OPERATION

KWB Easyfire

EF2

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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 appreciate your comments and suggestions.

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:

↘ Precondition

⇢ Work step

↳ Result

Page texts

The keywords to the left of the text column assist you in immediately detecting the content of the text paragraph.

Cross references

A reference to another section of this document can be recognized with an arrow and the page number in brackets. Example: **About this manual [►8]**

Legal

Intellectual Property

When operating the contractual goods, the installation, operating and other technical regulations and instructions from KWB must be strictly observed and adhered to.

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.
	⇢ Use only original parts or parts that have been expressly approved by the manufacturer.
	⇢ 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 [►41]** 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-provided fire protection

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

- NO storage of flammable agents in the boiler room.
- NO direct connection to rooms in which flammable gases or liquids are stored (Garage, storeroom etc).

Fire extinguisher

- 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, electrical 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 cm^2 per kW, but no less than 400 cm^2.
- 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 standards:

ÖNORM H 5170 – Construction and fire-protection requirements

Frost protection

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

Room temperature

- 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.

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
Pellets	≤10% water content, 6 mm diameter	Inclined floor: = 0.9 m³ x heating load in kW	= 400 kg heating load in kW
		Without inclined floor: = 0.75 m³ x 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

An optimal storage room ensures that the pellets are protected during storage.

- 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

- 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

- 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 cm^2 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 Grading of the safety instructions

In this documentation, warnings with the following hazard levels are used to indicate direct dangers and important safety regulations:

NOTE	**General information** We use this display to indicate and describe **important information**.
⚠ **CAUTION**	**Beginning hazard** We use this display to indicate and describe **beginning hazards**. If these stated hazards are **not observed**, **injuries, property damage and environmental damage** can occur.
⚠ **WARNING**	**Medium hazard** We use this display to indicate and describe hazards. If this warning is **not observed**, **severe or fatal injuries** can occur.
⚠ **DANGER**	**Serious hazard** We use this display to indicate and describe **hazards**. **If this warning is not observed, severe or fatal injuries occur!**

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.

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.

1.1.3 Comply with the safety instructions

NOTE	**Please comply with the safety instructions** Your system has been tested for safety and it satisfies the applicable standards, directives and regulations. Failure to comply with the safety instructions or improper use poses danger of material damage. In addition, failure to comply with the safety instructions or improper use also poses a life-threatening hazard!

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://partnernet.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 signs		Use mask
	Follow instructions		Use welding mask
	Use hearing protection		Before maintenance and repair disconnect from mains
	Use eye protection		Check barrier
	Earth before use		Keep closed
	Disconnect plug from the mains!		Use gas detector
	Use foot protection		Continuous ventilation to the outside is required
	Use hand protection		Ventilation required

Command sign (safety colour blue)			
	Use protective clothing		Entry only with a second person on the 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 pacemakers 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 of danger of falling		Warning of sharp object

Warning signs (safety colour yellow)			
	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

1.3 Stickers

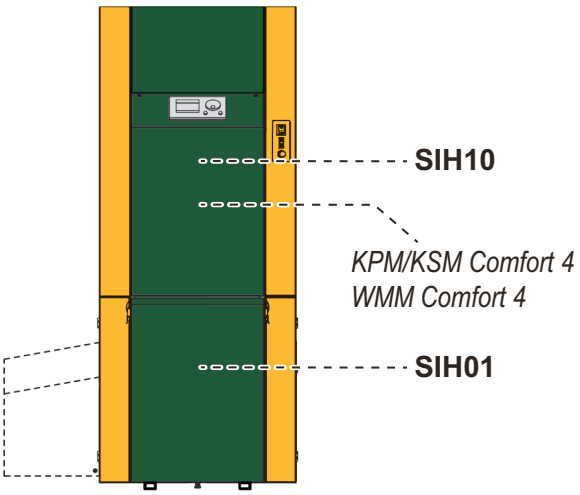
NOTE	**Hazard due to missing safety sticker**
	↘ Safety stickers save lives! They protect you against injuries and prevent damage to property and equipment! ⇢ Ensure the correct use of the heating system: Attach ALL stickers as indicated in the instructions! ⇢ Give the unused stickers to the operator 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:

27-2000226 – Languages: DE | EN | FR	**27-2000227 – Languages: ES | IT | SL**

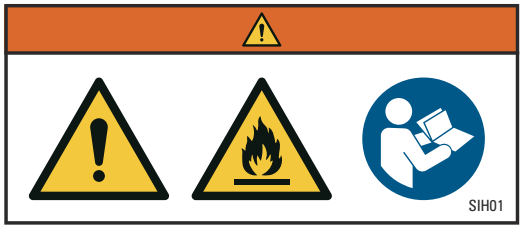
1.3.1 Stickers on the front part



→ Check whether the sticker SIH10 is attached to the control cabinet cover plate so it is clearly visible.

→ Check whether the sticker SIH01 is attached to the combustion chamber door so it is clearly visible.

Risk of burnback! (SIH01)



Warning - Risk of burnback!

Warning - Flammable materials!

Follow the instructions!

Close all combustion chamber doors and maintenance openings before switching on the system!

Check whether the two stickers showing the plug assignment of the KWB Comfort 4 have been attached to the inside of the control cabinet cover plate so they are clearly visible:

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
104	Förder-/Trommelmotor (Pin 1-2-3) & Hauptantrieb (Pin 4-5-6) / Conveyor/drum motor (pin 1-2-3) and main drive (pin 4-5-6) / Moteur d'extraction/Moteur à tambour (broches 1-2-3) et entraînement principal (broches 4-5-6)
108	Mischer od. Ventil RLA (Pin 1-2-4-7) / Mixer or valve RFB (pin 1-2-4-7) / Vanne mélangeuse ou vanne MTR (broches 1-2-4-7)
109	Wascheinrichtung (wie 122, aber Stecker) / Washing unit (as 122, but plug) / Dispositif de lavage (comme 122, mais connecteur)
110	Drehrost Motor / Revolving grate (motor) / Grille rotative moteur
111	STB / STL / STB
112	Zündung Pellets / Ignition, pellets / Amorçage des granulés
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)
115	Gebläse Verbrennungsluft (Pin 1-2-3) / Fan, combustion air (pin 1-2-3) / Ventilateur air de combustion (broches 1-2-3)
120	Mischer RLA / Mixer return flow boost / Mélang. MTR
121	Kessel- od. Pufferladepumpe / Boiler or buffer charging pump / Pompe d'alimentation de chaudière ou de ballon tampon
122	Wascheinrichtung (nur bei EF2 CC4) / Washing unit (only for EF2 CC4) / Dispositif de lavage (uniquement pour EF2 CC4)
123	Zubringer- od. Ladepumpe Puffer 0 / Supply or charge pump Buffer 0 / Pompe d'alimentation ou de charge ballon tampon 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, z.B. Wassermangel-Sicherung / Reserve safety input, e.g. low water pressure switch / Entrée de sécurité de réserve, par ex. sécurité manque d'eau
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 (Muss bei EF2 und CF2 gebügelt bleiben!) / Sensor, overfill protection cover conveyor channel (Must remain bridged in EF2 and CF2!) / Capteur couvercle de protection de trop-plein conduite d'alimentation (doit rester shunté avec EF2 et CF2 !)
132	TÜB Lagerraum (gebügelt oder verwendet) / TMFS storage room (bridged or used) / CTC local de stockage (shuntée ou utilisée)
133	CO-Sensor / CO sensor / Capteur CO
134	Hausbus [OUT] / House bus [OUT] / Bus domestique [OUT]
135	Kesselbus [OUT] / Boiler bus [OUT] / Bus chaudière [OUT]
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 VCC

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	Füllstand 1 (Pin 2-5-8) / Fill level 1 (pin 2-5-8) / Niveau 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
209	Hauptantrieb Drehzahl / Main drive, speed / Vitesse entraînement principal
210	Verbrennungsluft Drehzahl (Pin 1-2-3) / Combustion air speed (pin 1-2-3) / Vitesse de l'air de combustion (broches 1-2-3)
211	Saugzug Drehzahl (Pin 4-5-6) / Induced draught fan speed (pin 4-5-6) / Vitesse du tirage (broches 4-5-6)
215	Unterdruck-Messdose 0–5 VDC / Negative pressure sensor 0–5 VDC / Boîte dynamométrique de dépressurisation 0–5 VCC
217	Rücklauf-Temp. / Return flow temp. / Temp. de retour
218	Kesselvorlauf-Temp. / Boiler forward flow temp. / Temp. de départ de la chaudière
220	Flamm-Temperatur / Flame temperature / Température de la flamme
230	Freigabe Verbrennung (Ext. 1) / Release combustion (ext.1) / Activation combustion (Ext. 1)
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 d. Rauchsauger (gebügelt ausgeliefert) / Released by smoke extractor (delivered bridged) / Activation via l'absorbeur de fumées (livré shunté)
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
235	Kesselpumpe PWM 1 / Boiler pump PWM 1 / MLI pompe de la chaudière 1
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
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*

KPM/KSM EF2

Plug list KPM/KSM – KWB Comfort 4 (symbol display)

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

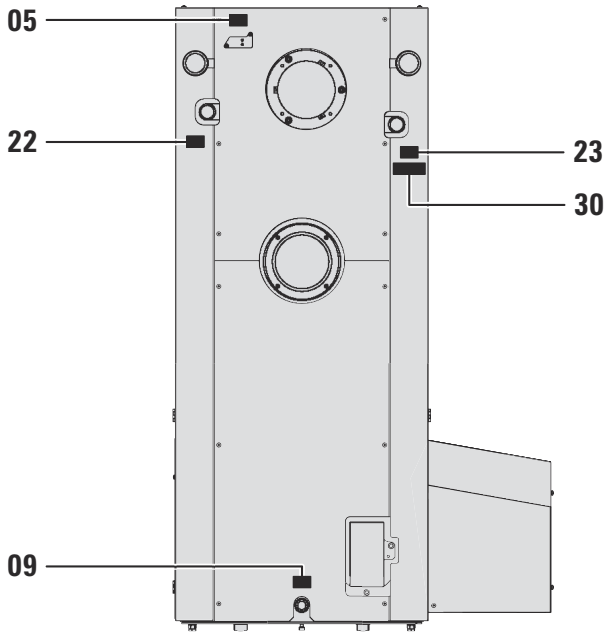
300	Versorgung 230 VAC / Supply 230 VAC / Alimentation 230 VCA
301	Pumpe/Ventil Zweitwärmequelle / Pump/valve for secondary heating source / Pompe/vanne seconde source de chaleur
302	Solarpumpe 2 / Umschaltventil / Solar pump 2 / switchover valve / Pompe solaire 2/vanne de commutation
303	Solarpumpe / 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
345	Solar Durchfluss- & Temperatursensor (Vortex) / 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
361	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 !
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
364	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
366	Eingehende Busverbindung vom KPM (#136) / Incoming bus connection from KPM (#136) / Liaison bus entrante en provenance du KPM (#136)
367	RS232-Schnittstelle / RS232 interface / Interface RS232
368	Versorgung 24 VDC / Supply 24 VDC / Alimentation 24 VCC

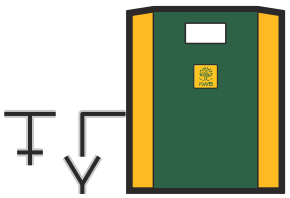
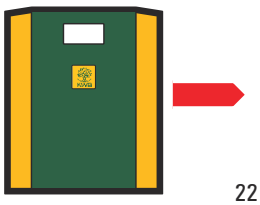
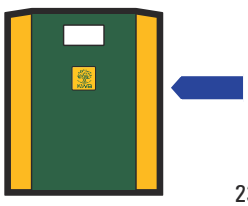
WMM EF2

Plug list WMM – KWB Comfort 4 (symbol display)

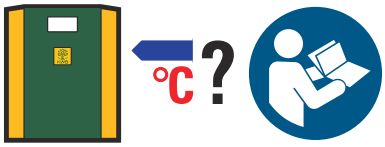
1.3.2 Stickers on the rear side

Type EF2:

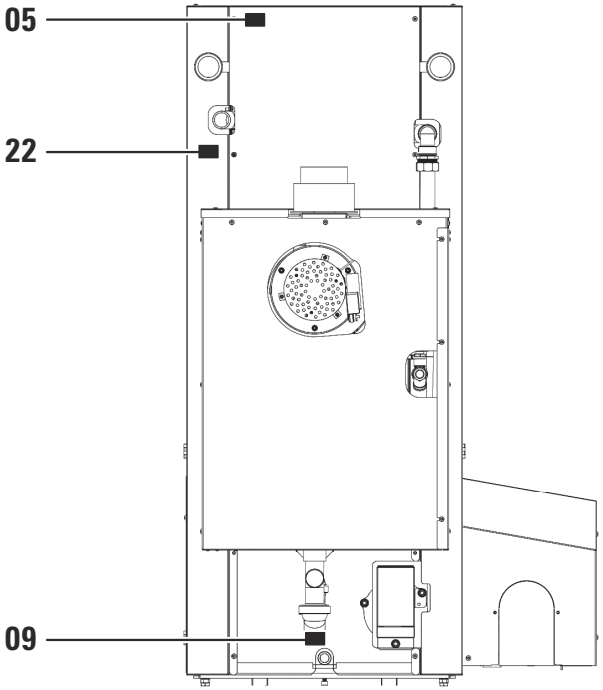


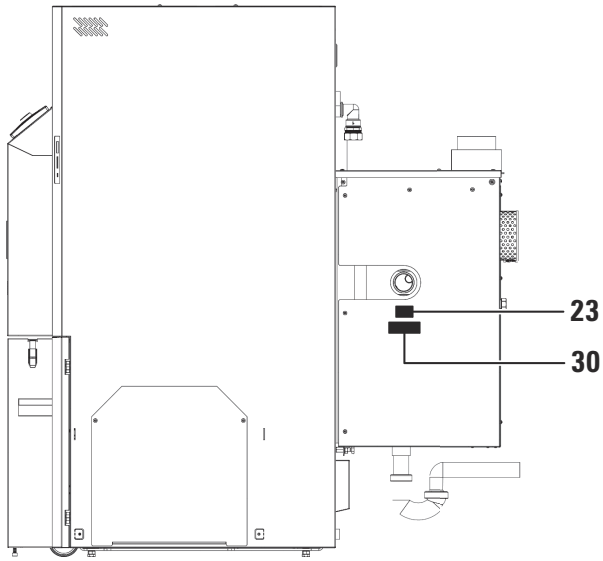
Power supply (05)	230 VAC 13 A C 05	Power supply
Emptying (09)	 09	Emptying
Forward flow (22)	 22	Forward flow
Return flow (23)	 23	Return flow

Install return flow boost according to instruction manual (30)

 30	Install return flow boost according to instruction manual

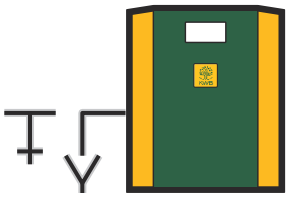
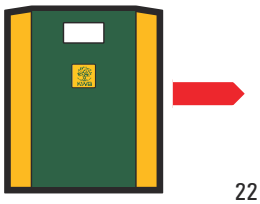
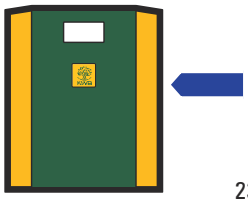
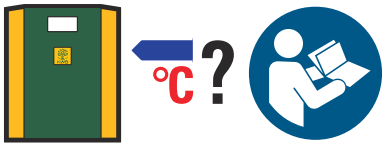
Type EF2 CC4:





Power supply (05)

230 VAC 13 A C 05	Power supply

Emptying (09)	 09	Emptying
Forward flow (22)	 22	Forward flow
Return flow (23)	 23	Return flow
Install return flow boost according to instruction manual (30)	 30	Install return flow boost according to instruction manual

Type plate

⇢ Make sure that the type plate has been attached to the casing varnished green in the upper right corner (the type plate was included in the operating instructions at the factory).

