in due time, an alarm appears:

- 02.14 Fuel storage empty! [► 96]
- 02.15 Fuel container is empty! [► 96] (only applies to KWB Multifire with hopper)

Filling the storage room with pellets**⚠ WARNING****Danger of suffocation due to gas**

- ↳ In extreme cases, increased concentrations of toxic gases may occur in the fuel storage room (e.g. carbon monoxide).
- ↳ Breathing in too much carbon monoxide represents a risk for your health.
- ⇒ Please turn off the heating system at least one hour before entering the room!
- ⇒ Air out the fuel storage room for at least 15 minutes before entering - and keep it ventilated during your presence in the room!
- ⇒ Ensure that a second person is present to monitor the activities! This person must be stationed outside of the storage room!
- ⇒ Also, in the event of storage rooms that are only accessible from above or are difficult to access the person entering the storage room must be additionally secured.



- ⇒ Switch the system off 1 hour before filling (Comfort 4: Boiler On/Off [► 66]).
- ⇒ Seal the openings of the fuel storage room so they are dust-tight!

⚠ WARNING**Dust explosion due to static load**

During the filling, the dust proportion is very high in the air.

- ⇒ You must ensure that all components of the filling system have been connected in a conductive manner and have been earthed!

Note: Only certified retailers fill your storage room according to standard regulations (dust proportion after the injection into the storage room: <2% for pellets).

Filling the storage room with wood chips

The compacting of wood chips in the storage room is NOT permitted - the conveyor system CAN NOT hold the vehicle!

- ↳ The maximum fill height depends on the fuel and the storage room diameter.
The fill height is approx. 1.5 times of the storage room diameter.
- ⇒ Switch off the plant via the control system (System on/off).
- ⇒ Then fill the storage room to a max. height of 2 m.
- ⇒ Switch on the plant again by means of the control system.
- ⇒ Start the measuring operation ("chimney sweep button") and select nominal load measuring at the control unit. Wait until the stirrer turns and the stirrer arms retract.
- ⇒ Press the ↻ button after a successful ignition and end the measuring mode.

Only for MF2 D

- Only for MF2 ZI ⇒ Change the menu Conveyor system [▶ 66] and activate the command Fill manually so that the stirrer turns and the stirrer arms retract.
- ⇒ Switch off the plant via the control system.
- ⇒ Now you can completely fill the storage room.

Please also see

- 📄 Switch on/off [▶ 66]
- 📄 Fuel pellets [▶ 40]
- 📄 Fuel wood chips [▶ 41]

4.1.7 Safety in the storage area



Fig. 5: Symbol representation

- ⇒ Please ensure that a warning sticker is **permanently** and **legibly** attached at the entrance to the pellet storage room pointing out dangers and correct behaviour!
- ⇒ For the sake of your own safety you must comply with the locally applicable fire protection regulations (TRVB H 118 or similar locally applicable provisions) with respect to walls, ceilings and doors and comply with all requirements for safety devices!
- ⇒ The pellet storage room must be designed based on ÖNORM M 7137.

Ventilation storage room

ÖNORM M 7137 requires ventilation of fuel storage rooms to prevent hazardous carbon monoxide concentrations.

- ⇒ Ask your pellet supplier to carry out the following inspections:
 - Inspect the seals of the covers: Do they function properly?
 - Fasten of the cover only with the respective special tools: turn to the stop (= torque approximately 10 Nm).
An even pressure on the sealing can only be ensured only if four key ribs are locked at the cover – two ribs may result in leaks due to uneven pressure!

Version A (recommended!): Injection connectors lead to the outside

- ⇒ Use a sufficient number of KWB injection connectors with ventilation opening (20 cm² each).

Required conditions		Number of injection connectors
Ventilation line ≤ 2 m	Storage volume ≤ 10 t	2
Ventilation line ≤ 2 m	Storage volume > 10 t	3
Ventilation line > 2 m		3

Version B (not recommended!): The injection connectors lead to the interior of the building

- ⇒ Seal the ventilation openings of the injector connection caps: No CO gases should reach the building's interior!
- ⇒ Ensure air extraction to the outside via a separate ventilation opening.
- ⇒ Please note that this ventilation opening must be dust-tight and pressure-resistant during filling, but that a subsequent ventilation must be possible.

4.1.8 Storage room maintenance

Note: For a quick visual inspection, KWB offers door protection planks with an inspection window (Art. No.: 24-2000167).

NOTE**Clean fuel storage room for reliable operation**

- ⇒ Keep your storage room, the conveyor system and the heating system clean and dry - periodically perform all the inspections and maintenance work!
- ⇒ We recommend emptying the storage room completely from time to time. This should occur at least every 2 years for the KWB sampling probes!
- ⇒ Doing so will reduce the risk of a dust explosion and simultaneously improves the reliability of the heating system.
Tip: Perform this task in spring.

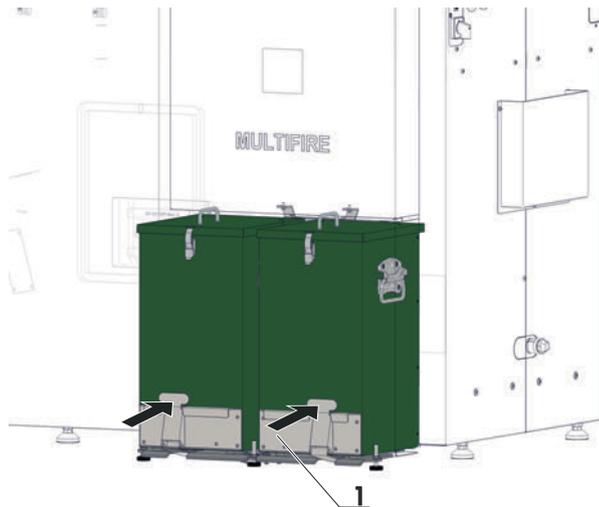
Protect from moisture

Pellets immediately swell when they come into contact with water or moist walls and floors. These moist pellets decompose and become useless. At worst, they can jam the conveyor system.

4.2 Ash container**4.2.1 Removing the ash container****⚠ WARNING****Do not open/remove ash container during operation!**

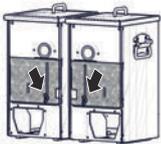
As soon as the ash container is removed, the fuel conveyance is stopped and the combustion is shut down. This may lead to undesired effects during operation (increased exhaust gas and soot generation).

- ⇒ First, switch off your system in the menu via the "System On/Off" option.
- ⇒ Press the foot pedal down at the front of the ash container [1].



⇒ Pull the ash container straight off from the front. This triggers an alarm:
KWB Comfort 4: 02.02 The ash container was incorrectly installed [► 94]

⇒ Push the plate on the back of the ash container (picture) over the channel opening and secure this plate using the two wing screws.



4.2.2 Emptying the ash container

⚠ WARNING



Risk of fire and injuries due to hot embers!

- ⇒ Only empty the ash into a heat-resistant container!
- ⇒ Only empty out cold ashes!



37

- ↪ **Attention:** An ash container filled right to the edge can be as heavy as 36 kg.
- ⇒ Mind the weight of the filled ash container before moving the ash container! Lift correctly!
- ⇒ Remove the cover for emptying (can be removed without tools).
- ⇒ After you have emptied the ash container, ensure that the cover seals tightly again! If required, replace the sponge rubber seal on the underside of the cover.

4.2.3 Reattaching the ash container

- ⇒ Open the plate at the rear of the ash container.
- ⇒ Slide the ash container onto the system.
- ⇒ Lock the ash container with the lever at the front. Push the lever upward.
- ⇒ The system detects the fitted ash container, switches on again and switches to the most recent active operating mode.

- ⇒ The alarm message disappears automatically as soon as the ash container has been properly installed.

4.2.4 Ash

- ⇒ Regularly check the fill level of the ash container.
- ⇒ If you want to avoid the large weight of a filled ash container, make sure to empty it before it is completely filled.

4.2.4.1 What is ash?

The accumulating ash contains the residues of the fuel in concentrated form.

Disposing of the ash

- ⇒ Ask the competent municipality regarding the correct disposal of the ash!
- ⇒ Comply with their instructions.

Incomplete combustion

Well-burned ash is grey and fine-powdered. Should you discover partially burned fuel on the revolving grate or in the ash container, this may be a sign of incomplete combustion – and it is in your interest to have customer service correct it!

4.2.4.2 Ash quantity

Pellets: For a certified quality, a fuel amount of 100% incurs ~1.0% total ash.

Wood chips: When using wood chips, a fuel amount of 100% incurs for the quality categories

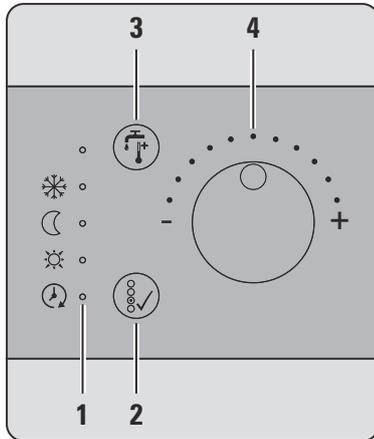
- A1 ≤ 1%
- A2 ≤ 1,5 %
- B1 ≤ 3 %

of total ash.

5 Basic control unit

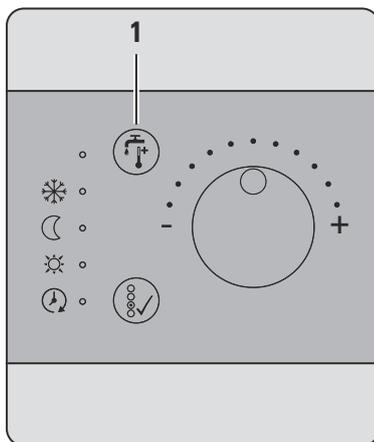
The Basic control unit operates without touch screen and graphic user interface – two buttons and a dial are all it takes to change the main functions.

5.1 Basic control unit operating elements



- | | |
|---------------------------|--------------------|
| 1 LED bar | 3 Heat DHW 1x |
| 2 Program selector button | 4 Temperature dial |

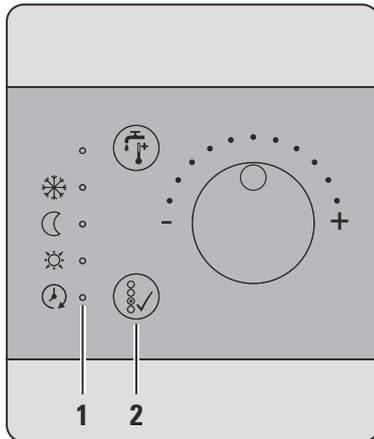
5.2 Heat DHW 1x



You can activate the function "Heat DHW 1x" via the Basic control unit [BGB] if the DHWC temperature is too low.

- ⇒ Push the button "Heat DHW 1x" (1).
The button will light up.
- ⇒ Push the button once more to end the function at any time.
The button light will turn off.
- ⇒ Once the target temperature specified in the menu DHWC [▶ 59] has been reached, the button light will turn off.

5.3 Select program

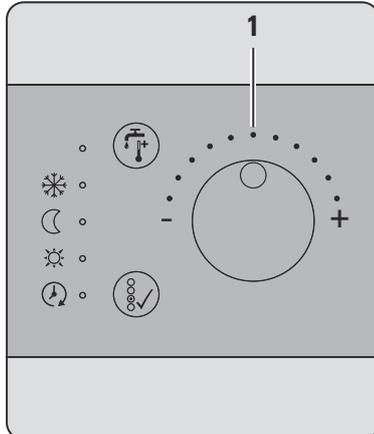


When in normal operation, the Basic control unit will indicate the current program with a green LED (1).

- ⇒ The control unit switches to the next program on the list every time you push the program selector button (2): Frost protection | Reduct | Comfort | Automatic. When you press the button once more at the end of the list, the program selection will restart with the first program.

NOTE: If none of the LEDs are lit, then the program at the Exclusive control unit at the boiler has been switched off or the Basic control unit has been de-energised.

5.4 Selecting the room temperature



- ➔ The Basic control unit contains an integrated temperature sensor whose readings are used to control the heating system.
- ➔ You can increase or decrease the room temperature setpoint by max. 5°C using the temperature dial (1). In the temperature dial's neutral position (see illustration), the system heats to a room temperature setpoint specified at the Exclusive control unit at the boiler.
- ⇒ Turn the temperature dial to the left to lower the room temperature. Every point on the scale corresponds to one degree Celsius.
- ⇒ Turn the temperature dial to the right to increase the room temperature. Every point on the scale corresponds to one degree Celsius.

Party mode

The Basic control unit has no option that permits activation of the party mode. If you want to maintain the comfort temperature beyond the end of the specified heating time, you need to activate the "comfort" program.

Do not forget to reset the program back to its initial position later!

5.5 LED meanings

LED flashes
slowly

A slowly flashing LED (3 sec on, 1 sec off) does not display a fault, but indicates special programs: The Basic control unit [BGB] thus indicates that either the party mode, holiday program or the screed program is active.

A full list you will find in **section** Meaning of the LEDs at the Basic control unit [BGB] [► 90].

6 KWB Comfort 4 functions

Below, we describe the menus and options of the KWB Comfort 4. If you are unsure about their application, please ask your heating technology partner or KWB customer service **first** before you change any values!

6.1 Heating circuits

Configuring the heating circuits is an essential part of the adjustment of the entire heating system.

Every heating circuit is a separate and closed water circulation in a heating system: A pump transports the heating water ("forward flow") to the consumers (radiator, floor or wall heating ...); the water dissipates the heat at this point and flows cooled down back into the boiler ("return flow") where it will be reheated.

When you configure the heating circuits, please take into account:

- Before **every** command, you must select the heating circuit that is to be affected by the command! (Exception: There is only one heating circuit.)
- All your commands only affect this **one** heating circuit!

The control system works with two setpoint temperatures that need to be maintained at specific times:

- "Comfort temperature": room temperature for a comfortable ambient temperature
- "Reduction temperature": Reduced temperature for lower energy use
This is often called "night lowering".

Better to check twice whether you have selected the correct heating circuit before you execute a command or before changing any values!

6.1.1 Room temperature

If the heating control does not reach the desired room temperature, you have several options to increase or decrease the temperature:

- Change the setpoint room temperature
- Move the heating curve root point (you will find more details on the heating curve on one of the following pages!)
- Check the sensor position for the room temperature and of the sensor for the outside temperature and move their positions, if required.

Adjust the room temperature

⇒ Start by defining the values for the comfort or reduction temperature (Heating circuits >> *Select heating circuit* >> Room temperature).

For comparison, the screen also displays the currently measured temperature in the room (actual temperature). This value, however, is only displayed when an actual room sensor is connected! (Without a sensor, the display shows "not available".)

To determine whether the control is using the comfort or the reduction temperature, or the frost protection temperature due to a shutdown, select Operating mode >> Heating circuits >> *Select heating circuit* in the menu.

Both target values are valid immediately, but the implementation depends on the current operating mode.

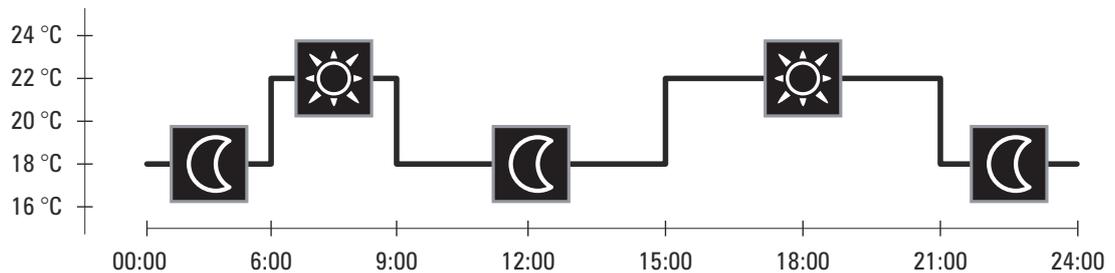
6.1.2 Heating program

You can generally specify the heating system's behaviour via the heating program.

- In the menu Heating circuits >> e.g. HC 1.2 Floor >> Heating program you can select one of 5 heating programs:
Automatic | Frost protection | Off | Comfort | Reduction
- You can in addition access the two programs via the shortcut button "select program":
frost protection | reduct | comfort | automatic | party | holiday

The right program for every need

- Frost protection: The heating circuit switches off when the measured outside temperature exceeds the specified values. This basic setting can be defined in the Frost protection menu.
- Reduct: The heating circuit always remains on the reduction temperature.
- Comfort: The heating circuit always remains on the comfort temperature.
- Automatic: The heating circuit switches between comfort and reduction temperature at specified times and is switched off when certain outside temperatures [▶ 56] are reached.

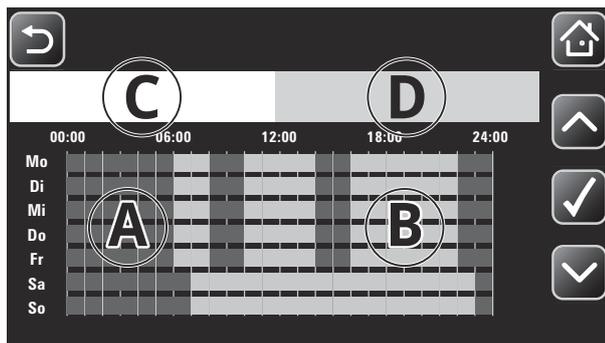


- Off: The heating circuit will no longer send heating requests.
Warning: This heating program does NOT contain frost protection!
- Party: The party program [▶ 56] extends the comfort temperature mode one time.
- Holiday: The holiday program [▶ 56] maintains a specific temperature during a defined time period.

6.1.3 Heating times

The setting heating circuits >> *select heating circuit* heating times shows at what times the KWB Comfort 4 will switch to reduction temperature and comfort temperature if the "automatic" program is active.

Overview



A Times with reduction temperature (dark)

C Overview

B Times with comfort temperature (light)

D Change times

Heating times

- ⇒ If you want to change the displayed times, select the button Change times and decide to which time period the change should apply:
- For all working days: Monday – Friday
 - For every day of the week: Monday – Sunday
 - For each individual day: Mon Tue Wed Thu Fri Sat Sun

⇒ Only then you can define a maximum of 3 time periods in which the control is to heat to the comfort temperature.

Confirm the new time periods by selecting the button transfer values.

⇒ If you do not want to use a specific time period, set the values for On and Off to the same time: The KWB Comfort 4 will then detect this time period as an empty entry.

6.1.4 Party mode



Select party mode when you want to keep the room temperature at the comfort temperature for longer as an exception. This works in all KWB Comfort 4 programs.

If the party mode is active, the green circle appears in the touch button.

After the period specified in heating up to, the KWB Comfort 4 switches back to the previously selected program.

6.1.5 Holiday program



Activate the holiday program if the heating should maintain a specific room temperature (temperature) for a certain period of time. First, define the end and subsequently the start of the holiday program.

The control remains in the current program until the specified start date has been reached. Only then, the green circle appears in the touch button.

After the specified end of the holiday program, the control switches back to the previously selected program (at 00:00 midnight).

If you want to **prematurely** end the holiday program, switch the function to Off.

6.1.6 Settings

⇒ Heating circuits >> *Select heating circuit* >> Settings

6.1.6.1 Outside temperature switch-off

In the menu under Heating circuits >> *Select heating circuit* >> Setting

If the setting Switch-off active is set to On AND the heating program "Automatic" is active, then the heating circuit will switch off as long as the measured outside temperature exceeds the heating limit (comfort/reduction operation).

The status shown is "outside temperature-dependent deactivated."

If the outside temperature is to be averaged over a configurable time period, the parameter Mean value calculation must be set to On.

If the averaged outside temperature falls below the set limit value by -0.5°C , the heating circuit switches to the specified heating program. If the averaged outside temperature rises above the set limit value by $+0.5^{\circ}\text{C}$, the heating circuit switches Off again (status: "Outside temperature-dependent deactivated").

Outside temperature averaged shows the actual averaged outside temperature, time period, mean value shows the time period set for all heating circuits under Basic settings >> Outside temperature sensor >> Time period, mean value HC.

The time period for the mean value calculation for all heating circuits can be set under Basic settings >> Outside temperature sensor >> Time period, mean value HC.

6.1.6.2 Operating values

Specify forward flow temperatures

You can specify the two limit values for the heating circuit via the values temperature max. (factory setting: 50 °C) and temperature min. (usually: 20 °C).

Taking the room influence into account

A precondition for this is an existing room temperature sensor!

The room influence factor indicates to what degree the room temperature should be taken into account in the calculation of the forward flow temperature setpoint.

- ↳ The factory setting is "0", i.e. the room temperature is NOT taken into account.
- ⇒ Enter a factor between 0 and 10 if the heating circuit comprises a room temperature sensor. The value 10 stands for a change of 2.5 °C.

Example: If the actual room temperature is greater than the setpoint room temperature by 1°C, the control calculates a lower forward flow temperature for a setpoint room temperature which is 2.5 °C lower at "10" room influence.

When in "frost protection" mode, the heating circuit is only really switched off if the room influence is >1 and the room temperature has been reached.

Activate ECO operation

Sensor

A precondition for this is an existing room temperature sensor!

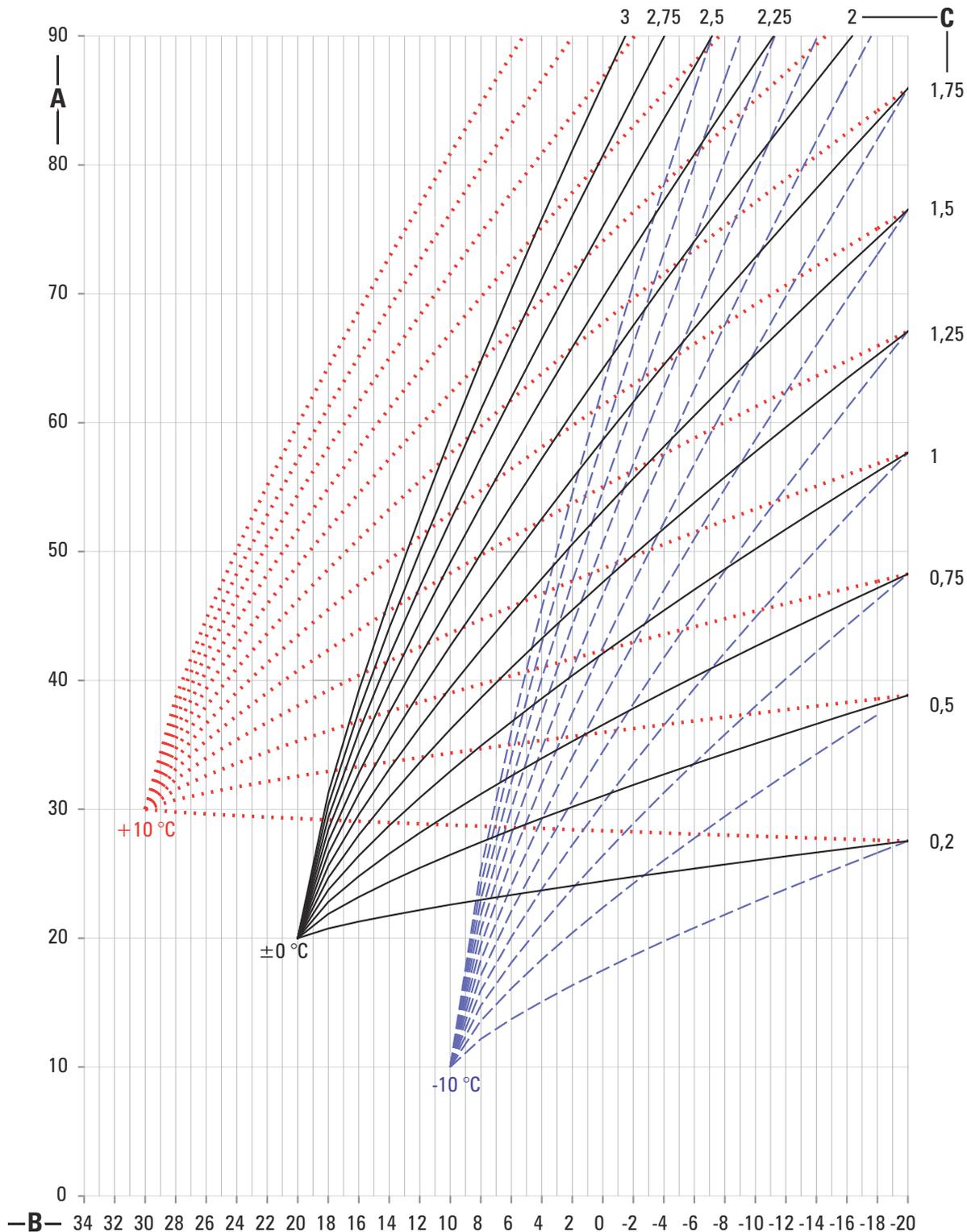
You can adjust the reaction speed to temperatures via the Eco operation setting.

