



Technology and planning

KWB MULTIFIRE

Wood chip and wood pellet
heating system

*We provide
energy
for life!*



valid as of March 2015

KWB MULTIFIRE

Wood chip and pellet heating system 20–120 kW

Robust all-rounder for economical heating

www.kwb.net

clean⁺ **EFFICIENCY**
Combustion technology

Valuable Partnership



More than 2,000 installers and more than 60,000 customers put their trust in us by deciding in favour of a KWB partnership. This "valuable asset" is also an integral component of our company philosophy and the basis of our business relationships. In addition, KWB focuses on appreciation, reliability and a large amount of responsibility vis-à-vis our environment and future generations. This I guarantee personally and this is also symbolised by KWB's trademark: the tree of life.

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KWB stands for power and heat from biomass and is **synonymous** with innovative biomass heating systems. It developed, for example, the first wood chip heating system with a fully automatically cleaning heat exchanger. In 2006, the largest private research and development centre for biomass in Europe was established at the company's main location in Austria. What else speaks for a partnership?

97% of our customers recommend KWB to others

According to recent customer surveys, 97 % of all KWB customers recommend the company KWB and its products to others. Satisfied customers are the highest praise for a company – a priceless token of trust!

Safety because of our award-winning service

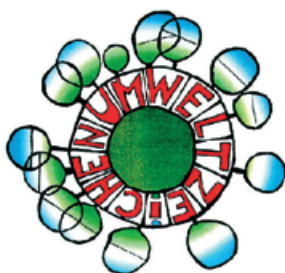
Availability, flexibility and proximity to our customers are customer service requirements that must be met. KWB's own factory customer service exceeds these expectations and has received several related awards.

Noticeable benefits through product development

When working on the further development of the KWB product line, our main focus is on the tangible and noticeable benefits for the partner and end customer with a high functional safety, whilst giving a high-quality, robust high-tech product.

Time savings through effortless comfort

Thanks to our close partnership with installers and design companies, a large amount of valuable experience contributes to the product development and guarantees the highest possible installation and operating comfort, which helps save what is most valuable to us: time.



ROBUST ALL-ROUNDER

The large power range of 20 to 120 kW combined with fuel flexibility makes it possible to deploy the new KWB Multifire wood chip and pellet heating system in a larger single family home and also in commercial facilities including smaller district heating networks.



Clean combustion

Stress free combustion thanks to a variable rotary grate speed and air supply



High efficiency combustion

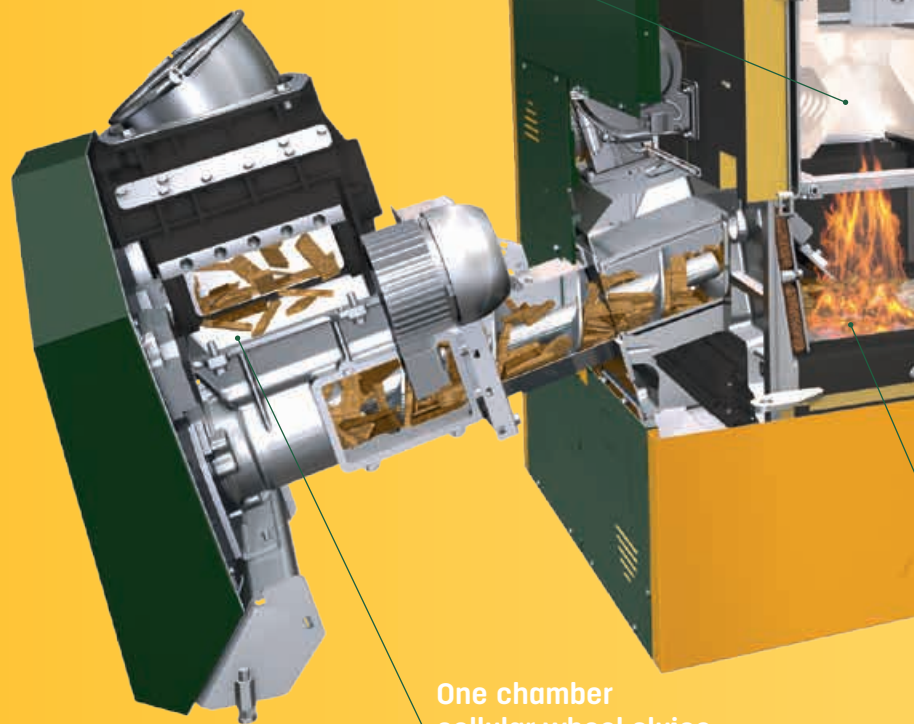
Complete and almost emission free combustion through special geometries and materials

CFD-optimised silicon carbide combustion chamber

Low emissions thanks to optimised exhaust gas routing and high combustion temperatures.

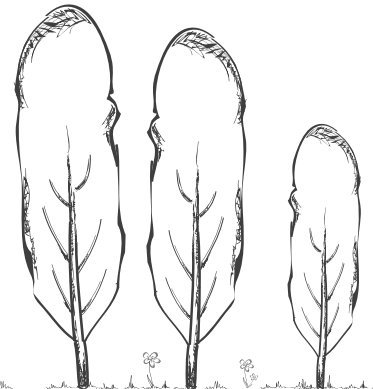
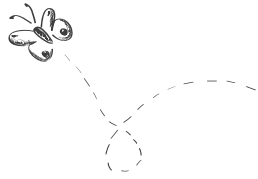
CFD-optimised nozzle geometry and arrangement

Full wood gas combustion thanks to optimal turbulence and a long retention period



One chamber cellular wheel sluce

Robust cast housing with hardened, replaceable cutting edges and a deep filling chamber and large sealing surfaces



Return flow boost

Optimised hydraulics aligned with the system

KWB Comfort 3 control

2-button control with dial and an easy to understand graphic display

Automatic ash removal

Into a convenient ash container with integrated fill level monitoring



Cellular wheel sluice

Maximum operating safety and incident free operation



High efficiency turbulators

Optimal heat exchange with low exhaust gas temperatures and a consistently high efficiency coefficient

Combustion system

Crawler burner with high alloy and self cleaning cast, rotary grate elements

MULTIFIRE

KWB CRAWLER BURNER

The new KWB Crawler Burner¹ is the centrepiece of the new KWB Multifire wood chip and pellet heating system. Thanks to its fuel flexibility and its automatic adjustment to changing fuel qualities. The KWB Crawler Burner¹ is a true all-rounder which is well-equipped to deal with wood chips and pellets as well as agricultural fuels², suitable for wood chips of sufficient quality A1,A2 and B1 up to grain sizes P16S (G30), P31S (G50) consistent with ISO 17225-4. Wood pellets must be of sufficient qualities (A1) consistent with ISO 17225-2.

Optimised fuel feed geometry

An even fuel bed and fully filled rotary grate ensure the highest burnout quality

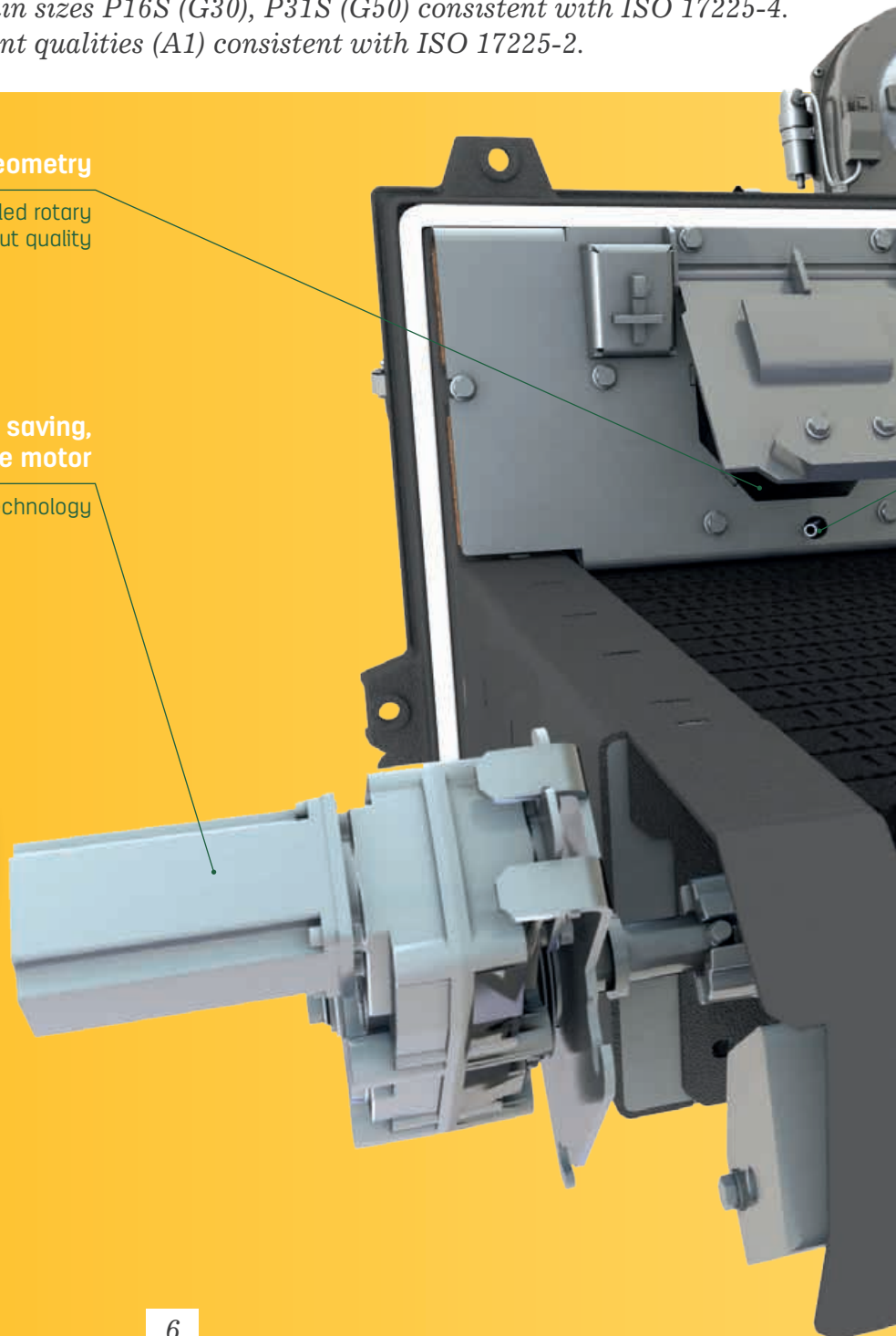
Drive containing a power saving, intelligent multi phase motor

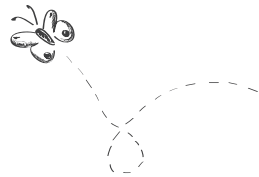
proven automotive technology



Self-cleaning rotary grate elements

From high alloy cast





Power saving high efficiency ignition

Extremely short ignition times thanks to a ceramic ignition element and a quicker igniter recognition



Stressfree combustion

Quiet fuel bed thanks to an even and slow rotary grate speed for low emissions



Fuel recognition plus¹

Highest fuel utilisation despite changing fuel quality thanks to the combustion control's automatic adjustment (rotary grate speed and air supply)

¹ patent application has been submitted ² depending on local legal permission

OUR ADVANTAGES

*clean*EFFICIENCY TECHNOLOGY



Clean and efficient through a twice controlled combustion

While the broadband lambda probe in the burnout control ensures minimum emissions, a full fuel utilisation is ensured by the highly sensitive temperature sensor in the burnout control.



Clean and efficient thanks to a highly efficient combustion

The combustion room design, which was optimised with a computer aided simulation, is perfectly supported by the high temperature silicon carbide lining and thus achieves excellent combustion conditions with the lowest emissions.



High fuel flexibility

The KWB Crawler Burner makes it possible to use different fuels such as wood chips and pellets as well as agricultural fuels¹ of varying quality.



Efficient due to a high efficiency factor

The proven high efficiency turbulators from the KWB product family guarantee an optimal heat exchange through which they reach a consistently high efficiency coefficient both in partial load as well as nominal load.

YOUR BENEFITS

KWB MULTIFIRE WOOD CHIP AND PELLET HEATING SYSTEM



Space saving

The new KWB Multifire impresses thanks to the various space saving installation options and can even be placed directly in wall corners or in rooms with very low ceilings.



Intermediate hopper for lowest power consumption

Due to the proven intermediate hopper and the intelligent drive motors we guarantee lowest power consumption and no fuel feed during night times. Also a manual fill of the intermediate hopper is possible.



Easy planning and installation

It is very easy to transport the heating system into any type of heating room thanks to the delivery process and because it can be quickly disassembled into modules. The fuel feed can occur either from the left or the right and can be determined on site.



Installation- and service-friendly

The easy access to specific inspection points and the effortless replacement of individual modules makes the service personnel's work significantly easier. In addition, a startup assistant leads the operator quickly and actively through the commissioning process.

cleanEFFICIENCY

COMBUSTION TECHNOLOGY

CLEANEFFICIENCY is a label that we give to KWB heating systems **which** are built to achieve lower emission values, highest efficiency and use very little fuel and energy and were specifically optimised to provide a perfect interaction of construction and control elements.

cleanEFFICIENCY sums up in one word the technology package developed by the KWB Innovation Centre that achieves higher efficiency, lower emissions and maximum comfort.

Thanks to KWB's many years of expertise, the KWB biomass heating systems with *cleanEFFICIENCY* was further perfected in a comprehensive system, which makes it synonymous with modern high-tech biomass heating systems. The differences between KWB biomass heating systems having *cleanEFFICIENCY* included and regular models are evident in clearly visible technical and geometrical measures as well as fine-tuning and subtle differences imperceptible at first glance.