⇢ Check in case of KWB Easyfire models for ambient air-independent operation whether the standard type according to DIN 18897-1 for ambient air-independent combustion air ducting is indicated on the type plate!

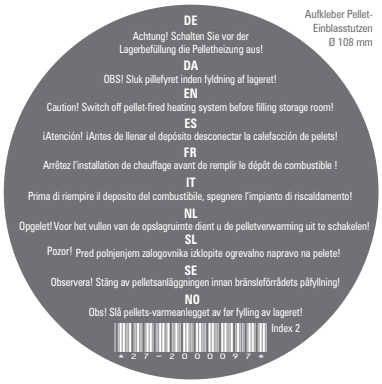
1.3.3 Stickers on the ash container

⇢ Check whether the following sticker is attached to the cover of the ash container.

Heavy load (36)	 36	Mind the weight of the filled ash container before moving the ash container! 40 kg

1.3.4 Stickers on the injection connector

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



1.3.5 Stickers for the storage room

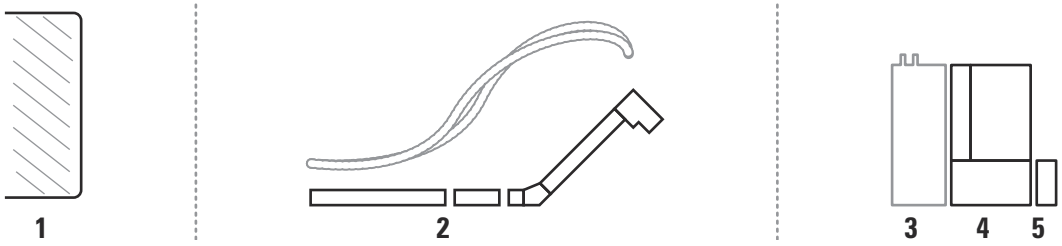
⇢ Always ensure that the storage room warnings are attached to the door of the storage room!

Sticker storage room pellets

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

2 Overview

2.1 System components



Schematic diagram of the system elements

1	Fuel storage room	4	Boiler with heat exchanger and control
2	Conveyor system: Suction conveyor system and/or screw	5	Ash container
3	Hopper (optional)		

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.

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.

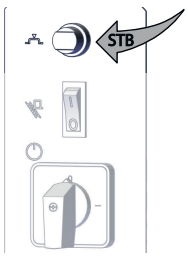
Negative pressure monitoring

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

Combustion chamber monitor

Using the flame temperature sensor, the combustion chamber is directly monitored and the ignition of the fuel is reliably detected.

Safety temperature limiter [STL]



This system shuts down the heating system if the boiler temperature should rise to >95°C (optionally >100 °C).

↘ What happens?

⇢ Depending on the system: The fuel conveyance is switched off.

⇢ Depending on the system: The fire shutter closes independently.

⇢ 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! [►85]**

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 [TÜB]

A temperature monitoring device ([TÜB] pursuant to TRVB H 118) can be installed in the conduit where the conveyor channel crosses from the fuel storage into the heating room.

When the measured temperature rises above 70 °C, the alarm **02.05 The temperature in the fuel storage is too high! [►86]** is displayed and the boiler shuts down.

Flame temperature sensor

The flame temperature sensor monitors the ignition procedure in the combustion chamber.

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 [►86]**

Additional safety elements

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

Main switch

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

⚠ WARNING **Uncontrolled combustion due to premature switch-off**

↘ If the boiler is switched off via the main switch during heating operations, the boiler goes into an uncontrolled state!

⇢ Wait until the operating state "ready" is displayed before switching off the boiler via the main switch!

Please also see

🗎 02.00 Safety thermostat! Boiler overheating! (►85)

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).

Plastic chimneys are not permitted for pellet heating systems!

2.4 Implementation advice - condensing boiler technology

When using a condensing boiler module, the exhaust gas in the condensing boiler heat exchanger is cooled down to below the condensation value. The humidity in the exhaust gas condenses and the so-called condensation heat is released in the form of additionally available heat.

A basic requirement for an efficient use of the condensing boiler technology is a low return flow temperature (max. 35°C). The lower the return flow temperature, the higher the efficiency.

If the heating circuits (radiators) do not fulfil these requirements, KWB recommends installing a buffer storage tank with integrated hot water heating.

When using a condensing boiler module, the following standards apply in addition to the other standards listed in these instructions:

- ÖNORM M 7551: Boiler – wood-burning boiler, manually and automatically stocked fire with up to 500 kW
- ÖNORM H 5152: Condensing boiler firing system, planning guidelines

2.4.1 Notification requirement for condensing boiler systems

The system must be reported to the regionally competent authority as a condensing boiler system with condensate introduction (e.g. in Austria: Abwasserverband (wastewater association); Germany: Untere Abwasserbehörde (local lower wastewater authority)).

2.4.2 Chimney system when using a condensing boiler system

When using a condensing boiler system, the chimney must meet the following requirements:

- Moisture-resistant
- Suitable for solid fuels
- T-400 soot fire-resistant
- Condensate-tight (use of seals or conical plugged-in, metal-seated sealing systems).
- Certificate (CE or UA label)
- Suitable condensate drain available
- In addition, KWB recommends using a pipe bend instead of a T-piece at the junction into the chimney during a chimney retrofitting (insertion of a stainless steel chimney, placement outside). The objective is to drain the condensate via the connecting line as the chimney condensate openings tend to be too small.

NOTE	**You should always comply with the regionally applicable regulations** We recommend consulting with the responsible chimney sweep early, such as during the planning phase.

⚠ **WARNING**	**Risk of suffocation due to leaks in the connecting line** After an incident (soot fire), it is strictly necessary to replace the seals in the connecting line and the chimney!

2.4.3 Connecting line when using a condensing boiler system

When using a condensing boiler system, the connecting line must meet the following requirements:

- Moisture-insensitive / condensate-tight
- Made of stainless steel
- Min. 20 Pascal overpressure-tight
- Certificate (CE or UA label)
- Cleaning opening, exhaust gas measuring opening

The connecting piece should be installed via the shortest path possible on an incline to the chimney. Horizontal lines should be strictly avoided!

A possible backflow of the condensate into the condensing boiler heat exchanger is no problem as the condensate is drained via the siphon. A condensate trap is therefore not required.

All connections (including the boiler and chimney connections) must therefore be tightly sealed to prevent condensate from escaping!

2.4.4 Draft limiter when using a condensing boiler system

It is not necessary to install a draft limiter and blowback flap in boilers with a condensing boiler heat exchanger as the entire exhaust gas system must be sealed tight once it has been installed.

2.4.5 Condensate discharge when using a condensing boiler system

When using a condensing boiler system, condensate is generated which must be continuously discharged into the waste water system according to local regulations. For this reason, a wastewater connection is necessary to discharge the condensate and flushing water.

The discharge connection for the condensate must have the following features:

- Condensate-proof
- Frost-proof
- Installed to ensure a gravity-powered movement (min. 3%)

If gravity-powered movement is impossible, a suitable wastewater lifting system with a condensate-proof pump must be used.

Note: The condensate connection must not be modified or closed! The condensate discharge outlet must be regularly checked!

2.5 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 °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 ≤ 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 l/m²h must be selected up to a collector field size of approx. 25 m² 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!

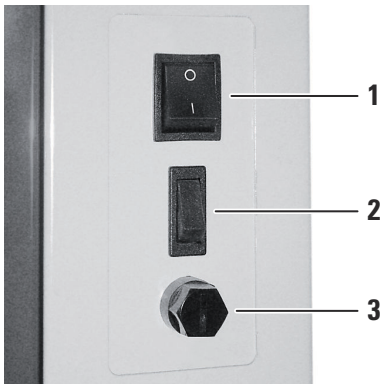
3.1 Front control units

⚠ 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!

Shortly after switching on your system, the Exclusive control unit will display the "Buttons" view. The KWB Comfort 4 control is now at your disposal.

The main switch is in the front centre: This is where you switch the system's power supply on and off.



KWB Easyfire control elements

1	Main switch	3	Safety temperature limiter STL
2	Measuring mode button (ONLY for certified technicians!)		

Operate the main switch (1) during maintenance or repair work or when the system is to remain switched off for a longer period of time. In our instructions, we will point this out at the appropriate juncture.

⚠ WARNING **Risk of suffocation from an opened combustion chamber door**

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

⇢ It is important to keep the combustion chamber door closed, especially when operating the heating system in ambient air-independent mode!

3.2 Exclusive control unit

3.2.1 Graphic interface

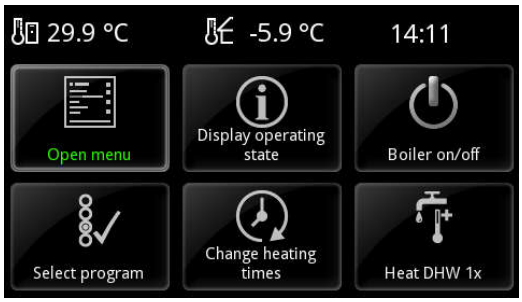
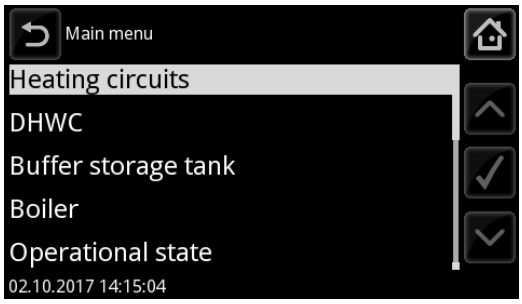
This section describes the operation of the KWB Comfort 4 using a Exclusive control unit. For the **Basic control unit [►76]**, please see the section Basic control unit.

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.

Start screen	Selection screen
	

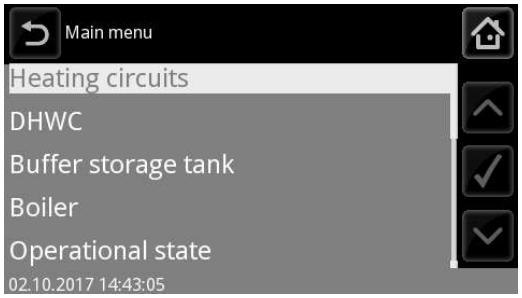
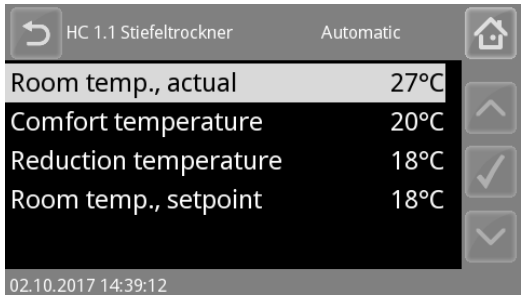
	Outside temperature		"One level up" or "back to the previous screen"
	Inside temperature		Title of the current screen
	Boiler temperature		Back to the start screen

- 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.

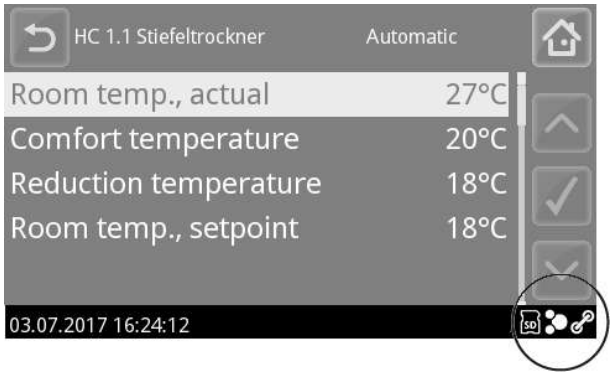
1	Button without special status
2	Selected button or last selected button using the dial
3	The green circle shows that this function is active.

"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
		
^	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
v	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



SD	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.

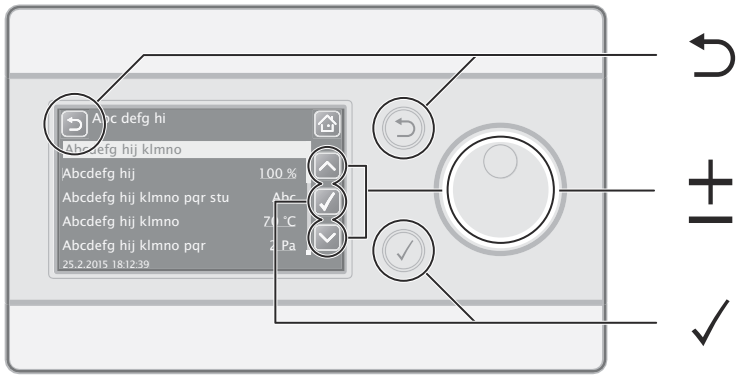
NOTE	**Protect your heating system**
	↘ False settings prevent fault-free operation with minimum emissions and low fuel usage. ⇢ Please read the entire operating instructions carefully. ⇢ If you have any questions, please contact the KWB customer service.

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 [►69]**.