- ⇒ Select Always | In comfort mode | In reduction mode to increase reaction speed and reduce heating times:
 - The heating circuit pump will switch off if the actual room temperature is above the setpoint room temperature by the value of the setting Hysteresis off.
 - When the actual room temperature is below the setpoint room temperature by the value of the setting Hysteresis off, the heating circuit pump will switch on again.
- ⇒ Select Off to ensure that the heating circuit pump runs independently of the current room temperature. This is a recommended setting for floor heating systems.

Adjust the heating curve

The KWB Comfort 4 calculates the required forward flow temperature for the heating circuits based on the measured outside temperature, the room temperature setpoint, the room influence factor, the specified heating curve slope and the specified root point offset.

Adjust the heating curve slope and the specified root point offset to your home's real conditions (size and temperature range of the radiators, building insulation, ...) to utilize the generated heat as efficiently as possible.



A	Forward flow temperature [°C]	B	Outdoor temperature [°C]	C	Slope
---	-------------------------------	---	--------------------------	---	-------

Slope

The slope of the heating curve determines how strongly the outside temperature influences the change in the forward flow temperature.

Example: A value of 0.5 means that an outside temperature change of ± 1 °C will on average trigger a ± 0.5 °C change in the forward flow temperature. The specified slope depends on the used heating system and the heat requirements of the rooms.

Root point

By offsetting the root point you specify the heating system's starting value. KWB Comfort 4 allows an offset by ± 10 °C.

Sequence

High forward flow temperatures (radiators)	Low forward flow temperatures (floor/wall heating)
1.2–1.6	approx. 0.5

Table 6: Typical values for a heating curve slope

In reality, it is impossible to calculate the perfect setting; it can only be approximated by making incremental adjustments. The goal is a heating curve that is as flat and low as possible where the generated heat is just barely sufficient to heat the house.

- ⇒ Open the thermostat valves for the observed reference range: This should be the coldest, least favoured space.
- ⇒ Is it always too warm or too cold?
Move the entire heating curve (root point AND slope!) down or up.
Since buildings are very slow to react, you should change the values not more frequently than every 2 days by max. 10% or 0.2 units.
- ⇒ Is it too cold in winter, but it is the right temperature during the transition time?
Increase the slope of the heating curve to trigger a stronger forward flow temperature increase when the outside temperature drops.
Change the slope not more frequently than every 2 days by max. 0.2 units.
- ⇒ Is it too cold during the transition time, but just right in winter?
Change the root point to trigger a stronger increase in forward flow temperature when the outside temperature increases.

6.1.7 Screed program

A screed program is integrated in the KWB Comfort. The screed program accelerates the drying of the screed and helps dissipate tension in the screed layer.

- ⇒ Contact your heating system company in this respect.

6.2 DHWC

A DHWC is the storage container for hot water. By using a number of parameters, you can specify the times during which the hot water is heated as well as the minimum and maximum temperatures.

6.2.1 When is the domestic hot water heated?

You can specify how the selected DHWC is generally charged (heated up) via a domestic hot water (DHW) program. You can choose between the programs Time | Temp. | Off.

Note: In the KWB EmpaCompact and KWB EmpaWell the settings in the Buffer temperature >> DHW temperature min. apply.

Program Time

- ⇒ DHWC >> *Select DHWC* >> Program

In the "Time" program, the control monitors whether the minimum temperature is undershot at the sensor during the specified charging times. In this case, the DHWC will be charged until the maximum temperature is reached at the sensor.

Tip: This time program is primarily suited for DHWCs that are additionally heated via solar power.

Charging times

You can specify the charging times for every individual day, for weekdays or jointly for all days in the menu DHWC >> *Select DHWC* >> Charging times.

Specify when each DHWC is to be heated up. Adjust the times to your individual daily routine.

Charging time	On	Off	On	Off
Monday	16:00	20:00	20:00	20:00
Tuesday	16:00	20:00	20:00	20:00
Wednesday	16:00	20:00	20:00	20:00
Thursday	16:00	20:00	20:00	20:00
Friday	16:00	20:00	20:00	20:00
Saturday	16:00	20:00	20:00	20:00
Sunday	16:00	20:00	20:00	20:00

Table 7: Factory settings - Charging times for DHWC

If you do not want to use a specific charging time, set the values for "On" and "Off" to the same time: The control will then detect this time period as an empty entry.

When the switch-off time has been reached, any initiated charging process is terminated.

Program Temperature

⇒ DHWC >> *Select DHWC* >> Program

The program "Temp." has no charging times: The DHWC is **always** heated to the maximum temperature at the sensor if the temperature falls below the minimum temperature at the sensor.

Activate this program if domestic hot water is to be available **at all times**.

Program off

⇒ DHWC >> *Select DHWC* >> Program

In the setting "Off", the automatic charging of the DHWC is switched off.

Select this setting, if you are not going to use the DHWC for a longer period of time.

In the program "Off" the legionella protection function is NOT performed and there is also no frost protection!

Heat DHW 1x



If the DHW is to be heated IMMEDIATELY (regardless of the current water temperature, the active program and the saved charging times), select in the menu DHWC >> *Select DHWC* >> Heat DHW 1x.

This function is not working ...

- ... if the maximum temperature has been exceeded.
- ... if the heat source is blocked or switched off.

Specify temperatures

In the menu DHWC >> *Select DHWC* >> Temperature, you can specify the generally used values for the Minimum temperature and maximum temperature. Additionally, the currently measured DHW temperature ("Temperature actual") is displayed. The actual domestic hot water (at the tap) depends on the potential downstream mixer valve and/or the sensor position in the storage tank.

The setting frost temperature defines the setpoint temperature during a holiday.

Please also see

📖 Chimney sweep function procedure [▶ 67]

6.2.2 Setting the Legionella protection

You can specify the day on which the DHWC temperature is increased to 65°C (factory setting) to kill the legionella bacteria in the menu DHWC >> *Select DHWC* >> Legionella protection.

The Legionella protection starts ...

- weekly
- only once on this day
- at the latest at 20:00 hours (8:00 p.m.)
- while the DHWC is being charged at any rate

Off

The Legionella protection is switched off in the setting Off (factory setting).

⇒ Increase the specified Legionella protection temperature, if required.

6.2.3 Set and activate holiday program

If you want to switch the DHWC off for a certain period of time you can activate the function in the menu DHWC >> *Select DHWC* >> Holiday program.

If the function is activated, you can specify time period and temperature.

- The DHWC is switched off on the day saved as the Start day.
- At 00:00 hours (12:00 a.m. or midnight) of the day saved as end day, the control will automatically activate the previously specified DHW program.

The setting Temperature defines the setpoint temperature during the holiday.

6.2.4 Circulation pump

In the menu DHWC >> *Select DHWC* >> circulation pump you can specify the program and settings for the circulation pump.

Program

In the setting Program, you can choose between Off | Automatic | Continuous operation.

In the automatic setting, the control starts the circulation pump only within the time windows specified in the menu runtime, when it is in continuous operation it will always start it.

If the with sensor option is active in the menu Basic settings >> Network settings >> DHWC, then the circulation pump will run only until the specified shutdown temperature has been reached. The pump restarts in 15-minute intervals.

The manual start of the circulation pump by pushing a button is independent of the selected program.

Runtimes

Under Runtime you can define 3 time windows during which the circulation pump is started.

6.3 Buffer storage tank

A "Buffer storage tank" is a storage tank for the heat that a boiler releases.

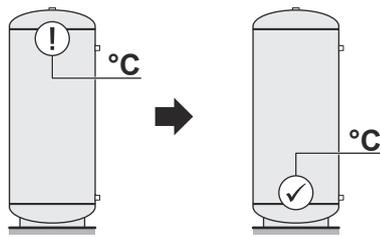
6.3.1 When will the buffer storage tank be charged?

You can specify via a buffer storage tank program how the selected buffer storage tank is generally charged (heated). In the menu Buffer storage tank >> *Select buffer* >> Buffer program you can select between Time | Time+ | Summer | Temperature | Off.

Modulating buffer operation

With an **activated modulating buffer operation**, the **boiler output** is determined/modulated based on the buffer fill level. See Buffer storage tank [► 69].

Program Time



In the program "Time", the control system monitors during the saved charging times whether the minimum temperature was reached at the upper sensor or whether the highest requested consumer temperature has been undershot. In this case, the buffer storage tank will be charged until the maximum temperature is reached at the lower sensor (S4 or S5).

Tip: This time program is primarily suited for buffer storage tanks that are additionally heated via solar power.

Charging times You can specify the charging times for every individual day or jointly for all days in the menu Buffer storage tank >> *Select buffer* >> Charging times.

Specify for each buffer storage tank when it is to be charged. Adjust the times to your individual daily routine.

NOTE! No charging will occur outside of these charging times (except solar charging).

Charging time	On	Off	On	Off
Monday	00:00	23:59	23:59	23:59
Tuesday	00:00	23:59	23:59	23:59
Wednesday	00:00	23:59	23:59	23:59
Thursday	00:00	23:59	23:59	23:59
Friday	00:00	23:59	23:59	23:59
Saturday	00:00	23:59	23:59	23:59
Sunday	00:00	23:59	23:59	23:59

Table 8: Factory settings - Charging times for buffer storage tanks

If you do not want to use a charging time period, set the values for "On" and "Off" to the same time: In this case, the control will recognize this period as an empty entry.

Program Time +

Works like the time program. However, consumer requests (outside of charging times!) are fulfilled if the buffer cannot fulfil these requests.

Program Temperature

The program "Temperature" has no charging times.

The buffer storage tank is heated up if ...

- the buffer temperature is lower than the highest requested temperature from the heating circuits or the DHWC ... or ...
- the minimum temperature at the upper sensor ("actual temperature 1" or "actual temperature 3") was undershot.

The charging continues until the specified maximum temperature is reached on the lower sensor ("actual temperature 4 or 5").

The minimum temperature is always maintained even if there is no heat request from the consumers.

Program off

In the setting Off, the automatic charging of the buffer storage tank is switched off.

Summer program

In the setting Summer, the automatic charging of the buffer storage tank is switched off.

If a consumer places a request, however, the boiler will heat up the buffer storage tank until the upper sensor temperature reaches the consumer's setpoint temperature. The buffer will not be fully charged, however, i.e. the lower setpoint temperatures remain disregarded.

Setting temperatures

You can specify the generally used values for Minimum temperature and maximum temperature in the menu Buffer storage tank >> *Select buffer* >> buffer temperature.

DHW temperature min.

Option

In buffer storage tanks with integrated domestic hot water generation (KWB Empa-Compact, KWB Empa-Well ...), this temperature determines which temperature the buffer storage tank should at least maintain at sensor 1 to ensure that sufficient hot water is available.

Charging is stopped if the min. temperature at sensor S1 is exceeded by 10 °C.

Exception: No charging will be performed in the buffer program Off!

Legionella protection

In the menu Buffer storage tank >> *Select buffer* >> Legionella protection, you can specify the day on which the buffer tank temperature is increased to 65°C (factory setting) to kill the bacteria.

The Legionella protection starts ...

- weekly
- only once on this day
- at the latest at 8:00 p.m.
- during the regular charging process of the buffer storage tank

Off

The Legionella protection is switched off in the setting Off (factory setting).

⇒ Increase the specified Legionella protection temperature, if required.

Please also see

📖 Operational state [▶ 67]

6.3.2 Circulation pump

In the menu Buffer tank >> *Select buffer tank* >> circulation pump you can specify the program and settings for the circulation pump.

Program

In the setting Program, you can choose between Off | Automatic | Continuous operation.

In the automatic setting, the control starts the circulation pump only within the time windows specified in the menu runtime, when it is in continuous operation it will always start it.

If, however, the option with sensor is active in the menu Basic settings >> Network settings >> Buffer tank, then the circulation pump will run only until the specified shutdown temperature has been reached. The pump restarts in 15-minute intervals.

The manual start of the circulation pump by pushing a button is independent of the selected program.

Runtimes

Under Runtime you can define 3 time windows during which the circulation pump is started.

6.4 Solar

6.4.1 Solar program

In the Solar program menu, you can choose between Automatic | Manual op. | Off.

- Automatic (factory setting)

Select this program, if the charging of the storage tank(s) is to be carried out automatically based on the specified temperature differentials.

- Manual mode

The "manual mode" is only to be used by a certified technician for brief functional tests or during commissioning! During this process, both outputs (pump | valve) are activated. The current temperatures and selected parameters no longer play a role. There is a risk of scalding or serious system damage.

- Off

If the operating mode "Off" is activated, all control functions are switched off. This may lead to overheating at the solar collector or other system components. The measured temperatures will continue to be displayed to provide an overview.

6.4.2 Operating values

In solar diagram 3 (2-storage tank switchover), the control system first shows a list of the available storage tanks.

Storage tank 1

Storage tank 2

6.4.2.1 Storage tank 1 + 2

Differential control

There is a separate adjustable maximum storage tank temperature for solar charging per storage tank. It can be set in Menu >> Solar >> Operating values >> Storage tank 1 >> Temperatures >> Maximum temperature >> e.g. 60°C.

In Menu >> Temperatures, you can select the values "Temperature differential On" and "Temperature differential Off".

"Automatic" program

Charging **starts** when

- the collector minimum temperature has been exceeded and
- the switch-on differential "Temperature differential On" between collector and storage tank has been exceeded and
- the maximum storage tank temperature has not been reached yet.

Charging **stops** when

- the collector minimum temperature has been undershot or
- the maximum storage tank temperature has been reached or
- the switch-off differential "Temperature differential Off" between storage tank and collector is undershot.

Temperatures

In this menu, you can specify the temperature settings for the respective storage tank for solar charging.

- Maximum temperature: 20–99 °C (factory setting: 60 °C)
Recommendation: DHWC 60 °C, Buffer storage tank 80 °C
 The respective storage tank is maximally charged to this temperature.

6.4.2.2 Switchover logic

Zone switchover

In 2-storage tank systems or 2-zone systems, the system switches between the two storage zones depending on the solar yield. While the system charges the lower storage area (zone 2), the control logic checks whether the solar yield is meanwhile high enough to charge the upper storage tank area (zone 1) up to the specified maximum temperature.

Absolute priority

With absolute priority, the primary storage tank zone is charged until the specified temperature setpoint value (factory setting 40 °C) is exceeded in storage tank 1 | zone1. During charging, no switchover occurs into the subordinate storage tank zone.

Switchover logic with priority switching

When using priority switching, it is always storage tank 1 or zone 1 in the buffer storage tank that gets priority charging.

- **2-zone switchover:** the upper zone of the buffer storage tank receives priority charging
- **2-storage tank switchover:** storage tank 1 gets priority charging

Factory setting

- Absolute priority: 20–99 °C (factory setting: 40 °C)
No switchover to storage tank 2 occurs up to this temperature.

6.4.2.3 Anti-blocking protection

Weekly (every Monday at 12:00 p.m. noon), both outputs (pump & switchover valve) are switched on.

6.4.2.4 Energy optimization

Note: This function is only available for heating-supporting solar systems (buffer storage tank is charged by the solar system).

If the function Energy optimization is activated, the buffer request from the boiler is suppressed by the boiler during solar charging. The buffer storage tank is consciously undersupplied by the boiler.

A precondition for this is that the system runs in the programs "Summer" (minimum boiler request) or "Time+". Details regarding the programs "Summer" and "Time+" can be found under *When will the buffer storage tank be charged?* [► 61]

In the menu >> Solar >> Operating values >> Energy optimization, you can select the following parameters.

- Energy optimization: On | Off (factory setting: Off)
- Shortfall: 5–50% (factory setting: 10%)

The required forward flow temperature of the consumers (heating circuits, DHWC) leads only to a recharging of the buffer by the boiler if the temperature is undershot by xx% in the buffer.

Example with 20% shortfall: Consumers, such as heating circuits or DHWC, request 40 °C from the buffer storage tank. The buffer request (e.g. heating circuits) is only passed on to the boiler (source) as of a temperature of <32 °C. During solar charging, the buffer storage tank is only charged to 37 °C (instead of 45 °C).

- Requ.delay: 10-120 min (factory setting: 30 min)

The shortfall remains active after the end of the solar charging for the period of the Requ.delay specified here. This is to bridge interruptions in solar charging due to cloud coverage.

To utilize solar energy as effectively as possible, the storage tanks should be ideally configured for solar charging.

The following settings refer to the charging carried out by the boiler.

- **DHWC**

Switch DHWC to time program and e.g. 17:00 to 22:00 o'clock. (see section When is the domestic hot water heated? [► 59]) The entered time depends on the alignment of the solar system and also on the hot water demand.

- **Buffer storage tank**

Program

Set the program to "Summer" during the summer months. (See section: When will the buffer storage tank be charged? [► 61])

In the winter months (heating period), set the program to "Temperature" or "Time+" and temperatures to 20/60 (min/max).

- **Buffer type**

Buffer type x.2 must be selected so that sensor 4 can be used as the switch-off sensor for the boiler request

- **Stratification**

Monitor the stratification (water amount) when recharging. Activate the dynamic return flow temperature when charging the boiler directly. (See section: MF2± - RFT dynamic)

6.5 Boiler

6.5.1 Switch on/off

With the setting Boiler On | Off you can define whether the boiler should be operating or not.

The display Status shows the current status of the boiler.

The display Boiler performance shows the current output in percent.

6.5.2 Conveyor system

Fill manually

Manual filling (On | Off) in the menu Boiler >> Conveyor system >> Fill manually activates the stirrer in systems with a hopper in order to fill the hopper with fuel.

Container fill level shows the current fill level of the container in per cent for systems with a hopper.

Last filling

You can specify when the hopper is to be filled irrespective of the fill level and when the last automatic filling of the hopper may occur via the two lines to set the Last filling (Off | On) and the Time. This prevents noise, e.g. at night. If the fuel is used up during the night and the boiler needs refueling, particularly larger systems will carry out a filling procedure during the night regardless.

Container fill level shows in systems with a hopper the current fill level of the container in per cent.

6.5.3 Chimney sweep function procedure

If you activate the function, the control will start a process to measure the boiler in the upper or lower load stage.

⚠ WARNING



Overloading of the heating system

- ↪ The system does NOT automatically switch off in this function!
- ↻ Only operate the system in this function under constant supervision!
- ↻ Provide for sufficient heat consumption!

Measuring nominal load

- ⇒ Push the measuring mode switch.
- ⇒ Select Measure nominal load or Measure partial load.
 - **Note:** The ignition processes sets in first if the system is not in operation when the measuring mode is started. The value remaining time only starts running once the system is in operation.
 - Status: Waiting nominal load
45 minutes operation (heat-up phase)
 - Status: Measuring mode nominal load >> Measure now!
25 minutes operation at 100% output
 - **Perform measurement (100% performance)**

Measuring partial load

- **Note:** The ignition processes sets in first if the system is not in operation when the measuring mode is started. The value remaining time only starts running once the system is in operation.
- Status: Waiting partial load
47 minutes operation (heat-up phase)
- Status: Measuring mode partial load >> Measure now!
25 minutes operation at 30% output
- **Perform measurement (30% performance)**

General information

- Once the function has been started, it can be cancelled at any time by pressing the Back button. ↶
- After the time for the chimney sweep function has elapsed, a query is displayed whether the measuring mode is to be extended.
 - Yes >> Measuring mode is extended by 25 minutes
 - No >> Measuring mode is terminated
 - If no selection is made, the measuring mode is automatically terminated after 5 minutes.

6.6 Operational state

You can only display values and states via this option, you CANNOT modify them.

6.6.1 Boiler

After the status (more details are provided in section Boiler status [▶ 67]), the actual boiler output is shown in per cent compared to the nominal load. The setpoint and actual boiler temperature values (Boiler temperature Setpoint | Boiler temperature Actual) are compared there.

The actual status of the Boiler pump (On | Off) is subsequently shown.

With regard to the return flow boost, you are shown the values for the Return flow temperature and mixer status: RFB mixer (On | Off).

The next value shows the system operating time converted to full load hours.

Subsequently, the Flame temperature Act and the current fuel factor are shown (in per cent).

6.6.1.1 Boiler status

Status	Description
--------	-------------

Off	Boiler is switched off
Ready (+Req):	Boiler is switched on, but will only heat up when the highest requested consumer temperature or the minimum boiler temperature has been undershot
Ready (+Wait time):	The boiler is switched on, but does NOT heat up because the request has been present for less than 5 seconds
Ready (-Req):	The boiler is switched on, but does NOT heat up because there is no heat consumption.
Ready (-Ext1):	Boiler is switched on, however, does NOT heat up because input "Extern 1" is open.
Ready (-CS):	The boiler is switched on, but does NOT heat up because the conveyor system is in operation
Ready (-Cleaning):	The boiler is switched on, but does NOT heat up because the cleaning is in operation
Ready (-SB):	The boiler is switched on, but does NOT heat up because the second boiler is in operation
Ready (-IgnStart):	The boiler is ready and has a request; it will start igniting shortly
Operation (Cleaning):	An operating hour-independent cleaning takes place during the ongoing combustion operation.
Operation:	Combustion operation
Taking system measurements:	The boiler is operated at the set capacity
Complete ignition:	Fuel is pushed in to spread the ember bed
Measuring mode:	System in measuring mode (measuring mode button)
Afterrun:	Fuel supply is shut down, the fans continue to run for a defined period of time
Restart:	The system restarts
Fault off:	System is switched off, a fault is present
Afterrun fault:	System is in afterrun due to a fault
Maintenance:	The system operates during the relay test (certified technician!), but this is only displayed in external log programs!
Ignition feeding 1	Boiler pushes in fuel for a defined period of time.
Ignition, feeding 2	Boiler pushes in fuel until it reaches the 'ignition' level at the ember bed.
Ignition CS filling:	Conveyor system pushes in fuel
Ignition, heating:	The heating element ignites the fuel. The ignition was successful if the flame temperature increases accordingly.
Ignition start induced draught:	The system starts operating, the induced draught and primary air fans start running.

6.6.2 Heating circuits

If the heating system contains several heating circuits, the control first shows a list of available heating circuits.

Only then you will see details regarding the current status of the selected heating circuit.

- The selected heating program is shown in the header: Automatic | Comfort | Reduct | Frost protection | Off
- The Status line shows the current status:
Automatic | Comfort | Reduct | Frost protection | Off | Holiday | Screed | External | Maximum heat consumption
- The additional information provides details:
External function | Priority DHWC | Party active | Off program | Holiday active | Outside the heating period | During the heating period | Outside temperature above frost protection limit | Frost protection active | Eco operation / Fast reduction | Outside temperature-dependent deactivated | Comfort program | Reduction program | Forward flow temperature below threshold value | Room temperature above the frost protection limit | Input "request" not set! | Overheating/Fault in secondary heating source | Boiler overheating | Boiler requests max. acceptance | Screed program | HC control not active

The subsequent lines juxtapose the room temperature, actual (measured temperature in the living quarters) and the room temperature, setpoint (desired temperature in the living room) and shows the currently measured outside temperature.

In addition, the status for the pump, mixer, incline and room influence is displayed.

6.6.3 DHWC

If the heating system contains several DHWC, the control first shows a list of available heating circuits.

Only then, the header shows the current program.

The display Status shows the reason for charging or not charging (e.g. holiday program).