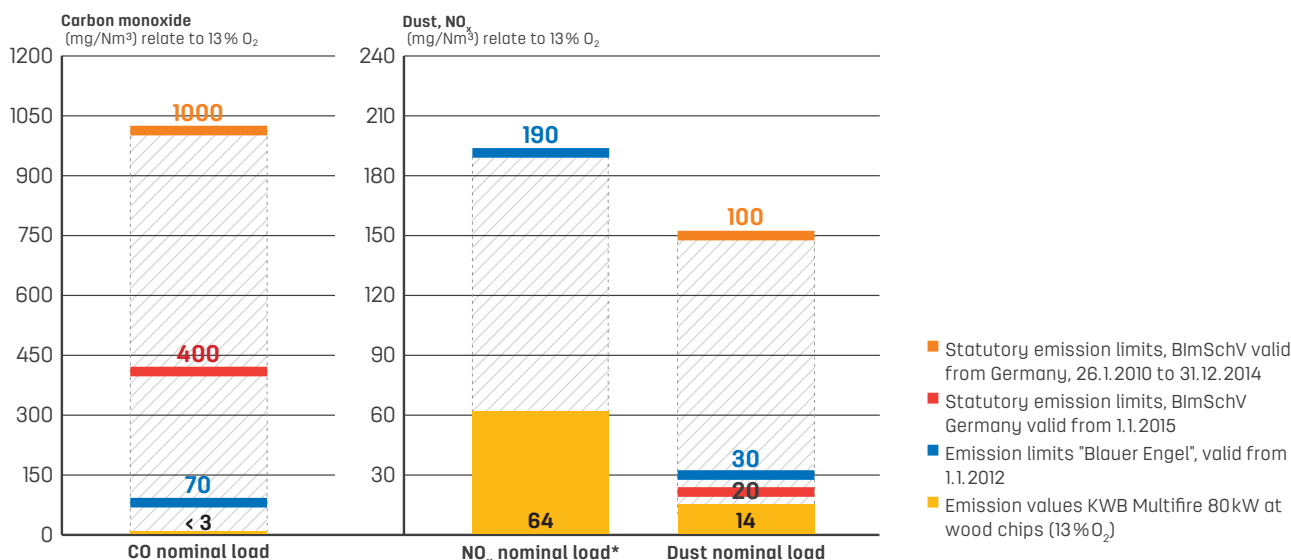
cleanEFFICIENCY is also a response to a looming climate change as a result of increasing environmental burdens. It is a future-oriented technology that offers a further decrease of pollutant emissions with consistently efficient heating performance with the highest levels of efficiency and maximum comfort. The *cleanEFFICIENCY* technology makes an enormous contribution in this respect.

As a visible result, the heating systems remain significantly below the limit values for emissions and are at the limit of what is technically measurable. This applies to both the partial load and nominal load.

- ✓ Lowest emission values
- ✓ Maximum efficiency

- ✓ Fuel and power saving technology
- ✓ Perfectly aligned comprehensive system

Emission testing at nominal load



The technology enables emissions at the boarder to be recognized at part load as well as nominal load.
 * The Bundesimmissionsschutz-Verordnung Germany does not give limits for oxides of nitrogen.



KWB COMFORT 3

THE COMFORTABLE CONTROL

EASY OPERATION

KWB Comfort 3 Microprocessor control system

KWB Comfort 3 is a modular system that is used to operate and regulate KWB bio-mass heating systems.

All adjustments can be executed using the 2-button control unit together with a dial on the innovative, easy to understand graphic display. It is also easy to configure the parameters for boiler, heating circuit, DHWC and buffer tank by using the logically structured menu system. The control unit fully automatically and infinitely variable adjusts boiler output according

to heat demand from standby to full load. The control concept ensures optimum combustion conditions, lowest emissions and maximum economic efficiency.

In addition to regulating the burner, it also provides comprehensive heat management – from a single family house to a district heating network. As a modular, expandable system, the KWB Comfort 3 makes it possible to control up to 32 heating circuits, 16 buffer tanks and 16 DHWCs.

It is also possible to link several digital or analogue remote-control devices.

The control unit consists of the following components:



Master board

Contains all inputs/outputs for boiler control, incl. sensors and terminal strip for external connections. The master board also includes the activation for one DHWC and one buffer tank with two temperature sensors.



Boiler control unit

This module is used to operate and regulate the boiler and for heat management purposes.



Heating circuit expansion module

Controls a max. of 2 heating circuits, one DHWC and one buffer tank (with 2 sensors) per module. Operation and monitoring are carried out using the boiler control unit or optionally using digital remote control devices.



Analogue remote control unit

Easy operation for one heating circuit with room sensor, respectively, consisting of a dial for adjusting the desired room temperature by $\pm 5^\circ\text{C}$ and a 4-position slide switch for selecting the heating program: automatic mode, lower mode, frost protection mode or day operation.



Digital remote control unit

Makes it possible to control one or more heating circuits with room sensor and to configure and monitor the heating circuit, DHWC and buffer tank management from the living room.



KWB Comfort Solar

The KWB Comfort Solar control system controls the heating system such that the free of charge solar energy is optimally routed into the buffer tank. In addition to functionality and design, the solar control system features an easy-to-use and self-explanatory user interface. A convenient commissioning wizard is available to the heating engineer.

KWB Comfort SMS

You can **query the current operating status and actively control the heating system using your mobile phone** (e.g. holiday program, party operation).

In addition to switching the heating system on and off, the operator can query current operating modes or make adjustments to the heating circuits, DHWC, buffer tanks, etc. In addition, alarm messages are sent

to the mobile phone. The sender receives acknowledgement of commands that have been executed through a reply by text message (SMS). The generation of commands and queries is simplified through the use of text message (SMS) templates that can be transmitted to the respective mobile phone by the KWB Comfort 3. KWB Comfort SMS is available in German, English, Italian, French, Spanish and Slovenian.



KWB Comfort Visio

KWB Comfort Visio is an additional component of the KWB Comfort series for visualisation, remote monitoring and remote control of your KWB heating system via your PC.

The conceptualisation of the KWB Comfort Visio with respect to project design and commissioning is truly revolutionary: connect and switch on, that's all it needs – the KWB Comfort Visio automatically adjusts to the heating system. KWB Comfort Visio is available in English and German.

Monitoring and operation

The KWB Comfort Visio displays operating values of boiler, heating circuits, DHWCs and buffer tanks. The

visualisation interface displays all configuration parameters of the heating system where they can be adjusted. In addition, the KWB Comfort Visio offers a comprehensive alarm management system, consisting of alarm statistics and log, as well as an extensive help system for the specific alarms.

Archiving

When using a computer on site, it is possible to use the comprehensive data recording and evaluation options of the KWB Comfort Visio.

Remote maintenance

The heating system can be accessed from any location via modem. It is thus possible to monitor the heating system and intervene if necessary. This makes it also possible for the KWB customer service to remotely maintain the customer's heating system.



Option 1: Visualization PC near the system



Option 2: No PC near the system

KWB Comfort InterCom

The KWB Comfort InterCom is an interface that facilitates the data exchange between the KWB Comfort control and external systems.

As, for example, higher level control or regulation systems or building automation systems. The data

exchange takes place by means of a serial connection, network connection or analogue modem connection. All boiler operating status parameters as well as individual alarms can be read out on the KWB Comfort control system. In addition, the external system can modify several parameters in the KWB Comfort control system.

FUEL STORAGE & CONVEYANCE

OPTIMISED FOR ANY TYPE OF REQUIREMENT

Aside from developing modern wood chip and pellet heating systems, KWB possesses extensive expertise with respect to the optimal storage and conveyance of wood chips and pellets. Thanks to KWB's flexible and diverse conveyor module system, a solution can be found for almost every structural situation.



Heating system in adjoining building
KWB Multifire with stirrer and conveying channel; direct storage room filling using tractor and front end loader



Heating system in the basement of a building
KWB Multifire with stirrer and conveying channel; direct storage room filling from trailer

CONVEYOR SYSTEMS

Fuel consumption and storage room size for wood chips

Heating load of the building [kW]	Consumption per year* [m³/a]	Storage room size for annual requirement*
20	50	74.0
30	75	111.0
40	100	148.0
50	125	185.0
60	150	222.0
80	200	296.0
100	250	370.0
120	300	444.0

* Using wood chips with 25% water content and size P16S (G30) according to ISO 17225-4

Annual utilisation factor: 2.5 m³ per kW heating load, Storage room size factor for annual requirement: 3.7 m³ per kW heating load



Heating system in separate boiler house

KWB Multifire twin boiler installation with common stirrer and two conveying channels; direct storage room filling from trailer



Heating system in the basement of a building

KWB Multifire with stirrer and conveying channel; direct storage filling via screw auger from bunker

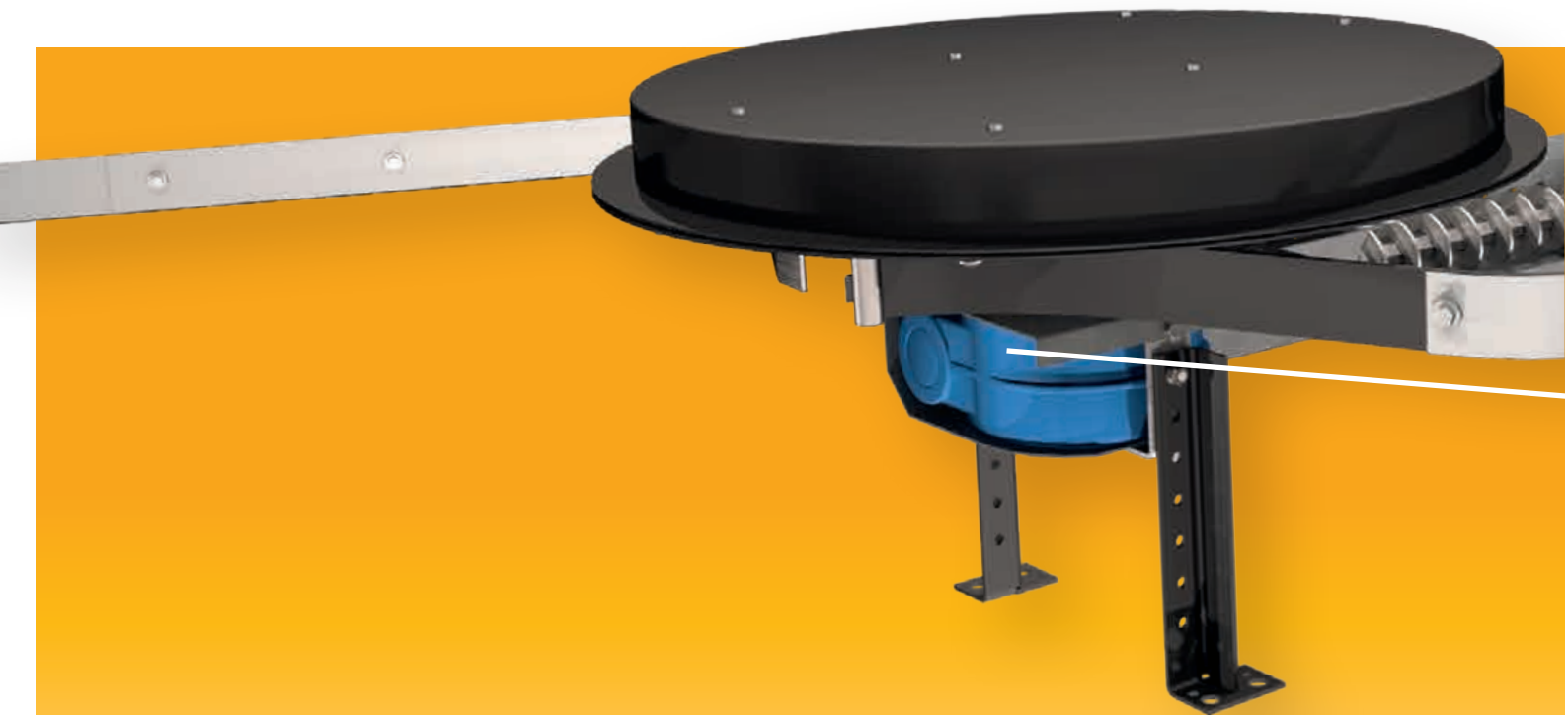
KWB STIRRER

RELIABLE, LONG SERVICE LIFE

The **KWB conveyor system**, which consists of a stirrer (stirrer diameter: 2.5 to 5.5 m) and conveyor screw on a **massive hollow shaft supported by two bearings**, is customized with respect to length and diameter based on the customer's structural conditions. Storage rooms may be square, rectangular or round and can be situated above the heating room, at the same level or below it.

Broad fuel flexibility

The conveying system is suitable for wood chips material according to quality A1, A2 and B1 up to grain size P16S (G30) and P31S (G50) pursuant to ISO 17225-4. Also it is suitable for wood pellets material according to quality A1 and A2 pursuant to ISO 17225-2.



reliable and long service life

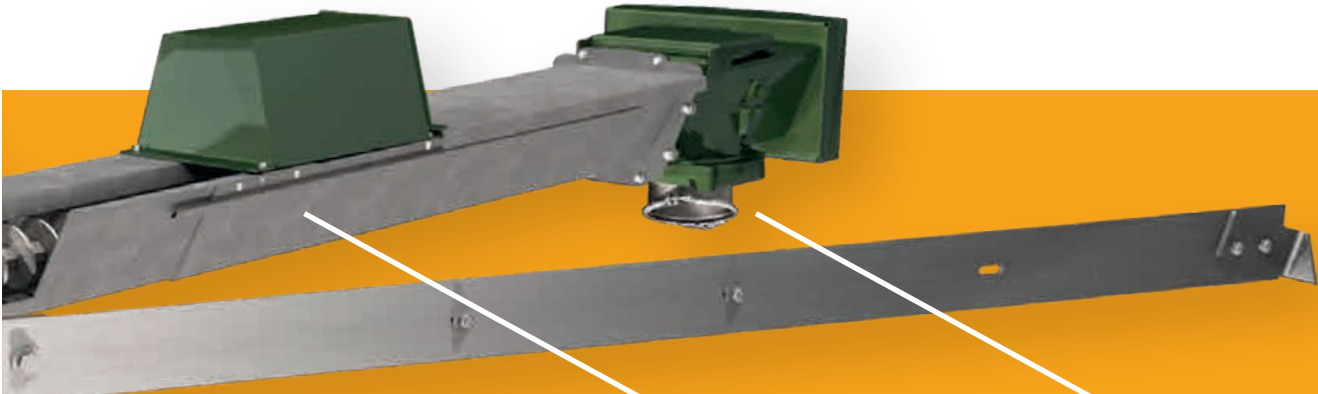
- ✓ **Long service life and high wear resistance** of the screw thanks to stainless steel spirals in the feed area and a maintenance-free, double sealed heavy duty gear unit in trough form.
- ✓ **No buoying upwards of the conveyor screw** in the channel due to an optimised channel shape.
- ✓ **No overfilling of the conveyor screw channel** due to progressively ascending spirals, an asymmetric opening and a reverse conveyor screw.

comfortable and customised

- ✓ **Efficient emptying of the fuel storage room** even with larger stirrer diameters due to the uniform contact force of the articulated-blade rotary stirrer over the entire diameter.
- ✓ **Low power consumption** through avoidance of mechanical resistance.
- ✓ **Full utilisation of the storage room space** is possible due to the various ascending screw options. The conveyor screw length is adjustable upon customer request.