3.3.2 Display the operating state

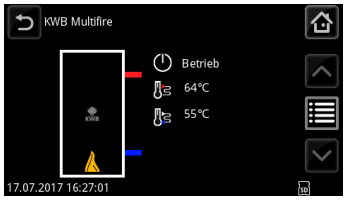
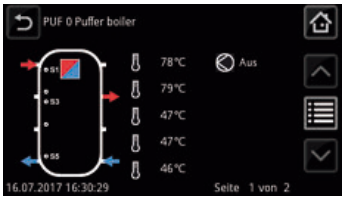
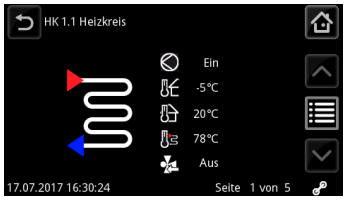
It is important that all components function properly in a heating system. The function "operating state" shows you a large number of readings and settings.

⇢ 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.

Graphic illustration of the heating system components

Boiler	Buffer	Heating circuits
		
DHW		
		

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 [►62]**.

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.

Please also see

Filling / refilling with fuel (►43)

3.3.4 Switch the boiler on/off

You can activate or deactivate the combustion in the boiler by pressing the shortcut button "Boiler On/Off".

			
Boiler is switched off.		Boiler is switched on.	

Switching on

⇢ Select the shortcut button "Boiler On/Off" in the "buttons" view.

↳ The fuel supply and the combustion are started **at the next request**.

↳ A green circle on the touch button displays this function.

Switch-off

⇢ Select the shortcut button "Boiler On/Off" in the "buttons" view.

↳ The fuel supply is stopped and the combustion is shutdown in a controlled way.

↳ The green circle on the touch button disappears.

The fuel still in the boiler will continue to burn until it is fully burned.

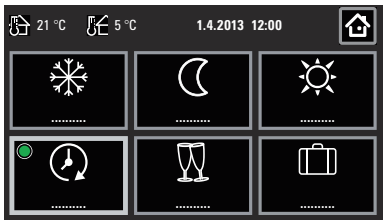
The heating control is NOT affected by this!
The entire heat distribution continues, all consumers (heating circuits, DHWCs, buffer storage tanks) are supplied with heat.

3.3.5 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

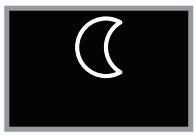


The green circle shows the currently active program.

Frost protection

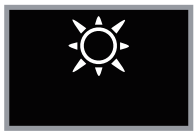
⇢ Select this program to protect the heating system from frost damage.

↳ 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.

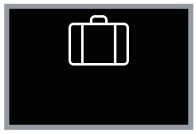
Party

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`.

3.3.6 Change 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.

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.

3.3.7 Heat DHW 1x

The shortcut button "Heat DHW 1×" 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 [►54]**.

→ 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.

Related functions

If you have to activate this function too frequently, either the **minimum temperature [►54]** of the DHWC is set too low or the charging times do not correspond to your DHW use.

3.3.8 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 [►49]** (`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 [►49]**.

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 [►63]**: 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.

3.3.9 Suction container filling

Note: Only for heating systems with suction system!

Last filling

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

The command `Switch off` (`Off|On`) makes it possible to switch off the conveyor system (only for systems with suction system).

Fill manually

`Manual filling` (`On|Off`) in the menu `Boiler >> Conveyor system >> Fill manually` (only for systems with suction system) activates the conveyor system in order to fill the suction container with fuel.

Please also see

Conveyor system (►62)

3.3.10 Switch off and restart

3.3.10.1 Shutting down the system

⚠ WARNING **Uncontrolled combustion due to premature switch-off**

↘ If the boiler is switched off via the main switch during heating operations, the boiler goes into an uncontrolled state!

⇢ Wait until the operating state "ready" is displayed before switching off the boiler via the main switch!

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 trigger the safety temperature limiter [STB].

Temporary shutdown

⇢ Press the shortcut button "Boiler On/Off".

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

Tip: Outside of heating season, disconnect the main plug at the rear of the boiler to avoid lightning damage.

3.3.10.2 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 [►69]**).

⇢ Switch on the system with the "Boiler On/Off" function.
As soon as a request is present, the following process starts:

↳ The fuel supply to the burner begins (operating state "Ready (-CS)". This procedure can take up to 30 minutes if the conveyor system is empty.

↳ Fuel is conveyed to the burner plate (operating state "Ignition feeding") and ignited (operating state "Ignition heating"). If the stoker screw was empty, several ignition attends may be necessary until a fuel 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

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

With regard to the delivery, please also ensure that the retailer providing the delivery is ENplus-certified.

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 for the KWB conveyor system S		6 mm	8 mm
Pellet stirrer Plus	with elbow screw	Yes	Yes
	Suction conveyor	Yes	Yes
	Drop hose	Yes	Yes
KWB Pellet Big Bag	with elbow screw	Yes	Yes
	Suction conveyor	Yes	Yes
	Drop hose	Yes	Yes
Conveyor screw	with elbow screw	Yes	No
	Suction conveyor	Yes	No

Pellet sizes for the KWB conveyor system S		6 mm	8 mm
	Drop hose	Yes	No
Buried tank	Suction conveyor	Yes	No
Sampling probe	Suction conveyor	Yes	No
KWB Pellet Box	Suction conveyor	Yes	No

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).

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

Bulk density	600 kg/m³		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%

4.1.3 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?

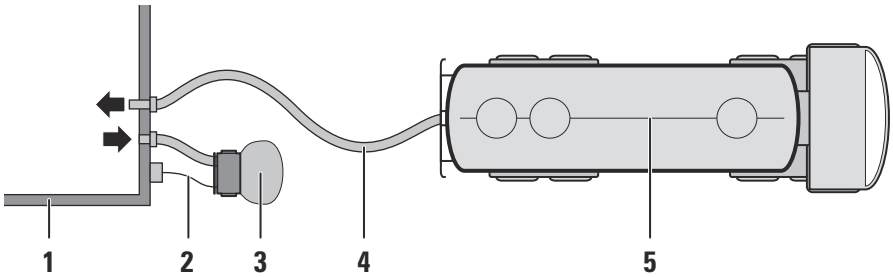
We require the use of ENplus-certified pellets. This ensures that you operate a low emission heating system and also the reliable operation of the system.

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.

4.1.4 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).

4.1.5 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 [►45]**.

⇢ Check the fuel quality (fuel: pellets).

Target condition pellets
Absolutely dry.
No masonry or plaster particles. No foreign objects, rocks, metal pieces ...

If the system is not filled in due time, the alarm **02.14 Fuel storage empty! [►88]** appears and the system switches off.

Filling the storage room with pellets

WARNING

Danger of suffocation due to poisonous gases

↘ 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!

⇢ Switch the system off 1 hour before filling (Comfort 4: **Boiler On/Off [►61]**).

⇢ 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 KWB Pellet Big Bag

- When filling the KWB Pellet Big Bag, NO extraction of the blow-in air is necessary – this must NOT be carried out: The blow-in air escapes through the fabric!
- Please check whether all windows or vents of the KWB Pellet Big Bag are sealed tightly.
- If there is a second nozzle, begin with filling up the KWB Pellet Big Bag first above the first nozzle up to the maximum mark and then switch over to the second one – simple and easy ...

Filling pressure for the KWB Pellet Big Bag

- The minimum filling pressure depends on the vehicle type and the hose length and should be between 0.8 bar (for 10 m) and 1.2 bar (for 30 m).
- The maximum permissible filling pressure is 1.5 bar.
- The filling pressure and the air supply for blowing in are dependent on the installation situation. They must be selected in such a manner that the pellets are distributed in the entire KWB Pellet Big Bag. During filling the fabric fully inflates and is then completely filled with pellets.

Filling the Pellet Box

Max. hose length for filling the pellet box

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

Filling pressure for the Pellet Box: The maximum permissible filling pressure is 0.2 bar!

⇢ Connect the filling and extraction hoses.

⇢ Set extraction to FULL power.

NOTE! Make sure that more air is extracted than blown in!

This ensures air circulation from the outside into the Pellet Box, and makes sure that the filling is nearly dust-free.

⇢ Slowly start blowing in the pellets.

Tip for optimal filling

⇢ After filling: Switch filling and extraction hoses. This way the space is fully used.

Please also see

Switch on/off (►61)
Fuel pellets (►41)

4.1.6 Safety in the storage area

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 cm^2 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.

4.1.7 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

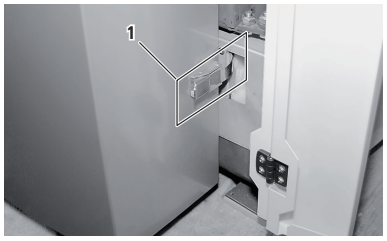
Pellets immediately swell when they come into contact with water or moist walls and floors. These moist pellets decompose and become useless. At worst, they can jam the conveyor system.

4.2 Ash container

If the ash container is full, no more ash can be moved out of the combustion chamber. After a short time this will lead to failure of the system. Depending on the size of the system, it is necessary to check the fill level of the ash container several times per heating season.

4.2.1 Removing the ash container

- ⇢ Fold open the swing doors to both sides of the ash container.



- ⇢ Open the fasteners (1) on both sides of the ash container.

⇢ Pull the ash container off straight, from the front.

↳ The system switches off as soon as you pull the ash container from the boiler.

Handle and wheels on the ash container are optionally available

⇢ Turn the closing cap (on the back side of the ash container) to close the opening.

Option: extendable handle

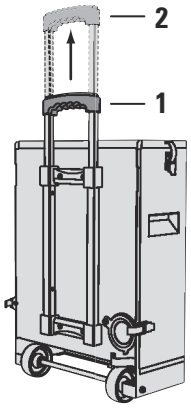
⇢ Pull the extendable handle out of the ash container: Press the closure latches down and pull the handle straight up until it engages.

↳ The ash container is now ready to transport for emptying.

NOTE	**Observe the weight**
	An ash container filled right to the edge can be as heavy as 40 kg!

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!



⇢ Only use the extendable handle (option) when you **pull**the ash container!
To do this, pull the handle out completely (2) until it engages.

⇢ To lift the ash container, move the extendable handle (option) to the first position (1) until it engages and grab under the ash container using both hands.

⇢ To empty, open both upper fasteners and remove the cover.

⇢ After you have emptied the ash container, ensure that the cover seals tightly again!

4.2.3 Attaching the ash container again

↘ If you are using the extendable handle: Press the closure latches down and push the extendable handle down until it engages.

⇢ Open the damper on the rear side.

⇢ Slide the ash container onto the system.

⇢ Secure the two lower fasteners!

↳ The system detects the fitted ash container, switches on again and switches to the last active operating mode.

⇢ Close both swing doors on the boiler.

↳ The alarm message disappears.

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.

4.2.4.2 Ash quantity

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

4.3 Flue gas system with balanced flue operation (option)

⇢ Regularly check and clean the air grille of the combustion air line to the outdoors!

⇢ Following a soot fire, the system must be checked for leaks!

⚠ WARNING	**Risk of suffocation due to connecting line leaks**
	After an incident (soot fire), it is absolutely necessary to replace the seals in the connecting line and the chimney!

5 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!

5.1 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!

5.1.1 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.

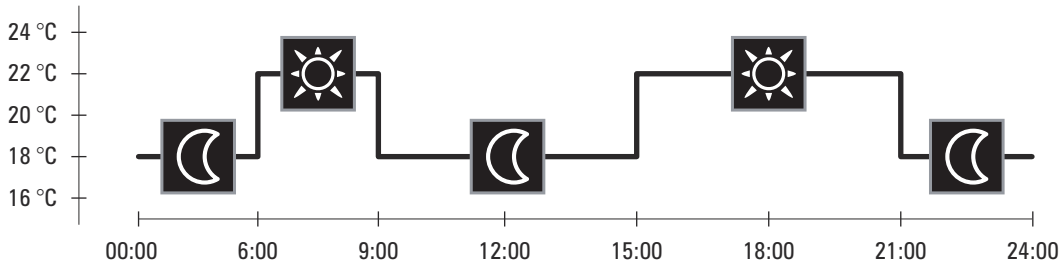
5.1.2 Heating program

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 [►51]** are reached.

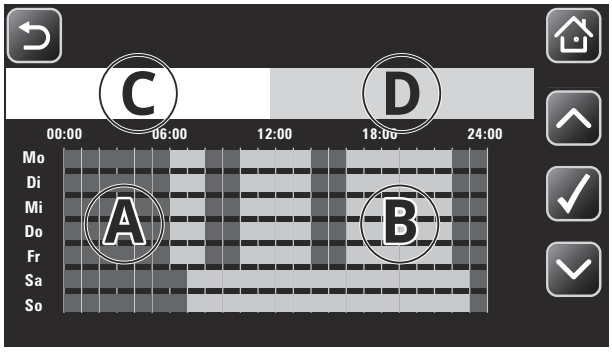


- `Off:` The heating circuit will no longer send heating requests.
  Warning: This heating program does NOT contain frost protection!
- `Party:` The **party program [►51]** extends the comfort temperature mode one time.
- `Holiday:` The **holiday program [►51]** maintains a specific temperature during a defined time period.

5.1.3 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.

5.1.4 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.

5.1.5 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`.

5.1.6 Settings

⇢ `Heating circuits >>` *Select heating circuit* `>> Settings`

5.1.6.1 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°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`.

5.1.6.2 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).

5.1.6.2.1 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.