Temperature The value temperature, actual shows the temperature measured at the sensor, while temperature, setpoint shows either the set maximum temperature or the set Legionella protection temperature to which the boiler is heated after the minimum temperature was undershot. The actual domestic hot water (at the tap) depends on the potential downstream mixer valve and/or the sensor position in the storage tank.

Charging pump shows the status of the pump (On | Off).

Request shows whether a heat request is pending (On | Off).

circulation In this area of the menu, you can see details regarding the circulation – but only if a circulation pump is activated:

Circulation pump shows the pump status (On | Off).

Push button shows the status of the push button (On | Off).

Temperature displays the measured circulation temperature (only relevant if the pump is running!).

6.6.4 Buffer storage tank

If the heating system contains several buffer storage tanks, the control will first show a list of available buffer storage tanks.

Temperatures

Only then it will show you the (max.) 5 measured temperatures. This view shows sensor "S1" (= temperature 1) in top position and "S5" (= temperature 5) in bottom position. If a sensor has not been placed, the text "missing" will be displayed instead of the temperature.

Status

This area shows both the temperature, setpoint and also whether the buffer has issued a request and whether the pump is running.

If there is a switchover valve, the position of the switchover valve is shown (top | bottom).

Circulation

In this area of the menu page you can see details regarding the circulation – but only if a circulation pump is activated:

Circulation pump shows the pump status (On | Off).

Push button shows the status of the push button (On | Off).

Temperature displays the measured circulation temperature (only relevant if the pump is running!).

Modulating buffer operation

(only for activated modulating buffer operation)

Average buffer temperature shows the average temperature of the buffer sensors (S1 to Sx) (depending on the setting for the buffer fill level to sensors 2 to 5).

Buffer fill level from sensor S1-Sx. It is determined between sensor 1 [S1] to sensor x [Sx].

Average charging temperature

Buffer charge-up level shows the buffer charging level based on the average temperature of the installed (existing) buffer sensors (S1 – S5).

6.6.5 Solar

The operating status of the solar system is shown in the Main menu >> Operating status >> Solar.

- Status
 - Collector temperature
 - Temperature storage tank 1
 - Temperature storage tank 2
 - Pump 1 (in %)
 - Pump 2 (in %)
 - Diagram
 - Collector excess temp.
 - Heat output (in kW)
 - Heat quantity day (in kWh)
 - Heat quantity total (in kWh)
 - Collector forward flow temperature (in °C)
 - Collector return flow temperature (in °C)
 - Flow (in l/min)
- Shows the current flow.

6.6.6 Feeder pumps

If the heating system contains several feeder pumps, the control will first display a list of available feeder pumps.

Temperatur, setpoint displays the highest requested temperature of the group.

Request shows whether a heat request is pending at the source (On | Off).

Pump shows the status of the pump or the valve (On | Off).

Source shows the specified source which supplies the buffer storage tank or the group with heat.

6.6.7 Secondary heating sources

If the heating system contains several secondary heating sources, the control will first display a list of available heating sources.

Status Status shows the status (Off | Normal operation | Overheating | Delay) of the secondary heating source.

Boiler pump shows the status of the pump (On | Off).

Request shows whether a heat request is pending at the secondary heating source (On | Off).

Temperature Temperature shows the temperature measured at the secondary heating source.

6.6.8 Conveyor system (hopper)

The value status shows the status of the hopper:

- Off: The entire conveyor system is inactive.
- Fills: The conveyor system transports fuel.

The value container fill level shows the current fill level in %.

The value drive, conveyor system (On | Off) shows whether the conveyor motor is in operation.

The value temperature, drive displays the status of the overheating protection: When the status is Off, the motor is overheated.

The value power shows the current power consumption in Ampere and the cut-off current for the overload shutdown.

The value motor, return flow shows whether the automatic conveyor motor return flow is active after an overload (On) or not (Off).

The fire shutter is driven by a spring-return actuator. A small drive actuates the shutter and holds it open. When power is switched off, the shutter closes by itself. The system recognises whether the fire shutter is open or closed via two limit switches.

The status of the fire shutter is related to the **fire shutter** (abbreviated to "FS"):

- Shut: The fire shutter is completely closed.
- Opens: The fire shutter opens (prior to switching on the conveyor motor).
- Opens briefly: The fire shutter opens briefly then closes. This prevents fuel from jamming and impairing the seal function.
- Open: The fire shutter is opened completely.
- Closes: The fire shutter closes (after switching off the conveyor motor).
- Error: Limit switch defective – call customer service.

The value Motor, FS shows the motor status:

- On: The motor is active, the fire shutter is opening or is open.
- Off: The motor is inactive, the fire shutter is closed or closing.

The values of both limit switches must correspond to this table:

	Fire shutter closed	Fire shutter NOT closed
Display Limit switch closed	Off	On
Display Limit switch open	Off	On

The value overfill protection cover shows whether the respective limit switch has been triggered at the conveyor channel:

- On: Normal operation. The overfill protection cover is sealed.
- Off: The limit switch triggered a conveyor system stop. The message 07.01 The overfill protection switch of the conveyor system 1 is open! [▶ 101] is displayed.

The value TMFS fuel shows whether the temperature for the fuel storage (abbreviated to "TMFS") has triggered:

- On: Normal operation.
- Off: A fire alarm in the fuel storage or a wiring error has triggered a shutdown of the heating system. The message 02.05 The temperature in the fuel storage is too high! [▶ 94] is displayed.

6.6.9 Additional conveyor system

If the heating system contains several additional conveyor systems, the control will first display a list of available additional conveyor systems and/or of the available drives.

Only then you will see details regarding the current status of the selected additional heating system.

Drive, conveyor system shows whether the motor is turning (On) or not (Off).

Power shows the current power consumption in Ampere and the cut-off current for the overload shutdown.

Temperature, drive (On | Off) shows the status of the overheating protection. In the Off status, the motor is overheated.

Motor, return flow shows whether the automatic return flow of the additional conveyor motor is active after an overload (On) or not (Off).

Light barrier shows the light barrier status (On | Off).

Overfill protection cover shows whether the respective limit switch was triggered at the conveyor channel:

- On: Normal operation. The overfill protection cover is sealed.
- Off: The limit switch triggered a conveyor system stop. The message 07.01 The overfill protection switch of the conveyor system 1 is open! [▶ 101] is displayed.

Emergency escape switch shows the status of the emergency escape switch (On | Off).

Safety switch 24V shows the status of the safety switch 24V (On | Off).

Request shows whether a request exists for the respective additional conveyor system.

6.6.10 Heat quantity meter

This menu show the heat quantity meters that are read out via the M-bus.

If the heating system contains several heat quantity meters, the control will first display a list of available meters.

Attention: The displayed values are transferred cyclically (readout) and therefore do not need to correspond to the displayed meter values.

The

- collected energy (kWh),
- current output (kW),

- forward flow and return flow temperatures and the
- current flow volume (l/h) that the meter records are displayed.

The last read process shows the time at which these values were recorded.

Counter address and serial number are information relating to the readout counter.

The package counter is a continuous counter that shows the number of the transmitted read processes (0-255).

6.7 Date/Time

In the network, it is the control unit at the boiler or the Heat management module Exclusive [WMM] that prescribes the "system time": This time applies for all other control units in the same network.

The menu permits editing the date, time and time zone. Below, you can see the battery status.

Summer/winter time

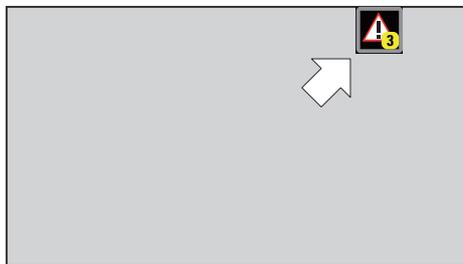
The switchover to summer/winter time occurs automatically!

Time zones

The control proposes possible time zones, and you can select in which time zone you are living (e.g. "Western European time zone," "Central European time zone" ...).

You can have the time zone determined for a specific location under <http://www.timeanddate.com/worldclock> (English) and <http://www.timeanddate.de> (German), and you will find a graphic representation of time zones under <http://www.zeitzonen.net/> (German).

6.8 Alarm system



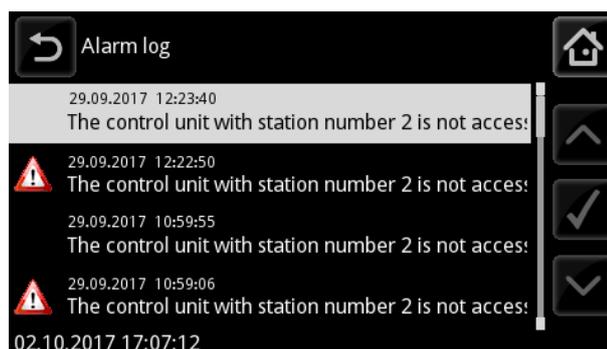
During ongoing operation, a symbol in the top right corner of the screen shows how many alarms are active.

Show alarms

The menu Show alarms will bring you to a list of all active alarms: Date and time are shown for every alarm. If you would like to view alarm details, select the respective line in the list.

Alarm log

The menu Alarm log shows all events related to alarms. Every event entry is displayed together with its date, time, reporting number and message text. Select the respective line in the list if you would like to view event details.



Alarm log symbol legend:



: Alarm is active.



: Alarm was acknowledged.



: Alarm has been rectified.

Rectify all alarms

You can rectify all open commands at once via the menu Rectify all alarms. In a dialogue, you will be asked you whether you really want to clear (rectify) all alarms!

6.9 Customer service

Support

The Support menu displays the KWB customer service phone number and collects all information you should have available for the KWB customer service: This includes the boiler and serial number and the exact software version.

Control interval

The menu control interval is meant for the operator and shows the number of checks performed by the operator.

The interval defines after how many full load hours the alarm 02.22 Control interval expired! [► 97] should be triggered. The remaining time automatically follows from this interval and CANNOT be changed.

When you select the command control completed, the control increases the number of maintenance events and sets a time stamp.

- The interval restarts every time this value is changed.

Maintenance

The maintenance menu shows the number of already carried out maintenance services as well as the most recent maintenance. The interval and the mathematically derived remaining time for next maintenance in CANNOT be modified.

Please also see

- 📄 02.21 Maintenance interval expired! [► 97]
- 📄 02.22 Control interval expired! [► 97]
- 📄 02.21 Maintenance interval expired! [► 97]

6.10 Expansions

6.10.1 Ethernet settings

You must first ensure that the Exclusive control unit [BGE] at the boiler or in the Heat management module Exclusive [WMM] has a network connection!

With DHCP	DHCP: Activate the DHCP service to activate the automatic assignment of IP addresses. In this case, the following details are shown after a short delay. Leave these values unchanged!
Without DHCP	Without DHCP, you will need to assign to the Exclusive control unit [BGE] <ul style="list-style-type: none">▪ a valid and free IP-address.▪ a subnet mask to share the IP networks.▪ a Gateway: This address is used to send all network requests to other networks or to the internet („Internet Gateway“).▪ DNS 1-3: Addresses (DNS server) for the name resolution. If the boiler is to be additionally connected to the KWB Comfort Online, it will be necessary to enter the gateway (gate) and the DNS server (DNS).

6.10.2 Comfort Online

This menu defines the access to the KWB Comfort Online (option).

- ➔ The setting remote access in the menu Server settings must be activated!
- ➔ Did you enter a valid boiler serial number?
 - ⇒ Wait until the chain symbol in the right bottom corner is displayed. The connection to the online platform has been established.

In the menu, server settings, there is a setting called remote access (On | Off; for Comfort Online it must be On!), the server name (ingress.comfort-online.com) and the port (7005) for the connection.

The menu connection status shows the status of the connection to the KWB Comfort online server. Check the network connection to your internet modem if a connection cannot be established.

Select registration and wait until the system shows you a TAN (transaction number).

You will need this TAN to add your system to your Comfort Online account: When you select the menu command "add system" on your Comfort Online terminal device, the system will automatically ask for this TAN.

To de-register the system from the KWB Comfort Online server, select de-register. KWB Comfort Online will subsequently not be functional until you re-register the system and connect it to an account!

Please also see

- 📖 20.08 ComfortOnline: Unknown BGE series number for this boiler series number [▶ 112]

6.10.3 SMS settings

If you want to be notified via SMS by the KWB Comfort, (provided you have a GSM modem), you will have to activate the SMS function in the menu Add-ons >> SMS settings.

Notifications of malfunctions are sent to a maximum of 2 mobile phones 10 seconds after their occurrence. Activate a max. of 2 phone numbers (On) and then enter the phone numbers.

Important: Enter the telephone numbers using the international format (e.g. "+43..." for Austria).

Assign a four-digit KWB Code, (only numbers!) to prevent unauthorised access to the system. Protect against misuse and change the code from time to time.

This code is to be sent along for every query and every control instruction. SMS messages without this code will be ignored by KWB Comfort.

The setting SMS reminder defines whether the system sends all messages only once to the mobile phones (Off) or whether it will repeat uncleared messages every 2 hours.

When you perform the command send SMS templates, the system will send 11 SMS templates with sample instructions to the first mobile phone number entered: This way, you will have all the content that you need for querying and controlling your KWB system on your mobile phone. After sending, the status automatically switches to Off.

The receiver strength helps you determine the best possible placement for the SMS system.

6.10.4 Mail settings

After you have entered a valid email address, e.g. max.mustermann@firma.de, you will be able to activate the send mail (On | Off) function.

When one or more alarms occur, respective notifications will be sent to the specified email address with a 10 s delay. Additional alarms will be sent only after expiration of the specified time interval (in minutes).

Disclaimer: KWB is not liable in the event of transmission errors (spam filters, anti-virus programs, no WLAN (WiFi) connection, recipient inbox is full, etc.) of the alarm emails!

A prerequisite for this function is:

- An internet connection

Please also see

📖 Ethernet settings [▶ 74]

6.10.5 Licenses

Licenses for the activation of software products

A license must be acquired so that the solar control or boiler master-and-slave circuit can be activated in the software.

A license for the software product cannot be shared by several devices at the same time.

The license authorises the licence holder to activate the following products under <https://license.kwb.net>.

- KWB solar control
- KWB boiler master-and-slave circuit
- KWB Heat management module Autonomous [WMM]

The license is valid for an unlimited time. Transferring a license to third parties is strictly prohibited!

Important information

The license certificate is enclosed with the boiler documentation. Please keep this license certificate safe. You will need the license and order numbers indicated on this certificate to activate the listed software functions.

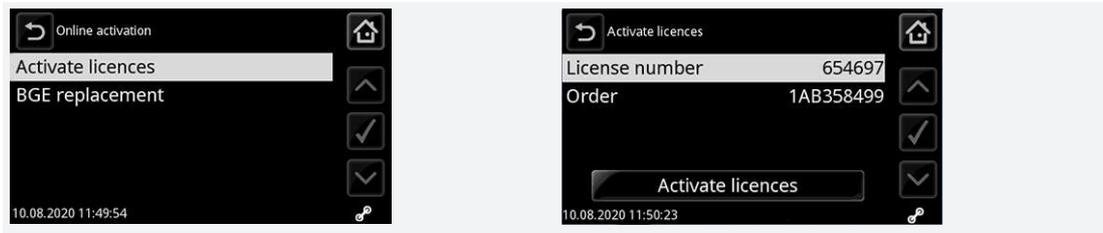
License activation with software version V19.11 or higher

There are 2 ways to activate a license:

1. System (boiler or autonomous heating management module) is **online**
2. System (boiler or autonomous heating management module) is **offline**

System is online

On the control unit, navigate to the menu >> Add-ons >> Licenses >> Online activation >> Activate licences and enter the license and order numbers indicated on the license certificate. The license will then be automatically released.



System is offline

⇒ On the control unit, navigate to the Menu >> Add-ons >> Licenses >> Offline activation >> BGE request ID. "BGE request ID" is shown. Please write it down.



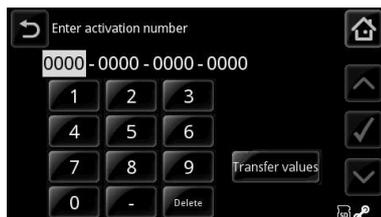
⇒ On your smartphone or computer, go to the internet and open the link <https://license.kwb.net>. Enter the license and order numbers indicated on your license certificate.

⇒ Select "license activation as of software version V19.11".

⇒ Enter the "BGE request ID".

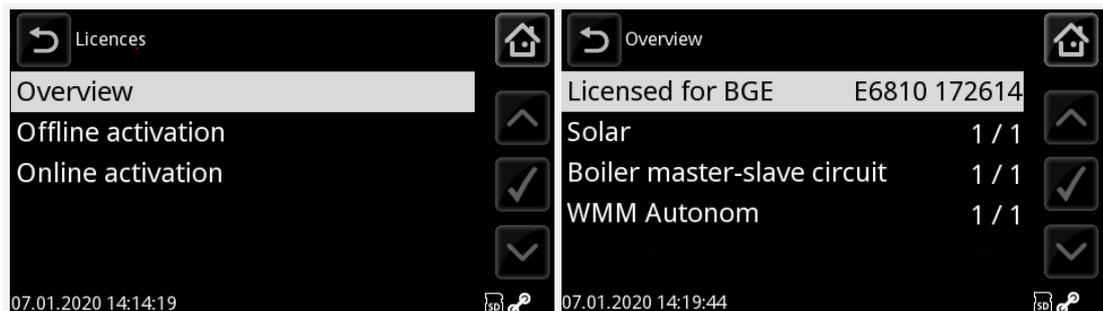
⇒ The 16-digit activation code will be displayed as a result. Please note it down.

⇒ On the control unit navigate to the menu >> Add-on >> Licenses >> Offline activation >> Activation code and enter the 16-digit activation code. This releases the license.



Overview of used licenses

⇒ The Menu >> Add-ons >> Licenses >> Overview provides a list of activated and used licenses. In the example below, you can see which licences are activated.



Please file the license certificate carefully away after activation. The data contained on the license will be needed to recover the license if you replace the electronics equipment at a later point in time.

6.10.6 ModBus settings

Data can be exchanged between the KWB Comfort 4 control and external systems (e.g. higher-level control or visualization systems, central building control systems, etc.) using ModBus protocol and a TCP link.

A prerequisite for this function is:

- External system modBus-capability
- The customer must provide the cabling (Ethernet)

6.11 Expert level

Safety-relevant settings are not accessible in standard operation. You can only access the protected menus by entering a code.

At midnight, the control will automatically switch back to the operator level.

3 safety levels

Operator	Normal level
Technician	Mostly released menus
Service	All menus are released

Touch screen operation

- ⇒ Enter your PIN code and confirm the number by pressing .
- ⇒ With the delete [Löschen] button you can delete the respectively last digit and repeat your entry.

Dial operation

- ⇒ You can specify the individual digits of the PIN code by turning the dial. The digit will appear as normal.
- ⇒ Press ✓ to confirm the digit at the respective position. Alternatively, you can also press on the dial. The digit will immediately afterwards be replaced by a star to hide the PIN code.
- ⇒ Once you have confirmed all digits individually, you need to confirm the entire number by pressing ✓.

7 Maintenance

Local fire safety regulations prescribe that the operator of a heating system must carry out monthly inspections and log these in an inspection book.

The best care for your system is ensured by concluding a KWB maintenance contract. Your KWB Partner would be pleased to provide information in this regard.

7.1 Reasons for on-going, professional maintenance service

The best care for your system is ensured by taking out a KWB maintenance contract. Your KWB Partner would be pleased to provide information in this regard.

NOTE



Regular maintenance of your heating system offers numerous advantages such as:

Optimal emission values and uniformly high levels of efficiency. This reduces your heating costs!

Cost savings thanks to a high level of operational reliability and maximum service life.

On-going optimisation of the heating system thanks to new technical findings.

If necessary you will receive more extensive training.

7.2 Standards for maintenance

[TRVB H 118]

The subsequent regulations originate from the Austrian "Technischen Richtlinie für vorbeugenden Brandschutz" [TRVB H118] (Technical Guideline for Preventative Fire Protection) – ensure that you comply with all corresponding local regulations!

7.2.1 Weekly visual inspection

⇒ Visually inspect the complete system including the fuel storage room, weekly. Immediately remedy any deficiencies that you find!

7.2.2 Monthly inspections

⇒ Perform the following inspections monthly and keep a log of these inspections. The respective forms can be found in section Forms [▶ 83].

- Functionality of the backfire device, in particular the reliable closing process
- Cleanliness of the exhaust routes (exhaust gas passes in the boiler, adapter and chimney).
- Proper operation of the control ... Are alarm messages displayed?
- Functionality of fault alarms and warning device(s) – if available.
- Proper operation of the combustion air fan and induced draught fan ... Are alarm messages displayed?
- Proper operation of the combustion chamber ... Are alarm messages displayed?

In addition, also provide for:

- A portable fire extinguisher that is ready for use.
- A boiler room free of flammable materials.
- Fully functional fire protection closures (fire protection doors – automatically closing).
- Legible system stickers, which KWB has provided for safe and correct operation (please order new stickers if necessary).

Please also see

📄 Check sheet for operators [▶ 84]

7.2.3 Professional maintenance

NOTE



Maintenance instructions

- Please always keep the Maintenance instructions (Maintenance instructions) with the system.
This document also describes those maintenance steps that may **only be carried out by certified technicians**.

NOTE



Maintenance after an incident

- The TRVB requires additional maintenance after an incident.
- Make sure to perform maintenance after every repair to ensure the proper functioning of the system.

Systems
≤ 150 kW:

Maintenance: 1 time annually (maintenance contract)

We recommend that you have a maintenance carried out annually by a certified technician based on a maintenance contract: This ensures incident-free operation, a long service life and an additional reduction of environmental impact!

Mandatory if there is no annual maintenance:

If you have an automatic wood burning heating system up to max. 150 kW, you are obliged to order maintenance at least every three years, which must be performed by a certified technician (factory customer service or authorised service partner).

Systems
≤ 300 kW:

Systems between 150 and 400 kW must – without exception – undergo maintenance every 2 years carried out by a certified technician.

7.2.4 Fill water

NOTE



Please comply with: ÖNORM H 5195 + VDI 2035

KWB assumes ÖNORM H 5195-1 / -2 for the initial filling and subsequent filling. You must also comply with local requirements (e.g. VDI 2035 - in part, these are stricter)!

The water quality is a significant factor for the smooth operation of the heating system. Deposits caused by limescale and rust mud can block pumps, damage boilers, reduce flow volumes, cause corrosion and lead to poor efficiency.

We assume that the heating system possesses flushing nozzles for forward flow and return flow as well as a standard-compliant heating protection program ("BWT AQA therm" or equivalent).

Purging

NOTE! Purge the system twice before commissioning!

Ventilation

When refilling make-up water you must first bleed the refilling hose before connecting it to prevent air from entering the system.

System book

The system operator is responsible for maintaining a system book (see section Logs [▶ 81]), Forms [▶ 83]). In this section, the respective steps are to be documented – from the planning to commissioning to maintenance.

7.2.4.1 Requirements for fill water

Limit values for fill-up or make-up water

	Austria	Germany	Switzerland
Total hardness	≤ 1.0 mmol/l	≤ 2.0 mmol/l	< 0.1 mmol/l
Conductivity	–	< 100 μS/cm	< 100 μS/cm
pH value	6.0 – 8.5	6.5 – 8.5	6.0 – 8.5
Chloride	< 30 mg/l	< 30 mg/l	< 30 mg/l

Additional requirements for Switzerland

The fill-up and make-up water must be demineralised (de-salted):

- As a result, the water will no longer contain any materials that might form deposits in the system.
- This way, the water is no longer electroconductive which prevents corrosion.
- Also, the process removes all neutral salts such as chlorides, sulphates and nitrates which attack corroding materials under certain conditions.

If part of the system water gets lost, e.g. due to repairs, the supplementary water must also be demineralised. It is not sufficient to soften the water. Before filling the systems, it is necessary to carry out a professional cleaning and purging of the heating system.