Wall-duct box

Easy accessible inspection cover even on fully filled storage rooms



Heavy duty gear unit

Robust, maintenance free, double sealed heavy duty gear unit



Channel with conveyor screw

Optimized channel shape - no floating of the screw



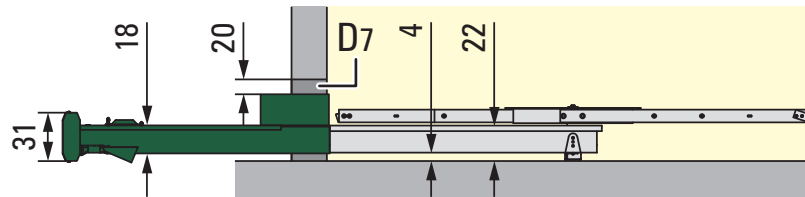
Cellular wheel sluice

A deep filling chamber ensures enough space for long and coarse wood chips

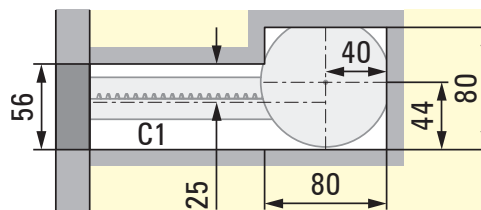
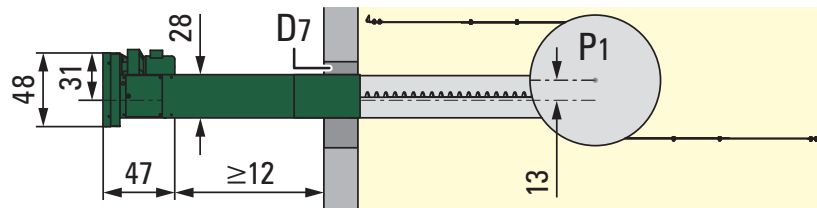
STIRRER WITH CONVEYOR SCREW

Depending on requirements, the stirrer is available in two different versions: as a spring blade rotary stirrer (stirrer diameter between 2.5 and 4.0 m) and as an articulated blade rotary stirrer (stirrer diameter between 4.0 and 5.5 m).

Outline



Ground plan



As shown in the diagram, a recess must be provided when the conveyor system is lowered into the ground. The depth of the recess is 22 cm. When the stirrer is lowered into the ground, the channel must be additionally equipped with at least 2 cm of acoustic insulation. The channel must be acoustically decoupled from the ground.

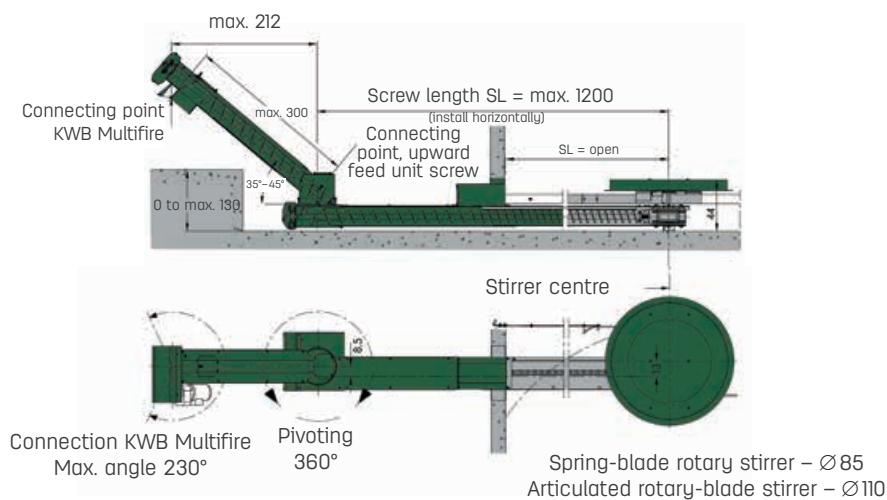
Legend

C1	It must be possible to dismantle the inclined floor or false floor up to 30 cm around the channel!	P1	Diameter of the stirrer cover plate: spring blade stirrer: \varnothing 85 cm, articulated blade stirrer: \varnothing 110 cm.
D7	Wall duct 60×60 cm: seal after installation; the channel must be acoustically decoupled (at least 2 cm acoustic insulation)		Diameter of the stirrer: spring blade stirrer: \varnothing 2.5 m, 3.0 m, 3.5 m, 4.0 m (4.5 m only for pellets), articulated blade stirrer: \varnothing 4.0 m, 4.5 m, 5.0 m, 5.5 m

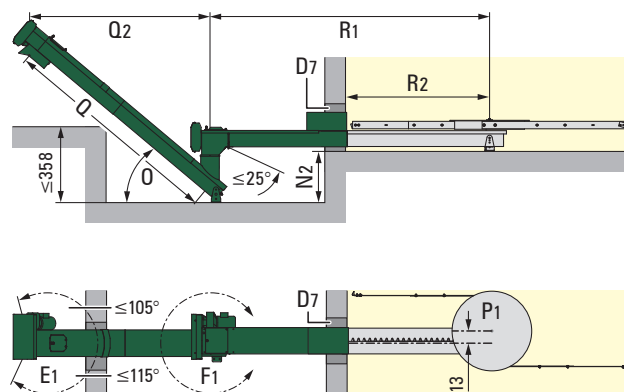
STIRRER WITH ASCENDING SCREW

For situations where there are level differences between storage room and heating room, or for a horizontal installation of the stirrer, we offer two innovative ascending-screw models: an ascending screw with upward transfer and an ascending screw with downward transfer.

Ascending screw with upward transfer



Ascending screw with downward transfer



Legend

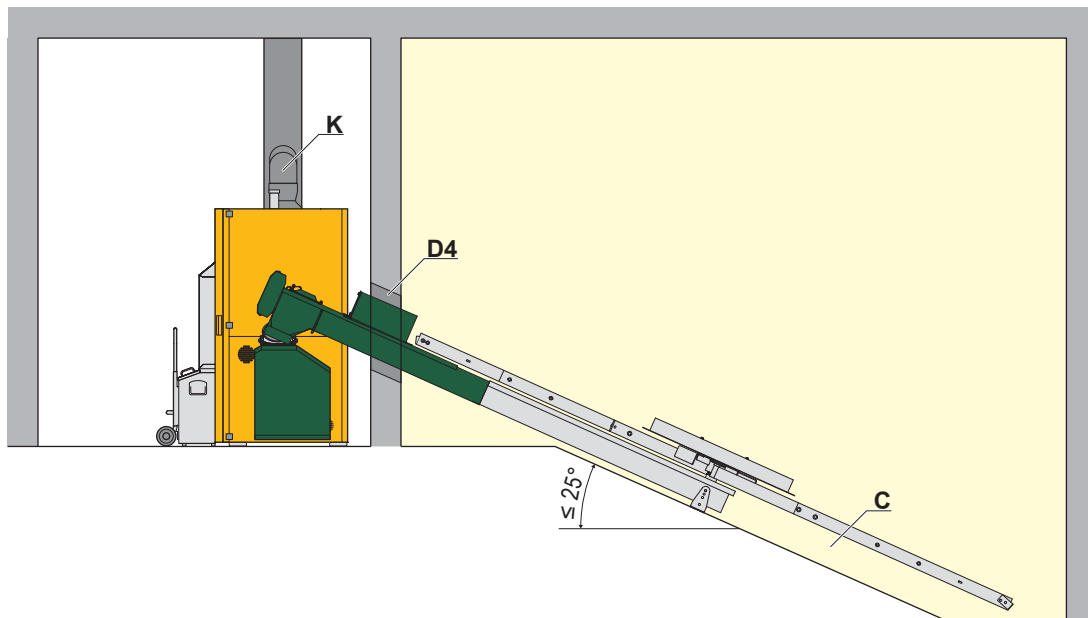
D7	Wall duct 60×60 cm: seal after installation; the channel must be acoustically decoupled (at least 2 cm acoustic insulation)
E1	Swing range ascending screw
F1	Free rotation
N2	Shaft depth: 0°-25°: ≥ 45 cm, 26°-35°: ≥ 50 cm, 36°-45°: ≥ 60 cm
O	Incline for wood chips: 5°-45°, Incline for pellets: 0°-40°
P1	Diameter of the stirrer cover plate: spring blade stirrer: Ø85 cm, articulated blade stirrer: Ø110 cm. Diameter of the stirrer: spring blade stirrer: Ø2.5 m, 3.0 m, 3.5 m, 4.0 m (4.5 m only for pellets), articulated blade stirrer: Ø4.0 m, 4.5 m, 5.0 m, 5.5 m

Q	Screw length (from connection point: head piece drop shaft to the fire shutter): up to 15°: ≤ 12 m; 15°-45°: ≤ 6 m
Q2	45° : ≤ 4,39 m, 15° : ≤ 11,60 m
R1	Screw length: up to 15°: ≤ 12 m; 15°-25°: ≤ 6 m
R2	Screw length open

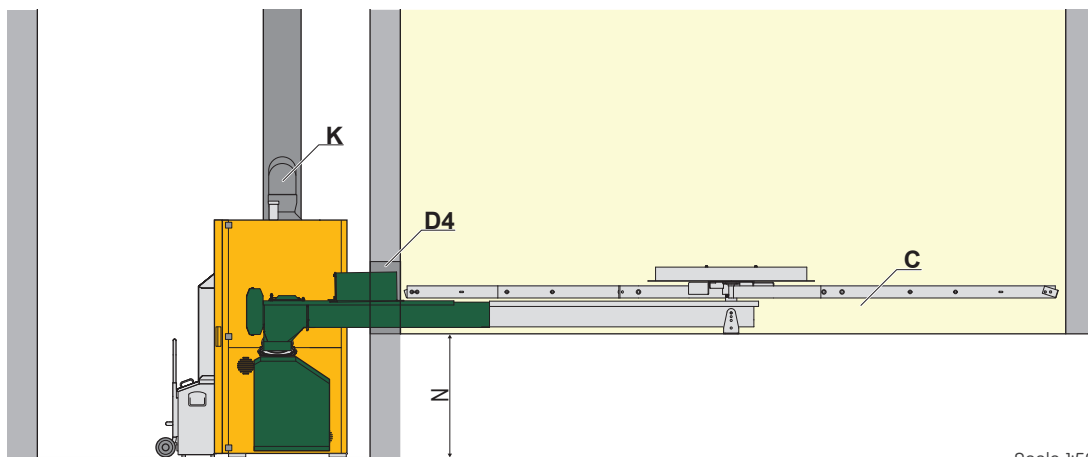
STORAGE ROOM ADJACENT TO HEATING ROOM

Illustration type MF2 D 100–120 kW

Outline



Outline



Scale 1:50

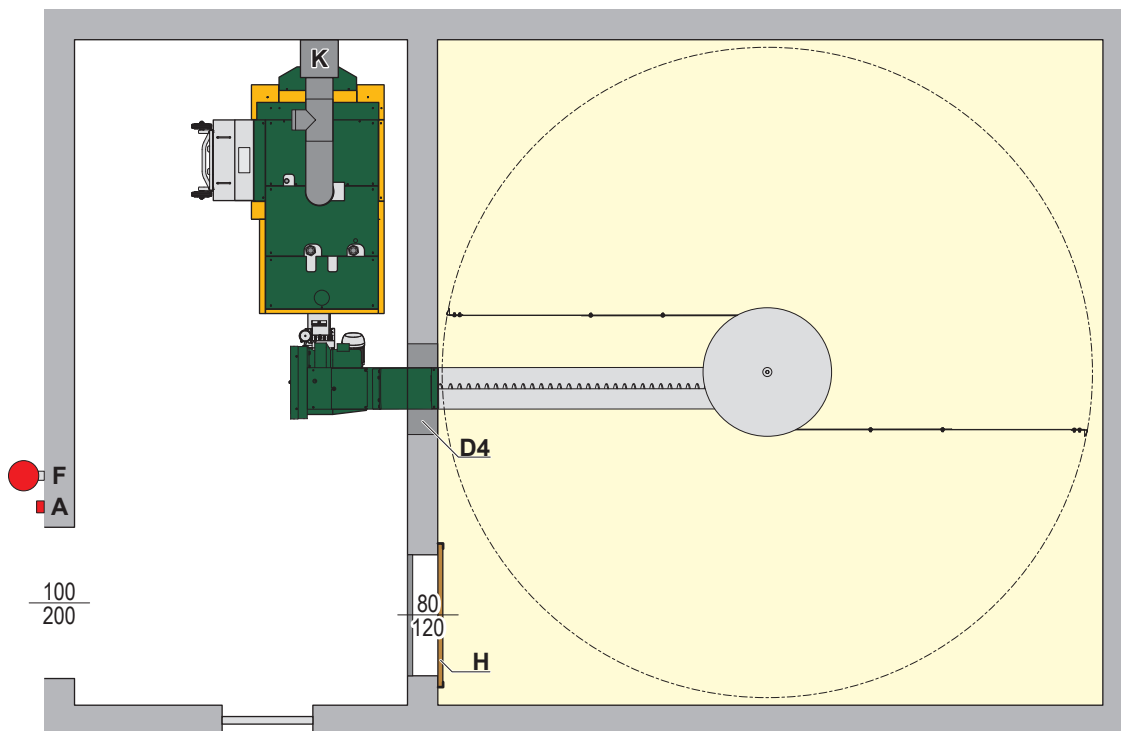
Legend

D4	Wall duct 60×60 cm; seal after installation; the channel must be acoustically decoupled (at least 2 cm acoustic insulation)	K	Chimney: Smoke tube and chimney model according to "Technical specifications" table Energy-saving damper: installation with blowback flap
C	False floor optional – it is possible to install the conveyor channel in a recess in the floor. (Rear ventilator and acoustic decoupling are recommended)	N	Cellular wheel sluice P16S (G30): 82 cm Cellular wheel sluice P31S (G50): 89 cm Intermediate hopper ZI: 107 cm
Note	<ul style="list-style-type: none"> • Ventilation heating room 5 cm² per kW, but at least ≥ 400 cm² • Ceiling load / static loads must be taken into account! • Strictly comply with local fire safety regulations and other regulations! • Maintain the legally prescribed distances to flammable parts! 		