5.1.6.2.2 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:

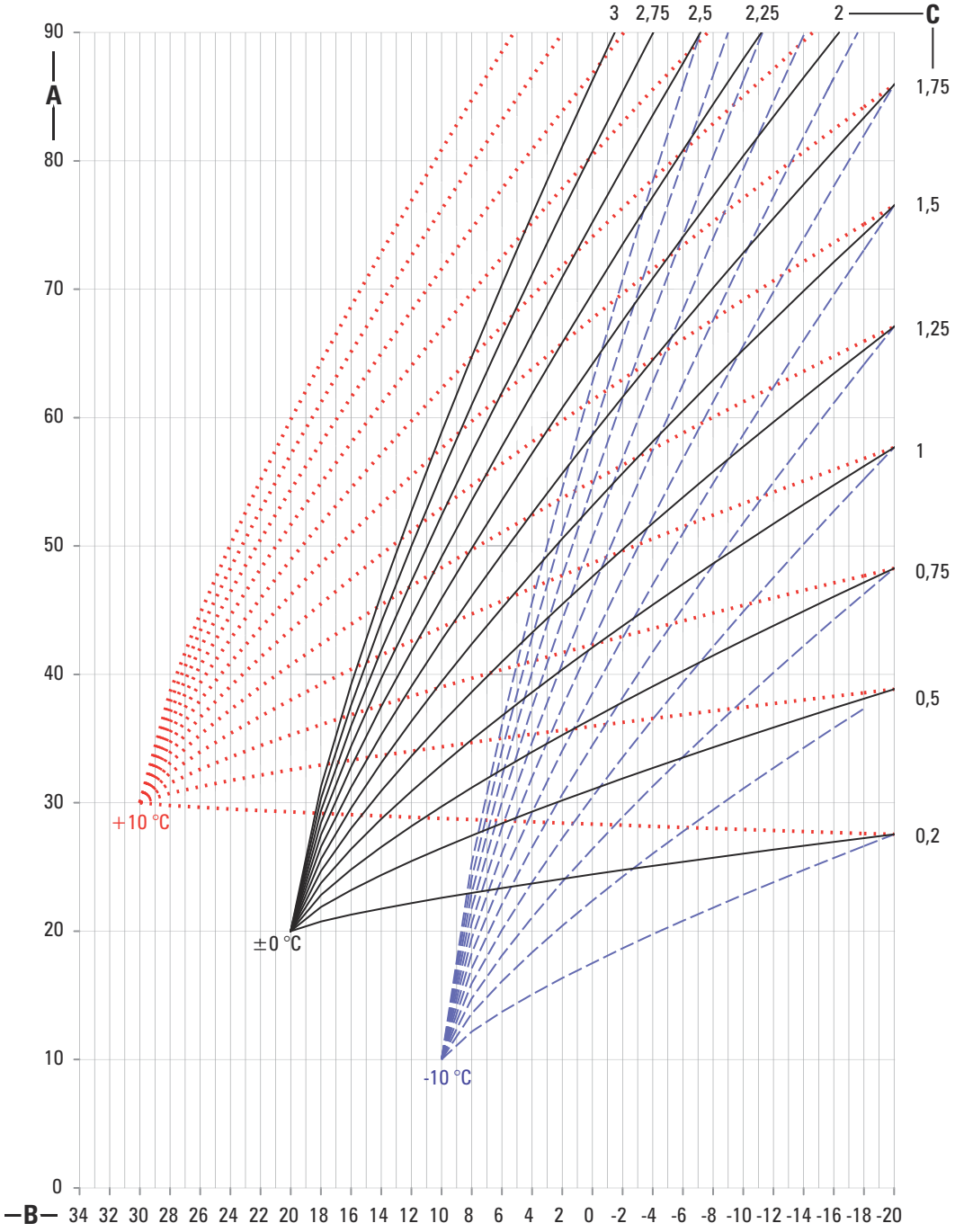
- The heating circuit pump will switch off if the actual room temperature is above the setpoint room temperature by the value of the setting `Hysteresis off`.
- When the actual room temperature is below the setpoint room temperature by the value of the setting `Hysteresis off`, the heating circuit pump 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.

5.1.6.2.3 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

Typical values for a heating curve slope

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

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.

5.1.7 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.

5.2 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.

5.2.1 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.

Factory settings - Charging times for DHWC

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

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 (►62)

5.2.2 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.

5.2.3 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.

5.2.4 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.

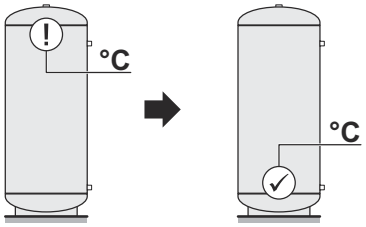
5.3 Buffer storage tank

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

5.3.1 When will the buffer storage tank be charged?

You determine via a buffer program how the selected buffer storage tank is generally charged (heated). In the menu `buffer storage tank >>` *Select buffer* `>> Buffer program`, choose between `Time` | `Time+` | `Summer` | `Temperature` | `Off`.

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 when each buffer storage tank 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).

Factory settings - Charging times for buffer storage tanks

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

If you do not want to use a 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.

Program Time+

This works like the time program. However, consumer requests (outside of charging times!) will be 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 set minimum 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.

Program Summer

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 specified 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 DHW 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 1 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 20:00 hours (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.

5.3.2 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.

5.4 Solar

5.4.1 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.

5.4.2 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

5.4.2.1 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.

5.4.2.1.1 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.

5.4.2.2 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.

5.4.2.3 Anti-blocking protection

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

5.4.2.4 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 under-supplied 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? [►57]**

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? [►54]**) 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? [►57]**)
  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)

5.5 Boiler

5.5.1 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.

5.5.2 Conveyor system

Fill manually

Manual filling (On|Off) in the menu Boiler >> Conveyor system >> Fill manually (only for systems with suction system) activates the conveyor system in order to fill the suction container with fuel.

Last filling

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

The command Switch off (Off|On) makes it possible to switch off the conveyor system (only for systems with suction system).

Lock probes

The menu "conveyor system" provides the option to individually activate and deactivate (On|Off) sampling probes only if you have a suction systems with sampling probes.

5.5.3 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!

⇢ Push the measuring mode switch.

⇢ Select Measure nominal load or Measure partial load.

Measuring nominal 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.

5.6 Operational state

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

5.6.1 Boiler

After `status` (see section **Boiler status [►63]**), the first page shows the current `boiler output` compared to the nominal load in per cent and compares the setpoint and current boiler temperature values (`boiler temperature, setpoint` | `boiler temperature, actual`) and shows the status of the `boiler pump`.

The second page shows the status of the return flow boost (`RFB valve`, the `RFB mixer or boiler pump %`), compares the setpoint and actual values of the return flow temperature (`return flow temperature, setpoint` | `return flow temperature, actual`) and outputs the system's operating hours converted to full load hours.

5.6.1.1 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 the fuel for the 1st ignition attempt.
Ignition, feeding 2	Boiler pushes in the fuel for an additional ignition attempt.
Ignition CS filling:	Conveyor system pushes in fuel
Ignition, heating:	The heating rod 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.
Ignition, wait:	The ignition procedure operates without heating rod. The ignition was successful if the conditions for operation have been fulfilled.

5.6.2 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.

5.6.3 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!).

5.6.4 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 you will be shown 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" is 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.

In case 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!).

5.6.5 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.

5.6.6 Fuel and ash

As of software version V18-9-1, it is possible to query

- the **pellet consumption**,
- the **residual pellet amount** (which still remains in the fuel storage) and
- the **ash fill level**

in the menu `Operating mode >> Fuel and Ash`

NOTE! These values are calculated exclusively based on the runtime of the main drive motor and may deviate from the actual amount!

Query consumption

The consumption can be queried in the menu `Operating mode >> Fuel and ash >> Consumption`.

- `Consumption:` 0,000 t

Query residual fuel amount

You find the following functions in the menu `Operating mode >> Fuel and ash >> Residual amount`:

- `Residual amount:` in kilogram (kg)
- `Last filling:` date (e.g. 27/3/2019)

- `At operating hours:` hours (h)
- `Message for residual amount:` in kilogram (kg)
- `Add fill amount:` in kilogram (kg)

Legacy systems After a software update ≥ V18-9-1 that contains this function for the first time, the pellet amount in the fuel storage room must be estimated and entered under `Operating mode >> Fuel and Ash >> Residual amount >> Residual amount`.

- `Residual amount:`

You can easily add new pellet fillings via the button `Add fill amount`. This amount is then automatically added to the residual amount.

When adding a fill amount, the date of the filling (`last filling`) and the operating hours `(operating hours)` are specified at the same time.

Alarm message for residual amount

You can additionally specify a residual amount. When the amount falls below this value, the alarm message `2.28 Fuel storage will soon be empty!` will be output (see section **02.28 Fuel storage will soon be empty! [►91]**).

Query fill level, ash container

You can find the following functions in the menu `Operating mode >> Fuel and ash >> Ash fill level`:

- `Last emptying:` date (e.g. 23/02/2019)
- `At operating hours:` hours (h)
- `Alarm message:` Yes | No (factory setting: Yes)
- `Calibration ash content:` hours (h)
- `Reset fill level:`

Legacy systems The ash container should be emptied after a software update ≥ V18-9-1 that contains the function for the first time since the fill level of the ash container is reset to 0% after an update.

When emptying the ash container, you will be asked via a dialogue window whether the ash container has been emptied.

NOTE! Do NOT turn off the main switch when emptying the ash container!

The fill level can be reset by pressing the button `Reset fill level`.

If the fill level in % displayed in the menu `Ash fill level` is incorrect, this can be adjusted via the set value in menu item "Calibration ash content" (factory setting: 226 h). Increase or decrease the hours until the displayed fill level matches the actual fill level of the ash container.

After the main drive has continuously run for 226 h, 100% is displayed under `Ash fill level`.

Note: In a new system, the value displayed under `Ash fill level` may not be correct as the substructure must first fill up with ash.

5.6.7 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.

5.6.8 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.

5.6.9 Conveyor system (screw)

The value overfill protection shows the status of the sensor that displays the fill level in the drop shaft (On: Drop shaft filled | Off: Drop shaft NOT filled).

The value drive, conveyor system shows the status of the conveyor system motor (On: Motor in operation | Off: Motor NOT in operation).

Optional:

The value TMFS fuel displays the status of the temperature switch for the fuel storage room monitoring: When the status Off is displayed, a fire alarm will be triggered in the fuel storage room.

The value Temperature, conveyor system shows the status of the motor overheating protection (On: normal operation | Off: motor overheated).

5.6.10 Conveyor system (suction system)

The field status shows:

- Forward flow: Suction turbine builds up conveyor pressure, conveyor motor is not running yet
- Fill: Conveyor system and suction turbine are in operation
- Fill break: Suction turbine keeps running, conveyor system takes a break (the setting idle time can be found in the menu **Conveyor system [►62]**)
- Off: Conveyor system NOT in operation.

Suction turbine shows whether the suction turbine is running (On) or not (Off).

Overfill protection shows whether the container is completely filled (On) or not (Off).

Drive, conveyor system shows whether the conveyor system is active (On) at the moment or not (Off).

Temperature, conveyor system shows the status of the motor overheating protection (On: normal operation | Off: motor overheated).

Optional:

TMFS fuel shows the status of the temperature switch for the fuel storage room monitoring (On: normal operation | Off: fire alarm in the fuel storage room or wiring problem).

Time remaining shows the remaining time until the next suction process.

Suction system with sampling probes

For suction systems with sampling probes, the menu shows additional modes:

The first line shows the status of the unit (`Off|Fill container|Flush`).

`Suction turbine` shows the status of the suction turbine (`On|Off`).

`Overfill protection` displays the status of the container fill level (`On`: container is filled `Off`: container is **not completely** filled).

`Drive, conveyor system` shows that the drum is to turn (`On|Off`).

`Empty probes` are indicated by their number:

Example

1	2	3	All three probes are empty
1		3	Probes 1 and 3 are empty
	2		Only probe 2 is empty

The current position of the switch unit is displayed under `probe`:

- GO … Start position (neutral point)
- P1, P2 or P3 … suction channels
- L4, L5 or L6 … flushing channels

`Max. fill time` shows the time in seconds allocated to each probe for the suction process.

`Remaining amount till sampling probe switch` shows the pellet amount in kilogram before the switch to the next sampling probe.

5.6.11 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).

5.7 Date/Time

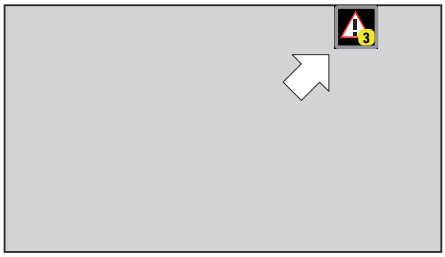
In the network, it is the control unit at the boiler or the Heat management module Exclusive [WMM] that prescribes the “system time”: This time applies for all other control units in the same network.

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.timeand-date.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).

5.8 Alarm system



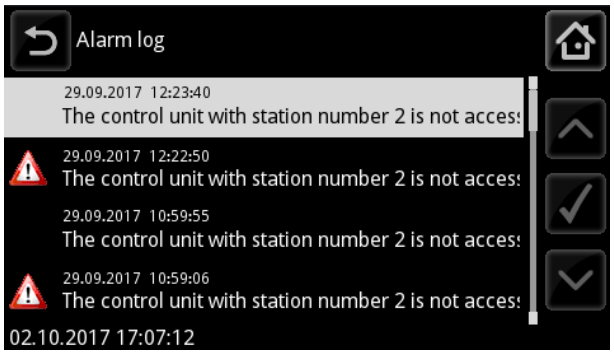
During ongoing operation, a symbol in the top right corner of the screen shows how many alarms are active.

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!

5.9 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! [►90]** 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! (►90)
- 02.22 Control interval expired! (►90)
- 02.21 Maintenance interval expired! (►90)

5.10 Expansions

5.10.1 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]

- 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).

5.10.2 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 (►98)

5.10.3 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.

5.10.4 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, these 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).

A prerequisite for this function is:

- Internet connection

Please also see

Ethernet settings (►71)

5.10.5 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 two ways to activate a license:

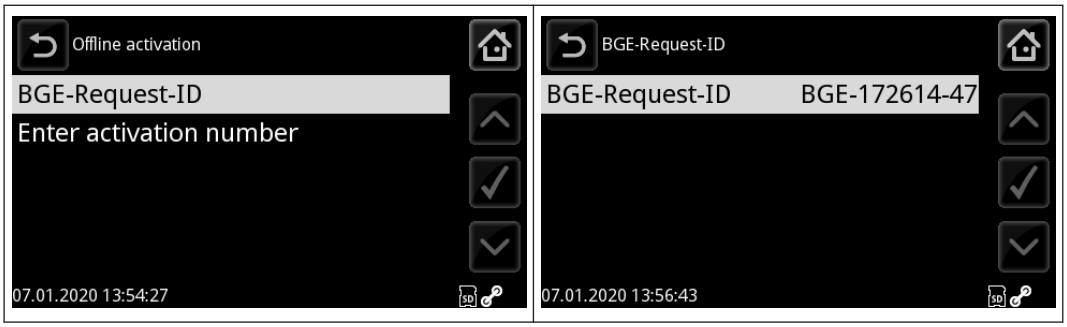
1. System (boiler or autonomous heating management module) is **online**
2. System (boiler or autonomous heating management module) is **offline**

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.