Check:

- After eight weeks, the ph-value of the water must be between 8.2 and 10.0. If the heating water comes into contact with aluminium, a ph-value between 8.0 and 8.5 should be targeted.
- Annually – the owner must log the readings

Limit values The following limit values for fill water are intended to ensure the long-term reliable operation of hot water heating systems: The fill water should be low-salt and alkaline and not exceed a specific hardness.

Total heat generation capacity	mmol/l		°dH	
	ÖNORM ¹	VDI ²	ÖNORM ¹	VDI ²
Specific water content of the system < 20 l/kW				
≤ 50 kW	≤3	≤3	≤16.8	≤16.8
> 50 to ≤ 200 kW	≤2	≤2	≤11.2	≤11.2
> 200 to ≤ 600 kW	≤1	≤1.5	≤5.6	≤8.4
Specific water content of the system ≥ 20 l/kW, but < 50 l/kW				
≤ 50 kW	≤2	≤2	≤11.2	≤11.2
Specific water content of the system ≥ 50 l/kW				
≤ 50 kW	≤1	≤0.02	≤5.6	<0.11

Table 9: Highest permitted total hardness of the fill water for heating systems with a heat generation system with large water content (WBS > 0.3 l/kW)

mmol/l ... SI unit sum alkaline earth | °dH ... German degrees of hardness

¹ acc. to ÖNORM H 5195-1:2010

² acc. to VDI 2035

7.2.4.2 Logs

You can find forms here:

- Maintenance instructions
- ÖNORM H 5195-1:2010 Appendix A and Appendix C
- VDI 2035 Appendix C and VDI 4708 sheet 1

7.2.5 Forms

⇒ Use the forms to log your checks – thank you!

7.2.5.1 System log

Inspection book for automatic wood-fired systems as specified in the Austrian "Technischen Richtlinie für vorbeugenden Brandschutz" TRVB H118 (Technical Guideline for Preventative Fire Protection)

System location
System installer
KWB – Kraft und Wärme aus Biomasse GmbH
Industriestr. 235
A-8321 St. Margarethen/Raab
Furnace system
Make:
Type:
Rated power:
Year of manufacture:
Serial number:

Check sheet for operators

Responsible operator

...

Year: ...

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12.

Monthly inspection on ... (day)

... ..

Fire extinguisher (if available)

Exhaust routes

Control

Warning devices

Fan

Combustion chamber

Fire extinguisher

Flammable material in the boiler room

Fire protection closures

Chimney cleaning

Remove fly ash using a vacuum only if
 NO automatic ash conveyor has been
 installed
 (only KWB Multifire, type MF2)

System pressure

Thermal discharge safety valve

Safety valve

Signature

Note: The check list for certified technicians is part of the Maintenance instructions.

Maintenance sheet

| | | |
|-----------------------------|---------------|--|
| Maintenance | Performed on: | Specialist company, certified technician |
| | ... | ... |
| Identified deficiencies: | | |
| Comments: | | |
| Deficiencies not rectified: | | |
| Signature: | | |
| ... | | |

7.3 Required tools for maintenance work

- Hand tools
- Combination wrench 13 mm
- Grease gun

Cleaning tools

- Vacuum with suction lance
- Compressor for compressed air
- Broom and shovel
- Wire brush
- Spatula and scraper

7.4 Maintenance intervals for operators

| Activity | Interval | Comments |
|--|--|--|
| Remove fly ash from the heat exchanger | Every 2nd time you empty the ash container | Removing fly ash [► 87] |
| | NOT necessary if you have an automatic ash extraction (option) | In this case, the second ash channel must be equipped with a conveyor screw and a motor. |
| Remove ash container and empty it | Depending on the boiler type, fuel quality and degree of heating 1 week and 6 months | Removing the ash container [► 48] |
| Visual inspection combustion chamber | weekly | — |
| Visually inspect the entire system | weekly | Visual inspection of the entire system [► 88] |
| Visual inspection storage room | weekly | Inspecting the storage room [► 87] |
| General inspections | monthly | Check sheet for operators [► 84] |

7.5 Before you begin

- ⇒ Shut the system down (Boiler On/Off).
- ⇒ Switch off the system (main switch to "0").
- ⇒ Pull the plug and secure the system against being switched on again.

WARNING

Risk of suffocation with negative pressure in the room



- ↪ Modern houses are so air-tight that – for example due to hood extractor systems – negative pressure could build up in the internal spaces. Opening the combustion chamber door would then draw carbonisation gases into the room!
- ⇒ Open a window before opening the combustion chamber door!
- ↪ This disperses pressure differences and ensures that an adequate chimney draught can extract the carbonisation gases.

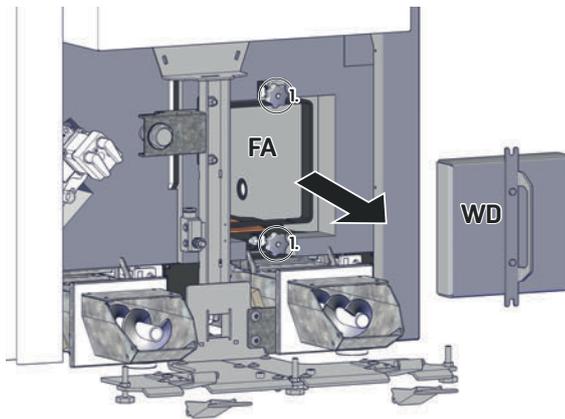
- ⇒ Let the system cool down: Only open the casing, combustion chamber door and maintenance cover when the system is **cold** and de-energised!

Equipment for cleaning work

- Gloves
- Wire brush
- Broom
- Clean your boiler using – vacuum including brush tool to minimise the amount of dust and ash being released.
- Lubricant: adhesive lubricant

7.6 Removing fly ash

| System with 1 ash screw | System with 2 ash screws |
|---|---|
| <p>↳ If only 1 ash channel with a screw is installed, you will need to vacuum out the fly ash during every 2nd emptying of the ash container.</p> <p>⇒ Perform the following steps:</p> | <p>↳ The 2nd ash channel moves the fly ash into the ash container.</p> <p>⇒ This is done automatically - There is nothing you need to do!</p> |



- ⇒ Loosen the two screws [1].
- ⇒ Press the upper screw with the bracket up and remove the maintenance cover [WD].
- ⇒ Vacuum out the fly ash area [FA].
- ⇒ Push the maintenance cover to the boiler and tighten the two screws.

WARNING



Risk of deflagration due to a loose maintenance cover

- ⇒ Make sure that the maintenance cover seals tightly when closed!

7.7 Inspecting the storage room

- ⇒ Inspect the storage room ventilation and clean the ventilation opening, if necessary.
- ⇒ Make sure that the sign that lists the risks of entering the storage room and rules of behaviour is attached to the entrance door to the storage room and legible.
If the sign is missing, order a new one at KWB or your KWB partner (image shows a similar sign).



Stickers on the door to the pellet storage room (example representation)

7.8 Visual inspection of the entire system

Instructions Check whether all instructions are available in the document holder.

Stickers Check whether all warnings have been attached in the respective hazard areas. You will find the individual locations in the operating instructions, in the section Stickers.

7.9 Cleaning the surfaces

⇒ Remove dirt from the casing or from the control elements using a soft, moist cloth.

⇒ **Note:** Use only mild cleaning agents – alcohol, cleaning solvents and similarly aggressive agents will damage the surfaces!

7.10 Interruption of operation

You should perform the following steps if you do NOT use the heating system for several weeks (e.g. summer break):

⇒ Clean the combustion chamber (vacuum).

⇒ Close all doors.

WITH frost protection

⇒ Have somebody check whether your system is sufficiently protected against frost.

WITHOUT frost protection

⇒ If you do NOT use the heating system in **winter**, then have the system emptied completely to protect it against frost.

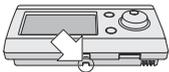
7.11 Battery change

Technical specifications

| | |
|------------|-----------------------------|
| Dimensions | 20 mm × 3.2 mm (ø × height) |
| Technology | Lithium |
| Size | CR 2032 |
| Voltage | 3 V |
| Capacity | 235 mAh |

Dismantle the Exclusive control unit

At the boiler ⇒ Pull the plug and secure the system against a restart.



- ⇒ Use a pen to push into the recess on the lower side of the control unit to release the lock as illustrated in the picture.
- ⇒ NOTE! Please note when using the control unit that the cable linking the control unit to the mounting base is very short!

Change battery

- ⇒ Open the battery cover.
It can be found at the bottom of the control unit, in the lower right corner.
- ⇒ Replace the battery.
Be sure to properly discard the used battery!
- ⇒ Insert the new battery as indicated (correct polarity!).



- ⇒ Close the battery cover.
- ⇒ Close the control unit (it must audibly snap in).

Note: The battery status is checked at regular intervals. For this reason, we recommend waiting for a minute after replacing the battery until the status is updated and the alarm is cleared.

8 Reacting to problems

You can find a complete list of the alarm messages for your boiler and the possible reactions to them in section Notifications [► 92].

8.1 Meaning of the LEDs at the Basic control unit [BGB]

A Basic control unit will NOT display any messages, instead it will notify with lit or flashing LEDs.

| | | |
|---|--|---|
| All LEDs light up red | Commissioning: The Basic control unit [BGB] has not yet been assigned to a heating circuit AND there is no alarm present. | A certified technician has to assign the Basic control unit [BGB] to a heating circuit AND clear the alarm. |
| All LEDs light up green | Initial commissioning: The Basic control unit [BGB] has not yet been assigned to a heating circuit. | A certified technician has to assign the Basic control unit [BGB] to a heating circuit. |
| No LED is lit | No heating program has been selected. | Select a program on the Exclusive control unit [BGE] at the boiler. |
| One LED lights up green | Everything is ok | |
| An LED flashes red | The heating system detected a fault during the party program. | You will find more details on the Exclusive control unit [BGE] at the boiler. |
| One LED lights up red | The heating system has detected a fault. | You will find more details on the Exclusive control unit [BGE] at the boiler. |
| One LED flashes green (3 s on, 1 s off) | Party mode or holiday program active | More details you will find on the Exclusive control unit [BGE] at the boiler. |
| Top LED flashes red | Fault: No network connection to the Exclusive control unit [BGE] at the boiler. | A certified technician needs to re-establish the network connection. |

8.2 Calling customer service

⇒ Please have the boiler type specified on the type plate at hand.

The following menus are helpful when contacting KWB customer service:

- The menu Customer service [► 74] shows the software version in use.
- The menu Operational state [► 67] shows the operating states or measured values of all important components (motors, sensors ...). This allows you or customer service to find the cause of possible faults and alarms and rectify them in a targeted way.

8.3 Setting the date and time of day

If the system was without power and the battery of the control unit is flat, the internal clock will stop working. The control unit will display the alarm 00.07 Battery empty [► 92].

⇒ Set the current date and time as described in section Date/Time [▶ 73].

According to the manufacturer, the battery must be replaced every 5 years. How to replace the control unit battery is described in section Battery change [▶ 88].

8.4 Activating the emergency stop switch

In rare cases, it may become necessary to activate the emergency stop switch. **Please note:**

CAUTION



Heat dissipation and combustion continue!

- ⇒ You have pressed the emergency stop switch ("emergency stop" as per TRVB H118).
 - ⇒ The heat dissipation and exhaust gas extraction continue. The combustion is stopped in a controlled manner.
- ⇒ Wait until the system has cooled down before taking further steps!

8.5 General fault at the power supply

| Error pattern | Possible cause | Remedying the error |
|----------------------------------|---|--|
| Nothing displayed on the display | General power failure | Switch on main switch |
| Control without electricity | Main switch switched off | RC protection switch or surge arrester switched on |
| | RC protection switch or surge arrester switched off | |

8.6 What to do after a power outage

Once the power is back on, the control will continue to operate in the previously selected operating mode.

WARNING



Risk of deflagration

In this situation, an orderly fuel combustion in the combustion chamber cannot be ensured. Flammable gases may develop that will ignite in an explosive manner when the door is opened!

- ⇒ Keep all boiler doors closed!
- ⇒ Let the boiler cool down!

⇒ Check after a power outage whether the safety temperature limiter (STB) has triggered at the boiler – and clear this block, if required.

8.7 What to do when smoke develops / exhaust smell become noticeable

DANGER

Life-threatening poisoning with exhaust gas possible

If exhaust gas smells become noticeable in the boiler room:

- ⇒ Keep all boiler doors closed!
- ⇒ Air out the boiler room!
- ⇒ You must immediately leave the boiler room and close the fire protection door!
- ⇒ You should also close all doors to the living quarters!
- ⇒ Let the fuel burn out and the boiler cool down!

If smoke escapes from the boiler during operation, there may be a fault with the negative pressure control system, or the induced draught fan is defective:

- ⇒ Press the emergency stop switch ("emergency stop" as per TRVB H 118).
- ⇒ Notify customer service.

NOTE



Recommendation:

Install a smoke detector and CO detector close to the system.

8.8 What to do in the event of a system fire

DANGER

In the event of a system fire: danger to life due to fire and toxic gases

What to do in case of a fire:

- ⇒ You must immediately leave the boiler room!
- ⇒ Close the fire protection door!
- ⇒ You should also close all doors to the living quarters!
- ⇒ Call the fire department!

8.9 Notifications

8.9.1 KWB Comfort 4 notifications

8.9.1.1 00.07 Battery empty

The battery in the Exclusive control unit will supply the control unit with power for approx. 5 years. If the system fails when the battery is empty, it will ask that you re-enter time and date at the next start.

Button cell almost empty

The button cell has a service life of between 1–7 years – depending on storage, switched-off condition of the Exclusive control unit [BGE], etc.

⇒ Replace the battery as described in the section "Maintenance" in the "Operating instructions".

Button cell holder faulty

⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.2 02.00 Safety thermostat! Boiler overheating!

The system will be switched off.

When an operating temperature of up to 95 °C is reached, the safety thermostat (more precisely: safety temperature limiter "STL") is triggered.

Overheating during operation

- ⇒ Carry out a visual inspection of the system.
- ⇒ Let the boiler cool down before resetting the thermostat.
- ⇒ Reset the thermostat: Screw off the black cap on the switch bracket on the side and press the button below it with a pen until you hear a clicking sound.
- ⇒ Monitor the system for a longer period.

Overheating after a power outage

- ⇒ Let the boiler cool down before resetting the thermostat.
- ⇒ Reset the thermostat: Screw off the black cap on the switch bracket on the side and press the button below it with a pen until you hear a clicking sound.
- ⇒ Monitor the system for a longer period.

The boiler is running under full load at high setpoint temperatures and the heat consumption suddenly stops.

- ⇒ Check the boiler temperature sensor and cabling to the sensor (contact issue).
- ⇒ Check the hydraulic system for a sudden interruption of the heat consumption (pump, safety thermostat transmission line, ...).
- ⇒ Notify your heating system company or the KWB customer service.

Check whether the thermal discharge safety valve is closed (at the discharge).

8.9.1.3 02.01 The emergency stop switch was pressed!

The emergency-stop button was pressed

- ⇒ Determine why this switch (emergency-stop switch) was pressed.
- ⇒ If the system is OK, press the emergency-stop switch once more. The alarm will be automatically cleared.

In all other cases:

- ⇒ Notify your heating system company or the KWB customer service.

DANGER



No emergency-stop switch connected – Danger!

- ⇒ Have an emergency-stop switch connected according to the building regulations that apply to you!

8.9.1.4 02.02 The ash container was incorrectly installed

The system will be switched off.

One of the ash containers has been removed

⇒ Replace the missing ash container.

One of the ash containers was installed incorrectly

⇒ Ensure that the ash containers are installed correctly.

If an external ash removal into a separate ash bin exists: Overfill protection cover of the transfer container is open

⇒ Check the transfer container for foreign objects or bridge building within the container.

The ash/transfer container switch was installed incorrectly

⇒ Check the switch setting.

Cabling error

⇒ Check the cabling.

⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.5 02.03 Electronic error on digital inputs!

The digital and analogue inputs are not reaching the boiler modules.

⇒ Notify your heating system company or the KWB customer service.

8.9.1.6 02.04 Boiler signal module error

The Boiler signal module [KSM]) is missing or faulty

⇒ Notify your heating system company or the KWB customer service.

8.9.1.7 02.05 The temperature in the fuel storage is too high!** DANGER****Fire in the fuel storage room!**

⇒ Keep all openings on the boiler and to the storage area closed to cut off the air supply.

⇒ Call the fire department!

The system will be switched off.

The switch of the fuel temperature monitoring ("TMFS") in the fuel storage area reacts at 70°C or is defective!

Fire alarm in the storage room

⇒ Immediately notify the fire department if the conveyor channel is **hot**, or if there is a **smell of burning** or if there are **visible burn marks!** (As with the safety instructions above)

Please contact your heating technician or the KWB customer service if the conveyor channel is cold.

Defective sensor or sensor cable

⇒ Check the sensor and cabling to the sensor.

⇒ Notify your heating system company or the KWB customer service.

8.9.1.8 02.06 Alarm! Internal error!

Alarm for internal use.

⇒ Notify your heating system company or the KWB customer service.

8.9.1.9 02.07 The secondary air fan speed is too low!

The speed of the fan has been under 60 revolutions per minute for one minutes now.

⇒ Notify your heating system company or the KWB customer service.

8.9.1.10 02.08 The primary air fan speed is too low!

The speed of the fan has been under 60 revolutions per minute for one minutes now.

⇒ Check the cabling of the fan.

⇒ Notify your heating system company or the KWB customer service.

8.9.1.11 02.09 The induced draught fan speed is too low

The speed of the fan has been under 100 revolutions per minute for 2 minutes now.

⇒ Check the cabling of the fan.

⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.12 02.10 The negative pressure in the combustion chamber cannot be regulated!

The induced draught fan has NOT been able to adjust the required negative pressure of 0.04 mbar in the combustion chamber for more than 5 minutes now!

The system will be switched off.

Boiler leaking

⇒ Switch off the system and allow it to cool down before you check whether the boiler is sealed tightly!

Possible leakage spots: boiler door, maintenance covers, ash containers

The heat exchanger is blocked

⇒ Check whether the heat exchanger cleaning works properly.

⇒ Check whether the heat exchanger inlet is open.

Cross section exhaust paths constricted

⇒ Check the area above the post-combustion ring for adhesions or caking and remove them.

⇒ Check the area below the heat exchanger including the exhaust gas pipe for excessive ash residue and remove it.

No automatic fly ash removal installed

⇒ Regularly remove the fly ash below the heat exchanger and from the exhaust gas pipe using appropriate tools.

In order to increase the emptying intervals, KWB optionally offers an automatic fly ash removal. If interested, contact your KWB partner or the KWB customer service.

Induced draught fan does not work properly

⇒ Check the function of the induced draught fan (e.g. fan wheel).

Negative pressure measurement blocked or sensor defective

- ⇒ Check whether the measuring spot or negative pressure hose has been run improperly or has a kink.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.13 02.12 Lambda probe is defective!

The system will be switched off.

- ⇒ Notify your heating system company or the KWB customer service.

8.9.1.14 02.13 Conveyor motor is overheated!

The system will be switched off.

Thermal motor protection has been triggered: The motor is too hot!

- ⇒ Wait until the motor has cooled down and clear the alarm.
- ⇒ If this fault recurs, call you heating technician or the KWB customer service.

8.9.1.15 02.14 Fuel storage empty!

The system will be switched off.

Rectify the cause, **before** you clear the alarm.

No fuel

The conveyor system has several times unsuccessfully tried to remove fuel from the storage area (the ignition level was not reached or the container could not be refilled).

- ⇒ Check the fuel supply!
- ⇒ Check the settings for the ignition level or the ember bed level when the ember bed flap is closed.
- ⇒ An external conveyor system with low conveyor capacity may also trigger this alarm. Increase the conveyor capacity (e.g. increase the drive speed).
- ⇒ When the system is initially commissioned or the conveyor line has been temporarily completely emptied, this alarm may occur several times until the conveyor line has been completely filled again.

8.9.1.16 02.15 Fuel container is empty!

The system will be switched off.

- ⇒ Notify your heating system company or the KWB customer service.

8.9.1.17 02.16 Overheated electronics

The temperature of the electronics (board) has exceeded the limit value of 70°C.

The system will be switched off.

When the temperature drops under 70 °C (minus hysteresis) again, the alarm is cleared automatically and the system restarts.

The temperature at the boiler is too high!

- ⇒ Check the completeness and correct installation of the boiler insulation.

- ⇒ Check whether the boiler room has sufficient ventilation.
Warning: Installing/operating an exhaust fan requires an air intake of respective size!
- ⇒ Notify your heating system company or the KWB customer service.

8.9.1.18 02.17 Boiler temperature sensor is missing or faulty!

Defective sensor or sensor cable

- ⇒ Check the sensor and cabling to the sensor (including plug connector and contacts).
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.19 02.18 Boiler temperature implausible

Temperature values that rise or fall to rapidly indicate a sensor defect. This alarm is triggered if the filtered boiler temperature rises or falls above average.

The alarm can also occur if the boiler temperature sensor is unplugged and plugged back in.

- ⇒ Notify your heating system company or the KWB customer service.

8.9.1.20 02.19 Return flow boost malfunction!

The return flow temperature does NOT reach the set setpoint value within the specified maximum time.

- ⇒ Notify your heating system company or the KWB customer service.

8.9.1.21 02.20 Return-flow sensor is missing or faulty

Defective sensor or sensor cable

- ⇒ Check the sensor and cabling to the sensor.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.22 02.21 Maintenance interval expired!

This notification is to remind you that you have to schedule the next maintenance with your heating system installer or the KWB customer service.

Only the factory customer service can change and/or reset the interval!

Please also see

- 📖 Customer service [▶ 74]

8.9.1.23 02.22 Control interval expired!

The stored information is deleted after expiration of a freely specifiable number of full load hours. The interval restarts each time after changes in the interval time or number of maintenance events in the customer service menu.

Note: This interval is deactivated in the factory settings.

Please also see

- 📖 Customer service [▶ 74]

8.9.1.24 02.23 Measuring mode is activated!**The rocker switch "Measuring mode" was activated**

In this status, all consumers run with maximum heat consumption.

After activation by pressing the rocker switch "Measuring mode", a selection window is displayed:



- Measure nominal load
- Measure partial load
- Cancel

After the measuring operation has been completed, the alarm clears automatically.

8.9.1.25 02.24 24V safety circuit not active, input 133**External safety device**

An external safety device (e.g. CO detector) was triggered at plug 133.

- ⇒ Check why the safety chain was interrupted (CO detector, low water pressure switch, ...).
- ⇒ Notify your heating system company or the KWB customer service, if necessary.

8.9.1.26 02.25 230 V Safety chain reserve is interrupted!

An external safety device (e.g. low water pressure switch) was interrupted at plug 128.

External safety device

An external safety device 230 V (e.g. low water pressure switch) was triggered at plug 128.

- ⇒ Check why the safety chain was interrupted (limit switch storage room door, low water pressure switch, ...).
- ⇒ Notify your heating system company or the KWB customer service, if necessary.

8.9.1.27 02.29 Secondary fan speed is too high!

The fan started running although it was not activated.

Cabling

- ⇒ Check the cabling of the fan.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.28 02.33 Primary air fan speed is too high!

The fan started running although it was not activated.

Cabling

- ⇒ Check the cabling of the fan.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.29 02.34 Induced draught fan speed is too high

The fan started running although it was not activated.

Cabling

- ⇒ Check the cabling of the fan.

- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.30 02.36 The flame temperature sensor is missing or faulty.

Sensor or sensor cabling faulty.

- ⇒ Check the sensor and the correct polarity of the cabling to the sensor.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.31 02.37 O₂ value exceeds permitted value during operation!

If the O₂ value increases by more than 18% during "operation", a "restart" is initiated. This alarm is triggered after several consecutive restarts in a brief interval and the system is shut down.

- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.32 02.38 Heat exchanger temp. too high!

This alarm occurs if the return flow temperature in the "operating" mode of the boiler is 10 °C higher than the boiler temperature and if moreover a temperature of 90 °C was exceeded in the minute mean.

The system will be switched off.