STORAGE ROOM ADJACENT TO HEATING ROOM

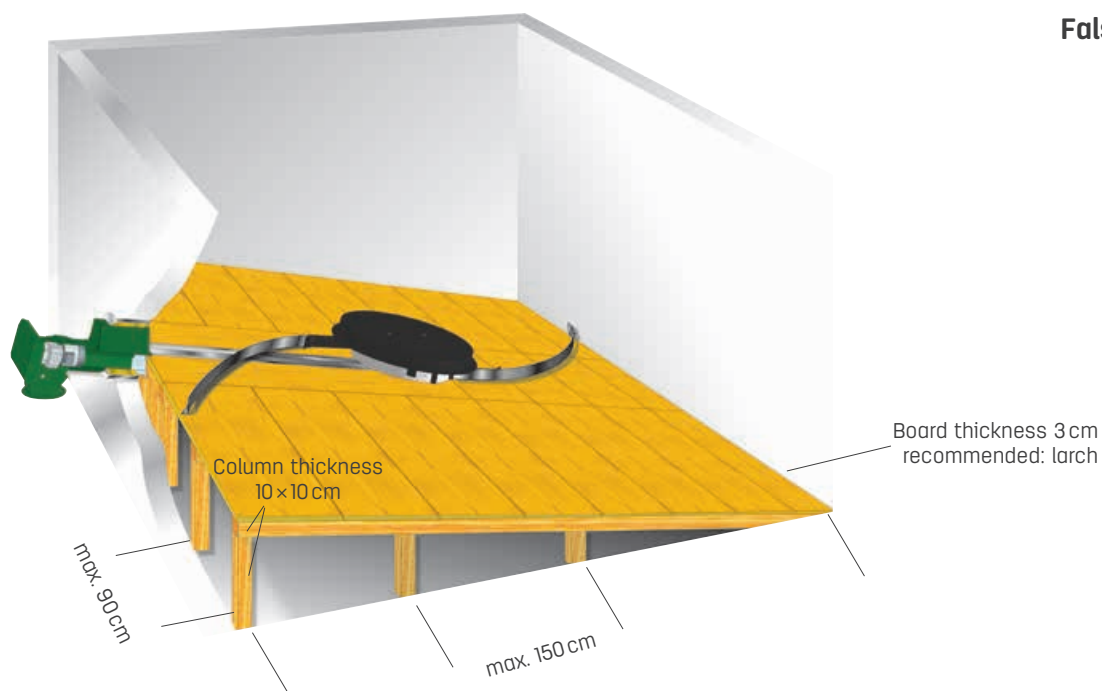
Illustration with type MF2 D 100–120 kW

Ground plan



Scale 1:50

False floor



Legend

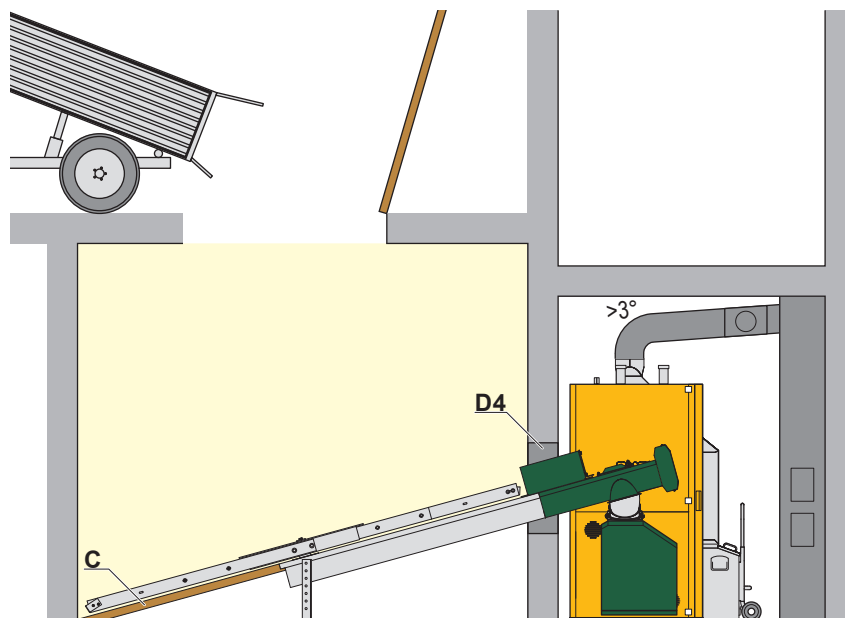
A	Emergency stop switch: Boiler NOT de-energised, but combustion stopped – heat dissipation continues!
D4	Wall duct 60×60 cm; seal after installation; the channel must be acoustically decoupled (at least 2 cm acoustic insulation)
F	Fire extinguisher

H	Hatch: protective door boards for pressure relief
K	Chimney: smoke tube and chimney model according to "Technical specifications" table, energy-saving damper: installation with blowblack flap

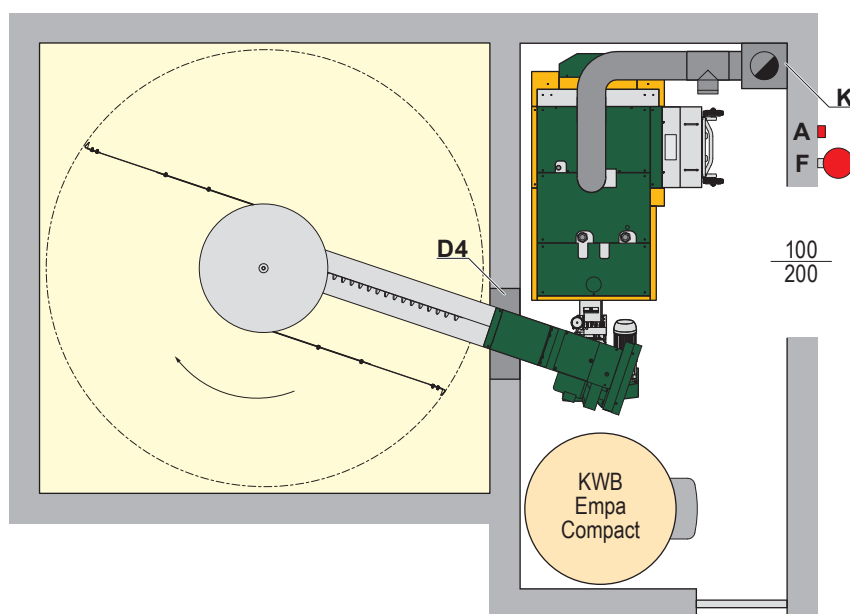
STORAGE ROOM ADJACENT TO HEATING ROOM

Illustration type MF2 D 100–120 kW

Outline



Ground plan



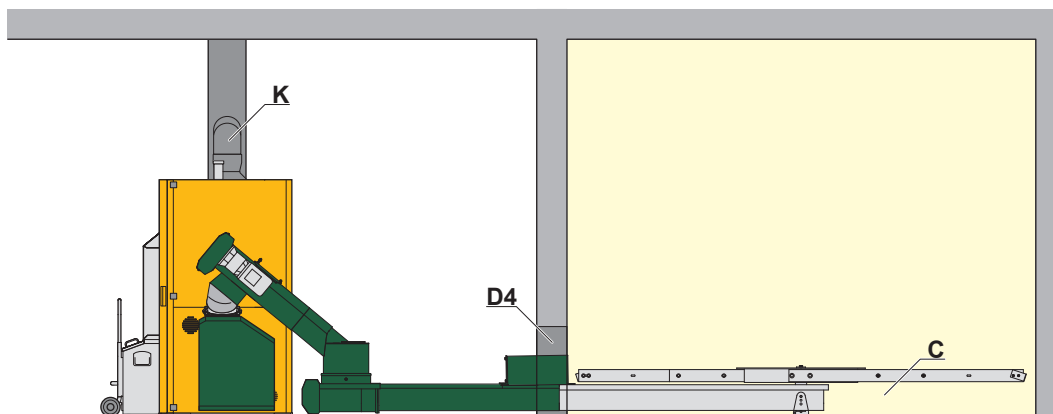
Scale 1:50

Legend

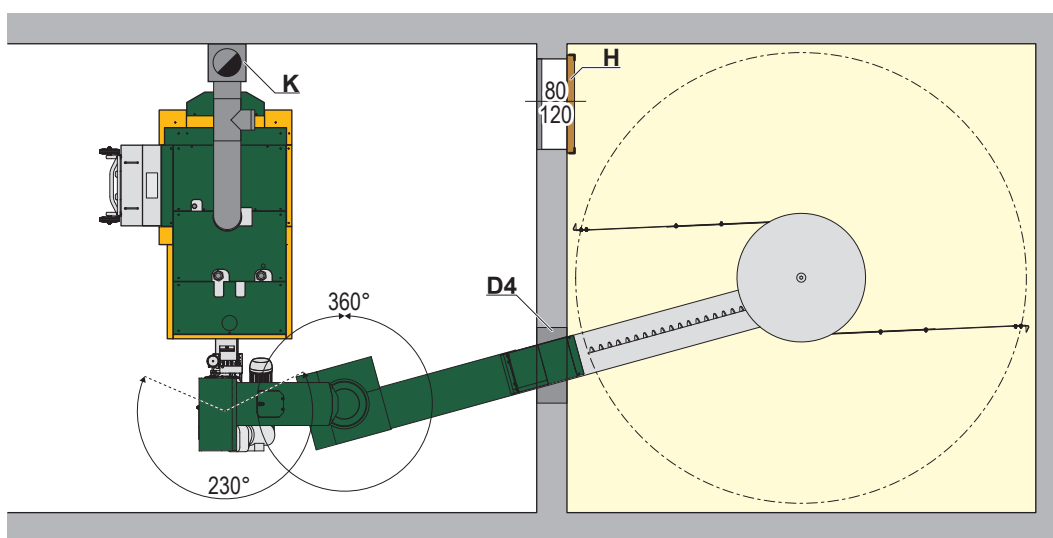
A	Emergency stop switch: Boiler NOT de-energised, but combustion stopped – heat dissipation continues!	F	Fire extinguisher
C	False floor optional – it is possible to install the conveyor channel in a recess in the floor (we recommend rear ventilation and acoustic decoupling)	K	Chimney: smoke tube and chimney model according to "Technical specifications" table, energy-saving damper: installation with blowback flap
D4	Wall duct 60×60 cm; seal after installation; the channel must be acoustically decoupled (at least 2 cm acoustic insulation)		

STORAGE ROOM ADJACENT TO HEATING ROOM

Illustration type MF2 D 100–120 kW



Outline



Ground plan

Scale 1:50

Legend

C	False floor optional – it is possible to install the conveyor channel in a recess in the floor (we recommend rear ventilation and acoustic decoupling)
D4	Wall duct 60×60 cm; seal after installation; the channel must be acoustically decoupled (at least 2 cm acoustic insulation)

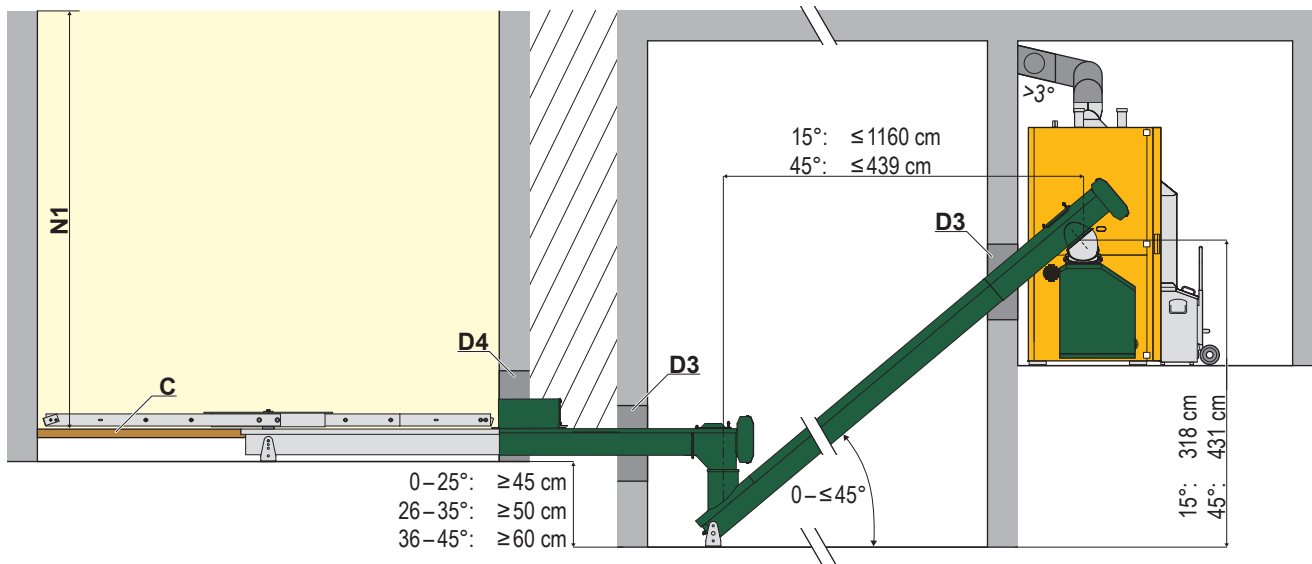
H	Hatch: protective door boards for pressure relief
K	Chimney: smoke tube and chimney model according to "Technical specifications" table, energy-saving damper: installation with blowback flap

Note	<ul style="list-style-type: none"> • Ventilation heating room 5 cm² per kW, but at least 400 cm² • Ceiling load / static loads must be taken into account! • Strictly comply with local fire safety regulations and other regulations! • Maintain the legally prescribed distances to flammable parts!
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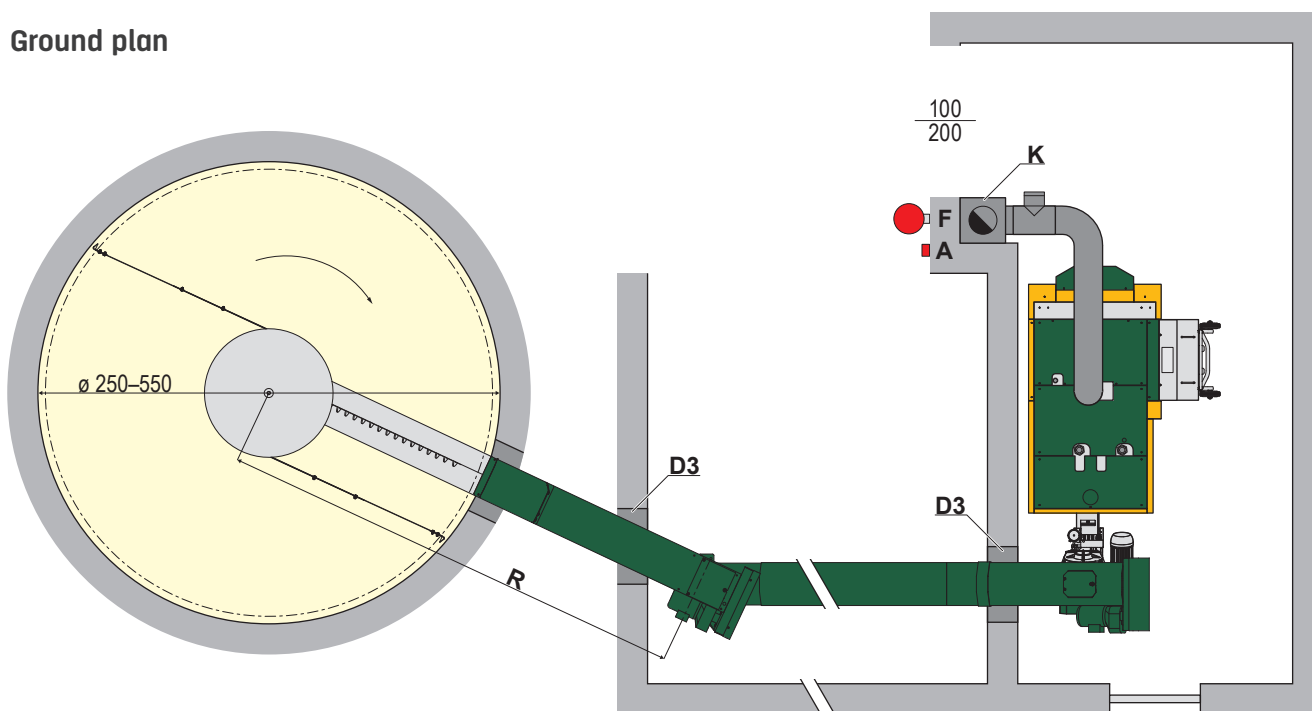
STORAGE ROOM AT A DISTANCE FROM THE HEATING ROOM