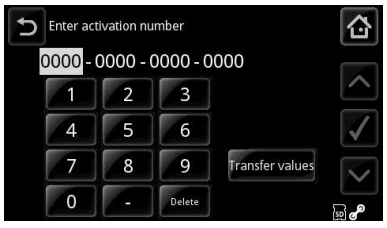
System is offline

1. 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.



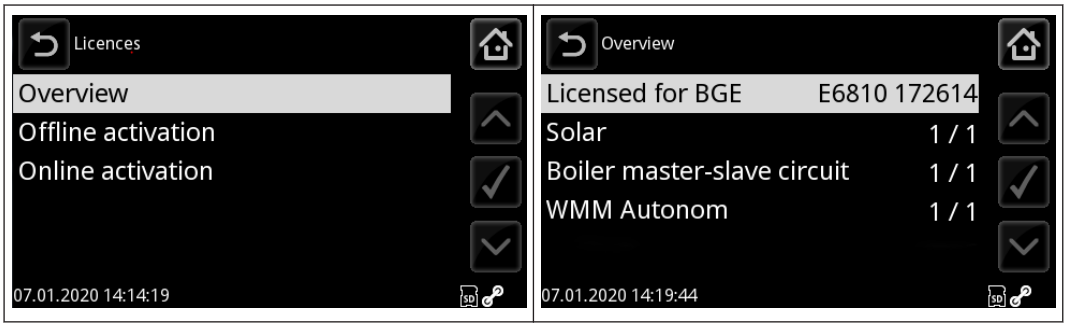
1. On your smartphone or computer, go to the internet and open the link https://license.kwb.net. Enter the license and order numbers indicated on your license certificate.

1. Select "license activation as of software version V19.11".
2. Enter the "`BGE request ID`".
3. The 16-digit activation code will be displayed as a result. Please note it down.
4. 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

1. The `Menu >> Add-ons >> Licenses >> Overview` provides a list of activated and used licenses.



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.

5.10.6 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)

5.11 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.

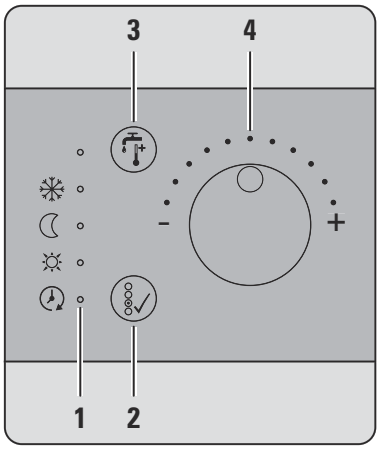
⇢ Press ✓ to confirm the digit at the respective position. Alternatively, you can also press on the dial. The digit will immediately afterwards be replaced by a star to hide the PIN code.

⇢ Once you have confirmed all digits individually, you need to confirm the entire number by pressing ✓.

6 Basic control unit

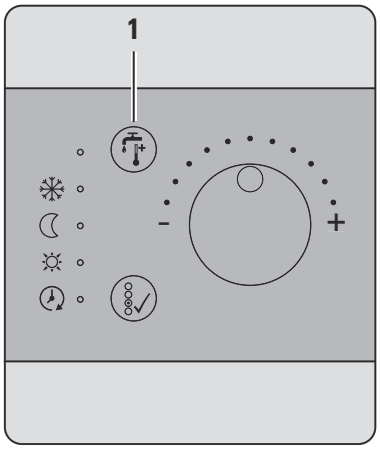
The Basic control unit operates without touch screen and graphic user interface – two buttons and a dial are all it takes to change the main functions.

6.1 Basic control unit operating elements



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

6.2 Heat DHW 1x



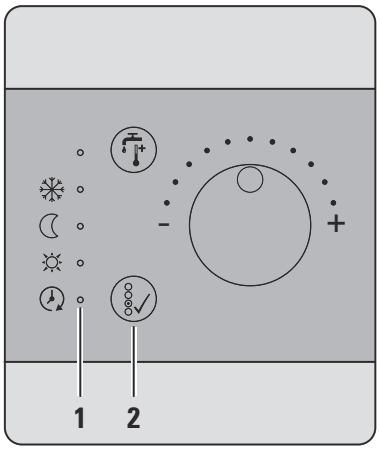
You can activate the function "Heat DHW 1x" via the Basic control unit [BGB] if the DHWC temperature is too low.

⇢ 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 [►54]** has been reached, the button light will turn off.

6.3 Select program

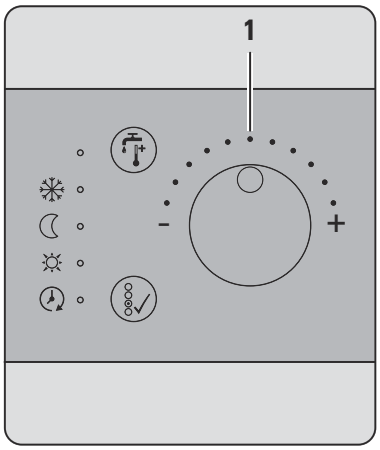


When in normal operation, the Basic control unit will indicate the current program with a green LED (1).

⇢ 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.

6.4 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!

6.5 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] [►79]**.

7 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 [►83]**.

7.1 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 holiday or party program.	More details you will find 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.

7.2 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 [►71]** shows the software version in use.
- The menu **Operational state [►63]** 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.

7.3 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 [►83]**.

⇢ Set the current date and time as described in section **Date/Time [►69]**.

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.

7.4 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).

⇢ Wait until the system has cooled down before taking further steps!

7.5 General fault at the power supply

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

7.6 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.

7.7 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.

7.8 Reacting to a CO alarm

For pellet heating systems which are operated ambient air-independently, we supply a CO sensor.

Operating functions

	LED	Comment
Normal operation	Green LED lights up	–
Alarm	Red LED lights up	Repeating sequence of 4 signal tones
	The alarm will sound until the CO concentration falls below the sensitivity threshold.	
Test	Red LED flashes	–
	By pressing the TEST button, the acoustic alarm can be suppressed for 5 minutes. If the concentration rises above 350 ppm, the alarm CANNOT be suppressed.	
Error	Yellow LED flashes	Sequence of 2 short signal tones every 60 s
	Flawed self-test – the CO alarm may be worn out (after approximately 6 years). Then replace the CO sensor!	

Text on the display

	Display	Comment
Normal operation	No display	CO concentration below the sensitivity threshold
TEST button	– – –	CO concentration <30 ppm

	Display	Comment
	If the CO concentration is > 30 ppm, then the appropriate concentration is displayed. Display remains active for 15 s.	
Alarm	If the CO concentration is > 50 ppm, then the display is activated automatically. Display remains active as long as the CO concentration is > 50 ppm.	

If this CO sensor sounds an alarm, the carbon monoxide concentration measured has been above a limit value for a while:

Meaning of the signal tones

Signal tone	Meaning
2 signal tones every 60 seconds: oo …….. oo ……..	The sensor's self-test produced an error: Check the device! **NO** CO alarm!
4 signal tones, constantly repeating: oooo .... oooo .... oooo .... oooo .... oooo	The sensor has measured too high a concentration. The red alarm LED also lights up. **CO ALARM!**

Alarm threshold of the CO sensor

CO concentration	Time exceeded
>50 ppm	60–90 min
>100 ppm	10-40 min
>300 ppm	< 3 min

- ⇢ **Remain calm**!
- ⇢ Do NOT enter the room where the heating system is located!
- ⇢ Open all doors and windows so that the area is ventilated and the carbon monoxide can escape.
- ⇢ If this is not sufficient, clear the building. Leave the doors and windows open and only re-enter the room when the alarm signal has stopped sounding.
- ⇢ If the sensor triggers an alarm, the alarm must first be rectified in the KWB Comfort 4 controller before the heating system can be put back into operation.
- ⇢ Inform your heating technician and KWB and describe the problem.

WARNING! In case of alarm, do NOT unplug the CO sensor!

False alarms can occur due to a high concentration of tobacco smoke or after the use of aerosols (propellant gas in sprays...).

⚠ WARNING **Danger of suffocation due to carbon monoxide**

- ↘ Carbon monoxide poisoning normally causes headaches, difficulty breathing, nausea, in extreme cases it can cause loss of consciousness and death!
- ⇢ Seek medical attention for anybody who is suffering from the effects of carbon monoxide poisoning. Inform medical personnel that you suspect carbon monoxide poisoning!
- ⇢ Only commission the pellet heating system after it has been checked and approved by appropriately-trained professionals.

7.9 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!

7.10 Notifications

KWB Comfort 4 notifications

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.

01.01 Exhaust gas temperature after ignition not achieved 2

The system will be switched off.

This alarm is triggered if the flame temperature increase after ignition has been reached, but the required flame temperature has NOT achieved the value specified in `ignition done` and `O2 max ignition success`.

Note: To be able to rectify the alarm, the combustion chamber must be inspected and cleared, if necessary!

Fuel missing

- ⇢ Check whether there is fuel in the combustion chamber.

Bad fuel

- ⇢ Check the fuel quality.
- ⇢ Remove wet or bad fuel from the combustion chamber. Restart the system until you have sufficient fuel in the combustion chamber.

Fault in the fuel supply

⇢ Check the fuel supply.

⇢ Check whether the conveyor system is working.

⇢ Clean the overfill protection sensor at the conveyor channel: A soiled sensor may stop the conveyor system.

Too much ash in the combustion chamber

Causes
- The ash container is full
- Revolving grate has failed or was configured incorrectly.
- Fuel is unsuitable

Consequences
- Ash is blocking the flame temperature sensor.
- Ash too high

⇢ If this fault recurs, call you heating technician or the KWB customer service.

Ignition piped is blocked

⚠ CAUTION **Burn injuries due to hot surfaces**

⇢ Ensure that the system is switched off and has cooled down before you begin!

⇢ Remove any deposits from the ignition pipe opening (see Maintenance instructions).

Ignition is set incorrectly or defective?

⇢ Is the ignition pipe positioned correctly?

⇢ Does the heating element work?

01.02 Ignition attempts unsuccessful!

The system was not able to ignite the fuel in the combustion chamber despite several attempts.

Note: To be able to rectify the alarm, the combustion chamber must be inspected and cleared, if necessary!

Fuel missing

⇢ Check whether there is fuel in the combustion chamber.

Bad fuel

⇢ Check the fuel quality.

Fault in the fuel supply

⇢ Check the fuel supply.

⇢ Check whether the conveyor system is working.

⇢ Clean the overfill protection sensor at the conveyor channel: A soiled sensor may stop the conveyor system.

Too much ash in the combustion chamber

Causes
- The ash container is full
- Rotary grate has failed or is configured incorrectly.
- Fuel is unsuitable

Consequences
- Ash is blocking the flame temperature sensor.
- Ash too high

⇢ If this fault recurs, call you heating technician or the KWB customer service.

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 set incorrectly or defective?

Is the ignition pipe positioned correctly?

Does the heating element work?

01.03 Induced draught fan speed is too high!

The main drive motor started running, although it was not activated.

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

01.04 Main drive speed is too low!

Speed of the main drive motor was below the limit value for 3 seconds.

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

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 front 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.

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!

02.02 The ash container was incorrectly installed

The system will be switched off.

Ash container has been removed

⇢ Replace the ash container.

The ash container was installed incorrectly

⇢ Ensure that the ash container is installed correctly.

Cabling error

⇢ Check the cabling.

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

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.

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.

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.

02.06 Alarm! Internal error!

Alarm for internal use.

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

02.08 The primary air fan speed is too low!

The speed of the fan has been below the minimum speed for 3 minutes now.

⇢ Check the cabling of the fan.

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

02.09 The induced draught fan speed is too low

The fan speed has been under 60 revolutions per minute for 5 minutes now and the negative pressure is insufficient.

⇢ 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.

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 0.09 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.

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

⇢ Clean the measuring tube: In the KWB Easyfire, the negative pressure sensor measures in the stoker pipe of the burner.

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

02.11 Negative pressure sensor is faulty!

Safety shutdown! The negative pressure values are more than 2 minutes outside of the measuring range.

The system will be switched off.

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

02.12 Lambda probe is defective!

The system switches to an emergency program with a reduced fuel factor if the lambda probe fails.

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

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.

02.14 Fuel storage empty!

The system will be switched off.

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

Fault in the fuel supply

⇢ Check the drive (stoker incl. chain) for proper functioning.

Bridge-building in the fuel storage:

⇢ Check the fuel storage room. If the storage room is sufficiently filled, it can be assumed that a bridge was built via the conveyor line.

⇢ Check the stirrer for proper functioning.

Only suction system:

⇢ Check in the relay test whether the conveyor system is running: Can you hear a trickling sound in the suction hose?

⇢ Rectify blockages by knocking on the suction hose.

⇢ Check whether the flow and return air lines of the container and of the connection hose to the system (stoker) are sealed.

No fuel

Screw

The conveyor system has unsuccessfully tried several times to remove fuel from the storage area.

⇢ Check the fuel supply!

⇢ 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.

Suction system

⇢ Check whether the sieve has been placed below the turbine and clean it, if necessary.

A suction process is triggered after the alarm is cleared and before the system is restarted.

Purging process with a single sampling probe

If the error is displayed although the sampling probe is covered with pellets, it is likely that pellets got stuck somewhere in the suction hose.

The respectively necessary purging process can be achieved by temporarily switching the two hoses:

⇢ Switch the suction hose and the return air hose.

⇢ Clear the alarm.

⇢ Let the conveyor system run for about 5 minutes (= purging).

⇢ Switch the system on using the main switch.

⇢ Switch the hoses back to their correct position.

⇢ Switch the system on again.

02.15 Fuel container is empty!

The system will be switched off.

The sensor in the storage container reports that the container is empty.

⇢ Fill fuel into the storage container.

This alarm clears automatically if the sensor detects fuel in the storage container.

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

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.

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.

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.

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.

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.

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 (►71)

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.

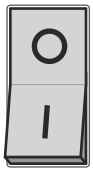
Please also see

Customer service (►71)

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.

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.

02.26 Fill level conveyor system implausible

The alarm is triggered when the capacitive proximity switch is blocked permanently although the stoker is running for a longer period of time.

⇢ Check whether the switch is dust-covered or whether a pellet is stuck to the switch.

⇢ Clean the capacitive proximity switch.

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

02.27 Fault at the sampling probes!

The control was NOT able to reach the switch unit or the activated probe in the specified amount of time.

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

02.28 Fuel storage will soon be empty!

This alarm is triggered when the sum of all unsuccessful suction processes exceeds a certain value (only for KWB suction conveyance with sampling probes):

- With 3 suction probes: 3 unsuccessful extraction processes
- With 2 suction probes: 2 unsuccessful extraction processes
- With 1 suction probe: 1 unsuccessful extraction process

The system triggers a message, but continues to run.