- ⇒ Notify your heating system company or the KWB customer service.

8.9.1.33 02.41 Invalid boiler series number

No boiler series number was entered or the number entered was invalid!

- ⇒ Notify your heating system company or the KWB customer service.

8.9.1.34 02.42 Boiler power module error!

The Boiler power module [KPM] is missing or faulty.

- ⇒ Notify your heating system company or the KWB customer service.

8.9.1.35 02.52 The buffer sensor for the modulating buffer operation is missing or faulty!

This alarm is triggered if a sensor at the buffer storage tank for the activated modulating buffer operation is missing or faulty.

In addition to the sensor alarm, the purpose of the alarm is to show the reason for the additionally necessary sensor.

Defective sensor or sensor cable

- ⇒ Check the sensor and cabling to the sensor.
- ⇒ If no additional sensor for the modulating buffer operation was installed, switch the "modulating buffer operation" off (in the MF2/PFP) in menu "Boiler >> Boiler settings >> Modulating buffer operation" or (in the EF2) in the menu "Boiler >> Boiler settings >> Boiler output >> Buffer charging logic" by switching to "Off".
- ⇒ If the modulating buffer operation is desired, the missing sensor must be installed.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.36 03.00-03.84 Sensor ... at the buffer storage tank ... is missing or faulty!

This alarm is available for each of the max. 5 sensors (1 to 5) at the 15 buffer storage tanks (0 to 14).

Defective sensor or sensor cable

- ⇒ Check the sensor and cabling to the sensor.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.37 04.00-04.33 DHWC temperature sensor ... is missing or faulty!

This alarm is available for each of the max. 2 sensors at the max. 14 DHWCs (1 to 14).

Defective sensor or sensor cable

- ⇒ Check the sensor and cabling to the sensor.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.38 05.00-05.15 Outside temperature sensor at the heat management module ... is missing or faulty!

This alarm is available for each of the max. 14 Heat management modules [WMM] (1 to 14).

- ⇒ Notify your heating system company or the KWB customer service.

8.9.1.39 06.00-06.15 BGB 2 at WMM ... is missing or faulty

This alarm is available for each of the max. 14 Heat management modules [WMM] (1 to 14).

- ⇒ Check the bus cabling.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.40 07.00 Ignition attempts unsuccessful!

The conditions for a successful ignition could not be met despite several attempts!

Important: To be able to clear the alarm, the combustion chamber must be inspected and cleared, if necessary!

Missing fuel or insufficient fuel amount

- ⇒ Check the ember bed flap function (for free movement).
- ⇒ Check the settings for the ignition level and/or the ember bed level when the ember bed flap is closed.
- ⇒ Reduce the necessary temperature increase for a successful ignition, if required (ignition level cannot be increased due to risk of deflagration).

Bad fuel

- ⇒ Check the fuel quality.
- ⇒ Remove wet or bad fuel (large pieces) from the combustion chamber and clear the alarm.

Too much ash in the combustion chamber

- ⇒ Check whether the crawler burner is functioning properly.

- ⇒ Check whether grate ash can be removed to a sufficient degree. If slag forms in the combustion chamber or the fuel has an increased ash content, a suitable fuel must be selected and/or the grate speed must be adjusted.

Ignition piped is blocked

CAUTION



Burn injuries due to hot surfaces

- ⇒ Ensure that the system is switched off and has cooled down before starting!

- ⇒ Remove any deposits from the ignition pipe opening (see Maintenance instructions).

Ignition is faulty

- ⇒ Check the heating element for proper functioning.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.41 07.01 The overflow protection switch of the conveyor system 1 is open!

The overflow protection cover has been lifted, this control as a result prevents that the conveyor screw gets stuck.

The system will be switched off.

WARNING



Unexpected start of the cellular wheel sluice

Risk of hand and arm getting caught and severed! Switch the system off before opening the conveyor channel!

WARNING



Unexpected start of the conveyor screw

Risk of hand and arm getting caught and severed! Switch the system off before opening the conveyor channel!

Faulty limit switch installation

- ⇒ Check the correct installation of the limit switch (orientation, cover tension).

Bridge-building due to large pieces in the drop shaft

- ⇒ Remove the fuel in the area below the overflow protection cover.

The fuel is not evacuated via the stoker

- ⇒ Check the stoker drive (incl. chain) for proper functioning.
- ⇒ Check whether fuel can be evacuated in sufficient amounts. Undefined fuel extraction amount in case of external conveyor systems (reduce drive speed of the external conveyor system or increase stoker afterrun time).
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.42 07.02 Faulty triac at the main drive or fuel extraction drive!

One of the triacs is faulty (permanently conductive).

The system will be switched off.

⇒ Notify your heating system company or the KWB customer service.

8.9.1.43 07.03 Main drive motor is overheated!

The system will be switched off.

Thermal motor protection has been triggered: The motor is too hot! Foreign object in a conveyor channel

⇒ Wait until the motor has cooled down. Now switch the system on again.

⚠ WARNING



Unexpected start of the cellular wheel sluice

Risk of hand and arm getting caught and severed! Switch the system off before opening the conveyor channel!

⚠ WARNING



Unexpected start of the conveyor screw

Risk of hand and arm getting caught and severed! Switch the system off before opening the conveyor channel!

⇒ If this fault recurs, call you heating technician or the KWB customer service.

8.9.1.44 07.04 Main drive motor is overloaded!

The system will be switched off.

⚠ WARNING



Unexpected start of the cellular wheel sluice

Risk of hand and arm getting caught and severed! Switch the system off before opening the conveyor channel!

⚠ WARNING



Unexpected start of the conveyor screw

Risk of hand and arm getting caught and severed! Switch the system off before opening the conveyor channel!

⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.45 07.05 Conveyor motor 1 is overloaded

The system will be switched off.

⚠ WARNING



Unexpected start of the cellular wheel sluice

Risk of hand and arm getting caught and severed! Switch the system off before opening the conveyor channel!

⚠ WARNING



Unexpected start of the conveyor screw

Risk of hand and arm getting caught and severed! Switch the system off before opening the conveyor channel!

Foreign objects in the fuel

Foreign objects in the fuel have overloaded the drive motor.

- ⇒ Use fuels that conforms to the standards!
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.46 07.06 Ultra sound sensor is faulty or occupied!

The ultrasonic sensor is soiled or fuel lies too close to the sensor.

Defective sensor or sensor cable

WARNING



Unexpected start of the conveyor screw

Risk of hand and arm getting caught and severed! Switch the system off before opening the conveyor channel!

WARNING



Unexpectedly closing fire shutter

Risk of hand and arm getting caught and severed! Switch the system off before opening the fire shutter!

- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.47 07.07 Safety shutdown: Temperature increase in the ash container!

The system will be switched off.

Temperature of the ash exceeds 85°C

Defective sensor or sensor cable

- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.48 07.08 Safety shutdown: Ash temperature sensor is missing or faulty!

Defective sensor or sensor cable

- ⇒ Notify your heating system company or the KWB customer service.

8.9.1.49 07.09 The temperature in the stoker channel is too high!

The system will be switched off.

The temperature in the stoker channel has exceeded the limit value of 90°C.

- ⇒ Notify your heating system company or the KWB customer service.

8.9.1.50 07.10 The stoker channel temperature sensor is missing or faulty!

The system will be switched off.

Defective sensor or sensor cable

- ⇒ Check the sensor and cabling to the sensor.

⇒ Notify your heating system company or the KWB customer service.

8.9.1.51 07.12 The ember bed sensor electronics are missing or is faulty!

The system will be switched off.

Defective sensor or sensor cable

⇒ Notify your heating system company or the KWB customer service.

8.9.1.52 07.13 The ember bed sensor electronics have been installed incorrectly!

The system will be switched off.

The ember bed sensor limit values (-50 and 750) have been exceeded.

⇒ Notify your heating system company or the KWB customer service.

8.9.1.53 07.15 The fire shutter does not open!

The system will be switched off.

The fire shutter cannot open.

The shutter had a temporary malfunction.

⇒ Check the fire shutter motor function by switching the system on and off via the **main switch**.

⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.54 07.16 The fire shutter does not close!

WARNING



Danger of backfire

If the fire shutter cannot be tightly closed, an increased risk of burnback exists.

⇒ Keep the heating system and the complete conveyor system under constant watch!

The system will be switched off.

⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.55 07.18 The grate drive is blocked!

The crawler burner drive reports a blockage. The boiler keeps running for 3 more full load hours and then shuts down.

⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.56 07.19 The ash conveyance motor is blocked!

The grate ash conveyor drive reports a blockage. The boiler keeps running for 3 more full load hours and then shuts down.

⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.57 07.20 The fly ash conveyor motor is blocked!

The fly ash conveyor drive reports a blockage. The boiler keeps running for 10 more full load hours and then shuts down.

- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.58 07.21 Check cleaning openings

The induced draught fan has been running for 15 minutes with more than 95% speed on average.

Note: This alarm does not trigger a fault shutdown! The exhaust gas paths, however, must be checked for cross section reduction in a timely manner to prevent a fault shutdown due to the subsequent alarm 02.10 The negative pressure in the combustion chamber cannot be regulated! [► 95].

Boiler leaking

- ⇒ Switch off the system and allow it to cool down before you check whether the boiler is sealed tightly! Possible leaks: Boiler door, maintenance openings, ash container

The heat exchanger is blocked

- ⇒ Check whether the heat exchanger cleaning works properly.
- ⇒ Check whether the heat exchanger inlet is open.

Cross section exhaust gas paths constricted

- ⇒ Check the area above the post-combustion ring for adhesions or caking and remove them.
- ⇒ Check the area below the heat exchanger including the exhaust gas pipe for excessive ash residue and remove it.

No automatic fly ash removal installed

- ⇒ Regularly remove the fly ash below the heat exchanger and from the exhaust gas pipe using appropriate tools (see maintenance instructions).

In order to increase the emptying intervals, KWB optionally offers an automatic fly ash removal. If interested, please contact your KWB partner or the KWB customer service.

Moist fuel

High levels of water content in the fuel combined with poor chimney draught can trigger this message.

- ⇒ Use only fuels that conform to the standards!

Induced draught fan does not work properly

- ⇒ Check the induced draught fan for proper functioning (e.g. fan wheel) and/or the correct installation of the ash containers.

Negative pressure measurement blocked or sensor defective

- ⇒ Check whether the measuring spot has been misplaced or the negative pressure hose has a kink.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.59 07.22 The ash container is almost full!

The alarm is triggered via the capacitive proximity switch at the ash container.

After a preset afterrun time has elapsed (factory setting: 10 full load hours), an automatic system shutdown occurs (alarm: 07.36 Ash container full – system is shutting down [► 107]).

⇒ Empty the ash container.

8.9.1.60 07.28 The burnout temperature sensor is missing or faulty!

The system triggers a message, but continues to run.

The fuel recognition plus is automatically deactivated when this error occurs.

⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.61 07.29 The water container of the emergency fire extinguishing system is empty!

The fill level of the emergency fire extinguishing system container is too low.

The system will be switched off.

Water has evaporated

⇒ Replenish the water if the water level in the container lies just below the float switch. This automatically clears the alarm.

The system leaks – the emergency fire extinguishing system was triggered

⇒ Check the system for leaks

⇒ Check the system for burnback and leaks in the stoker channel.

⇒ Remove the wet fuel from the stoker channel

⇒ Refill the water. This automatically clears the alarm.

⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.62 07.30 Exhaust gas recirculation fan speed is too low!

The speed of the fan has been under 300 revolutions per minute for 2 minutes now.

⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.63 07.31 The ember bed is too high

Too much fuel on the crawler burner

The alarm is given out if the specified ignition level is exceeded by 200 points.

The system will be switched off.

⇒ Remove the excess fuel from the combustion chamber and rectify the reason for the fault (e.g. remove spiky material).

Ash-rich fuel – Sintered ash at the grate that could not be removed

⇒ Check whether suitable fuel was selected and/or adjust the grate speed. Use the setting "air displacement" to adjust the primary air/secondary air ratio, if required.

The firebed flap or firebed sensor mechanics are installed incorrectly

⇒ Check the correct installation of the firebed flap and the sensor

⇒ Set the offset in the control with the flap completely closed so that the "firebed" value corresponds to 0.

- ⇒ Check the snug fit and/or proper placement of the transmitter cone on the firebed rods (4 mm projection transmitter rod to cone).
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.64 07.32 Ultrasonic sensor implausible

The sensor puts out implausible values.
The system will be switched off.

WARNING



Unexpected start of the conveyor screw

Risk of hand and arm getting caught and severed! Switch the system off before opening the conveyor channel!

- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.65 07.36 Ash container full – system is shutting down

After the alarm 07.22 The ash container is almost full! [▶ 105] was triggered, the system was shut-down after expiry of a preset time (factory setting: 10 full load hours).

- ⇒ Empty the ash container.

Note: To increase the emptying intervals, KWB optionally offers an ash conveyance into a 240 l ash bin. If interested, contact your KWB partner or the KWB customer service.

8.9.1.66 07.37 Exhaust gas recirculation shutter is unable to close!

The system will be switched off.

The exhaust gas recirculation shutter is unable to close!

The shutter had a temporary malfunction.

- ⇒ Check the motor function for the exhaust gas recirculation by switching the system on and off via the **main switch**.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.67 07.38 Exhaust gas recirculation shutter is unable to open!

The system will be switched off.

The exhaust gas recirculation shutter cannot open.

The shutter had a temporary malfunction.

- ⇒ Check the motor function for the exhaust gas recirculation by switching the system on and off via the **main switch**.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.68 07.41 Boiler power module: Rotary field mains supply wrong!

The system will be switched off. The rotary field mains supply of the Boiler power module [KPM] is wrong.

- ⇒ Have an electrician check and/or fix the electrical supply of the Boiler power module [KPM].
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.69 07.46 Grate drive motor faulty (short circuit)

The crawler burner drive reports a short circuit. The alarm "07.18 Grate drive is blocked!" usually occurs as a subsequent alarm.

To clear the alarm, switch the boiler for safety reasons at the main switch off and then on again after 10 seconds. Only in this way, it is possible to reset the electronics of the multi-phase motor.

Multi-phase motor faulty

- ⇒ Unplug both plugs from the motor. A short circuit or earth contact has probably occurred if it is possible to clear the alarm and now only the alarm "07.18 The grate drive is blocked!" is given out during activation in the relay test.
- ⇒ Plug in the plug and repeat the test. If the alarm "7.46 Grate drive motor is faulty (short circuit)" occurs again, replace the motor (without gearbox).

Cabling

- ⇒ Check the cabling between the boiler signal module (#244) and grate drive for damage or contact faults!
- ⇒ To clear the alarm, switch the boiler for safety reasons at the main switch off and then on again after 10 seconds. Only in this way, it is possible to reset the electronics of the multi-phase motor.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.70 07.47 Ash screw motor faulty (short circuit)

The ash screw drive reports a short circuit. The alarm "07.19 Ash conveyance motor is blocked!" usually occurs as a subsequent alarm.

To clear the alarm, switch the boiler for safety reasons at the main switch off and then on again after 10 seconds. Only in this way, it is possible to reset the electronics of the multi-phase motor.

Multi-phase motor faulty

- ⇒ Unplug both plugs from the motor. A short circuit or earth contact has probably occurred if it is possible to clear the alarm and now only the alarm "07.19 The ash conveyance motor is blocked!" is given out during activation in the relay test.
- ⇒ Plug in the plug and repeat the test. If the alarm "7.47 Ash screw motor is faulty (short circuit)" occurs again, replace the motor (without gearbox).

Cabling

- ⇒ Check the cabling between the boiler signal module (#245) and ash screw drive for damage or contact faults!
- ⇒ To clear the alarm, switch the boiler for safety reasons at the main switch off and then on again after 10 seconds. Only in this way, it is possible to reset the electronics of the multi-phase motor.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.71 07.48 Motor fly ash screw (short circuit)

The fly ash screw drive reports a short circuit. The alarm "07.20 The fly ash conveyor motor is blocked!" usually occurs as a subsequent alarm.

To clear the alarm, switch the boiler for safety reasons at the main switch off and then on again after 10 seconds. Only in this way, it is possible to reset the electronics of the multi-phase motor.

Multi-phase motor faulty

- ⇒ Unplug both plugs from the motor. A short circuit or earth contact has probably occurred if it is possible to clear the alarm and now only the alarm "07.20 The fly ash conveyor motor is blocked!" is given out during activation in the relay test.
- ⇒ Plug in the plug and repeat the test. If the alarm "7.48 Motor fly ash screw is faulty (short circuit)" occurs again, replace the motor (without gearbox).

Cabling

- ⇒ Check the cabling between the boiler signal module (#246) and fly ash screw drive for damage or contact faults!
- ⇒ To clear the alarm, switch the boiler for safety reasons at the main switch off and then on again after 10 seconds. Only in this way, it is possible to reset the electronics of the multi-phase motor.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.72 08.01-08.14 Internal error ... DHWC ...

An error occurred in one of the DHWCs (1 to 14) which the control should have prevented.

- ⇒ Notify your heating system company or the KWB customer service.

8.9.1.73 09.01-09.28 Internal error ... heating circuit ...

An error occurred in one of the heating circuits (1.1 to 14.2) that the control should have prevented.

- ⇒ Notify your heating system company or the KWB customer service.

8.9.1.74 10.00-10.14 Internal error ... group ...

An error occurred in one of the groups (0 to 14).

- ⇒ Notify your heating system company or the KWB customer service.

8.9.1.75 11.00-11.14 Internal error ... buffer storage tank ...

An error occurred in one of the buffer storage tanks (0 to 14) which the control should have prevented.

- ⇒ Notify your heating system company or the KWB customer service.

8.9.1.76 12.00-12.15 Boiler temperature sensor at the second boiler ... is missing or faulty!

This alarm exists for each of the max. 14 second boilers (1 to 14).

Defective sensor or sensor cable

- ⇒ Check the sensor and cabling to the sensor.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.77 13.00-13.30 Forward flow temperature sensor in the heating circuit ... is missing or faulty!

This alarm is available for every heating circuit.

Defective sensor or sensor cable

- ⇒ Check the sensor and cabling to the sensor.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.78 15.00-15.15 WMM ... not available!

The control has lost connection to the specified Heat management module [WMM] (1 to 14).

Power supply at the external Heat management module [WMM]

- ⇒ Check whether the power supply of the Heat management module [WMM] has failed in adjacent buildings during installation.
- ⇒ Check whether the power supply unit at the external Heat management module [WMM] was connected correctly.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.79 17.00 House bus connection error

The KWB "house bus" connects the boiler with other network components. This alarm is only displayed if there is a problem aligning two Exclusive control unit [BGE].

- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.80 17.01 More than one boiler control unit [BGE] detected!

The control found more than one Exclusive control unit [BGE] in the network that has been configured as the "BGE at the boiler".

- ⇒ Notify your heating system company or the KWB customer service.

8.9.1.81 17.02 Log error during parameter reconciliation!

Not all data could be transferred via the bus during parameter reconciliation.

- ⇒ Notify your heating system company or the KWB customer service.

8.9.1.82 17.03 Node with incompatible parameter version detected!

The control detected an Exclusive control unit [BGE] in the network whose parameters could not be exchanged with other control units.

- ⇒ Notify your heating system company or the KWB customer service.

8.9.1.83 17.04 Unacknowledged alarms are pending at the boiler

This message only appears on an Exclusive control unit [BGE] in the living quarters and alerts you to the fact that alarms are pending.

Use the Exclusive control unit [BGE] at the boiler to acknowledge the alarms.

- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.84 17.05 CAN: Internal error

Have the boiler information such as boiler number and software version (to be found in the menu Customer service >> Support) ready and contact your heating system company or KWB customer service.

8.9.1.85 17.06 No connection to boiler BGE

This message only appears on a Exclusive control unit [BGE] in the living quarters and alerts you to the fact that the connection to the control unit at the boiler or the Exclusive control unit [BGE] in the WMM has been interrupted.

Power supply at the boiler has failed

- ⇒ Check whether the power supply at the boiler has failed.
- ⇒ Check whether the boiler has been switched off.
- ⇒ If you cannot rectify the error, call your heating technician or the KWB Customer Service.

8.9.1.86 18.00-18.15 BGB 1 at WMM ... is missing or faulty!

This alarm is available for each of the max. 14 Heat management modules [WMM] (1 to 14).

- ⇒ Notify your heating system company or the KWB customer service.

8.9.1.87 19.00-19.30 Analogue room temperature sensor at heating circuit ... is missing or faulty!

Note: "Analogue sensor" refers to a PT1000 sensor and NOT the sensor in the mounting base of the Basic control unit [BGB] or Exclusive control unit [BGE]!

Defective sensor or sensor cable

- ⇒ Check the sensor and cabling to the sensor.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.88 20.00 ComfortOnline: Connection timeout!

No connection to the server. The connection is interrupted.

- ⇒ Check the network connection from the control unit to your internet modem (router) and the connection to the internet.
- ⇒ If you cannot clear the alarm, call your network technician.

8.9.1.89 20.01 ComfortOnline: Internal Error (Fifo error)!

- ⇒ Have the boiler information such as boiler number and software version (to be found in the menu Customer service >> Support) ready and contact your heating system company or KWB customer service.

8.9.1.90 20.02 ComfortOnline: Internal Error (Fifo buffer full)

- ⇒ Have the boiler information such as boiler number and software version (to be found in the menu Customer service >> Support) ready and contact your heating system company or KWB customer service.

8.9.1.91 20.03 ComfortOnline: Transport not enabled

- ⇒ Have the boiler information such as boiler number and software version (to be found in the menu Customer service >> Support) ready and contact your heating system company or KWB customer service.

8.9.1.92 20.04 ComfortOnline: Connection error

No connection to the server. The connection is interrupted.

- ⇒ Check the network connection from the control unit to your internet modem (router) and the connection to the internet.
- ⇒ If you cannot clear the alarm, call your network technician.

8.9.1.93 20.05 ComfortOnline: Login error

- ⇒ Have the boiler information such as boiler number and software version (to be found in the menu Customer service >> Support) ready and contact your heating system company or KWB customer service.

8.9.1.94 20.06 ComfortOnline: Server reports 'invalid telegram format'

- ⇒ Have the boiler information such as boiler number and software version (to be found in the menu Customer service >> Support) ready and contact your heating system company or KWB customer service.

8.9.1.95 20.07 ComfortOnline: Server reports 'BGE software version not supported'

The ComfortOnline server has detected that the installed software is not supported at the control unit. Remote access to the system is thus impossible.

- ⇒ Make sure that all Exclusive control units in the network have the most recent software.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.96 20.08 ComfortOnline: Unknown BGE series number for this boiler series number

The ComfortOnline server has detected that the control unit series number does not match the series number stored on the server.

- ⇒ Notify your heating system company or the KWB customer service.

Please also see

- 📖 Comfort Online [▶ 75]

8.9.1.97 20.09 ComfortOnline: Server reports 'A system with this series number is already online'

The ComfortOnline server has detected that a boiler with this serial number already exists.

- ⇒ Compare the boiler number and the series model version on the type plate with the data entered in the menu Boiler >> Boiler settings >> Serial number.
- ⇒ Please correct the number, if necessary, and perform the registration again.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.98 20.10 ComfortOnline: Server reports 'BGE with this ser. no. was already used with other boiler ser. no.'

The ComfortOnline server has detected that the control unit series number has already been used with another boiler series number.

Remote access to the system is thus impossible.

⇒ Notify your heating system company or the KWB customer service.

Please also see

📖 Comfort Online [▶ 75]

8.9.1.99 20.11 ComfortOnline: Server reports 'Unexpected message'

⇒ Have the boiler information such as boiler number and software version (to be found in the menu Customer service >> Support) ready and contact your heating system company or KWB customer service.

8.9.1.100 20.12 ComfortOnline: Server reports 'Unexpected server error'

⇒ Have the boiler information such as boiler number and software version (to be found in the menu Customer service >> Support) ready and contact your heating system company or KWB customer service.

8.9.1.101 20.13 ComfortOnline: Server reports 'Unexpected sequence counter'

⇒ Have the boiler information such as boiler number and software version (to be found in the menu Customer service >> Support) ready and contact your heating system company or KWB customer service.