Illustration type MF2 D 100–120 kW

Outline



Ground plan



Scale 1:50

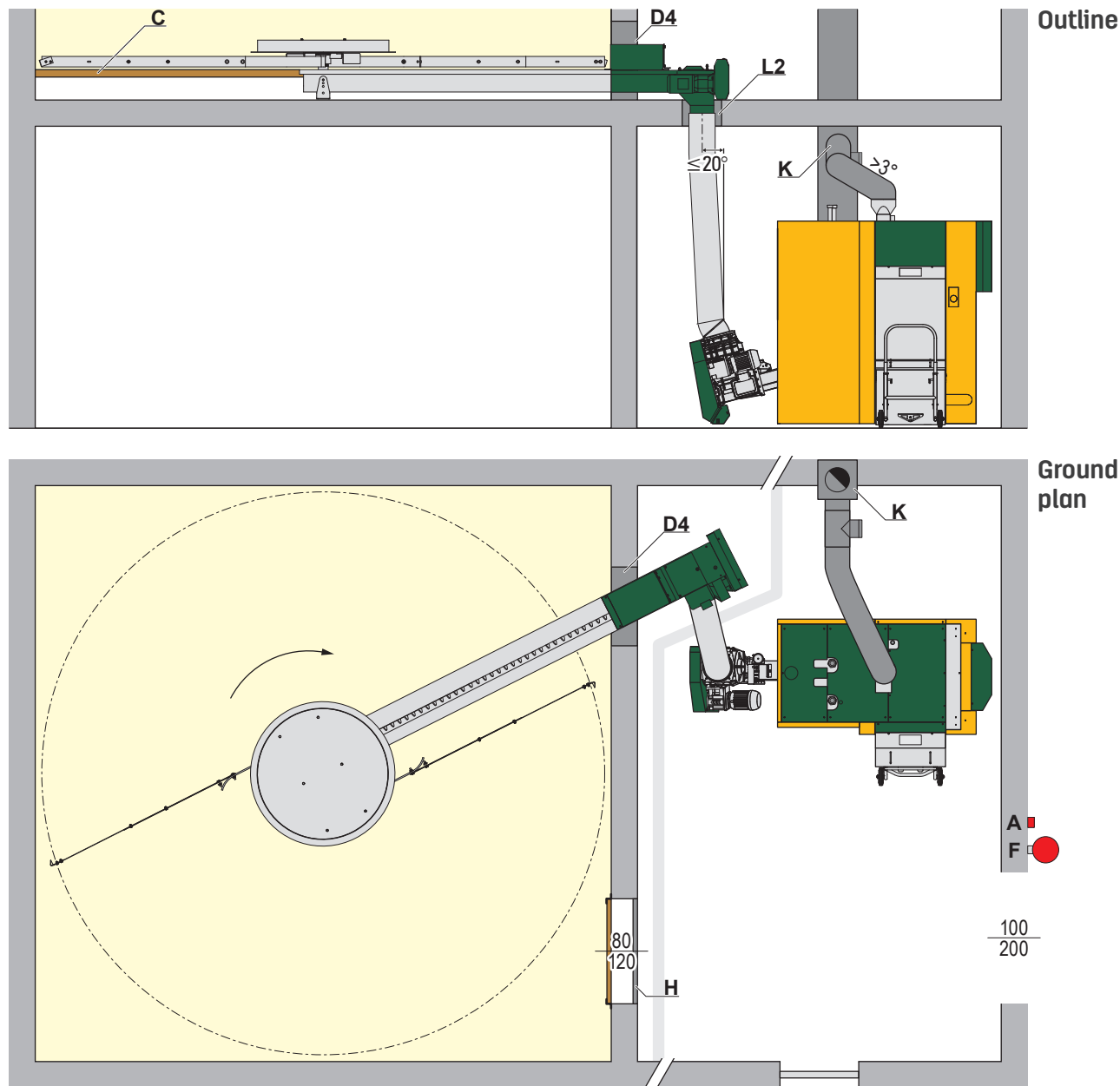
Legend

A	Emergency stop switch: Boiler NOT de-energised, but combustion stopped – heat dissipation continues!
C	False floor optional – it is possible to install the conveyor channel in a recess in the floor. (Rear ventilator and acoustic decoupling are recommended)
D3	Wall duct 50×50 cm; seal after installation; the channel must be acoustically decoupled (at least 2 cm acoustic insulation)
D4	Wall duct 60×60 cm; seal after installation, channel must be acoustically decoupled

F	Fire extinguisher
K	Chimney: smoke tube and chimney model according to "Technical specifications" table, energy-saving damper: installation with blowback flap
NI	Dumping height upon request (depends on width, length and fuel)
R	Screw length ≤ 1,200 cm

STORAGE ROOM ABOVE HEATING ROOM

Illustration type MF2 D 100–120 kW



Scale 1:50

Legend

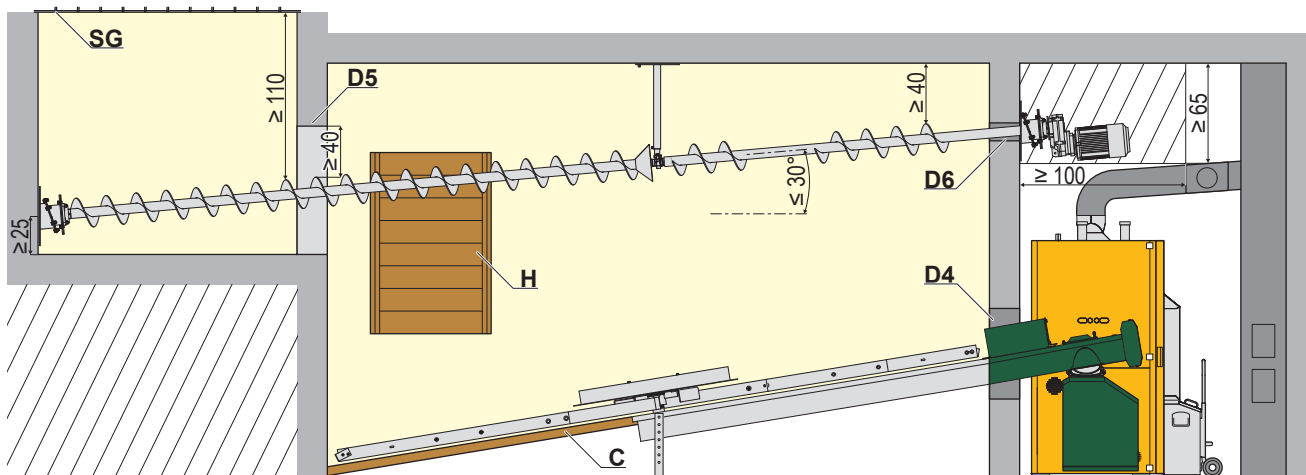
A	Emergency stop switch: Boiler NOT de-energised, but combustion stopped – heat dissipation continues!
C	False floor optional – it is possible to install the conveyor channel in a recess in the floor. (Rear ventilator and acoustic decoupling are recommended)
D4	Wall duct 60×60 cm; seal after installation; the channel must be acoustically decoupled (at least 2 cm acoustic insulation)
F	Fire extinguisher

H	Hatch: protective door boards for pressure relief
K	Chimney: smoke tube and chimney model according to "Technical specifications" table; energy-saving damper: installation with blowback flap
L2	Ceiling duct 30×30 cm; seal after installation; the channel must be acoustically decoupled (at least 2 cm acoustic insulation)

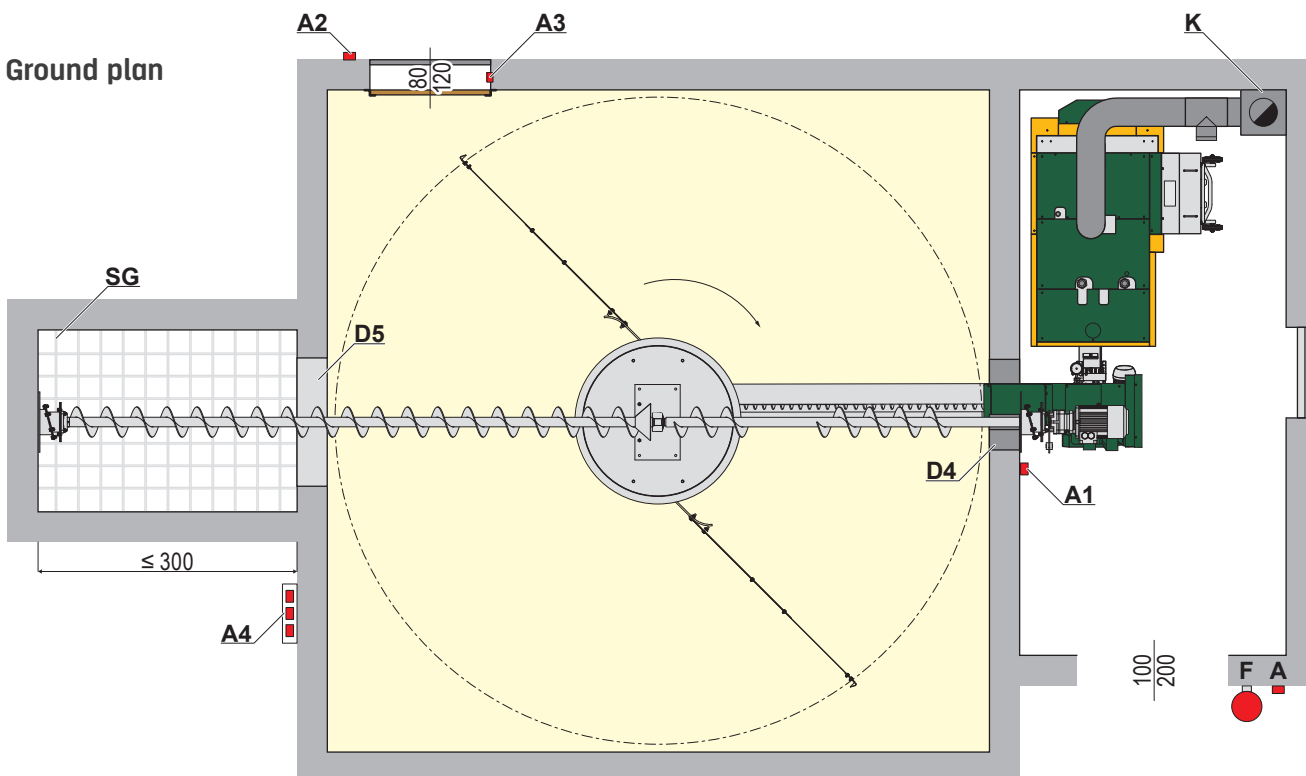
STORAGE ROOM ADJACENT TO HEATING ROOM

Illustration with type MF2 D 100–120 kW stirrer with filling screw

Outline



Ground plan

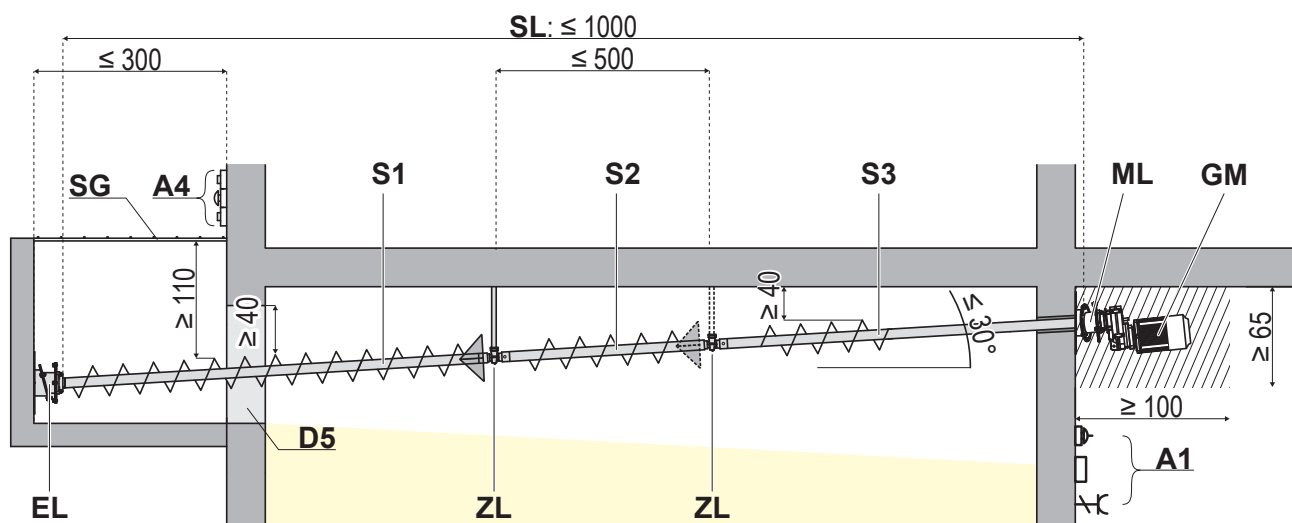


Legend

A	Emergency stop switch: Boiler NOT de-energised, but combustion stopped – heat dissipation continues!
A1	Emergency stop switch or push button: at the motor
A2	Emergency stop switch or push button with key: at the door to the fuel storage room
A3	Door contact end switch: on the door frame to the fuel storage room
A4	Emergency stop switch + ON button + OFF button: at the operator station at the filling shaft
C	False floor optional – it is possible to install the conveyor channel in a recess in the floor. (Rear ventilator and acoustic decoupling are recommended)
D4	Wall duct 60×60 cm; seal after installation; the channel must be acoustically decoupled (at least 2 cm acoustic insulation)

D5	Wall duct 80×80 cm; seal after installation; the channel must be acoustically decoupled (at least 2 cm acoustic insulation)
D6	Wall duct Ø10 cm; seal after installation; the channel must be acoustically decoupled (at least 2 cm acoustic insulation)
F	Fire extinguisher
H	Hatch: protective door boards for pressure relief
K	Chimney: smoke tube and chimney model according to "Technical specifications" table; energy-saving damper: installation with blowblack flap
SG	Tightly bolted protective grille Mesh width 20 cm

FILLING SCREW FOR WOOD CHIP STORAGE ROOM



Fuel:	Wood chips up to P16S (G30) or P31S (G50)
Displacement volume:	up to approx. 30 m ³ /h
Motor power:	4kW or 5.5 kW
Mains connection motor:	400V _{AC} plug CEE 5/16 A
Safety class motor:	IP55

Legend

D5	Wall duct 80×80 cm; seal after installation; the channel must be acoustically decoupled (at least 2 cm acoustic insulation)
EL	End bearing
BM	Drive motor
ML	Motor bearing
A4	Emergency stop switch + ON button + OFF button: at the operator station at the filling shaft
A1	Emergency stop switch or push button: at the motor