Low fuel

⇢ Check the fill level in the storage room.
Keep an eye on bridging above the sampling probes.

02.31 24 V safety circuit not active, input 131

The safety circuit connected to connector 131 is not active.

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.

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.

02.35 Room air CO value too high!

The system will be switched off.

The CO sensor included for ambient air-independent operation is either not connected, or it has detected an error during a self-test, or it has measured a CO concentration which is too high.

Escaping smoke

If the CO value in the room air is actually too high (acoustic alarm of the CO sensor: 4 signal tones – pause – 4 signal tones – pause ...) there is danger to life!

In the Operating instructions, you will find instructions on what to do in case of an alarm in the section "**Reacting to a CO alarm [►81]**".

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.

02.37 O2 value exceeds permitted value during operation!

If the O_2 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.

02.40 The flame temperature sensor for the pellet module 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.

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.

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.

02.46 Flame temperature in operation too low

The system will be switched off.

Fuel missing

⇢ Check whether there is fuel in the combustion chamber.

Fault in the fuel supply

⇢ Check the fuel supply.

⇢ Check whether the conveyor system is working.

⇢ Clean the overfill protection sensor at the conveyor channel: A soiled sensor may stop the conveyor system.

Too much ash in the combustion chamber

Causes

- The ash container is full
- Revolving grate has failed or was configured incorrectly.
- Fuel is unsuitable

Consequences

- Ash is blocking the flame temperature sensor.
- Ash too high

⇢ If this fault recurs, call you heating technician or the KWB customer service.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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 (►72)

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.

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 (►72)

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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 [►52]**) 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.

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.

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.

30.58 GSM modem error: CMS 303 operation not supported

An unexpected error occurred.

⇢ Clear the alarm.

⇢ If this fault recurs, call you heating technician or the KWB customer service.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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 Maintenance

⚠ WARNING

Perform work according to this operating manual only! Improper work can put you in life-threatening situations due to a lack of knowledge!

- ↘ Danger of crushing and entanglement through unexpected starting of mechanisms
- ↘ Risk of fire, explosion and electric shock from open casing, combustion chamber door and maintenance cover
- ↘ Asphyxiation risk due to carbonisation gases from smouldering fuel when the combustion chamber door or service cover is open!
- ⇢ Shut the system down (System on/off [Comfort 3] or `Kessel Ein/Aus` [Comfort 4] = controlled shutdown.
- ⇢ Let the system cool down for approx. 30 minutes before switching it off (main switch to "0").
- ⇢ Pull the plug and secure the system against being switched on again.
- ⇢ Allow the system to cool down. Only open the casing, combustion chamber door and service cover when the system is **cold** and de-energised!

8.1 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!

8.1.1 Weekly visual inspection

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

8.1.2 Monthly inspections

⇢ Perform the following inspections monthly and keep a log of these inspections. The respective forms can be found in section **Forms [►110]**.

- 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?
- Proper condensate discharge (option: condensing module)

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 (►111)

8.1.2.1 Maintaining the CO sensor

For pellet heating systems which are operated ambient air-independently, we include a CO sensor. We recommend checking this CO sensor once a month to see that it is functioning properly.

⇢ Clean the housing with a dry cloth. Remove any dust accumulations in the housing slits. Do not use any water, household cleaning agents or other cleaning agents!

⇢ Hold the TEST button down for 4 seconds.

↳ This way you activate the function test:
The 3 LEDs light up in alternation.
A signal sounds for 2 seconds after the test.

When the function test was positive, then the green LED lights up again. (For the description of the operating functions and the text on the display, see the "Operation" section.)

8.1.3 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.

8.1.4 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 [►109]**), **Forms [►110]**). In this section, the respective steps are to be documented – from the planning to commissioning to maintenance.

8.1.4.1 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 a reliable operation of hot water heating systems over the long term: The fill water must be low-salt and alkaline and must not exceed a certain hardness level.

Maximum total hardness based on the specific system volume

Total heating capacity	mmol/l		mval/l	°dH		°fH	°e
	Önorm	VDI		Önorm	VDI		
Boiler output ≤50 kW	≤3	≤3	≤6	≤16,8	≤16,8	≤30	≤21
Boiler output >50 to ≤200 kW	≤2	≤2	≤4	≤11,2	≤11,2	≤20	≤14
Boiler output >200 to ≤600 kW	≤1	≤1,5	≤2	≤5,6	≤8,4	≤10	≤7

mmol/l … SI unit sum alkaline earth | mval/l … equivalent quantity | °dH … German hardness | °fH … French degrees | °e … English hardness

8.1.4.2 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

8.1.5 Forms

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

8.1.5.1 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:

Please check: o External combustion air supply o Ambient air-independent operation (building ventilation system -> increased leak-tightness requirements)

8.1.5.1.1 Check sheet for operators

Responsible operator ...												
Year: ...	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
Monthly inspection on … (day)	...	...	...	...	...	...	...	...	...	...	...	...
Exhaust routes												
Control												
Warning devices												
Fan												
Combustion chamber												
Fire extinguisher												
Flammable material in the boiler room												
Fire protection closures												
Chimney cleaning												
Condensate discharge (option: condensing module)												
System pressure												
Thermal discharge safety valve												
Safety valve												
Signature												

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

8.1.5.1.2 Maintenance sheet

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

8.2 Maintenance intervals for operators

Your KWB Easyfire is equipped with an automatic cleaning system which collects both the after deposits in the heat exchanger as well as the fly ash in the combustion chamber. Only the ash container needs to be emptied at regular intervals:

Activity	Interval	Comments
Remove ashes from substructure and burner plate	NOT necessary!	The ash cushion in this area is used as insulation and thus supports the efficiency during the ignition procedure!
Vacuum ashes or fly ash out of the heat exchanger	NOT necessary!	This contamination is largely prevented by the dust separator.
Remove ash container and empty	Depending on the boiler type, fuel quality and degree of heating between 3 and 24 months	**Removing the ash container [▶46]**
Visually inspect the entire system	Depending on the degree of heating every 2 to 3 months	—
Cleaning of the exhaust gas pipe	Depending on local regulations	—
Check condensate discharge (option: condensing module)	Depending on the degree of heating every 2 to 3 months	—
Function test of the CO sensor (option)	Every month	**Maintaining the CO sensor [▶107]**

8.3 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

- Maintenance tool (supply, should be inserted in the right cable duct)
- 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

8.4 Maintenance steps

⚠ WARNING

Perform work according to this operating manual only! Improper work can put you in life-threatening situations due to a lack of knowledge!

↘ Danger of crushing and entanglement through unexpected starting of mechanisms

↘ Risk of fire, explosion and electric shock from open casing, combustion chamber door and maintenance cover

↘ Asphyxiation risk due to carbonisation gases from smouldering fuel when the combustion chamber door or service cover is open!

⇢ Shut the system down (System on/off [Comfort 3] or `Kessel Ein/Aus` [Comfort 4] = controlled shutdown.

⇢ Let the system cool down for approx. 30 minutes before switching it off (main switch to "0").

⇢ Pull the plug and secure the system against being switched on again.

⇢ Allow the system to cool down. Only open the casing, combustion chamber door and service cover when the system is **cold** and de-energised!

8.4.1 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!

8.4.2 Checking the combustion chamber

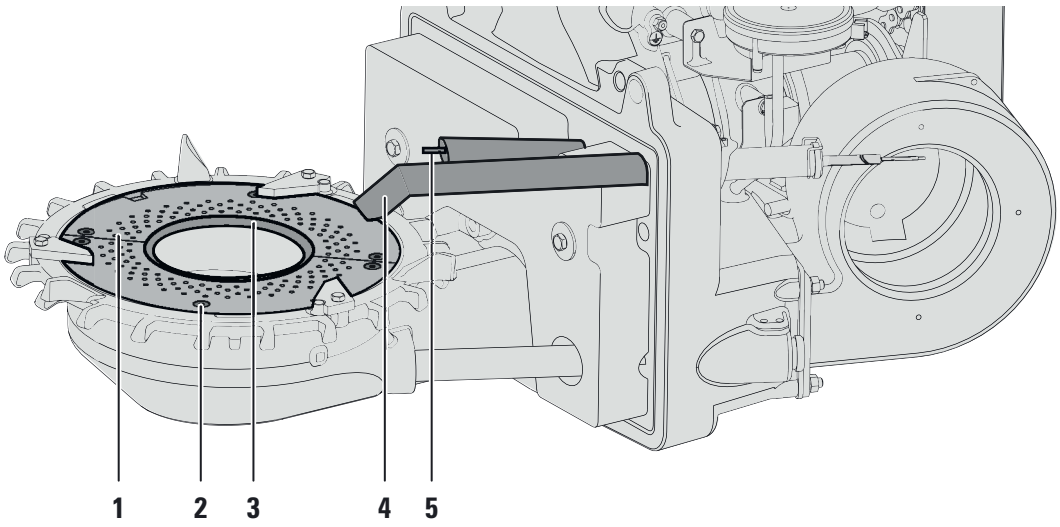
⇢ Check the combustion chamber approximately every 6 weeks – depending on the degree of heating:

- Remove the ashes above the burner plate level.
- The ashes must be free of partially burned or unburned pellets – this would indicate incomplete combustion!
- The burner plate must be free of slagging!

8.4.3 Emptying the ash container

See: **Removing the ash container [►46]**, **Emptying the ash container [►47]**, **Attaching the ash container again [►47]**, **Ash [►48]**.

8.4.4 Cleaning the burner plate and ignition pipe



1	Burner plate	2	Screws, burner plate halves
3	Feeder unit edge	4	Ignition pipe
5	Flame temperature sensor		

Burner plate

↘ Remove the ash and pellets from the burner plate!

⇢ Remove the deposits on the burner plate (1) using a wire brush and bump blocked air nozzles clear.

⇢ Vacuum off the burner plate (1).

⇢ Check the secure seat of the burner plate halves: Are all 6 screws (2) screwed in tightly?

Feeder

⇢ Remove the deposits on the edge of the feeder unit (3).

Ignition pipe

⇢ Remove the deposits on and in the ignition pipe (vacuum) (4).

Flame temperature sensor

⇢ Clean the flame temperature sensor (5).

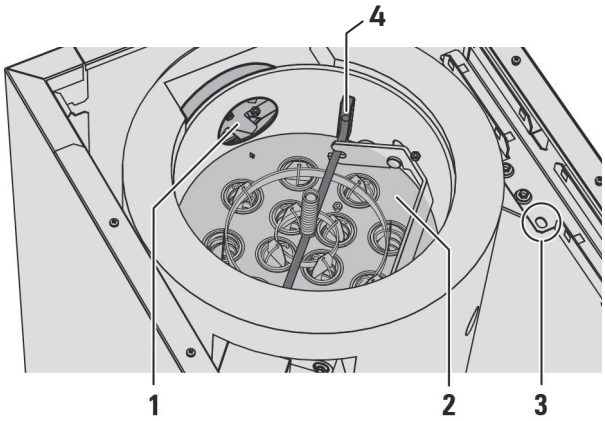
Ash revolving grate

⇢ Check the free movement of the ash revolving grate.

⇢ Check the ash revolving grate and the ash screw for wear.

NOTE	**Known fault**
	↘ The ash inside the substructure provides valuable insulation downwards and to the side.
	⇢ Leave the ash in the substructure!

8.4.5 Exhaust gas collecting chamber and induced draught fan



1	Induced draught fan	3	Position, maintenance wrench *Always stays with the boiler!*
2	Exhaust gas collecting chamber	4	Guide rail (both sides)

⇢ Lift off the casing cover.

⇢ Use the supplied maintenance wrench from the position in the right cable duct (3) to loosen the four cover bolts M8x30 under the insulation.
Lift off the boiler cover with a turning motion.

⇢ Vacuum the fly ash out of the collecting chamber (2).

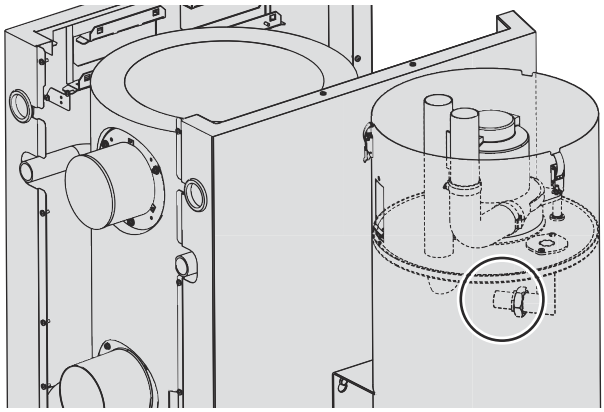
⇢ Check that the automatic heat exchanger cleaning for freedom of movement: Move the guide rails (4) manually up several times to clean the heat exchanger.

⇢ Remove any possible encrustation on the impellers of the induced draught fan (1).

⇢ Check the silicon seal of the boiler cover before you replace the cover and secure it with the bolts.

⇢ Insert the maintenance wrench back into its original position before you replace the casing cover.

8.4.6 Clean capacitive proximity switch (Option: suction container)



Suction container

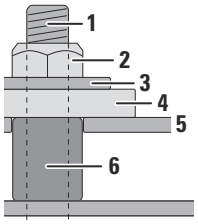
↘ Dust deposits can interfere with switch measurements!

⇢ Remove the suction container cover.

⇢ Unscrew the three screw connections to the turbine plate in order to be able to lever out the entire turbine.

⇢ **Carefully** clean the facing surface of the capacitive proximity switch using a brush.

⇢ Check the protective grille under the turbine for permeability.



⇢ Re-insert the turbine plate – use the spacer rubbers (6), rubber discs (4) and metal washers for fastening, as shown on the side.

Alternative

⇢ As an alternative to dismantling of the turbine, you can also directly dismantle the switch including bracket (2 screws) and re-install it in the exact same manner.

⇢ Reinstall the cover – make sure it seals tightly!

8.5 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	WITHOUT frost protection
⇢ Have somebody check whether your system is sufficiently protected against frost.	⇢ If you do NOT use the heating system **in winter**, then have the system emptied completely to protect it against frost.

8.6 Restarting the system after standstill periods

⇢ Switch the system on at the main switch.

⇢ When the battery is flat, you will need to reset the date and time of day (section**Setting the date/time of day [►34]**).

⇢ Switch the system on using the function System on/off [Comfort 3] or `Boiler On/Off` [Comfort 4].