8.9.1.102 21.00 The outside temperature sensor at the KSM is missing or faulty!

The control is unable to detect the external temperature sensor plugged in at the Boiler signal module [KSM].

The sensor is connected to the Heat management module [WMM]

⇒ Check the correct settings of the external temperature sensor or correct them, if necessary, under Basic settings >> Network settings.

Defective sensor or sensor cable

⇒ Check the sensor and cabling to the sensor.

⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.103 22.00-22.09 Boiler expansion module ...: Rotary field mains supply wrong!

This alarm is available for each of the max. 10 Boiler expansion modules [KEM] (1 bis 10).

The system will be switched off. The rotary field mains supply of the Boiler expansion module [KEM] is wrong.

⇒ Have an electrician check and/or fix the power supply of the Boiler expansion module [KEM].

⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.104 23.00-23.15 Circulation temperature sensor at the WMM ... is missing or faulty!

This alarm is available for each of the max. 14 DHWCs or buffer storage tanks (1 to 14).

Defective sensor or sensor cable

- ⇒ Check the sensor and cabling to the sensor.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.105 24.00 Error while securing the flash parameters

- ⇒ Have the boiler information such as boiler number and software version (to be found in the menu Customer service >> Support) ready and contact your heating system company or KWB customer service.

8.9.1.106 24.01 Error while loading settings

- ⇒ Make sure that all control units in the network have the most recent software.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.107 24.02 Error while securing the flash parameters

- ⇒ Have the boiler information such as boiler number and software version (to be found in the menu Customer service >> Support) ready and contact your heating system company or KWB customer service.

8.9.1.108 24.03 Error while loading settings

- ⇒ Have the boiler information such as boiler number and software version (to be found in the menu Customer service >> Support) ready and contact your heating system company or KWB customer service.

8.9.1.109 25.00 Configuration boiler bus failed.

This alarm indicates an error during the execution of the start-up assistant. This error is caused, e.g., by an incorrect bus cabling or unknown modules at the boiler bus.

- ⇒ Notify your heating system company or the KWB customer service.

8.9.1.110 25.01 Configuration house bus failed.

This alarm indicates an error during the execution of the start-up assistant. This error is caused, e.g., by incorrect bus cabling or duplicate Heat management module [WMM] addresses or unknown modules at the house bus.

- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.111 25.02 Boiler type was not configured

The control was not able to read the boiler type. This may e.g. occur after a software update or parameter import.

- ⇒ Notify your heating system company or the KWB customer service.

8.9.1.112 25.07 Restart required. Hardware configuration was changed.

The hardware configuration (number of boilers, IP address, etc.) was changed. A restart is required.

⇒ Use the function "Restart control unit" in the menu "Save/Reset" to restart the control unit.

8.9.1.113 26.00–26.15 WMM ... does not support 2nd heating circuit

You tried to activate a 2nd heating circuit, but the specified Heat management module [WMM] (1 to 14) does not support it!

KWB offers the Heat management module [WMM] in several versions – please note the number of available heating circuits!

⇒ If an additional heating circuit is required, contact your KWB partner or the KWB customer service.

8.9.1.114 27.00-27.15 WMM ... does not support a secondary heating source

You tried to activate a secondary heating source, but the specified Heat management module [WMM] (1 to 14) does not support it!

⇒ Contact your KWB partner or the KWB customer service if a secondary heating source needs to be connected, if required.

8.9.1.115 28.00–28.30 The Exclusive control unit [BGE] with node number ... is not available!

The specified Exclusive control unit [BGE] cannot be found in the network.

Bus fault

⇒ Check the bus cabling: Follow the respective instructions in the Connection instructions.

⇒ Check whether the Heat management module [WMM] connected to the Exclusive control unit [BGE] has a functioning power supply and functions properly.

⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.116 29.00-29.30 Heating circuit ...: Room influence and Eco operation require a sensor for the room temperature.

This alarm is available for every heating circuit.

The functions room influence (explained in section Room influence) and eco operation (explained in section Taking the room influence into account [► 57]) can only function if a room temperature sensor was assigned for the respective heating circuit.

⇒ Activate a room temperature sensor.

⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.117 30.00 GSM modem does not respond

Communication with GSM modem is interrupted.

⇒ Communication with the GSM modem could NOT be established, however, the system continues to run.

Communication path is interrupted.

⇒ GSM modem is not supplied with power.

- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.118 30.01 GSM modem error

Communication with GSM modem is interrupted.

- ⇒ Communication with the GSM modem could NOT be established, however, the system continues to run.

Communication path is interrupted.

- ⇒ GSM modem is not supplied with power.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.119 30.58 GSM modem error: CMS 303 operation not supported

An unexpected error occurred.

- ⇒ Clear the alarm.
- ⇒ If this fault recurs, call your heating technician or the KWB customer service.

8.9.1.120 31.00-31.09 KEM ... not available!

This alarm is available for each of the maximally 10 Boiler expansion modules [KEM] (1 to 10).

The control has lost connection to the specified Boiler expansion module [KEM] (1 to 10).

Power supply at the external Boiler expansion module [KEM]

- ⇒ Check whether the power supply unit at the external Boiler expansion module [KEM] was connected correctly.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.121 32.00-32.09 Emergency escape switch (emergency stop switch) KEM... was pressed!

This alarm is available for each of the maximally 10 Boiler expansion modules [KEM] (1 to 10).

The emergency-stop button was pressed

- ⇒ Determine why this switch (emergency-stop switch) was pressed.
- ⇒ If the system is OK, press the emergency-stop switch once more. The alarm will be cleared automatically.
- ⇒ In all other cases:
- ⇒ Notify your heating system company or the KWB customer service.

DANGER



No emergency-stop switch connected – life-threatening danger!

- ⇒ Have an emergency-stop switch connected according to the building code that applies to you!

8.9.1.122 33.00-33.09 Safety circle External KEM ... interrupted!

This alarm is available for each of the maximally 10 Boiler expansion modules [KEM] (1 to 10).

External safety device

An external safety device (e.g. limit switch storage room door) was triggered at plug 404.

- ⇒ Check why the safety chain was interrupted (limit switch storage room door, ...).
- ⇒ Notify your heating system company or the KWB Customer Service, if necessary.

8.9.1.123 34.00-34.09 KEM...: The temperature in the fuel storage is too high!

This alarm is available for each of the max. 10 Boiler expansion modules [KEM] (1 to 10).

The system will be switched off.

DANGER



Fire in the fuel storage room!

- ⇒ Keep all openings on the boiler and to the storage area closed to cut off the air supply.
- ⇒ Call the fire department!

The switch of the fuel temperature monitoring ("TM") in the conveyor channel reacts at 70°C or is defective!

Fire alarm in the storage room

- ⇒ If the conveyor channel is hot or if there is a smell of burning or visible burn marks, you must notify the fire department immediately!
- ⇒ Please contact your heating technician or the KWB customer service if the conveyor channel is cold.

Defective sensor or sensor cable

- ⇒ Check the sensor and cabling to the sensor (contact problem).
- ⇒ Notify your heating system company or the KWB customer service.

8.9.1.124 35.00-35.09 KEM...: Drive 1 is overheated!

This alarm is available for each of the max. 10 Boiler expansion modules [KEM] (1 to 10).

Thermal motor protection has been triggered: The motor is too hot!

The system will be switched off.

Foreign object in a conveyor channel

WARNING



Unexpected start of the conveyor screw

Risk of hand and arm getting caught and severed! Switch the system off before opening the conveyor channel!

- ⇒ Notify your heating system company or the KWB customer service.

8.9.1.125 36.00-36.09 KEM...: Drive 2 is overheated!

This alarm is available for each of the max. 10 Boiler expansion modules [KEM] (1 to 10).

Thermal motor protection has been triggered: The motor is too hot!

The system will be switched off.

Foreign object in a conveyor channel**⚠ WARNING****Unexpected start of the conveyor screw**

Risk of hand and arm getting caught and severed! Switch the system off before opening the conveyor channel!

⇒ Notify your heating system company or the KWB customer service.

8.9.1.126 40.00-40.09 KEM...: Overload drive 1!

This alarm is available for each of the max. 10 Boiler expansion modules [KEM] (1 to 10).

⚠ WARNING**Unexpected start of the cellular wheel sluice**

Risk of hand and arm getting caught and severed! Switch the system off before opening the conveyor channel!

⚠ WARNING**Unexpected start of the conveyor screw**

Risk of hand and arm getting caught and severed! Switch the system off before opening the conveyor channel!

⇒ Use fuels that conforms to the standards!

⇒ Notify your heating system company or the KWB customer service.

8.9.1.127 41.00-41.09 KEM...: Overload drive 2!

This alarm is available for each of the max. 10 Boiler expansion modules [KEM] (1 to 10).

⚠ WARNING**Unexpected start of the cellular wheel sluice**

Risk of hand and arm getting caught and severed! Switch the system off before opening the conveyor channel!

⚠ WARNING**Unexpected start of the conveyor screw**

Risk of hand and arm getting caught and severed! Switch the system off before opening the conveyor channel!

⇒ Use fuels that conforms to the standards!

⇒ Notify your heating system company or the KWB customer service.

8.9.1.128 42.00-42.09 KEM...: Phase 2 interruption!

This alarm is available for each of the maximally 10 Boiler expansion modules [KEM] (1 to 10).

When the motor was switched on, it turned out that phase 2 of the mains supply to the Boiler expansion module [KEM] is missing.

The system will be switched off.

⇒ Have an electrician check the power supply of the Boiler expansion module [KEM].

⇒ Notify your heating system company or the KWB customer service.

8.9.1.129 43.00-43.09 KEM...: Phase 3 interruption!

This alarm is available for each of the maximally 10 Boiler expansion modules [KEM] (1 to 10).
When the motor was switched on, it turned out that phase 3 of the mains supply to the Boiler expansion module [KEM] is missing.

The system will be switched off.

- ⇒ Have an electrician check the power supply of the Boiler expansion module [KEM].
- ⇒ Notify your heating system company or the KWB customer service.

8.9.1.130 44.00-44.09 KEM...: Overfill protection switch drive 1 is open!

This alarm is available for each of the maximally 10 Boiler expansion modules [KEM] (1 to 10).

The overfill protection cover got lifted. The control reacts by preventing the conveyor screw from jamming.

The system will be switched off.

WARNING



Unexpected start of the cellular wheel sluice

Risk of hand and arm getting caught and severed! Switch the system off before opening the conveyor channel!

WARNING



Unexpected start of the conveyor screw

Risk of hand and arm getting caught and severed! Switch the system off before opening the conveyor channel!

Faulty limit switch installation

- ⇒ Check the correct installation of the limit switch (e.g. orientation, cover tension).

Bridge-building is not removed

- ⇒ Remove the fuel in the area below the overfill protection cover.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.131 45.00-45.09 KEM...: Ash bin is missing!

This alarm is available for each of the max. 10 Boiler expansion modules [KEM] (1 to 10).

The system will be switched off.

The ash bin has been removed or the ash bin cover has not been correctly installed.

- ⇒ Install the missing ash bin and/or replace the ash bin cover.

Ash bin switch has been installed incorrectly

- ⇒ Check the switch setting.

Cabling error

- ⇒ Check the cabling.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.132 46.00-46.09 KEM...: Drive 1 triac is faulty

This alarm is available for each of the max. 10 Boiler expansion modules [KEM] (1 to 10).

The triac for drive 1 at the Boiler expansion module [KEM] is faulty (permanently conductive!).

The system will be switched off.

⇒ Notify your heating system company or the KWB customer service.

8.9.1.133 47.00-47.09 KEM...: Drive 2 triac faulty

This alarm is available for each of the max. 10 Boiler expansion modules [KEM] (1 to 10).

The triac for drive 2 at the Boiler expansion module [KEM] is faulty (permanently conductive!).

The system will be switched off.

⇒ Notify your heating system company or the KWB customer service.

8.9.1.134 49.00-49.30 Threshold value of heating circuit {1.1-14.2} exceeds the minimum temperature!

This alarm exists for each of the max. 28 heating circuits [HC ...] {1.1 to 14.2}.

The threshold value is set to a higher value than the minimum forward flow temperature!

⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.135 51.01-51.14 Solar system {1-14}: Assignment of a non-activated storage tank!

This alarm is available for each of the max. 14 solar systems (1-14).

Note for the assignment of non-activated storage tanks:

A non-activated storage tank is to be assigned to the selected solar hydraulics system diagram. The alarm automatically clears as soon as the respective storage tank is activated.

(For buffer storage tanks, the selected buffer type does not need to correspond to a buffer type with solar register.)

⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.136 52.01-52.14 Solar system {1-14}: Assignment of an already used storage tank!

This alarm is available for each of the max. 14 solar systems (1-14).

NOTE! The storage tank was already selected for another solar system (zone):

An already used storage tank is to be assigned to the selected solar hydraulics system diagram. The alarm automatically clears as soon as the respective storage tank is activated at least once.

⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.137 53.01-53.14 WMM {1-14} does not support solar

This alarm is available for each of the max. 14 Heat management modules [WMM] (1-14).

No solar control can be activated on this Heat management module as only one heating circuit is supported. The solar control is only supported on a Heat management module [WMM] with two heating circuits or a Heat management module Universal.

⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.138 54.01-54.14 The collector temperature sensor of the solar system {1-14} is missing or faulty!

This alarm is available for each of the max. 14 solar systems (1-14).

The collector temperature sensor, the sensor input or a connecting cable is missing or faulty.

⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.139 55.01-55.14 The forward-flow temperature sensor of the solar system {1-14} is missing or faulty!

This alarm is available for each of the max. 14 solar systems (1-14).

The forward-flow temperature sensor, the sensor input or a connecting cable is missing or faulty.

⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.140 57.01-57.14 Solar system {1-14}: Licence invalid

This alarm is available for each of the max. 14 solar systems (1-14).

License invalid

A license must be purchased so that the solar control can be released in the software. A license for the software product may not be shared by several devices at the same time.

- Case 1: ⇒ Purchase a license and load it into the control unit, see section KWB Comfort 4 functions
- Case 2: ⇒ The Exclusive control unit [BGE] or Heat management module [WMM] needs to be replaced. This also requires a new license!
- Case 3: ⇒ Check the uploaded license to see if the serial number of the uploaded license matches the serial number of the installed modules.
⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.141 58.00-58.16 Group/Puffer {0-14} must not have itself as source.

This alarm is available for each of the max. 15 buffer storage tanks (0-14).

⇒ Check and correct the set source of the supply pump or the buffer storage tank in the menu Basic settings >> Network settings >> Buffer storage tank / Supply pumps. **As source, select the group (or the boiler) that supplies the buffer storage tank or, for the supply pump, the group/buffer from which it draws the heat.**

⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.142 59.00-59.15 Source configuration of Group/Buffer {0-14} invalid

This alarm is available for each of the max. 15 buffer storage tanks (0-14).

⇒ Check and correct the set source of the supply pump or the buffer storage tank in the menu Basic settings >> Network settings >> Buffer storage tank / Supply pumps. **Select one source that is available in the system.**

- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.143 64.00 Can bus address of the M-bus module is false



The address switches at the C4 M-bus interface module were configured incorrectly.

- ⇒ The address switches must be configured according to the illustration.
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.144 64.01 The M-bus interface module is not available

The control has lost the connection to the C4 M-bus interface module.

- ⇒ Check the power supply at the module!
- ⇒ Check whether the power supply of the M-bus interface module has failed. This is detectable if the **green LED** at the **power supply unit** or the **LEDs** on the **module** are not lit.



Possible causes

Bus fault

- ⇒ Check the bus cabling:
Follow the respective instructions in the connection instructions.
- ⇒ Check for correct termination:
Has the terminating resistor been set correctly?
- ⇒ If you cannot rectify the alarm despite all these measures, call your heating technician or the KWB customer service.

8.9.1.145 64.02 The M-bus meter is not available

The control has lost connection to the M-bus heat quantity meter.

Possible causes

Check the proper functioning of the meter

- ⇒ Check whether the heat quantity meter shows an error on the display.
- ⇒ Check with battery-operated meters that the battery is still full.

Bus fault

- ⇒ Check the M-bus cabling of the meters.
Follow the respective instructions in the connection instructions or the manual for the meter.

Configuration error

- ⇒ Check the Meter address or Sec. address. Do the meter settings correspond to these?

Note

- ⇒ Each bus address must only occur once!
- ⇒ Query interval too short (occurs too frequently).
Check the manufacturer's specifications for the heat quantity meter regarding the max. permissible query intervals and correct them in the menu under Basic settings >> Network settings >> Heat quantity meter.

8.9.1.146

8.9.1.147

8.9.1.148

8.9.1.149

9 Dismantling and disposal

9.1 Dismantling

- ➔ Dismantle the boiler in reverse order of the assembly sequence. Consult KWB Customer Service for advice! Comply with local regulations!
- ⇒ Shut down the heating system and disconnect the boiler from the mains after the system has cooled down.
- ⇒ Empty the boiler.

WARNING

Fatal crushing (pulled muscles) caused by heavy components! Inappropriate lifting/transporting can lead to fatal injury and serious damage to the equipment.



- ➔ **Only trained staff** may lift/transport heavy components!
- ➔ **Keep the component weight in mind – handle accordingly:**
 - ⊕ Verify transport securing devices BEFORE lifting / transporting!
 - ⊕ Keep the centre of gravity in mind - always secure components to prevent slipping and tilting!
 - ⊕ Select stable bases, suitable tools and assistance from staff!
 - ⊕ Lift with your back straight, NOT too heavy.
 - ⊕ Use your personal protection equipment[PSA].
 - ⊕ In difficult areas ensure that people and system are safe!

- ⇒ Remove and empty the ash container.
- ⇒ Disconnect the boiler from the hydraulic system and the chimney connection.
- ⇒ Dismantle the casing cover parts and the cabling.
- ⇒ Disconnect the heat exchanger from the combustion chamber.
- ⇒ Disconnect the stoker from the combustion chamber and the conveyor system.
- ⇒ Remove the cellular sluice wheel.
- ⇒ Remove the crawler burner from the combustion chamber.

9.2 Disposal

- ⇒ Comply with local waste disposal regulations! Ensure environmentally sound disposal pursuant to AWG (Austria) or country-specific provisions.
- ⇒ Recyclable materials can be taken separately and in clean condition to the specified recycling points.

In principle, you can dispose of the heating system as residual or bulky waste – but we recommend separating its components for recycling purposes (in a recycling centre) in order to handle resources in a more sustainable manner.

Plastic materials

The control unit housings, cable bushings and seals are made of plastic or rubber.

Construction waste

This includes the insulation (mineral wool) and the refractory bricks from the combustion chamber.

Metal

Our main material is metal which can be recycled efficiently: Substructure, burner, heat exchanger, cables ...

Circuit boards

- ⇒ Dispose of these responsibly!
Comply with all local waste disposal regulations!

CAUTION

Hazardous waste – dispose of properly!

The metals on and in the circuit boards do NOT belong in the household waste.



- ↪ All circuit boards used by KWB comply with the "Directive 2002/95/EC for the restriction of certain hazardous substances in electrical and electronics equipment".
- ⇒ Take the circuit boards to a proper disposal facility – this helps protect the environment!
- ⇒ Dispose of the circuit boards at collection points for electronic waste only.

Battery

CAUTION

Environmental contamination by batteries



- ↪ There is a lithium battery inside the boiler control unit.
- ⇒ Dispose of the battery separately. When doing so, you must comply with all local regulations!

The following characters below the garbage bin symbol stand for:

- Pb: Battery contains lead
- Cd: Battery contains cadmium
- Hg: Battery contains mercury

Old batteries may not be disposed of in the household waste: EU Directive 2006/66/EC obligates consumers to dispose of batteries/rechargeable batteries at a collection point (more information can be found at <http://www.epbaeurope.net/>). Returning batteries to communal collection points is free of charge for private households.

Alternatively, you can send used batteries from the KWB control unit back to us. When sending batteries/rechargeable batteries, you must meet a few special conditions: Please inquire ahead of time (hazardous materials) and be sure to provide sufficient postage.

10 Appendix

Please also see

-  Declaration of Conformity [[▶ 127](#)]
-  Technical data table KWB Multifire - log wood [[▶ 129](#)]
-  Technical data table KWB Multifire - pellets [[▶ 130](#)]
-  TDT-MF2-D-ZI_mit_Pellets_EN [[▶ 131](#)]

EU-Declaration of Conformity

As specified by the EC Machinery Directive 2006/42/EC, Annex II 1 A

We hereby declare that the specified system in the series version complies with all applicable provisions of the Machine Directive.