S1	Filling screw, part 1
S2	Filling screw, part 2
S3	Filling screw, part 3
SG	Protective grille
SL	Max. filling screw length
ZL	Intermediate bearing

Note	<ul style="list-style-type: none"> • Ventilation heating room 5 cm² per kW, but at least 400 cm² • Ceiling load / static loads must be taken into account! • Strictly comply with local fire safety regulations and other regulations! • Maintain the legally prescribed distances to flammable materials!
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CONVEYOR SYSTEM FOR DOUBLE HEATING SYSTEMS

Illustration with type MF2 D 100–120 kW double heating system with Y-stirrer

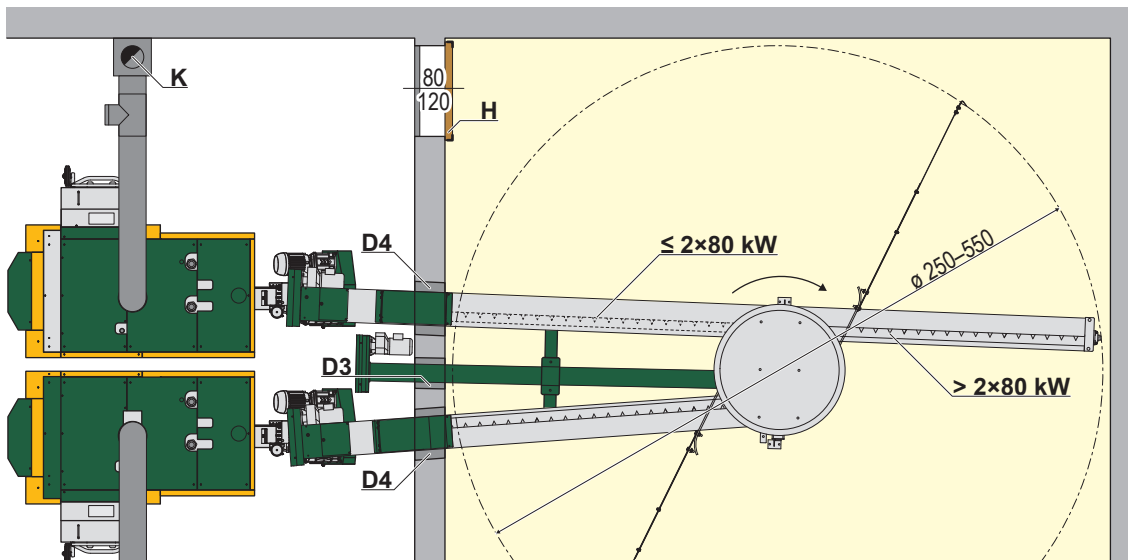
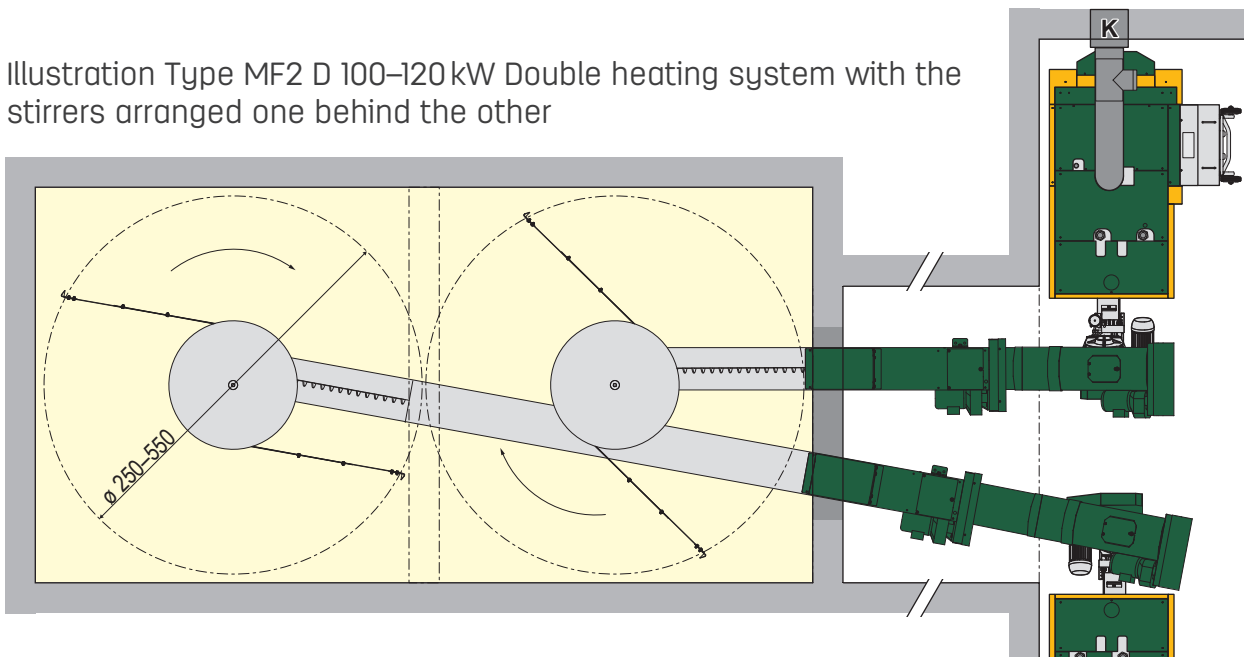


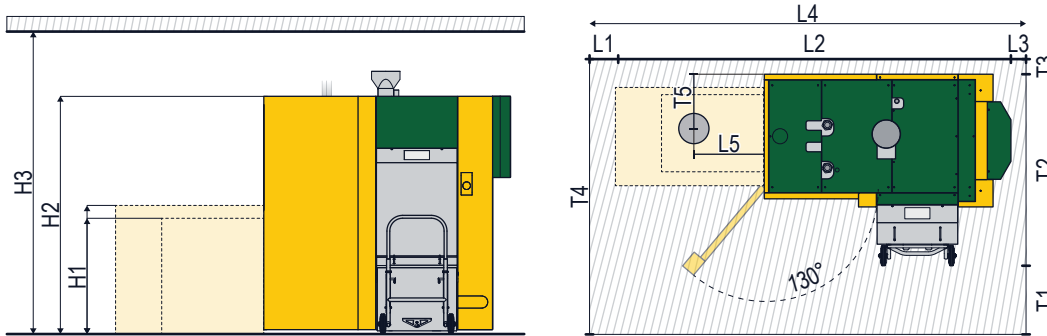
Illustration Type MF2 D 100–120 kW Double heating system with the stirrers arranged one behind the other



Legend

D3	Wall duct 50×50 cm; seal after installation; the channel must be acoustically decoupled (at least 2 cm acoustic insulation)	H	Hatch: protective door boards for pressure relief
D4	Wall duct 60×60 cm; seal after installation; the channel must be acoustically decoupled (at least 2 cm acoustic insulation)	K	Chimney: smoke tube and chimney model according to "Technical specifications" table, energy-saving damper: installation with blowback flap
Note	<ul style="list-style-type: none"> • Ventilation heating room 5 cm² per kW, but at least 400 cm² • Ceiling load / static loads must be taken into account! • Strictly comply with local fire safety regulations and other regulations! • Maintain the legally prescribed distances to flammable materials! 		

INSTALLATION DIMENSIONS



[cm]		MF2 20–50 kW		MF2 60–80 kW		MF2 100–120 kW	
		D	ZI	D	ZI	D	ZI
H1	Medium height of the dropping edge of the cellular wheel sluice P16S (G30)	80	-	80	-	80	-
	Medium height of the dropping edge of the cellular wheel sluice P31S (G50)	-	-	88	-	88	-
	Medium height of the dropping edge of the hopper	-	98	-	98	-	98
H2	Height KWB Multifire	159	159	167	167	167	167
H3	Minimum room height	200	200	220*	220*	210	210
	Minimum room height - Exhaust gas pipe above heat exchanger	210	210	220	220	230	230
L1	Free space	20	20	20	20	20	20
L2	Heating system length P16S (G30) / P31S (G50)	205 / -	245 / -	223 / 232	262 / -	234 / 243	274 / -
L3	Free space	6	6	6	6	6	6
L4	Minimum room length	>231	>271	>249 / 258	>288	>260 / 269	>300
L5	Distance between the boiler casing and the connection point of the cellular wheel sluice wood chips P16S (G30) and P31S (G50) at 0°	43 / -	-	44 / 50	-	44 / 50	-
	Distance between the boiler casing and the connection point of the cellular wheel sluice wood chips P16S (G30) and P31S (G50) at 45°	48 / -	-	50 / 56	-	50 / 56	-
	Distance between the boiler casing and the connection point of the cellular wheel sluice of the intermediate hopper	-	71	-	71	-	71
T1	Free space	40	40	40	40	40	40
T2	Heating system depth	123	123	134	134	134	134
T3	Free space	6	6	6	6	6	6
T4	Minimum room depth	>169	>169	>180	>180	>180	>180
T5	Plant outer edge to the connection point Feeder or intermediate container	33	37	39	42	39	42

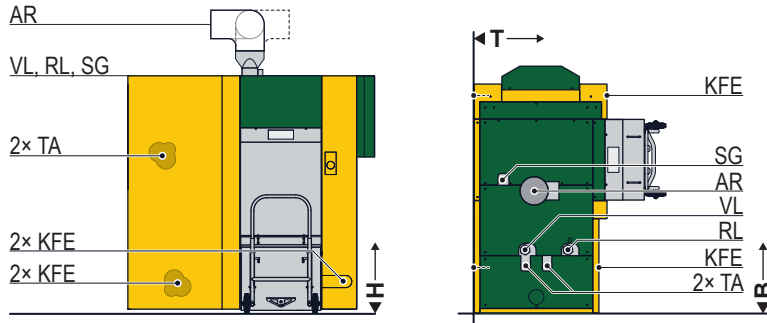
D ... KWB Multifire type MF2 D ZI ... KWB Multifire type MF2 ZI

Dimensions for moving the boiler into the respective space

KWB Multifire	Largest part of boiler as delivered	Largest part of boiler after deconstruction	Largest part pre-assembled
Type MF2 D / ZI 20-50 kW	70 x 153	70 x 106	74 x 166
Type MF2 D / ZI 60-120 kW	80 x 161	80 x 125	85 x 180

Information regarding hydraulics requirements can be downloaded at www.kwb.net

CONNECTING DIMENSIONS



Legend	Connecting dimensions MF2	20-50 kW	60-80 kW	100-120 kW
AR	Exhaust gas pipe	∅ 15 H: 166 B: 72 T: 37	∅ 18 H: 185 B: 85 T: 42	∅ 20 H: 175 B: 85 T: 42
	Exhaust gas pipe incl. bend	H: 184	H: 192	H: 192
	Exhaust gas pipe incl. bend above heat exchanger	H: 196	H: 206	H: 215
VL	Forward flow	∅ 32, G 5/4" H: 157 B: 44 T: 32	∅ 50, G 2" H: 180 B: 44 T: 36	∅ 50, G 2" H: 180 B: 44 T: 36
RL	Return flow	∅ 32, G 5/4" H: 157 B: 44 T: 56	∅ 50, G 2" H: 180 B: 44 T: 65	∅ 50, G 2" H: 180 B: 44 T: 65
SG	Safety group	∅ R 1" H: 157 B: 72 T: 17	∅ R 1" H: 171 B: 93 T: 19	∅ R 1" H: 171 B: 93 T: 19
TA	Thermal safety valve – inflow	∅ R 1/2" H: 107 B: 29 T: 42	∅ R 1/2" H: 127 B: 31 T: 47	∅ R 1/2" H: 127 B: 31 T: 47
TA	Thermal safety valve – discharge	∅ R 1/2" H: 107 B: 29 T: 32	∅ R 1/2" H: 127 B: 31 T: 37	∅ R 1/2" H: 127 B: 31 T: 37
KFE	Connecting height boiler filling and emptying	∅ Rp 1/2" H: 22 & 23	∅ Rp 1/2" H: 22 & 23	∅ Rp 1/2" H: 22 & 23
		B: 35 & 124	B: 35 & 141	B: 35 & 153
		T: 61 & 67	T: 72 & 79	T: 72 & 79