As soon as there is a request, the system or boiler will start operating:

⇢ The fuel supply to the burner begins (operating state "Ready (-CS)". This procedure can take up to 30 minutes if the conveyor system is empty.

⇢ Fuel is conveyed to the burner plate (operating state "Ignition feeding") and ignited (operating state "Ignition heating"). If the stoker screw was empty, several ignition attends may be necessary until a fuel 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)").

8.7 Conveyor system maintenance

Also make sure to check the conveyor system during every heating system maintenance.

8.7.1 Wearing parts

For screw conveyance

- Drop hose between conveyor system and stoker

For suction conveyors

- # 12-1001577: Hose set 12.5 m (incl. 25 m hose reel, clamps and anchor bolts)
- # 12-1001578: Hose set 25 m (incl. 2x25 m hose reel, clamps and anchor bolts)
- Drop hose between suction container and stoker

For the hopper

- Drop hose between hopper and stoker

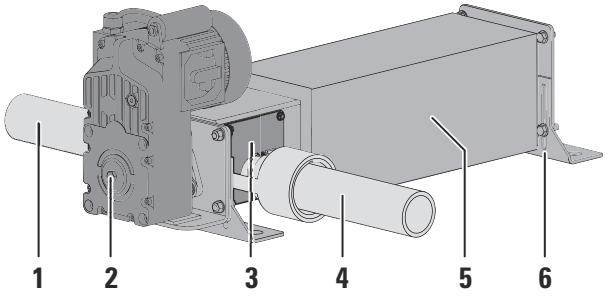
8.7.2 Maintenance steps

For suction conveyors

⇢ Check the hoses for damage.

⇢ If required, replace the hoses.

8.7.2.1 Cleaning the head section for suction conveyor system



1	Suction hose	4	Return air hose
2	Drive	5	Wall duct
3	Inspection opening	6	Mounting bracket, bearing side

↘ The head section for the suction conveyor has an inspection opening [3] on each side.

⇢ Unscrew – on both sides – the 4 self-drilling screws 5.5×19, respectively.

⇢ Remove the two inspection covers.

⇢ Remove the deposits in the area of the screw.

⇢ Lubricate the bearings with a standard lubricant.

8.8 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)

9 Appendix

Please also see

- Technical data table EF2 (►122)
- Technical data table EF2 CC4 (►124)
- Declaration of Conformity (►126)

9.1 The Clean Air Act 1993 and Smoke Control Areas

Under the Clean Air Act local authorities may declare the whole or part of the district of the authority to be a smoke control area. It is an offence to emit smoke from a chimney of a building, from a furnace or from any fixed boiler if located in a designated smoke control area. It is also an offence to acquire an "unauthorised fuel" for use within a smoke control area unless it is used in an "exempt" appliance ("exempted" from the controls which generally apply in the smoke control area).

In England appliances are exempted by publication on a list by the Secretary of State in accordance with changes made to sections 20 and 21 of the Clean Air Act 1993 by section 15 of the Deregulation Act 2015. Similarly in Scotland appliances are exempted by publication on a list by Scottish Ministers under section 50 of the Regulatory Reform (Scotland) Act 2014.

In Wales and Northern Ireland these are authorised by regulations made by Welsh Ministers and by the Department of the Environment respectively.

Further information on the requirements of the Clean Air Act can be found here:
https://www.gov.uk/smoke-control-area-rules

Your local authority is responsible for implementing the Clean Air Act 1993 including designation and supervision of smoke control areas and you can contact them for details of Clean Air Act requirements.

- The KWB Easyfire EF2 S/GS/V has been recommended as suitable for use in smoke control areas when burning wood pellet.

9.2 Efficient and low-emission operation

(Based on the assignment baseline RAL-UZ 112 "The Blue Angel")

Dear Customer,

For efficient and low-emission operation of your KWB heating system, please follow these instructions:

- The installation and adjustment of the system may only be performed by qualified, trained personnel.
- Use only **Fuels [►41]** prescribed by us. Only then can a low-emission, economic and trouble-free operation of your heating system be guaranteed.
- Use pumps of efficiency class A to reduce the system's energy requirements!
- Perform the recommended maintenance and cleaning work described in section**Standards for maintenance [►106]** at regular intervals. By doing this, you will not only be ensuring the operational reliability of the heating system but also its efficient and low-emission operation. The best way of caring for your heating system is by taking out a maintenance contract.
- Your boiler is adjustable within an output range of 30% to 100% of the boiler's rated power. The devices should be operated as much as possible in the medium and upper power range (adapted to the respective heat demand) in order to prevent unnecessary emissions

in low-load operation. Ideally, the combination with a modulating room and heating system controller prevents unnecessary cycling and ensures running times that are as long as possible.

- From an energy technology standpoint, we recommend a buffer tank and a combination with a solar heating system. This ensures efficient and low-emission operation of your heating system.

EF2 S / EF2 GS / EF2 V 18.01.2021	Unit	8	12	15	22	25	30	35	38
Rated power	kW	8,0	12,0	15,0	22,0	25,0	30,0	34,9	38
Partial load	kW	2,4	3,5	4,4	6,4	7,3	8,7	10,1	11,4
Boiler efficiency at rated power	%	92,4	94,0	94,3	95,0	95,2	95,4	95,7	95,3
Boiler efficiency at partial load	%	91,4	89,4	90,0	91,5	92,4	93,8	95,3	94,9
Fuel thermal output at rated load	kW	8,7	12,8	15,9	23,2	26,3	31,4	36,5	39,9
Fuel thermal output at partial load	kW	2,6	3,9	4,9	7,0	7,9	9,2	10,6	12,0
Boiler class according to EN 303-5:2012	–	5	5	5	5	5	5	5	5
EU Energy Label		A+	A+	A+	A+	A+	A+	A+	A+
Water side									
Water content	l	40	40	52	52	78	78	78	78
Water connection, forward/return flow (internal thread)	inch	1	1	1	1	5/4	5/4	5/4	5/4
	mm	25,4	25,4	25,4	25,4	31,8	31,8	31,8	31,8
	DN	25	25	25	25	32	32	32	32
Water connection for filling and/or emptying	inch	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
(internal thread)	mm	12,7	12,7	12,7	12,7	12,7	12,7	12,7	12,7
Thermal safety valve: no	–	×	×	×	×	×	×	×	×
Water-side resistance at 10 K	mbar	5,7	12	34	55,9	39,1	52,1	66,2	66,2
	Pa	570	1200	3400	5590	3910	5210	6620	6620
Water-side resistance at 20 K	mbar	1,7	3,5	9,5	15,4	10,8	14,1	18,1	18,1
	Pa	170	350	945	1540	1080	1410	1810	1810
Boiler-entry temperature (for installation of the KWB-supplied two-way valve with servomotor)	°C	10–70	10–70	10–70	10–70	10–70	10–70	10–70	10–70
Boiler-entry temperature (for installation of an external return-flow boost device)	°C	40–70	40–70	40–70	40–70	40–70	40–70	40–70	40–70
Working temperature/operating temperature	°C	80	80	80	80	80	80	80	80
Maximum permitted temperature	°C	110	110	110	110	110	110	110	110
Maximum operating pressure	bar	3,5	3,5	3,5	3,5	3,5	3,5	3,5	3,5
Volume flow at spread 10 K	m^3/h	0,69	1,03	1,29	1,89	2,15	2,58	3,01	3,01
Volume flow at spread 15 K	m^3/h	0,46	0,69	0,86	1,26	1,43	1,72	2,00	2,00
Volume flow at spread 20 K	m^3/h	0,34	0,52	0,64	0,95	1,07	1,29	1,50	1,50
Minimum usable buffer tank volume	l	500	500	500	800	800	800	1.000	1.000
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
Combustion chamber pressure	mbar	-0,20	-0,20	-0,20	-0,20	-0,20	-0,20	-0,20	-0,20
Required draft at rated power/partial load	mbar	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05
		0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03
Suction available	–	✓	✓	✓	✓	✓	✓	✓	✓
Exhaust-gas temperature at rated power	°C	120	120	120	120	120	120	120	120
Exhaust-gas temp. Partial load	°C	90	90	90	90	90	90	90	90
Exhaust-gas mass flow at rated power	kg/s	0,006	0,009	0,011	0,016	0,018	0,022	0,026	0,028
Exhaust-gas mass flow at partial load	kg/s	0,002	0,003	0,004	0,005	0,006	0,007	0,008	0,008
Exhaust-gas volume at rated power	Nm^3/h	16,5	24,9	31,1	45,2	51,3	61,4	71,2	77,3
Exhaust-gas volume at partial load	Nm^3/h	5,3	7,9	9,8	14,1	15,9	18,7	21,5	23,3
Exhaust-gas connection height boiler side	mm	750	750	860	860	1050	1050	1050	1050
Exhaust-gas pipe diameter	mm	130	130	130	130	150	150	150	150
Incline of the smoke-pipe	°	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3
Chimney diameter (approx. values)	mm	140	140	140	140	160	160	160	160
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
Density	kg/m^3	≥ 600	≥ 600	≥ 600	≥ 600	≥ 600	≥ 600	≥ 600	≥ 600
Water content	% by weight	≤ 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
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
Diameter	mm	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
Raw material: Pure wood, bark proportion <15 %	–	–	–	–	–	–	–	–	–
Ash									
Ash container volume	l	28	28	28	28	28	28	28	28
Ash container filled	kg	27	27	27	27	27	27	27	27
Ash removal system	–	✓	✓	✓	✓	✓	✓	✓	✓
Electrical system									
Connection	–	230V, 1~	230V, 1~	230V, 1~	230V, 1~	230V, 1~	230V, 1~	230V, 1~	230V, 1~
		50Hz, C13 A	50Hz, C13 A	50Hz, C13 A	50Hz, C13 A	50Hz, C13 A	50Hz, C13 A	50Hz, C13 A	50Hz, C13 A
Connected power EF2 V	W	559	559	559	559	577	577	577	577
Connected power EF2 S	W	609	609	609	609	627	627	627	627
Connected power EF2 GS	W	2189	2189	2189	2189	2207	2207	2207	2207
Connected power EF2 GS with sample probes	W	2444	2444	2444	2444	2462	2462	2462	2462
Storage container									
Contents storage container for type EF2 V	l	107	107	107	107	107	107	107	107
Contents storage container for type EF2 S + 300	l	300	300	300	300	300	300	300	300
Suction conveyor type EF2 GS									
Max. suction length	m	25	25	25	25	25	25	25	25
Max. suction head	m	5	5	5	5	5	5	5	5
Contents storage container for type EF2 GS	l	42	42	67	67	90	90	90	90

EF2 S / EF2 GS / EF2 V 18.01.2021	Unit	8	12	15	22	25	30	35	38
Weights									
Boiler weight EF2 V	kg	341	341	370	370	416	416	416	416
Boiler weight EF2 S	kg	326	326	352	352	394	394	394	394
Boiler weight EF2 GS	kg	349	349	378	378	424	424	424	424
Emissions according to test report									
Test report no.	–	BLT-014/12	BLT-019/10	***	BLT-020/10	***	***	BLT-021/10	***
O_2 content rated power	Vol.-%	7,7	9,2	8,6	7,3	7,0	6,6	6,1	6,0
O_2 content partial load	Vol.-%	12,4	9,7	9,9	10,3	10,4	10,7	10,9	10,5
CO_2 content rated power	Vol.-%	11,2	11,4	11,9	13,2	13,4	13,9	14,4	14,3
CO_2 content partial load	Vol.-%	8,8	10,9	10,7	10,3	10,2	9,9	9,7	10,0
Noise emissions									
Normal operating noise at rated power	dB(A)	< 70	< 70	< 70	< 70	< 70	< 70	< 70	< 70
Reference 10 % O_2 dry (EN 303-5)									
CO at rated power	mg/Nm³	30,0	33,0	27,6	15,0	13,8	11,9	10,0	11,0
CO at partial load	mg/Nm³	102,0	20,0	21,5	25,0	25,7	26,8	28,0	22,0
NOx at rated power	mg/Nm³	124,0	135,0	137,7	144,0	147,5	153,2	159,0	170,0
NOx at partial load	mg/Nm³	95,0	131,0	131,0	131,0	133,3	137,2	141,0	149,0
OGC at rated power	mg/Nm³	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 2
OGC at partial load	mg/Nm³	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 2
Dust at rated power	mg/Nm³	19,0	21,0	16,8	7,0	8,4	10,7	13,0	15,0
Dust at partial load	mg/Nm³	13,0	9,0	11,7	18,0	15,9	12,5	9,0	10,0
Reference 11 % O_2 dry									
CO at rated power	mg/Nm³	27,3	30,0	25,1	13,6	12,6	10,8	9,1	10,0
CO at partial load	mg/Nm³	92,7	18,2	19,5	22,7	23,4	24,4	25,5	20,0
NOx at rated power	mg/Nm³	112,7	122,7	125,2	130,9	134,1	139,3	144,5	154,5
NOx at partial load	mg/Nm³	86,4	119,1	119,1	119,1	121,2	124,7	128,2	135,5
OGC at rated power	mg/Nm³	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 2
OGC at partial load	mg/Nm³	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 2
Dust at rated power	mg/Nm³	17,3	19,1	15,3	6,4	7,6	9,7	11,8	13,6
Dust at partial load	mg/Nm³	11,8	8,2	10,6	16,4	14,5	11,3	8,2	9,1
Reference 13 % O_2 dry (FJ-BLT)									
CO at rated power	mg/Nm³	22,0	24,0	20,1	11,0	10,1	8,5	7,0	8,0
CO at partial load	mg/Nm³	74,0	15,0	15,9	18,0	18,5	19,2	20,0	16,0
NOx at rated power	mg/Nm³	90,0	98,0	100,1	105,0	107,3	111,2	115,0	124,0
NOx at partial load	mg/Nm³	69,0	96,0	95,7	95,0	96,8	99,9	103,0	108,0
OGC at rated power	mg/Nm³	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 2
OGC at partial load	mg/Nm³	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Dust at rated power	mg/Nm³	14,0	15,0	12,0	5,0	6,2	8,1	10,0	11,0
Dust at partial load	mg/Nm³	10,0	7,0	8,8	13,0	11,4	8,7	6,0	7,0
In accordance with § 15a-BVG Austria									
CO at rated power	mg/MJ	14,0	15,0	12,6	7,0	6,3	5,2	4,0	5,0
CO at partial load	mg/MJ	48,0	9,0	9,9	12,0	12,2	12,6	13,0	11,0
NOx at rated power	mg/MJ	58,0	63,0	64,2	67,0	68,4	70,7	73,0	84,0
NOx at partial load	mg/MJ	44,0	61,0	61,0	61,0	61,9	63,5	65,0	74,0
OGC at rated power	mg/MJ	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
OGC at partial load	mg/MJ	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Dust at rated power	mg/MJ	9,0	10,0	7,9	3,0	3,7	4,8	6,0	8,0
Dust at partial load	mg/MJ	6,0	4,0	5,2	8,0	7,1	5,5	4,0	5,0