Boilers of the model range

KWB Multifire 20–120 kW, comprising the models
MF2 D/ZI 20 / 30 / 40 / 45 / 50 / 60 / 65 / 70 / 80 / 100 / 108 / 120

in combination with conveyor systems

Stirrer M, conveyor channel with conveyor screw M,
drive unit, ascending channel with conveyor screw M, downpipe

Furthermore, the system conforms to the following directives/applicable regulations:

EMC Directive 2014/30/EU; Directive 2014/35/EU, RoHS Directive 2011/65/EU; Ecodesign Directive 2009/125/EG, EnEV 2021 Switzerland

Applied European harmonised standards:

EN 303-5:2012, EN 60335-1:2014-04, EN 60335-2-102:2006, ÖNORM EN ISO 12100:2013-10-15

KWB – Kraft und Wärme aus
Biomasse GmbH

St. Margarethen an der Raab
06.07.2021



Authorised representative for
the compilation of the technical
documents

Place,
Date

Helmut Matschnig, Managing
Director

UK CA Declaration of Conformity

As specified by the UK Supply of Machinery (Safety) Regulations 2008 (S.I. 2008 No. 1597) Schedule 2 Part 2 Annex II Section 1 Part A, amended by the Product Safety and Metrology etc. (Amendment etc.) (EU Exit) Regulations 2019

We hereby declare that the specified system in the series version complies with all applicable provisions of the Supply of Machinery (Safety) Regulations 2008 (S.I. 2008 No. 1597)

Boilers of the model range

KWB Multifire 20–120 kW, comprising the models
MF2 D/ZI 20 / 30 / 40 / 45 / 50 / 60 / 65 / 70 / 80 / 100 / 108 / 120

in combination with conveyor systems

Stirrer M, conveyor channel with conveyor screw M,
drive unit, ascending channel with conveyor screw M, downpipe

Furthermore, the system conforms to the following directives/applicable regulations:

Electromagnetic Compatibility Regulations 2016 (S.I. 2016/1091); Electrical Equipment (Safety) Regulations 2016; The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 (S.I. 2012/3032); Ecodesign for Energy-Related Products and Energy Information;

Applied European harmonised standards:

Supply of Machinery (Safety) Regulations 2008 (S.I. 2008 No. 1597)

KWB – Kraft und Wärme aus
Biomasse GmbH

St. Margarethen an der Raab
15.07.2021



Authorised representative for
the compilation of the technical
documents

Place,
Date

Helmut Matschnig, Managing
Director

| MF2 D/ZI MF2 E D/ZI 03.05.2021 | Unit | 20 | 30 ¹ | 30 ² | 40 | 45 ¹ | 50 ¹ | 60 ¹ | 65 ¹ | 70 ¹ | 80 | 100 ² | 108 ¹ | 120 | |
|--|--------------------|--------------|-----------------|-----------------|-------------|-----------------|-----------------|-----------------|-----------------------|-----------------|-------------|------------------|------------------|---------------|--|
| Rated power | kW | 20 | 30 | 32.5 | 40 | 45 | 49.5 | 60 | 65 | 69.5 | 80 | 99/100/101 | 108 | 120 | |
| Partial load | kW | 6.0 | 9.0 | 9.8 | 12.0 | 13.5 | 14.9 | 18.0 | 19.5 | 20.9 | 24.0 | 30.0 | 32.4 | 36.0 | |
| Boiler efficiency at rated power (values with dust filter) | % | 94,8 (94,8) | 95,1 (95,1) | 95,2 (95,2) | 94,0 (95,4) | 94,0 (95,3) | 93,9 (95,3) | 93,8 (95,2) | 93,8 (95,1) | 93,7 (95,0) | 93,6 (94,9) | 93,8 (95,3) | 93,9 (95,5) | 94,0 (95,7) | |
| Boiler efficiency at partial load (values with dust filter) | % | 92,4 (92,4) | 93,0 (93,0) | 93,1 (93,1) | 92,7 (93,5) | 92,6 (93,6) | 92,6 (93,7) | 92,4 (93,9) | 92,3 (94,0) | 92,3 (94,1) | 92,1 (94,3) | 93,3 (95,0) | 93,7 (95,2) | 94,4 (95,6) | |
| Fuel thermal output at rated power (values with dust filter) | kW | 21,1 (21,1) | 31,5 (31,5) | 34,1 (34,1) | 42,6 (41,8) | 47,9 (47,2) | 52,7 (51,9) | 64,0 (63,0) | 69,3 (68,3) | 74,2 (73,2) | 85,5 (84,3) | 106,6 (104,9) | 115 (113,1) | 127,7 (125,4) | |
| Fuel thermal output at partial load (values with dust filter) | kW | 6,5 (6,5) | 9,7 (9,7) | 10,5 (10,5) | 12,9 (12,9) | 14,6 (14,4) | 16,0 (15,8) | 19,5 (19,2) | 21,1 (20,7) | 22,6 (22,2) | 26,1 (25,5) | 32,2 (31,6) | 34,6 (34,0) | 38,1 (37,7) | |
| Boiler class according to EN 303-5:2012 | – | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | |
| EU Energy label | – | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | |
| Water side | | | | | | | | | | | | | | | |
| Water content | l | 155 | 155 | 155 | 135 | 135 | 135 | 165 | 165 | 165 | 165 | 195 | 195 | 195 | |
| Water connection, forward/return flow (internal thread) without return-flow boost device | Inch mm DN | 5/4 | 5/4 | 5/4 | 5/4 | 5/4 | 5/4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| Water connection, forward/return flow (internal thread) with return-flow boost device | Inch mm DN | 5/4 | 5/4 | 5/4 | 5/4 | 5/4 | 5/4 | 6/4 | 6/4 | 6/4 | 6/4 | 2 | 2 | 2 | |
| Water connection for filling and/or emptying (internal thread) | inch mm | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | |
| Water connection for thermal safety valve (external thread) | Inch mm | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | |
| Thermal safety valve: pressure | bar | 2-4 | 2-4 | 2-4 | 2-4 | 2-4 | 2-4 | 2-4 | 2-4 | 2-4 | 2-4 | 2-4 | 2-4 | 2-4 | |
| Thermal safety valve: required cold water temperature | °C | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | |
| Water-side resistance at 10 K | mbar Pa | 37,0 | 37,0 | 85,4 | 153,8 | 200,2 | 242,1 | 56,1 | 67,2 | 77,2 | 100,6 | 158,0 | 172,8 | 228,7 | |
| Water-side resistance at 20 K | mbar Pa | 8,5 | 8,5 | 20,2 | 37,0 | 47,2 | 58,7 | 13,5 | 16,3 | 18,7 | 24,5 | 38,7 | 42,3 | 56,1 | |
| Boiler-entry temperature | °C | 55-70 | 55-70 | 55-70 | 55-70 | 55-70 | 55-70 | 55-70 | 55-70 | 55-70 | 55-70 | 55-70 | 55-70 | 55-70 | |
| Working temperature/operating temperature | °C | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | |
| Working temperature/operating temperature (optional) | °C | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | |
| Maximum permitted temperature | °C | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | |
| Max. operating pressure | bar | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | |
| Exhaust-gas side (for chimney calculation) | | | | | | | | | | | | | | | |
| Combustion chamber temperature | °C | 900-1100 | 900-1100 | 900-1100 | 900-1100 | 900-1100 | 900-1100 | 900-1100 | 900-1100 | 900-1100 | 900-1100 | 900-1100 | 900-1100 | 900-1100 | |
| Combustion chamber pressure | mbar Pa | -0,5...-5 | -0,5...-5 | -0,5...-5 | -0,5...-5 | -0,5...-5 | -0,5...-5 | -0,5...-5 | -0,5...-5 | -0,5...-5 | -0,5...-5 | -0,5...-5 | -0,5...-5 | -0,5...-5 | |
| Required draft at rated power | mbar Pa | 0,05 | 0,05 | 0,05 | 0,05 | 0,05 | 0,05 | 0,05 | 0,05 | 0,05 | 0,05 | 0,05 | 0,05 | 0,05 | |
| Required draft at partial load | mbar Pa | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | |
| Suction required: yes | – | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Exhaust-gas temperature at rated power | °C | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | |
| Exhaust-gas temp. Partial load | °C | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | |
| Exhaust-gas mass flow at rated power | kg/s | 0,014 | 0,014 | 0,021 | 0,029 | 0,032 | 0,036 | 0,043 | 0,046 | 0,050 | 0,057 | 0,071 | 0,082 | 0,086 | |
| Exhaust-gas mass flow at partial load | kg/s | 0,005 | 0,005 | 0,006 | 0,010 | 0,009 | 0,010 | 0,012 | 0,013 | 0,014 | 0,016 | 0,020 | 0,023 | 0,024 | |
| Exhaust-gas mass flow at rated power | kg/h | 51,3 | 51,3 | 77,0 | 102,6 | 115,5 | 128,3 | 154,0 | 166,8 | 178,3 | 205,3 | 256,6 | 295,1 | 307,9 | |
| Exhaust-gas mass flow at partial load | kg/h | 18,5 | 18,5 | 27,8 | 37,0 | 41,7 | 46,3 | 55,5 | 60,2 | 64,3 | 74,1 | 92,6 | 106,5 | 111,1 | |
| Exhaust-gas volume at rated power | Nm ³ /h | 40,1 | 40,1 | 60,1 | 80,2 | 90,2 | 100,2 | 120,2 | 130,3 | 139,3 | 160,3 | 200,4 | 230,5 | 240,5 | |
| Exhaust-gas volume at partial load | Nm ³ /h | 14,5 | 14,5 | 21,7 | 28,9 | 32,5 | 36,1 | 43,4 | 47,0 | 50,2 | 57,8 | 72,3 | 83,1 | 86,7 | |
| Incline of the exhaust-gas pipe | ° | ≥ 3 | ≥ 3 | ≥ 3 | ≥ 3 | ≥ 3 | ≥ 3 | ≥ 3 | ≥ 3 | ≥ 3 | ≥ 3 | ≥ 3 | ≥ 3 | ≥ 3 | |
| Connection height exhaust-gas pipe | mm | >1395 | >1395 | >1395 | >1395 | >1395 | >1395 | >1445 | >1445 | >1445 | >1445 | >1445 | >1445 | >1445 | |
| Exhaust-gas pipe diameter | mm | 150 | 150 | 150 | 150 | 150 | 150 | 180 | 180 | 180 | 180 | 200 | 200 | 200 | |
| Chimney diameter (approx. values) | mm | 180 | 180 | 180 | 180 | 180 | 180 | 200 | 200 | 200 | 200 | 220 | 220 | 220 | |
| Chimney design: Moisture-resistant | – | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Fuel: Wood chips, ISO 17225-4 | | | | | | | | | | | | | | | |
| Maximum water content | – | M40 | M40 | M40 | M40 | M40 | M40 | M40 | M40 | M40 | M40 | M40 | M40 | M40 | |
| Maximum fuel size | – | P16S | P16S | P16S | P16S | P16S | P16S | P16S | P16S | P16S | P16S | P16S | P16S | P16S | |
| Ash | | | | | | | | | | | | | | | |
| Ash container volume | l | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | |
| Ash container filled | kg | 36 | 36 | 36 | 36 | 36 | 36 | 36 | 36 | 36 | 36 | 36 | 36 | 36 | |
| Ash removal system | – | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Convenient ash container (optional) | l | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | |
| Electrical system | | | | | | | | | | | | | | | |
| Connection: CEE 5-pole 400 V _{AC} | – | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz | |
| | | 13 A | 13 A | 13 A | 13 A | 13 A | 13 A | 13 A | 13 A | 13 A | 13 A | 13 A | 13 A | 13 A | |
| Connected power MF2 D: P16S/P31S | W | 1769 | 1769 | 1769 | 1769 | 1769 | 1769 | 1827 | 1827 | 1827 | 1827 | 1827 | 1827 | 1827 | |
| Connected power MF2 ZI | W | 1655 | 1655 | 1655 | 1655 | 1655 | 1655 | 1713 | 1713 | 1713 | 1713 | 1713 | 1713 | 1713 | |
| Connected load dust filter | W | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | |
| Weights | | | | | | | | | | | | | | | |
| Heat exchanger module, assembled | kg | 300 | 300 | 300 | 340 | 340 | 340 | 360 | 360 | 360 | 360 | 450 | 450 | 450 | |
| Burning chamber module, assembled | kg | 265 | 265 | 265 | 265 | 265 | 265 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | |
| Boiler weight MF2 D (P16S/P31S) | kg | 920 | 920 | 920 | 980 | 980 | 980 | 1100 | 1100 | 1100 | 1100 | 1200 | 1200 | 1200 | |
| Boiler weight MF2 ZI | kg | 890 | 890 | 890 | 930 | 930 | 930 | 1070 | 1070 | 1070 | 1070 | 1170 | 1170 | 1170 | |
| Weight dust filter (stand-alone) | kg | 138 (152) | 138 (152) | 138 (152) | 138 (152) | 138 (152) | 138 (152) | 168 (203) | 168 (203) | 168 (203) | 168 (203) | 191 (203) | 191 (203) | 191 (203) | |
| Emissions according to test report | | | | | | | | | | | | | | | |
| Test report no. | – | O-B-00592-21 | | | | | | | 18-IN-AT-UW-OO-EX-255 | | | | | | |
| Test report no. | – | O-B-00593-21 | | | | | | | | | | | | | |
| Noise emissions (EN 15036-1)¹⁾ | | | | | | | | | | | | | | | |
| Normal operating noise at rated power | dB(A) | < 70 | < 70 | < 70 | < 70 | < 70 | < 70 | < 70 | < 70 | < 70 | < 70 | < 70 | < 70 | < 70 | |
| Ref. 10 % O₂ dry (EN303-5) | | | | | | | | | | | | | | | |
| CO at rated power (values with dust filter) | mg/Nm ³ | 4 (4) | 3 (3) | 3 (3) | <4 (2) | 5 (2) | 6 (2) | 9 (2) | 10 (2) | 11(2) | 14 (2) | 15 (3) | 15 (3) | 16 (3) | |
| CO at partial load (values with dust filter) | mg/Nm ³ | 86 (86) | 59 (59) | 52 (52) | 15 (31) | 17 (35) | 19 (38) | 23 (46) | 24 (50) | 26 (53) | 30 (61) | 47 (36) | 53 (26) | 63 (11) | |
| NO _x at rated power (values with dust filter) | mg/Nm ³ | 87 (87) | 83 (83) | 82 (82) | 93 (79) | 93 (80) | 93 (81) | 92 (83) | 92 (84) | 92 (85) | 91 (87) | 93 (84) | 93 (82) | 94 (80) | |
| NO _x at partial load (values with dust filter) | mg/Nm ³ | 66 (66) | 71 (71) | 72 (72) | 61 (76) | 64 (74) | 67 (73) | 73 (69) | 75 (67) | 78 (66) | 84 (62) | 81 (62) | 79 (62) | 77 (62) | |
| OGC at rated power (values with dust filter) | mg/Nm ³ | 1 (1) | 1 (1) | 1 (1) | <3 (1) | <3 (1) | <3 (1) | <3 (1) | <3 (1) | <3 (1) | <3 (1) | <3 (1) | <3 (1) | <3 (1) | |
| OGC at partial load (values with dust filter) | mg/Nm ³ | 2 (2) | 2 (2) | 1 (1) | <4 (1) | <4 (1) | <4 (1) | <4 (2) | <4 (2) | <4 (2) | <3 (2) | <3 (2) | <3 (1) | <3 (1) | |
| Dust at nominal load (values with dust filter) | mg/Nm ³ | 5,4 (2,2) | 5,4 (1,5) | 5,3 (1,3) | 14 (0,7) | 14 (0,7) | 14 (0,7) | 14 (0,6) | 14 (0,6) | 14 (0,6) | 14 (0,5) | 14 (0,7) | 14 (0,7) | 14 (0,8) | |
| Dust at partial load (values with dust filter) | mg/Nm ³ | 17,8 (1,5) | 12,7 (1,3) | 11,4 (1,2) | 10 (1,0) | 11 (1,0) | 11 (1,0) | 12 (1,0) | 13 (1,0) | 13 (1,0) | 14 (1,0) | 10 (1,1) | 8 (1,1) | 5 (1,1) | |
| Ref. 13 % O₂ dry | | | | | | | | | | | | | | | |
| CO at rated power (values with dust filter) | mg/Nm ³ | 3 (3) | 2 (2) | 2 (2) | <3 (1) | 4 (1) | 5 (1) | 7 (1) | 8 (1) | 8 (1) | 10 (1) | 11 (2) | 11 (2) | 12 (2) | |
| CO at partial load (values with dust filter) | mg/Nm ³ | 63 (63) | 43 (43) | 37 (37) | 11 (22) | 12 (25) | 14 (27) | 16 (33) | 18 (36) | 19 (38) | 22 (44) | 34 (26) | 39 (19) | 46 (8) | |
| NO _x at rated power (values with dust filter) | mg/Nm ³ | 63 (63) | 60 (60) | 59 (59) | 68 (57) | 68 (58) | 67 (58) | 67 (60) | 67 (61) | 67 (61) | 66 (63) | 67 (61) | 68 (60) | 68 (58) | |
| NO _x at partial load (values with dust filter) | mg/Nm ³ | 48 (48) | 52 (52) | 52 (52) | 44 (55) | 47 (54) | 48 (53) | 53 (50) | 55 (49) | 57 (48) | 61 (45) | 59 (45) | 58 (45) | 56 (45) | |
| OGC at rated power (values with dust filter) | mg/Nm ³ | <1 (<1) | 1 (1) | 1 (1) | <2 (1) | <3 (1) | <3 (1) | <3 (1) | <3 (1) | <3 (1) | <2 (<1) | <3 (<1) | <3 (<1) | <2 (<1) | |
| OGC at partial load (values with dust filter) | mg/Nm ³ | <1 (<1) | 1 (1) | 1 (1) | <3 (1) | <3 (1) | <3 (1) | <3 (1) | <3 (1) | <3 (1) | <3 (1) | <3 (1) | <3 (1) | <3 (1) | |
| Dust at nominal load (values with dust filter) | mg/Nm ³ | 3,9 (1,6) | 3,9 (1,1) | 3,9 (0,9) | 10 (0,5) | 10 (0,5) | 10 (0,5) | 10 (0,5) | 10 (0,4) | 10 (0,4) | 10 (0,4) | 10 (0,5) | 10 (0,5) | 10 (0,6) | |
| Dust at partial load (values with dust filter) | mg/Nm ³ | 12,9 (1,1) | 9,2 (0,9) | 8,2 (0,9) | 8 (0,7) | 8 (0,7) | 8 (0,7) | 9 (0,7) | 9 (0,7) | 9 (0,7) | 10 (0,7) | 7 (0,8) | 5 (0,8) | 3 | |

| MF2 R D/ZI MF2 ER D/ZI 03.05.2021 | Unit | 40 | 45 ¹ | 50 ¹ | 60 ¹ | 65 ¹ | 70 ¹ | 80 | 100 ² | 108 ¹ | 120 ¹ |
|--|--------------------|-----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------|------------------|------------------|------------------|
| Rated power | kW | 40 | 45 | 49,5 | 60 | 65 | 69,5 | 80 | 99/100/101 | 108 | 120 |
| Partial load | kW | 12,0 | 13,5 | 14,9 | 18,0 | 19,5 | 20,9 | 24,0 | 30,0 | 32,4 | 36,0 |
| Boiler efficiency at rated power (pellets) | % | 96,5 | 96,4 | 96,3 | 96,1 | 96,1 | 96,0 | 95,8 | 95,8 | 95,7 | 95,7 |
| Boiler efficiency at partial load (pellets) | % | 94,8 | 94,9 | 94,9 | 95,1 | 95,2 | 95,2 | 95,4 | 95,7 | 95,8 | 96,0 |
| Fuel thermal output at rated power (pellets) | kW | 41,5 | 46,7 | 51,4 | 62,4 | 67,6 | 72,4 | 83,5 | 104,4 | 112,9 | 125,4 |
| Fuel thermal output at partial load (pellets) | kW | 12,7 | 14,2 | 15,6 | 18,9 | 20,5 | 21,9 | 25,2 | 31,3 | 33,8 | 37,5 |
| Boiler class according to EN 303-5:2012 | - | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| EU Energy label | - | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| Water side | | | | | | | | | | | |
| Water content | l | 135 | 135 | 135 | 165 | 165 | 165 | 165 | 195 | 195 | 195 |
| Water connection, forward/return flow (internal thread) without return-flow boost device | Inch
mm
DN | 5/4 | 5/4 | 5/4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Water connection, forward/return flow (internal thread) with return-flow boost device | Inch
mm
DN | 5/4 | 5/4 | 5/4 | 6/4 | 6/4 | 6/4 | 6/4 | 2 | 2 | 2 |
| Water connection for filling and/or emptying (internal thread) | inch
mm | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 |
| Water connection for thermal safety valve (external thread) | inch
mm | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 |
| Thermal safety valve: pressure | bar | 2-4 | 2-4 | 2-4 | 2-4 | 2-4 | 2-4 | 2-4 | 2-4 | 2-4 | 2-4 |
| Thermal safety valve: required cold water temperature | °C | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Water-side resistance at 10 K | mbar
Pa | 153,8 | 200,2 | 242,8 | 56,1 | 67,2 | 77,2 | 100,6 | 158,0 | 172,8 | 228,4 |
| Water-side resistance at 20 K | mbar
Pa | 37,0 | 48,4 | 58,7 | 13,5 | 16,3 | 18,7 | 24,5 | 38,7 | 42,3 | 56,1 |
| Boiler-entry temperature | °C | 55-70 | 55-70 | 55-70 | 55-70 | 55-70 | 55-70 | 55-70 | 55-70 | 55-70 | 55-70 |
| Working temperature/operating temperature | °C | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| Working temperature/operating temperature (optional) | °C | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| Maximum permitted temperature | °C | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 |
| Max. operating pressure | bar | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 | 3,5 |
| Exhaust-gas side (for chimney calculation) | | | | | | | | | | | |
| Combustion chamber temperature | °C | 900-1100 | 900-1100 | 900-1100 | 900-1100 | 900-1100 | 900-1100 | 900-1100 | 900-1100 | 900-1100 | 900-1100 |
| Combustion chamber pressure | mbar
Pa | -0,5...-5 | -0,5...-5 | -0,5...-5 | -0,5...-5 | -0,5...-5 | -0,5...-5 | -0,5...-5 | -0,5...-5 | -0,5...-5 | -0,5...-5 |
| Required draft at rated power | mbar
Pa | 0,05 | 0,05 | 0,05 | 0,05 | 0,05 | 0,05 | 0,05 | 0,05 | 0,05 | 0,05 |
| Required draft at partial load | mbar
Pa | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 |
| Suction required: yes | - | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Exhaust-gas temperature at rated power | °C | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 |
| Exhaust-gas temp. Partial load | °C | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Exhaust-gas mass flow at rated power | kg/s | 0,029 | 0,032 | 0,036 | 0,043 | 0,046 | 0,050 | 0,057 | 0,071 | 0,082 | 0,086 |
| Exhaust-gas mass flow at partial load | kg/s | 0,010 | 0,009 | 0,010 | 0,012 | 0,013 | 0,014 | 0,016 | 0,020 | 0,023 | 0,024 |
| Exhaust-gas mass flow at rated power | kg/h | 102,6 | 115,5 | 128,3 | 154,0 | 166,8 | 178,3 | 205,3 | 256,6 | 295,1 | 307,9 |
| Exhaust-gas mass flow at partial load | kg/h | 37,0 | 41,7 | 46,3 | 55,5 | 60,2 | 64,3 | 74,1 | 92,6 | 106,5 | 111,1 |
| Exhaust-gas volume at rated power | Nm ³ /h | 80,2 | 90,2 | 100,2 | 120,2 | 130,3 | 139,3 | 160,3 | 200,4 | 230,5 | 240,5 |
| Exhaust-gas volume at partial load | Nm ³ /h | 28,9 | 32,5 | 36,1 | 43,4 | 47,0 | 50,2 | 57,8 | 72,3 | 83,1 | 86,7 |
| Incline of the exhaust-gas pipe | ° | ≥ 3 | ≥ 3 | ≥ 3 | ≥ 3 | ≥ 3 | ≥ 3 | ≥ 3 | ≥ 3 | ≥ 3 | ≥ 3 |
| Connection height exhaust-gas pipe | mm | >1395 | >1395 | >1395 | >1445 | >1445 | >1445 | >1445 | >1445 | >1445 | >1445 |
| Exhaust-gas pipe diameter | mm | 150 | 150 | 150 | 180 | 180 | 180 | 180 | 200 | 200 | 200 |
| Chimney diameter (approx. values) | mm | 180 | 180 | 180 | 200 | 200 | 200 | 200 | 220 | 220 | 220 |
| Chimney design: Moisture-resistant | - | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Fuel: Pellets of pure wood in accordance with ISO 17225-2 | | | | | | | | | | | |
| Calorific value | MJ/kg | 16,5 | 16,5 | 16,5 | 16,5 | 16,5 | 16,5 | 16,5 | 16,5 | 16,5 | 16,5 |
| Density | kg/m ³ | ≥ 600 | ≥ 600 | ≥ 600 | ≥ 600 | ≥ 600 | ≥ 600 | ≥ 600 | ≥ 600 | ≥ 600 | ≥ 600 |
| Water content | % by weight | ≤ 10 | ≤ 10 | ≤ 10 | ≤ 10 | ≤ 10 | ≤ 10 | ≤ 10 | ≤ 10 | ≤ 10 | ≤ 10 |
| Ash content | % by weight | ≤ 0,7 | ≤ 0,7 | ≤ 0,7 | ≤ 0,7 | ≤ 0,7 | ≤ 0,7 | ≤ 0,7 | ≤ 0,7 | ≤ 0,7 | ≤ 0,7 |
| Length | mm | 3,15-40 | 3,15-40 | 3,15-40 | 3,15-40 | 3,15-40 | 3,15-40 | 3,15-40 | 3,15-40 | 3,15-40 | 3,15-40 |
| Diameter | mm | 6±1 | 6±1 | 6±1 | 6±1 | 6±1 | 6±1 | 6±1 | 6±1 | 6±1 | 6±1 |
| Dust proportion before loading | % by weight | ≤ 1 | ≤ 1 | ≤ 1 | ≤ 1 | ≤ 1 | ≤ 1 | ≤ 1 | ≤ 1 | ≤ 1 | ≤ 1 |
| Raw material: pure wood, bark content <15 % | - | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Ash | | | | | | | | | | | |
| Ash container volume | l | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| Ash container filled | kg | 36 | 36 | 36 | 36 | 36 | 36 | 36 | 36 | 36 | 36 |
| Ash removal system | - | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Electrical system | | | | | | | | | | | |
| Connection: CEE 5-pole 400 V _{AC} | - | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz | 50 Hz |
| Connected power MF2 D: P16S | W | 1769 | 1769 | 1769 | 1827 | 1827 | 1827 | 1827 | 1827 | 1827 | 1827 |
| Connected power MF2 ZI | W | 1655 | 1655 | 1655 | 1713 | 1713 | 1713 | 1713 | 1713 | 1713 | 1713 |
| Connected load dust filter | W | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 |
| Weights | | | | | | | | | | | |
| Heat exchanger module, assembled | kg | 340 | 340 | 340 | 360 | 360 | 360 | 360 | 450 | 450 | 450 |
| Burning chamber module, assembled | kg | 265 | 265 | 265 | 320 | 320 | 320 | 320 | 320 | 320 | 320 |
| Boiler weight MF2 D (P16B/P45A) | kg | 980 | 980 | 980 | 1100 | 1100 | 1100 | 1100 | 1200 | 1200 | 1200 |
| Boiler weight MF2 ZI | kg | 930 | 930 | 930 | 1070 | 1070 | 1070 | 1070 | 1170 | 1170 | 1170 |
| Weight dust filter (stand-alone) | kg | 138 (152) | 138 (152) | 138 (152) | 168 (203) | 168 (203) | 168 (203) | 168 (203) | 191 (203) | 191 (203) | 191 (203) |
| Emissions according to test report (values with dust filter) | | | | | | | | | | | |
| Test report no. | - | O-B-00503-21 O-B-00501-21 | | | | | | | | | |
| Noise emissions (EN 15036-1)³ | | | | | | | | | | | |
| Normal operating noise at rated power | dB(A) | < 70 | < 70 | < 70 | < 70 | < 70 | < 70 | < 70 | < 70 | < 70 | < 70 |
| Ref. 10 % O₂ dry (EN303-5) | | | | | | | | | | | |
| CO at rated power | mg/Nm ³ | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 |
| CO at partial load | mg/Nm ³ | 63 | 63 | 63 | 62 | 62 | 61 | 61 | 41 | 39 | 25 |
| NO _x at rated power | mg/Nm ³ | 110 | 109 | 109 | 108 | 107 | 106 | 105 | 106 | 106 | 106 |
| NO _x at partial load | mg/Nm ³ | 99 | 98 | 97 | 95 | 94 | 93 | 91 | 93 | 94 | 95 |
| OGC at rated power | mg/Nm ³ | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| OGC at partial load | mg/Nm ³ | 1 | 1 | 1 | 2 | 2 | 2 | 3 | 2 | 2 | 2 |
| Dust at nominal load (values with dust filter) | mg/Nm ³ | 2,8 (0,9) | 2,8 (0,9) | 2,8 (0,9) | 2,7 (0,8) | 2,7 (0,8) | 2,7 (0,8) | 2,6 (0,7) | 2,7 (0,6) | 2,7 (0,6) | 2,8 (0,6) |
| Dust at partial load (values with dust filter) | mg/Nm ³ | 2,4 (0,6) | 2,3 (0,6) | 2,3 (0,6) | 2,2 (0,6) | 2,1 (0,6) | 2,0 (0,6) | 1,9 (0,6) | 1,9 (0,6) | 1,9 (0,6) | 1,8 (0,6) |
| Ref. 13 % O₂ dry | | | | | | | | | | | |
| CO at rated power | mg/Nm ³ | 1 | 1 | 1 | 1 | 1 | <1 | <1 | 1 | 1 | 1 |
| CO at partial load | mg/Nm ³ | 46 | 46 | 46 | 45 | 45 | 45 | 44 | 29 | 23 | 14 |
| NO _x at rated power | mg/Nm ³ | 80 | 80 | 79 | 78 | 78 | 77 | 76 | 77 | 77 | 77 |
| NO _x at partial load | mg/Nm ³ | 72 | 71 | 71 | 69 | 68 | 68 | 66 | 68 | 69 | 70 |
| OGC at rated power | mg/Nm ³ | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| OGC at partial load | mg/Nm ³ | <1 | <1 | <1 | 1 | 1 | 1 | 1 | 1 | <1 | <1 |
| Dust at nominal load (values with dust filter) | mg/Nm ³ | 2,0 (0,6) | 2,0 (0,6) | 2,0 (0,6) | 2,0 (0,6) | 1,9 (0,5) | 1,9 (0,5) | 1,9 (0,5) | 2,0 (0,5) | 2,0 (0,4) | 2,0 (0,4) |
| Dust at partial load (values with dust filter) | mg/Nm ³ | 1,7 (0,5) | 1,7 (0,5) | 1,6 (0,5) | 1,6 (0,5) | 1,5 (0,4) | 1,5 (0,4) | 1,4 (0,4) | 1,4 (0,4) | 1,3 (0,5) | 1,3 (0,5) |
| In accordance with § 15a-BVG Austria | | | | | | | | | | | |
| CO at rated power | mg/MJ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | 1 | 2 | 2 |
| CO at partial load | mg/MJ | 32 | 32 | 32 | 32 | 31 | 31 | 31 | 20 | 16 | 10 |
| NO _x at rated power | mg/MJ | 55 | 55 | 55 | 54 | 54 | 54 | 53 | 53 | 54 | 54 |
| NO _x at partial load | mg/MJ | 50 | 50 | 49 | 48 | 48 | 47 | 46 | 47 | 48 | 48 |
| OGC at rated power | mg/MJ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| OGC at partial load | mg/MJ | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| Dust at nominal load (values with dust filter) | mg/Nm ³ | 1 (<1) | 1 (<1) | 1 (<1) | 1 (<1) | 1 (<1) | 1 (<1) | 1 (<1) | 1 (<1) | 1 (<1) | 1 (<1) |
| Dust at partial load (values with dust filter) | mg/Nm ³ | 1 (<1) | 1 (<1) | 1 (<1) | 1 (<1) | 1 (<1) | 1 (<1) | 1 (<1) | 1 (<1) | 1 (<1) | 1 (<1) |