H ... Height T ... Depth B ... Width

TECHNICAL SPECIFICATIONS

MF2 D / MF2 ZI	Unit	20	30 ¹	30 ²	40	45 ¹	50 ¹	60 ¹	65 ¹	70 ¹	80	100 ²	108 ¹	120
Rated power	kW	20	30	32,5	40	45	49,5	60	65	69,5	80	99 101	108	120
Partial load	kW	6,0	9,0	9,8	12,0	13,5	15,0	18,0	19,5	20,9	24,0	30,0	32,4	36,0
Boiler efficiency at rated power	%	93,0	93,7	93,8	94,3	94,3	94,3	94,3	94,2	94,2	94,2	94,3	94,3	94,4
Boiler efficiency at partial load	%	90,2	91,7	92,1	93,2	93,3	93,4	93,6	93,7	93,8	94,0	94,4	94,6	94,8
Fuel thermal output at rated power	kW	21,5	32,0	34,6	42,4	47,7	52,5	63,6	69,0	73,8	84,9	106,0	114,5	127,1
Fuel thermal output at partial load	kW	6,7	9,8	10,6	12,9	14,5	16,1	19,2	20,8	22,2	25,5	31,8	34,2	38,0
Boiler class according to EN 303-5:2012	-	5	5	5	5	5	5	5	5	5	5	5	5	5
Water side														
Water content	l	155	155	155	135	135	135	165	165	165	165	195	195	195
Water connection, forward/return flow (internal thread) without return-flow boost device	Inch	5/4	5/4	5/4	5/4	5/4	5/4	2	2	2	2	2	2	2
	mm DN	31,8 32	31,8 32	31,8 32	31,8 32	31,8 32	31,8 32	50,1 50	50,1 50	50,1 50	50,1 50	50,1 50	50,1 50	50,1 50
Water connection, forward/return flow (internal thread) with return-flow boost device	Inch	5/4	5/4	5/4	5/4	5/4	5/4	6/4	6/4	6/4	6/4	2	2	2
	mm DN	31,8 32	31,8 32	31,8 32	31,8 32	31,8 32	31,8 32	38,1 40	38,1 40	38,1 40	38,1 40	50,1 50	50,1 50	50,1 50
Water connection for filling and/or emptying (internal thread)	inch mm	3/4 19,05	3/4 19,05	3/4 19,05	3/4 19,05	3/4 19,05	3/4 19,05	3/4 19,05	3/4 19,05	3/4 19,05	3/4 19,05	3/4 19,05	3/4 19,05	3/4 19,05
Water connection for thermal safety valve (external thread)	Inch mm	1/2 12,7	1/2 12,7	1/2 12,7	1/2 12,7	1/2 12,7	1/2 12,7	1/2 12,7	1/2 12,7	1/2 12,7	1/2 12,7	1/2 12,7	1/2 12,7	1/2 12,7
Thermal safety valve: pressure	bar	2-6	2-6	2-6	2-6	2-6	2-6	2-6	2-6	2-6	2-6	2-6	2-6	2-6
Thermal safety valve: required cold water temperature	°C	20	20	20	20	20	20	20	20	20	20	20	20	20
Water-side resistance at 10 K	mbar	36,97	36,97	85,38	153,75	200,2	242,08	56,10	67,2	77,2	100,61	158,03	172,8	228,37
	Pa	3697	3697	8538	15375	20020	24208	5610	6720	7720	10061	15803	17280	22837
Water-side resistance at 20 K	mbar	8,51	8,51	20,24	36,97	48,4	58,68	13,53	16,3	18,7	24,49	38,68	42,3	56,10
	Pa	851	851	2024	3697	4840	5868	1353	1630	1870	2449	3868	4230	5610
Boiler-entry temperature	°C	55-70	55-70	55-70	55-70	55-70	55-70	55-70	55-70	55-70	55-70	55-70	55-70	55-70
Working temperature/operating temperature	°C	90	90	90	90	90	90	90	90	90	90	90	90	90
Maximum permitted temperature	°C	110	110	110	110	110	110	110	110	110	110	110	110	110
Max. operating pressure	bar	3,5	3,5	3,5	3,5	3,5	3,5	3,5	3,5	3,5	3,5	3,5	3,5	3,5
Exhaust-gas side (for chimney calculation)														
Combustion chamber temperature	°C	900-1100	900-1100	900-1100	900-1100	900-1100	900-1100	900-1100	900-1100	900-1100	900-1100	900-1100	900-1100	900-1100
Combustion chamber pressure	mbar	-0,5...-5	-0,5...-5	-0,5...-5	-0,5...-5	-0,5...-5	-0,5...-5	-0,5...-5	-0,5...-5	-0,5...-5	-0,5...-5	-0,5...-5	-0,5...-5	-0,5...-5
	Pa	-5...-50	-5...-50	-5...-50	-5...-50	-5...-50	-5...-50	-5...-50	-5...-50	-5...-50	-5...-50	-5...-50	-5...-50	-5...-50
Required draft at rated power	mbar	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05
	Pa	5	5	5	5	5	5	5	5	5	5	5	5	5
Required draft at partial load	mbar	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03
	Pa	3	3	3	3	3	3	3	3	3	3	3	3	3
Suction required: yes	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Exhaust-gas temperature at rated power	°C	140	140	140	140	140	140	140	140	140	140	140	140	140
Exhaust-gas temp. Partial load	°C	100	100	100	100	100	100	100	100	100	100	100	100	100
Exhaust-gas mass flow at rated power	kg/s	0,014	0,014	0,021	0,029	0,032	0,036	0,043	0,046	0,050	0,057	0,071	0,082	0,086
Exhaust-gas mass flow at partial load	kg/s	0,005	0,005	0,006	0,010	0,009	0,010	0,012	0,013	0,014	0,016	0,020	0,023	0,024
Exhaust-gas mass flow at rated power	kg/h	51,3	51,3	77,0	102,6	115,5	128,3	154,0	166,8	178,3	205,3	256,6	295,1	307,9
Exhaust-gas mass flow at partial load	kg/h	18,5	18,5	27,8	37,0	41,7	46,3	55,5	60,2	64,3	74,1	92,6	106,5	111,1
Exhaust-gas volume at rated power	Nm ³ /h	40,1	40,1	60,1	80,2	90,2	100,2	120,2	130,3	139,3	160,4	200,4	230,5	240,5
Exhaust-gas volume at partial load	Nm ³ /h	14,5	14,5	21,7	28,9	32,5	36,1	43,4	47,0	50,2	57,8	72,3	83,1	86,7
Incline of the exhaust-gas pipe	°	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3
Connection height exhaust-gas pipe	mm	1735	1735	1735	1735	1735	1735	1830	1830	1830	1830	1830	1830	1830
Exhaust-gas pipe diameter	mm	150	150	150	150	150	150	180	180	180	180	200	200	200
Chimney diameter (approx. values)	mm	150	150	150	180	180	180	180	180	200	200	220	220	220
Chimney design: Moisture-resistant	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Fuel: Wood chips, ISO 17225-4														
Maximum water content	-	M40	M40	M40	M40	M40	M40	M40	M40	M40	M40	M40	M40	M40
Maximum fuel size	-	P16S	P16S	P16S	P16S	P16S	P16S	P16S P31S	P16S P31S	P16S P31S	P16S P31S	P16S P31S	P16S P31S	P16S P31S
Ash														
Ash container volume	l	70	70	70	70	70	70	70	70	70	70	70	70	70
Ash container filled	kg	80	80	80	80	80	80	80	80	80	80	80	80	80
Ash removal system	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Electrical system														
Connection: CEE 5-pole	-	400 V _{AC} 50 Hz 13 A	400 V _{AC} 50 Hz 13 A	400 V _{AC} 50 Hz 13 A	400 V _{AC} 50 Hz 13 A	400 V _{AC} 50 Hz 13 A	400 V _{AC} 50 Hz 13 A	400 V _{AC} 50 Hz 13 A	400 V _{AC} 50 Hz 13 A	400 V _{AC} 50 Hz 13 A	400 V _{AC} 50 Hz 13 A	400 V _{AC} 50 Hz 13 A	400 V _{AC} 50 Hz 13 A	400 V _{AC} 50 Hz 13 A
Connected power MF2 D: P16S/P31S	W	1769	1769	1769	1769	1769	1769	1827	1827	1827	1827	1827	1827	1827
Connected power MF2 ZI	W	1655	1655	1655	1655	1655	1655	1713	1713	1713	1713	1713	1713	1713
Weights														
Water jacket	kg	300	300	300	340	340	340	360	360	360	360	450	450	450
Boiler body	kg	265	265	265	265	265	265	320	320	320	320	320	320	320
Boiler weight MF2 D (P16S/P31S)	kg	920	920	920	980	980	980	1100	1100	1100	1100	1200	1200	1200
Boiler weight MF2 ZI	kg	890	890	890	930	930	930	1070	1070	1070	1070	1170	1170	1170

MF2 D / MF2 ZI	Unit	20	30 ¹	30 ²	40	45 ¹	50 ¹	60 ¹	65 ¹	70 ¹	80	100 ²	108 ¹	120
Emissions according to test report														
Test report no.	-	13-UWW/Wels-EX-344/1-4												
Noise emissions (EN 15036-1)														
Normal operating noise at rated power	dB(A)	< 70	< 70	< 70	< 70	< 70	< 70	< 70	< 70	< 70	< 70	< 70	< 70	< 70
Wood chips, Ref. 10 % O₂ dry (EN303-5)														
CO at rated power	mg/Nm ³	16	12	10	4	< 7	< 7	< 7	< 7	< 7	< 4	< 7	< 7	3
CO at partial load	mg/Nm ³	102	83	78	63	58	54	44	39	34	24	22	21	19
NO _x at rated power	mg/Nm ³	132	121	118	109	106	104	99	96	94	88	107	115	126
NO _x at partial load	mg/Nm ³	109	106	105	103	102	100	98	96	95	93	88	86	83
OGC at rated power	mg/Nm ³	< 3	< 4	< 4	< 3	< 4	< 4	< 4	< 4	< 4	< 3	< 4	< 4	< 3
OGC at partial load	mg/Nm ³	4	< 4	< 4	2	< 4	< 4	< 4	< 4	< 4	< 3	< 4	< 4	< 3
Dust at rated power	mg/Nm ³	15	16	16	17	17	18	19	19	19	20	20	19	19
Dust at partial load	mg/Nm ³	11	12	12	12	13	13	13	13	13	12	14	14	14
Wood chips, Ref. 11 % O₂ dry														
CO at rated power	mg/Nm ³	15	11	9	4	< 6	< 6	< 6	< 6	< 6	< 3	< 6	< 6	3
CO at partial load	mg/Nm ³	92	75	71	57	53	49	40	35	31	22	20	19	17
NO _x at rated power	mg/Nm ³	120	110	107	99	97	94	90	87	85	80	97	105	114
NO _x at partial load	mg/Nm ³	99	96	96	93	92	91	89	87	86	84	80	79	76
OGC at rated power	mg/Nm ³	< 3	< 4	< 4	< 2	< 4	< 4	< 4	< 4	< 4	< 2	< 4	< 4	< 2
OGC at partial load	mg/Nm ³	3	< 4	< 4	2	< 4	< 4	< 4	< 4	< 4	< 2	< 4	< 4	< 2
Dust at rated power	mg/Nm ³	14	15	15	15	16	16	17	17	17	18	18	18	17
Dust at partial load	mg/Nm ³	10	10	11	11	12	12	12	12	12	11	12	12	13
Wood chips, Ref. 13 % O₂ dry														
CO at rated power	mg/Nm ³	11	9	7	3	< 5	< 5	< 5	< 5	< 5	< 3	< 5	< 5	< 5
CO at partial load	mg/Nm ³	74	60	56	32	42	39	32	28	25	18	16	15	14
NO _x at rated power	mg/Nm ³	96	88	86	79	77	75	72	70	68	64	78	84	91
NO _x at partial load	mg/Nm ³	80	77	77	75	74	73	71	70	69	67	64	63	61
OGC at rated power	mg/Nm ³	< 2	< 3	< 3	< 2	< 3	< 3	< 3	< 3	< 3	< 2	< 3	< 3	< 2
OGC at partial load	mg/Nm ³	3	< 3	< 3	2	< 3	< 3	< 3	< 3	< 3	< 2	< 3	< 3	< 2
Dust at rated power	mg/Nm ³	11	12	12	12	13	13	13	14	14	14	14	14	14
Dust at partial load	mg/Nm ³	8	8	8	9	9	9	9	9	9	9	10	10	10
PPBT ³	mg/Nm ³	12	13	13	13	14	14	14	15	15	15	15	15	15
Wood chips, In accordance with § 15a-BVG Austria														
CO at rated power	mg/MJ	8	5	4	2	3	3	< 3	< 3	< 3	< 2	< 2	2	2
CO at partial load	mg/MJ	50	49	49	48	44	39	30	26	21	12	11	10	9
NO _x at rated power	mg/MJ	66	60	59	54	53	51	49	47	46	43	53	56	62
NO _x at partial load	mg/MJ	54	53	52	51	50	50	49	48	47	46	44	43	41
OGC at rated power	mg/MJ	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
OGC at partial load	mg/MJ	2	1	1	1	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Dust at rated power	mg/MJ	7	8	8	8	8	8	9	9	9	10	10	9	9
Dust at partial load	mg/MJ	5	6	6	6	6	6	6	6	6	6	7	7	7

20.01.2015

1 ... Drawing inspection

2 ... Typification variants

3 ... PPBT = PP (dust) + 42% OGC according to Conto Termico 28.12.2012

mg/Nm³ ... milligram per standard cubic meter (Nm³ - standard cubic meter under 1013 hectopascal at 0 °C)