*** ... Drawing inspection, values for intermediate sizes interpolated

FJ-BLT ... Franciso Josephinum Wieselburg – Biomass Logistic Technology

mg/Nm³ ... Milligram per standard cubic meter (1 Nm³ under 1.013 hectopascal at 0 °C)

EF2 S / EF2 GS / EF2 V 18.01.2021	Unit	CC4 10	CC4 12	CC4 15	CC4 22	CC4 25	CC4 30	CC4 35	CC4 40
Rated power	kW	10,0	12,0	15,0	22,0	25,0	30,0	34,9	40
Partial load	kW	3,0	3,6	4,5	6,6	7,5	9,0	10,5	12,0
Boiler efficiency at rated power (based on the net calorific value)	%	101,6	101,8	102,1	102,8	102,7	102,6	102,5	103,1
Boiler efficiency at partial load (based on the net calorific value)	%	96,9	97,2	97,6	98,6	99,2	100,1	101,0	101,7
Boiler efficiency at rated power (based on the gross calorific value)	%	93,4	93,6	93,9	94,7	94,7	94,6	94,6	95,0
Boiler efficiency at partial load (based on the gross calorific value)	%	89,0	89,3	89,8	90,8	91,4	92,3	93,2	93,7
Fuel thermal output at rated load (based on the net calorific value)	kW	9,8	11,8	14,7	21,4	24,3	29,2	34,0	38,8
Fuel thermal output at partial load (based on the net calorific value)	kW	3,1	3,7	4,6	6,7	7,6	9,0	10,4	11,8
Boiler class according to EN 303-5:2012	–	5	5	5	5	5	5	5	5
EU Energy Label	–	A+	A+	A++	A++	A++	A++	A++	A++
Water side									
Water content	l	40	40	52	52	78	78	78	78
Water connection, forward/return flow (internal thread)	inch	1 / 6/4	1 / 6/4	1 / 6/4	1 / 6/4	5/4 / 6/4	5/4 / 6/4	5/4 / 6/4	5/4 / 6/4
	mm	25,4 / 38,1	25,4 / 38,1	25,4 / 38,1	25,4 / 38,1	31,8 / 38,1	31,8 / 38,1	31,8 / 38,1	31,8 / 38,1
	DN	25 / 40	25 / 40	25 / 40	25 / 40	32 / 40	32 / 40	32 / 40	32 / 40
Water connection for filling and/or emptying (internal thread)	inch	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
	mm	12,7	12,7	12,7	12,7	12,7	12,7	12,7	12,7
Thermal safety valve: no	–	×	×	×	×	×	×	×	×
Water-side resistance at 10 K	mbar Pa	17,3	30,5	50,3	96,4	95,9	95,2	94,4	124,7
Water-side resistance at 20 K	mbar Pa	4,89	7,7	12,0	21,9	22,6	23,8	24,95	32,4
Boiler-entry temperature (for installation of the KWB-supplied two-way valve with servomotor)	°C	10–70	10–70	10–70	10–70	10–70	10–70	10–70	10–70
Boiler-entry temperature (for installation of an external return-flow boost device)	°C	40-70	40-70	40-70	40-70	40-70	40-70	40-70	40-70
Working temperature/operating temperature	°C	80	80	80	80	80	80	80	80
Maximum permitted temperature	°C	110	110	110	110	110	110	110	110
Maximum operating pressure	bar	3	3	3	3	3	3	3	3
Volume flow at spread 10 K	m^3/h	0,86	1,03	1,29	1,89	2,15	2,58	3,01	3,44
Volume flow at spread 15 K	m^3/h	0,57	0,69	0,86	1,26	1,43	1,72	2,00	2,30
Volume flow at spread 20 K	m^3/h	0,43	0,52	0,64	0,95	1,07	1,29	1,50	1,72
Minimum usable buffer tank volume	l	500	500	500	800	800	800	1.000	1.000
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
Combustion chamber pressure	mbar	-0,20	-0,20	-0,20	-0,20	-0,20	-0,20	-0,20	-0,20
Required draft at rated power/partial load	mbar	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01
		0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01
Suction available	–	✓	✓	✓	✓	✓	✓	✓	✓
Exhaust-gas temperature at rated power	°C	40–70	40–70	40–70	40–70	40–70	40–70	40–70	40–70
Exhaust-gas temp. Partial load	°C	40–70	40–70	40–70	40–70	40–70	40–70	40–70	40–70
Exhaust-gas mass flow at rated power	kg/s	0,007	0,009	0,011	0,016	0,018	0,022	0,026	0,031
Exhaust-gas mass flow at partial load	kg/s	0,002	0,003	0,004	0,005	0,006	0,007	0,008	0,009
Exhaust-gas volume at rated power	Nm^3/h	20,8	24,9	31,1	45,2	51,3	61,4	71,2	83
Exhaust-gas volume at partial load	Nm^3/h	6,6	7,9	9,8	14,1	15,9	18,7	21,5	26,2
Exhaust-gas connection height boiler side	mm	990	990	1110	1110	1241	1241	1241	1241
Exhaust-gas pipe diameter	mm	100/130	100/130	100/130	100/130	150	150	150	150
Chimney diameter (approx. values)	mm	140	140	140	140	160	160	160	160
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
Density	kg/m^3	≥ 600	≥ 600	≥ 600	≥ 600	≥ 600	≥ 600	≥ 600	≥ 600
Water content	% by weight	≤ 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
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
Diameter	mm	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
Raw material: Pure wood, bark proportion <15 %	–	–	–	–	–	–	–	–	–
Ash									
Ash container volume	l	28	28	28	28	28	28	28	28
Ash container filled	kg	27	27	27	27	27	27	27	27
Ash removal system	–	✓	✓	✓	✓	✓	✓	✓	✓
Electrical system									
Connection	–	230V, 1~ 50Hz, C13 A	230V, 1~ 50Hz, C13 A	230V, 1~ 50Hz, C13 A	230V, 1~ 50Hz, C13 A	230V, 1~ 50Hz, C13 A	230V, 1~ 50Hz, C13 A	230V, 1~ 50Hz, C13 A	230V, 1~ 50Hz, C13 A
Connected power EF2 V	W	559	559	559	559	577	577	577	577
Connected power EF2 S	W	609	609	609	609	627	627	627	627
Connected power EF2 GS	W	2.189	2.189	2.189	2.189	2.207	2.207	2.207	2.207
Connected power EF2 GS with sample probes	W	2.444	2.444	2.444	2.444	2.462	2.462	2.462	2.462
Storage container									
Contents storage container for type EF2 V	l	107	107	107	107	107	107	107	107
Contents storage container for type EF2 S + 300	l	300	300	300	300	300	300	300	300
Suction conveyor type EF2 GS									
Max. suction length	m	25	25	25	25	25	25	25	25
Max. suction head	m	5	5	5	5	5	5	5	5
Contents storage container for type EF2 GS	l	42	42	67	67	90	90	90	90

EF2 S / EF2 GS / EF2 V 18.01.2021	Unit	CC4 10	CC4 12	CC4 15	CC4 22	CC4 25	CC4 30	CC4 35	CC4 40
Weights									
Boiler weight EF2 V	kg	341	341	370	370	416	416	416	416
Boiler weight EF2 S	kg	326	326	352	352	394	394	394	394
Boiler weight EF2 GS	kg	349	349	378	378	424	424	424	424
Emissions according to test report		TÜV Austria	TÜV Austria	TÜV Austria	TÜV Austria	TÜV Austria	TÜV Austria	TÜV Austria	TÜV Austria
Test report no.	–	17-IN-AT-UW WE-EX-284/2	18-U-032/SD	18-U-033/SD	17-IN-AT-UW WE-EX-284/3	18-U-034/SD	18-U-035/SD	17-IN-AT-UW WE-EX-284/4	18-U-036/SD
O_2 content rated power	Vol.-%	8,2	8,0	7,6	6,8	6,9	7,0	7,1	6,9
O_2 content partial load	Vol.-%	8,8	8,8	8,9	9,0	9,0	9,1	9,1	10,2
CO_2 content rated power	Vol.-%	12,0	12,2	12,5	13,1	13,1	13,2	13,3	13,4
CO_2 content partial load	Vol.-%	11,3	11,3	11,2	11,1	11,1	11,2	11,3	10,1
Noise emissions									
Normal operating noise at rated power	dB(A)	< 70	< 70	< 70	< 70	< 70	< 70	< 70	< 70
Reference 10 % O_2 dry (EN 303-5)									
CO at rated power	mg/Nm³	35	35	35	35	29	20	11	11
CO at partial load	mg/Nm³	29	32	36	45	52	64	75	55
NOx at rated power	mg/Nm³	164	164	164	163	166	171	176	179
NOx at partial load	mg/Nm³	144	143	141	136	139	143	147	155
OGC at rated power	mg/Nm³	2,6	< 3	< 2	< 2	< 2	< 2	< 2	< 2
OGC at partial load	mg/Nm³	< 2	< 2	< 2	< 3	< 3	< 3	< 3	< 3
Dust at rated power	mg/Nm³	19	19	18	17	16	15	13	17
Dust at partial load	mg/Nm³	8	9	11	14	16	18	21	17
Reference 11 % O_2 dry									
CO at rated power	mg/Nm³	32	32	32	32	27	18	10	9
CO at partial load	mg/Nm³	27	29	33	41	47	58	68	50
NOx at rated power	mg/Nm³	149	149	149	149	152	156	160	162
NOx at partial load	mg/Nm³	131	130	128	123	126	130	134	141
OGC at rated power	mg/Nm³	2,3	< 2	< 2	< 2	< 2	< 2	< 2	< 2
OGC at partial load	mg/Nm³	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 3
Dust at rated power	mg/Nm³	18	18	17	16	15	14	12	16
Dust at partial load	mg/Nm³	7	8	10	13	14	17	19	15
Reference 13 % O_2 dry (TÜV-AUSTRIA)									
CO at rated power	mg/Nm³	25	25	25	26	22	15	8	8
CO at partial load	mg/Nm³	21	23	26	33	38	47	55	40
NOx at rated power	mg/Nm³	120	120	120	119	121	125	128	130
NOx at partial load	mg/Nm³	105	104	103	99	101	104	107	113
OGC at rated power	mg/Nm³	1,9	< 2	< 2	< 2	< 2	< 2	< 2	<2
OGC at partial load	mg/Nm³	< 2	< 2	< 2	< 2	< 2	< 2	< 2	<3
Dust at rated power	mg/Nm³	14	14	14	13	12	11	10	12
Dust at partial load	mg/Nm³	6	7	8	10	11	13	15	12
In accordance with § 15a-BVG Austria									
CO at rated power	mg/MJ	17	17	17	18	15	10	5	5
CO at partial load	mg/MJ	14	15	17	22	25	31	37	27
NOx at rated power	mg/MJ	81	81	81	81	82	85	87	88
NOx at partial load	mg/MJ	71	70	69	67	68	71	73	77
OGC at rated power	mg/MJ	1,3	< 1	< 1	< 1	< 1	< 1	< 1	<1
OGC at partial load	mg/MJ	< 1	< 1	< 1	< 2	< 2	< 2	< 2	< 2
Dust at rated power	mg/MJ	10	10	9	8	8	7	6	8
Dust at partial load	mg/MJ	4	5	5	7	8	9	10	8
EF2 with condenser module									
Length, boiler and condenser module	mm	1.295	1.295	1.346	1.346	1.395	1.395	1.395	1.448
Length, condenser module	mm	431	431	484	484	530	530	530	585
Width, boiler and condenser module	mm	874	874	874	874	874	874	874	874
Width, condenser module	mm	532	532	532	532	532	532	532	623
Distance, condensate discharge to boiler side	mm	260	260	275	275	280	280	280	295
Connection height, return flow	mm	606	606	725	725	899	899	899	899
Connection height, condensate discharge	mm	150 - 160	150 - 160	150 - 240	150 - 240	150 - 410	150 - 410	150 - 410	150 - 310
Connection height, washing unit	mm	547,0	547,0	667,0	667,0	840,0	840,0	840,0	922,0
Condensate/nominal load hour	l	0,8 - 1	0,9 - 1,3	1 - 1,5	1,9 - 2,3	2 - 2,5	2,2 - 2,6	2,3 - 2,7	2,5 - 3
Connection, washing unit	inch	1/2"	1/2"	3/4"	3/4"	3/4"	3/4"	3/4"	1/2"
Connection, condensate discharge	DN	40mm	40mm	40mm	40mm	40mm	40mm	40mm	40mm
Weight, condenser module	kg	49	49	59	59	59	59	59	84

mg/Nm³ ... Milligram per standard cubic meter (1 Nm³ under 1.013 hectopascal at 0 °C)

*** ... Drawing inspection, values for intermediate sizes interpolated

KWB – Kraft und Wärme aus Biomasse GmbH
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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 Easyfire 8–40 kW, comprising the models
EF2 S/GS/V 8 / 12 / 15 / 22 / 25 / 30 / 33 / 35 / 38
EF2 CC4 S/GS/V 10 / 12 / 15 / 22 / 25 / 30 / 35 / 40

in combination with conveyor systems
Pellet Stirrer Plus with elbow screw or suction conveyor, KWB Pellet Big Bag with elbow screw or suction conveyor, conveyor screw with elbow screw or suction conveyor, KWB Pellet Box with suction conveyor, sampling probes with suction conveyor, buried tank with suction conveyor

Furthermore, the system conforms to the following directives/applicable regulations:
EMC Directive 2014/30/EU; Directive 2014/35/EU; RoHS Directive 2011/65/EU

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
EF2 CC4 S/GS/V: ÖNORM M 7551:2012

KWB – Kraft und Wärme aus Biomasse GmbH	St. Margarethen an der Raab 19. 06. 2018	
Authorised representative for the compilation of the technical documents	Place, Date	Helmut Matschnig, Managing Director

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.

Night lowering

Room temperature that the heating should maintain or reach outside the daily heating times.

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.

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.

Keyword index

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