¹) Drawing inspection

²) Typification variants

³) Normal operating noise at rated power: Leq(A) at 1 m distance (ISO 11202:2010)
mg/Nm³ ... milligram per standard cubic meter (Nm³ - standard cubic meter under 1013 hectopascal at 0 °C)

| MF2 D / MF2 ZI 18.01.2021 | Unit | 20 | 30 ¹ | 30 ² | 40 | 45 ¹ | 50 ¹ | 60 ¹ | 65 ¹ | 70 ¹ | 80 | 100 ² | 108 ¹ | 120 |
|--|--------------------|-----------------------|-----------------|-----------------|------|-----------------|-----------------|-----------------|-----------------|-----------------|------|------------------|------------------|------|
| Weights | | | | | | | | | | | | | | |
| Water jacket | kg | 300 | 300 | 300 | 340 | 340 | 340 | 360 | 360 | 360 | 360 | 450 | 450 | 450 |
| Boiler body | kg | 265 | 265 | 265 | 265 | 265 | 265 | 320 | 320 | 320 | 320 | 320 | 320 | 320 |
| Boiler weight MF2 D (P16B/P45A) | kg | 920 | 920 | 920 | 980 | 980 | 980 | 1100 | 1100 | 1100 | 1100 | 1200 | 1200 | 1200 |
| Boiler weight MF2 ZI | kg | - | - | - | - | - | - | 1129 | 1129 | 1129 | 1129 | 1229 | 1229 | 1229 |
| Emissions according to test report | | | | | | | | | | | | | | |
| Test report no. | - | 13-UW/Wels-EX-344/1-4 | | | | | | | | | | | | |
| Noise emissions (EN 15036-1) | | | | | | | | | | | | | | |
| Normal operating noise at rated power | dB(A) | < 70 | < 70 | < 70 | < 70 | < 70 | < 70 | < 70 | < 70 | < 70 | < 70 | < 70 | < 70 | < 70 |
| Ref. 10 % O₂ dry (EN303-5) | | | | | | | | | | | | | | |
| CO at rated power | mg/Nm ³ | 13 | 9 | 7 | 4 | 6 | 8 | 12 | 14 | 16 | 20 | 14 | 12 | < 4 |
| CO at partial load | mg/Nm ³ | 65 | 50 | 46 | 34 | 32 | 30 | 25 | 22 | 20 | 15 | 24 | 28 | 40 |
| NO _x at rated power | mg/Nm ³ | 120 | 124 | 124 | 127 | 125 | 122 | 117 | 115 | 112 | 107 | 117 | 121 | 134 |
| NO _x at partial load | mg/Nm ³ | 117 | 107 | 105 | 97 | 97 | 98 | 98 | 98 | 99 | 99 | 100 | 101 | 102 |
| OGC at rated power | mg/Nm ³ | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 |
| OGC at partial load | mg/Nm ³ | 5 | 4 | 4 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 |
| Dust at rated power | mg/Nm ³ | 14 | 17 | 17 | 19 | 19 | 19 | 18 | 18 | 18 | 17 | 17 | 18 | 18 |
| Dust at partial load | mg/Nm ³ | 10 | 12 | 13 | 14 | 14 | 14 | 13 | 12 | 12 | 11 | 12 | 13 | 14 |
| Ref. 11 % O₂ dry | | | | | | | | | | | | | | |
| CO at rated power | mg/Nm ³ | 12 | 8 | 6 | 3 | 5 | 7 | 11 | 13 | 15 | 19 | 13 | 11 | < 4 |
| CO at partial load | mg/Nm ³ | 59 | 45 | 42 | 31 | 29 | 27 | 23 | 20 | 18 | 14 | 22 | 25 | 36 |
| NO _x at rated power | mg/Nm ³ | 109 | 113 | 113 | 115 | 114 | 111 | 106 | 105 | 102 | 97 | 106 | 110 | 121 |
| NO _x at partial load | mg/Nm ³ | 106 | 97 | 95 | 88 | 88 | 89 | 89 | 89 | 90 | 90 | 91 | 92 | 93 |
| OGC at rated power | mg/Nm ³ | < 3 | < 3 | < 3 | < 2 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 |
| OGC at partial load | mg/Nm ³ | 5 | 4 | 4 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 | < 3 |
| Dust at rated power | mg/Nm ³ | 12 | 15 | 15 | 17 | 17 | 17 | 16 | 16 | 16 | 15 | 15 | 16 | 16 |
| Dust at partial load | mg/Nm ³ | 9 | 11 | 12 | 12 | 13 | 13 | 12 | 11 | 11 | 10 | 11 | 12 | 12 |
| Ref. 13 % O₂ dry | | | | | | | | | | | | | | |
| CO at rated power | mg/Nm ³ | 10 | 7 | 5 | 3 | 4 | 6 | 9 | 10 | 12 | 15 | 10 | 9 | < 3 |
| CO at partial load | mg/Nm ³ | 48 | 36 | 33 | 27 | 23 | 22 | 18 | 16 | 15 | 12 | 17 | 20 | 29 |
| NO _x at rated power | mg/Nm ³ | 87 | 90 | 90 | 92 | 91 | 89 | 85 | 84 | 81 | 78 | 85 | 88 | 97 |
| NO _x at partial load | mg/Nm ³ | 85 | 78 | 76 | 70 | 71 | 71 | 71 | 71 | 72 | 72 | 73 | 73 | 74 |
| OGC at rated power | mg/Nm ³ | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 |
| OGC at partial load | mg/Nm ³ | 4 | 3 | 3 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 |
| Dust at rated power | mg/Nm ³ | 10 | 12 | 12 | 14 | 14 | 14 | 13 | 13 | 13 | 12 | 12 | 13 | 13 |
| Dust at partial load | mg/Nm ³ | 7 | 9 | 9 | 10 | 10 | 10 | 9 | 9 | 9 | 8 | 9 | 9 | 10 |
| In accordance with § 15a-BVG Austria | | | | | | | | | | | | | | |
| CO at rated power | mg/MJ | 7 | 5 | 4 | 2 | 3 | 4 | 6 | 7 | 8 | 10 | 6 | 4 | < 2 |
| CO at partial load | mg/MJ | 32 | 25 | 23 | 18 | 17 | 16 | 13 | 12 | 11 | 8 | 14 | 16 | 20 |
| NO _x at rated power | mg/MJ | 59 | 66 | 67 | 72 | 70 | 67 | 63 | 60 | 58 | 53 | 60 | 62 | 66 |
| NO _x at partial load | mg/MJ | 58 | 53 | 52 | 48 | 48 | 48 | 49 | 49 | 49 | 49 | 50 | 50 | 50 |
| OGC at rated power | mg/MJ | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 1 |
| OGC at partial load | mg/MJ | 3 | < 3 | < 3 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 |
| Dust at rated power | mg/MJ | 7 | 8 | 8 | 9 | 9 | 9 | 9 | 8 | 8 | 8 | 9 | 9 | 9 |
| Dust at partial load | mg/MJ | 5 | 6 | 6 | 7 | 7 | 7 | 6 | 6 | 6 | 5 | 6 | 6 | 7 |

1... Drawing inspection

2... Typification variants

mg/Nm³ ... milligram per standard cubic meter (Nm³ - standard cubic meter under 1013 hectopascal at 0 °C)

Glossary

DHCP

The abbreviation stands for "Dynamic Host Configuration Protocol". It is used to assign IP addresses to clients.

Forward flow

The forward flow is the heating water path from the boiler to the radiators.

Gateway

While previously a gateway initiated a protocol conversion to connect networks with different protocols, the gateway today is more of a router to other subnets.

Heating circuit

A heating circuit is a self-contained water circuit in a heating system. A pump moves the water that was heated to the consumers (e.g. floor heating, radiators). At the consumers, the hot water dissipates heat energy to the environment and after it has cooled down it flows back to the boiler.

IP address

IP addresses are used to assign an address to devices in large networks. Customary notation consists of 4 numbers between 0 and 255.

LED

LED stands for "light-emitting diode". The light-emitting diode is an electronic component that generates light using electric power.

mAh

One Ampere hour is the electric charge that flows through a conductor in the course of an hour if the electrical current is constant at 1 Ampere.

Night lowering

Room temperature that the heating should maintain or reach outside the daily heating times.

One loose cubic meter

One loose cubic meter corresponds to one cubic meter (m³) of loosely poured wood mass (= 650 kg pellets).

Return flow

The return flow is the path of the cooled down heating water from the radiator to the boiler.

Return flow temperature

Temperature of the heating water when entering the boiler, i.e. after cycling through the radiators, underfloor heating etc.

Setting

A "setting" is a selectable menu line in which you can change values.

Solid measure of timber (fm)

One solid measure of timber corresponds to one cubic meter (m³) of solid wood material WITHOUT spaces.

Stacked cubic meter (rm) or also stere

One stacked cubic meter corresponds to one cubic meter (m³) of solid wood material WITH spaces.

Sub-menu

A sub-menu is a selectable menu line via which you can access other (lower) menu levels.

Subnet mask

In connection with the IP address, the subnet mask (also called net mask, network mask) determines which IP addresses are searched in the internet network and which IP addresses can be reached in other networks via a router.

Triac

Semiconductor switch element for phase-angle controllers for AC voltage - e.g. speed control with motors

V

Volt is the unit for electrical potential.

Keyword index

Symbols

| | |
|-------|----|
| [HLE] | 10 |
| [SLE] | 10 |
| °dH | 81 |

A

| | |
|------------------------------|--------|
| Air vent | 9 |
| Alarm log | 73 |
| alkaline | 81 |
| Always | 57 |
| ÖNORM H 5195-1:2010 | 82 |
| Automatic | 38, 52 |
| Heating program | 55 |
| Automatic program | 37 |
| Average buffer temperature | 70 |
| Average charging temperature | 70 |

B

| | |
|------------------------------|------------|
| Battery | 73, 92 |
| Boiler | 66 |
| Boiler control unit | 90 |
| Boiler performance | 43, 66, 67 |
| Boiler pump | 67 |
| Boiler serial number | 75 |
| Boiler temperature, actual | 67 |
| Boiler temperature, setpoint | 67 |
| Bridge formation | 44 |
| Broadband lambda probe | 28 |
| Buffer | |
| charge | 62 |
| Buffer charge-up level | 70 |
| Buffer fill level | 70 |
| Buffer program | 61 |
| Buffer storage tank | 61 |
| Temperature | 70 |
| buffer temperature | 62 |

C

| | |
|--------------------|----------------|
| CEE plug | 14 |
| Heating times | 38 |
| Charging pump | 69 |
| Charging time | |
| Buffer | 59, 62 |
| Charging times | 59, 62 |
| Check | 74 |
| Circulation pump | 61, 63, 69, 70 |
| Clean all surfaces | 88 |
| Cleaning | 88 |
| Clock | 90 |
| CO | 46 |

| | |
|--|--------|
| Cold water pressure | 23 |
| Comfort | 52 |
| Heating program | 55 |
| Comfort operation | 57 |
| Comfort program | 37 |
| Comfort temperature | 54 |
| comfort-online.com | 75 |
| Complete ignition | 39 |
| Container fill level | 66, 71 |
| Continuous operation | 61, 63 |
| Conveying height | 11 |
| Corrosion | 80 |
| Cubic meter of loosely poured wood chips | 44 |

D

| | |
|------------------------|--------|
| Danger of suffocation | 46 |
| Date | 73 |
| DHCP | 75 |
| DHW program | 59 |
| DHW temperature | 69 |
| DHWC | 38, 59 |
| Dial | 52 |
| Dimensions | 42 |
| directive | |
| fire protection | 8 |
| DNS server | 75 |
| Drive temperature | 71, 72 |
| Drive, conveyor system | 71, 72 |
| Drying | |
| Screed | 59 |
| Dual operation | 33 |
| dust explosion | 11 |

E

| | |
|-----------------------------|----------------|
| Emergency escape switch | 72 |
| emergency fire extinguisher | 27 |
| Emergency-stop switch | 93 |
| emission values | 79 |
| Empty entry | 38, 56, 60, 62 |
| EN 14961 | |
| -1 (wood chips) | 43 |
| End | 37, 56, 61 |
| explosion protection | 11 |
| Extinguisher | 14 |

F

| | |
|---------------|--------|
| Fast charging | 38, 51 |
| Fill height | 44 |
| Fill manually | 66 |
| Fill water | 81 |

| | | | |
|----------------------------|-------------------|---------------------------------------|--------|
| Fill water limit values | 81 | Hysteresis On | 57 |
| Filling line | 11 | | |
| Fine material portion | 42 | I | |
| Fire extinguisher | 9, 14, 79 | Ignition feeding | 39 |
| Fire extinguishing system | | Ignition filling | 39 |
| Automatic | 10 | Ignition heating | 39 |
| Manual | 10 | incorrect | |
| fire protection | 47 | stickers | 18 |
| customer-provided | 9 | Injection connector | 11 |
| Fire protection doors | 79 | Inlet, thermal discharge safety valve | 23 |
| Fire shutter | 26 | Inspection book | 83 |
| Fire-resistant | 11 | installation guidelines | 8 |
| Floor | 9 | Internet Gateway | 75 |
| Floor heating system | 57 | Interval | 74 |
| foreign objects | 42 | IP address | 75 |
| Forms | 81 | ISO 17225 | 40, 42 |
| Forward flow | 54 | | |
| Frost protection | 9, 37, 52, 60, 88 | K | |
| Heating program | 55 | KWB Code | 75 |
| Frost temperature | 60 | | |
| Fuel bed | 39 | L | |
| Fuel storage room | 79 | Lambda probe | 28 |
| Fuel supply | 39 | Last filling | 66 |
| Full load hours | 67 | Last read process | 73 |
| fully charged | 63 | Leaves | 41 |
| | | LED | 52 |
| G | | LED flashes | |
| Gateway | 75 | green | 90 |
| German degrees of hardness | 81 | red | 90 |
| Glue | 43 | Legionella | 60, 69 |
| Grain distribution | 43 | Legionella protection | 60, 63 |
| Grass | 41 | Light barrier | 72 |
| Grease gun | 86 | Limit switch | 71 |
| guarantee requirement | 8 | loose cubic meter (srm) | 44 |
| | | Lowered temperature | 37 |
| H | | low-salt | 81 |
| Heat DHW 1x | 38 | | |
| Heat quantity meter | 72 | M | |
| Heating circuit | 54 | Main fraction | 42 |
| Heating circuit pump | 57 | Main menu | 34 |
| heating costs | 79 | Main portion | 42 |
| Heating curve | | Main switch | 31, 39 |
| Slope | 57 | Maintenance | 74 |
| Steepness | 57 | Maintenance contract | 79, 80 |
| Heating limit | 56 | Minimum temperature | |
| Heating program | 54, 69 | Buffer | 62 |
| Heating times | 55 | missing | |
| Holiday | 60 | stickers | 18 |
| Holiday program | 37, 56, 61 | mmol/l | 81 |
| Hose coupling | 11 | Mobile phone | 75 |
| Hot water | 59 | Moisture content | 41, 43 |
| House connection box | 45 | Motor, FS | 71 |
| Hysteresis Off | 57 | | |

Keyword index

Mould growth 41, 43

N

navigate 34
Needles 41
Negative pressure 26
Network settings 61, 63
Night lowering 54
Noise development 41
Nominal load 39
Number 74

O

Off 60, 62
 Heating program 55
On 60
ÖNORM 7133 42
operational reliability 79
Operational state 39
Outdoor temperature-dependent shutdown 56
Outlet, thermal discharge safety valve 23
Outside temperature 56, 69
Outside temperature switch-off 37
Overfill protection 28
Overfill protection cover 72, 119
Overpressure 11

P

Package counter 73
Party mode 37, 39, 56
Pellets
 Low-quality 40
 Standardised 40
Phone number: 75
Pipelines 11
Plastic 43
Portable fire extinguisher 9
Power 71, 72
Power supply 22, 31
prematurely 38, 56
Pressboard panel 43
Program 61, 63
Program off 60, 62
Program selection 52
Program Temperature 60, 62
Program Time 59, 62
Program Time+ 62
Pump 70
Pumping truck 11
Purging 80
Push button 61, 63, 69, 70

R

Reaction speed 57
Ready (+Requ) 39
Receiver strength 76
Rectify all alarms 74
Reduct 52
 Heating program 55
Reduction operation 57
Reduction program 37
Reduction temperature 54
Registration 75
Remaining time 74
Remote access 75
Request 69, 70, 72
Return flow 54, 72
Return flow temperature 67
RFB mixer 67
Ricochet protection mat 11
Rocks 41, 42
Room influence 57
Room temperature 52, 54
Room temperature, actual 54, 69
Room temperature, setpoint 69
Rotten wood 41
Rule of thumb 44
Runtimes 61, 63
Rust mud 80

S

Safety device 117
Safety switch 24V 72
Safety temperature limiter 91
Safety valve 28
Sand 41
Scale 52
Scraper 86
Send email 76
Send SMS templates 76
Serial number 73
Server settings 75
service life 79
Shortcut button 38
Show alarms 73
Silo truck 45
SMS 75
SMS reminder 75
Soil 41
Solid cubic meter 44
Spatula 86
Temperature 60
Stacked cubic meter 44
Standard wood chips 43
Standby 39

| | |
|--------------------|------------|
| Start | 37, 56, 61 |
| Status | 66, 67, 71 |
| STB | 91 |
| Sticker | 47 |
| stickers | 18 |
| Stop Escape | 9 |
| Storage tank | 51 |
| Subnet mask | 75 |
| sum alkaline earth | 81 |
| summer break | 88 |
| Summer program | 62 |
| Summer/winter time | 35, 73 |
| Switch-off active | 56 |
| Switchover valve | 70 |
| System book | 80 |

T

| | |
|-----------------------|----------------------------|
| TAN | 75 |
| Temperature | 37, 56, 60, 61, 62, 69, 70 |
| Temperature actual | 60 |
| Temperature dial | 52 |
| Temperature, setpoint | 70 |
| Time | 62, 73 |
| time control | 52 |
| Time interval | 76 |
| Time program | 59 |
| Time zone | 73 |
| Time zones | 73 |
| TM | 117 |
| TMFS | 94 |
| TMFS fuel | 72 |
| training | 79 |
| Transaction number | 75 |
| TRVB | 79, 83 |
| TRVB H118 | 8 |

V

| | |
|---------------------|----|
| Vacuum | 86 |
| VDI 2035 Appendix C | 82 |

W

| | |
|-------------------------|--------|
| warranty requirement | 8 |
| Water container | 27 |
| Water quality | 80 |
| With sensor | 61, 63 |
| Wood chips | 41 |
| Intended for the system | 41 |
| Low-quality | 41 |
| Standardised | 42 |



KWB - Kraft und Wärme aus Biomasse GmbH

Industriestraße 235

8321 St. Margarethen an der Raab

+43 3115 6116-0

office@kwb.at | www.kwb.net

Original manual • Index 2 • 2021-07 • EN



21-2001866