TECHNICAL SPECIFICATIONS

MF2 D / MF2 ZI	Unit	20	30 ¹	30 ²	40	45 ¹	50 ¹	60 ¹	65 ¹	70 ¹	80	100 ²	108 ¹	120
Rated power	kW	20	30	32,5	40	45	49,5	60	65	69,5	80	99 101	108	120
Partial load	kW	6,0	9,0	9,8	12,0	13,5	15,0	18,0	19,5	20,9	24,0	30,0	32,4	36,0
Boiler efficiency at rated power (pellets)	%	93,6	94,4	94,5	95,1	95,0	94,8	94,6	94,4	94,3	94,0	94,0	94,1	94,1
Boiler efficiency at partial load (pellets)	%	90,4	92,0	92,4	93,6	93,7	93,9	94,1	94,2	94,3	94,6	94,4	94,3	94,2
Fuel thermal output at rated power (pellets)	kW	21,4	31,8	34,4	42,1	47,4	52,2	63,4	68,9	73,7	85,1	106,3	114,8	127,5
Fuel thermal output at partial load (pellets)	kW	6,6	9,8	10,6	12,8	14,4	16,0	19,1	20,7	22,1	25,4	31,8	34,4	38,2
Boiler class according to EN 303-5:2012	-	5	5	5	5	5	5	5	5	5	5	5	5	5
Water side														
Water content	l	155	155	155	135	135	135	165	165	165	165	195	195	195
Water connection, forward/return flow (internal thread) without return-flow boost device	Inch	5/4	5/4	5/4	5/4	5/4	5/4	2	2	2	2	2	2	2
	mm	31,8	31,8	31,8	31,8	31,8	31,8	50,1	50,1	50,1	50,1	50,1	50,1	50,1
	DN	32	32	32	32	32	32	50	50	50	50	50	50	50
Water connection, forward/return flow (internal thread) with return-flow boost device	Inch	5/4	5/4	5/4	5/4	5/4	5/4	6/4	6/4	6/4	6/4	2	2	2
	mm	31,8	31,8	31,8	31,8	31,8	31,8	38,1	38,1	38,1	38,1	50,1	50,1	50,1
	DN	32	32	32	32	32	32	40	40	40	40	50	50	50
Water connection for filling and/or emptying (internal thread)	inch	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4
	mm	19,05	19,05	19,05	19,05	19,05	19,05	19,05	19,05	19,05	19,05	19,05	19,05	19,05
Water connection for thermal safety valve (external thread)	Inch	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
	mm	12,7	12,7	12,7	12,7	12,7	12,7	12,7	12,7	12,7	12,7	12,7	12,7	12,7
Thermal safety valve: pressure	bar	2-6	2-6	2-6	2-6	2-6	2-6	2-6	2-6	2-6	2-6	2-6	2-6	2-6
Thermal safety valve: required cold water temperature	°C	20	20	20	20	20	20	20	20	20	20	20	20	20
Water-side resistance at 10 K	mbar	36,97	36,97	85,38	153,75	200,2	242,08	56,10	67,2	77,2	100,61	158,03	172,8	228,37
	Pa	3697	3697	8538	15375	20020	24208	5610	6720	7720	10061	15803	17280	22837
Water-side resistance at 20 K	mbar	8,51	8,51	20,24	36,97	48,4	58,68	13,53	16,3	18,7	24,49	38,68	42,3	56,10
	Pa	851	851	2024	3697	4840	5868	1353	1630	1870	2449	3868	4230	5610
Boiler-entry temperature	°C	55-70	55-70	55-70	55-70	55-70	55-70	55-70	55-70	55-70	55-70	55-70	55-70	55-70
Working temperature/operating temperature	°C	90	90	90	90	90	90	90	90	90	90	90	90	90
Maximum permitted temperature	°C	110	110	110	110	110	110	110	110	110	110	110	110	110
Max. operating pressure	bar	3,5	3,5	3,5	3,5	3,5	3,5	3,5	3,5	3,5	3,5	3,5	3,5	3,5
Exhaust-gas side (for chimney calculation)														
Combustion chamber temperature	°C	900-1100	900-1100	900-1100	900-1100	900-1100	900-1100	900-1100	900-1100	900-1100	900-1100	900-1100	900-1100	900-1100
Combustion chamber pressure	mbar	-0,5...-5	-0,5...-5	-0,5...-5	-0,5...-5	-0,5...-5	-0,5...-5	-0,5...-5	-0,5...-5	-0,5...-5	-0,5...-5	-0,5...-5	-0,5...-5	-0,5...-5
	Pa	-5...-50	-5...-50	-5...-50	-5...-50	-5...-50	-5...-50	-5...-50	-5...-50	-5...-50	-5...-50	-5...-50	-5...-50	-5...-50
Required draft at rated power	mbar	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05
	Pa	5	5	5	5	5	5	5	5	5	5	5	5	5
Required draft at partial load	mbar	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03
	Pa	3	3	3	3	3	3	3	3	3	3	3	3	3
Suction required: yes	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Exhaust-gas temperature at rated power	°C	140	140	140	140	140	140	140	140	140	140	140	140	140
Exhaust-gas temp. Partial load	°C	100	100	100	100	100	100	100	100	100	100	100	100	100
Exhaust-gas mass flow at rated power	kg/s	0,014	0,014	0,021	0,029	0,032	0,036	0,043	0,046	0,050	0,057	0,071	0,082	0,086
Exhaust-gas mass flow at partial load	kg/s	0,005	0,005	0,006	0,010	0,009	0,010	0,012	0,013	0,014	0,016	0,020	0,023	0,024
Exhaust-gas mass flow at rated power	kg/h	51,3	51,3	77,0	102,6	115,5	128,3	154,0	166,8	178,3	205,3	256,6	295,1	307,9
Exhaust-gas mass flow at partial load	kg/h	18,5	18,5	27,8	37,0	41,7	46,3	55,5	60,2	64,3	74,1	92,6	106,5	111,1
Exhaust-gas volume at rated power	Nm³/h	40,1	40,1	60,1	80,2	90,2	100,2	120,2	130,3	139,3	160,4	200,4	230,5	240,5
Exhaust-gas volume at partial load	Nm³/h	14,5	14,5	21,7	28,9	32,5	36,1	43,4	47,0	50,2	57,8	72,3	83,1	86,7
Incline of the exhaust-gas pipe	°	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3
Connection height exhaust-gas pipe	mm	1735	1735	1735	1735	1735	1735	1830	1830	1830	1830	1830	1830	1830
Exhaust-gas pipe diameter	mm	150	150	150	150	150	150	180	180	180	180	200	200	200
Chimney diameter (approx. values)	mm	150	150	150	180	180	180	180	180	200	200	220	220	220
Chimney design: Moisture-resistant	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Fuel: Pellets of pure wood in accordance with ISO 17225-2														
Calorific value	MJ/kg	16,5	16,5	16,5	16,5	16,5	16,5	16,5	16,5	16,5	16,5	16,5	16,5	16,5
Density	kg/m³	≥ 600	≥ 600	≥ 600	≥ 600	≥ 600	≥ 600	≥ 600	≥ 600	≥ 600	≥ 600	≥ 600	≥ 600	≥ 600
Water content	% by weight	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10
Ash content	% by weight	≤ 0,7	≤ 0,7	≤ 0,7	≤ 0,7	≤ 0,7	≤ 0,7	≤ 0,7	≤ 0,7	≤ 0,7	≤ 0,7	≤ 0,7	≤ 0,7	≤ 0,7
Length	mm	3,15-40	3,15-40	3,15-40	3,15-40	3,15-40	3,15-40	3,15-40	3,15-40	3,15-40	3,15-40	3,15-40	3,15-40	3,15-40
Diameter	mm	6±1	6±1	6±1	6±1	6±1	6±1	6±1	6±1	6±1	6±1	6±1	6±1	6±1
Dust proportion before loading	% by weight	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1
Raw material: pure wood, bark content <15 %	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ash														
Ash container volume	l	70	70	70	70	70	70	70	70	70	70	70	70	70
Ash container filled	kg	80	80	80	80	80	80	80	80	80	80	80	80	80
Ash removal system	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Electrical system														
Connection: CEE 5-pole	-	400 V _{AC} 50 Hz 13 A	400 V _{AC} 50 Hz 13 A	400 V _{AC} 50 Hz 13 A	400 V _{AC} 50 Hz 13 A	400 V _{AC} 50 Hz 13 A	400 V _{AC} 50 Hz 13 A	400 V _{AC} 50 Hz 13 A	400 V _{AC} 50 Hz 13 A	400 V _{AC} 50 Hz 13 A	400 V _{AC} 50 Hz 13 A	400 V _{AC} 50 Hz 13 A	400 V _{AC} 50 Hz 13 A	400 V _{AC} 50 Hz 13 A
Connected power MF2 D: P16S	W	1769	1769	1769	1769	1769	1769	1827	1827	1827	1827	1827	1827	1827
Connected power MF2 ZI	W	1655	1655	1655	1655	1655	1655	1713	1713	1713	1713	1713	1713	1713

MF2 D / MF2 ZI	Unit	20	30 ¹	30 ²	40	45 ¹	50 ¹	60 ¹	65 ¹	70 ¹	80	100 ²	108 ¹	120
Weights														
Water jacket	kg	300	300	300	340	340	340	360	360	360	360	450	450	450
Boiler body	kg	265	265	265	265	265	265	320	320	320	320	320	320	320
Boiler weight MF2 D (P16B/P45A)	kg	920	920	920	980	980	980	1100	1100	1100	1100	1200	1200	1200
Boiler weight MF2 ZI	kg	-	-	-	-	-	-	1129	1129	1129	1129	1229	1229	1229
Boiler weight MF2 ZI	kg	890	890	890	930	930	930	1070	1070	1070	1070	1170	1170	1170
Emissions according to test report														
Test report no.	-	13-UW/Wels-EX-344/1-4												
Noise emissions (EN 15036-1)														
Normal operating noise at rated power	dB(A)	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70
Wood chips, Ref. 10 % O₂ dry (EN303-5)														
CO at rated power	mg/Nm ³	13	10	9	4	9	10	14	15	17	20	15	13	<4
CO at partial load	mg/Nm ³	65	50	46	34	32	30	25	22	20	15	24	28	40
NO _x at rated power	mg/Nm ³	120	124	124	127	125	122	117	115	112	107	116	121	134
NO _x at partial load	mg/Nm ³	117	107	105	97	97	98	98	98	99	99	100	101	102
OGC at rated power	mg/Nm ³	<3	<4	<4	<3	<4	<4	<4	<4	<4	<3	<4	<4	<3
OGC at partial load	mg/Nm ³	5	<4	<4	<3	<4	<4	<4	<4	<4	<3	<4	<4	<3
Dust at rated power	mg/Nm ³	14	17	17	19	19	19	18	18	18	17	17	18	18
Dust at partial load	mg/Nm ³	10	12	13	14	14	14	13	13	13	11	13	13	14
Wood chips, Ref. 11 % O₂ dry														
CO at rated power	mg/Nm ³	12	9	8	3	8	9	13	14	15	19	14	12	<4
CO at partial load	mg/Nm ³	59	45	42	31	29	27	23	20	18	14	22	25	36
NO _x at rated power	mg/Nm ³	109	113	113	115	114	111	106	105	102	97	105	110	121
NO _x at partial load	mg/Nm ³	106	97	95	88	88	89	89	89	90	90	91	92	93
OGC at rated power	mg/Nm ³	<3	<3	<3	<2	<2	<2	<2	<2	<2	<3	<2	<2	<2
OGC at partial load	mg/Nm ³	5	<4	<4	<3	<3	<3	<3	<3	<3	<4	<3	<3	<3
Dust at rated power	mg/Nm ³	12	15	15	17	17	16	16	16	16	15	15	16	16
Dust at partial load	mg/Nm ³	9	11	12	12	13	13	12	12	12	10	12	12	12
Wood chips, Ref. 13 % O₂ dry														
CO at rated power	mg/Nm ³	10	7	7	3	7	7	10	11	12	15	11	9	<3
CO at partial load	mg/Nm ³	48	36	33	27	23	22	18	16	15	12	17	20	29
NO _x at rated power	mg/Nm ³	87	90	90	92	91	89	85	84	81	78	84	88	97
NO _x at partial load	mg/Nm ³	85	78	76	70	71	71	71	71	72	72	73	73	74
OGC at rated power	mg/Nm ³	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
OGC at partial load	mg/Nm ³	4	<4	<3	<2	<2	<2	<2	<2	<2	<2	<3	<3	<3
Dust at rated power	mg/Nm ³	10	12	12	14	14	14	13	13	13	12	12	13	13
Dust at partial load	mg/Nm ³	7	9	9	10	10	10	9	9	9	8	9	9	10
PPBT ³	mg/Nm ³	11	13	14	15	15	15	14	14	14	13	14	14	14
Wood chips, In accordance with § 15a-BVG Austria														
CO at rated power	mg/MJ	7	5	4	2	3	4	6	7	8	10	6	4	<2
CO at partial load	mg/MJ	32	25	23	18	17	16	13	12	11	8	14	16	20
NO _x at rated power	mg/MJ	59	66	67	72	70	67	63	60	58	53	60	62	66
NO _x at partial load	mg/MJ	58	53	52	48	48	48	49	49	49	49	50	50	50
OGC at rated power	mg/MJ	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1
OGC at partial load	mg/MJ	3	<3	<3	<2	<2	<2	<2	<2	<2	<2	<3	<3	<2
Dust at rated power	mg/MJ	7	8	8	9	9	9	9	8	8	8	9	9	9
Dust at partial load	mg/MJ	5	6	6	7	7	7	6	6	6	5	6	6	7

20.01.2015

1 ... Drawing inspection

2 ... Typification variants

3 ... PPBT = PP (dust) + 42% OGC according to Conto Termico 28.12.2012

mg/Nm³ ... milligram per standard cubic meter (Nm³ - standard cubic meter under 1013 hectopascal at 0 °C)

REQUIRED STRUCTURAL CONDITIONS

Note

Always observe the local statutory submission, construction and execution regulations that apply to you as a KWB system user! You can obtain these regulations, from the architect or competent authorities or similar authorities. Adherence to and verification of the local statutory regulations is a precondition for our guarantee, warranties and for your insurance coverage. KWB does not accept any liability, nor does it offer any warranties for any type of building measures. Proper execution of building measures is the sole responsibility of the system owner. As a biomass heating system user, you may be entitled to receive specific regional subsidies. Inquire promptly about time limits and procedures for handling subsidy applications. Comply with the dimension specifications in the installation examples and technical specifications. Without laying claim to an exhaustive treatment of the issue at hand and without suspension of any conditions imposed by the authorities, based on the Austrian Directive TRVB H 118 and ÖKL technical bulletins No. 56 and No. 66, we recommend the configuration described below.

Heating room

Concrete flooring, plain or tiled; height-adjustable system feet can be used to compensate minor irregularities. All materials for floors, walls and ceilings must be fire resistant in REI90*; the heating room door (see boiler dimensions table for moving the boiler into the room) as it is a fire door (EI₂-30-C*) must open in escape direction and close automatically, the connection door to the fuel storage room must be an automatically closing fire door (EI₂-30-C*). Non-opening E30* Heating room window; non-closing intake air opening 5 cm² per kW rated power of heating system, but no less than 400 cm². If the boiler output is > 60 kW, it is necessary to integrate one ventilation opening near the floor and another ventilation opening near the ceiling; the supply air ducting must be routed directly into the opening; if it crosses other rooms, the air duct must feature an I90* envelope; a protective grille with a mesh width of < 5 mm must be fitted on the outside of ventilation openings. Permanently installed lighting and electrical supply to the heating system; light and labelled emergency stop switch of the heating system, in an easily accessible location outside the heating room in the vicinity of the heating room door. A portable fire extinguisher (6 kg filling weight, EN3 standard) must be installed outside the heating room near the heating room door. The heating room as well as water lines and district heating pipes must be frost-resistant. There must be no storage of inflammable materials in the heating room outside the boiler system, storage container or hopper; no

direct connection to rooms where inflammable gases or liquids (garage) are stored. You must comply with the local installation regulations.

Fuel storage room

The structural requirements for the heating room also apply to the fuel storage room. The stirrer is installed in the middle of the storage room and is fastened to the concrete floor with anchor bolts. A rear ventilated false floor/inclined floor should be installed at the same level as the top edge of the fuel extractor. The wall duct (width 60 cm, height 60 cm) for the screw channel between the storage room and heating room should be partitioned such that it is fireproof (e.g. with mineral wool). If a pumping car is used to fill the fuel storage room with wood chips or pellets, it is necessary to mount hose couplings and pipelines (to be earthed) which are available from KWB. If this filling method is chosen, dust proof sealing of the fuel storage room is required. The escaping air is removed through a second earthed pipeline and hose coupling, or it is blown off into the open air after having passed through a filtering section. Suction removal or filtration of the transport air is the responsibility of the fuel supplier. The walls, windows and doors must withstand the overpressure created during the filling process. In the event of bulk fuel storage, no electrical installations are permissible in the fuel storage room since they pose an ignition hazard. KWB biomass heating systems are supplied with all the necessary fire-protection equipment included. Depending on the local installation situation, type of fuel and amount of storage, a manually triggered fire extinguisher and/or the built in fire extinguisher may have to be connected to a pressurised water line. The fire extinguisher with manual release, featuring a frost-proof connection (from the heating room), is to be fitted at least ¾" or as DN20 directly above the conduit of the fuel-extractor channel leading into the fuel storage room in the form of empty piping. The shut-off device which is to be installed in the heating room, must be marked with the following sign "Fire extinguisher fuel storage room". A fire extinguisher with manual release must be installed in a storage systems containing 50 to 200 m³ of wood chips for systems up to and including 400 kW. If such a fuel-storage room is built next to fire-resistant structural components without openings, a REI90* enclosure/sheathing is not necessary. In the case of wood chip storage rooms in utility outbuildings with a fire wall facing the living quarters, a REI90* design/sheathing of the fuel-storage room is not necessary if the fire section is smaller than 500 m². Fuel must be stored separately from other goods (e.g. by means of wooden planking). »

* in accordance with ÖNORM EN 13501

A manual-release extinguisher and an integrated extinguishing system must be installed. In the case of storing up to (and including) 200 m³ of other wood materials (with dust) in systems up to and including 400 kW, an integrated extinguisher must be installed in addition to a manual-release extinguisher. For systems greater than 400 kW or stored quantities greater than 200 m³, both (a manual-release extinguisher and an integrated extinguisher) are necessary (see TRVB H 118). Additional statutory safety and acceptance conditions apply to storage rooms and silos that are continuously suction-fed with shavings or sanding dust. If you have any questions, please contact your KWB factory representative. Above ground fuel stores must be accessible to the outside by means of a door measuring at least 1.80 m² across, which should be planked to prevent the fuel from trickling outside should the door be opened by mistake. The planking should be removable from the outside. An inspection opening (REI90*) must be installed above the fuel extractor channel. Please refer to the installation examples.

Ventilation in the pellet storage room

The storage rooms and storage containers must be ventilated according to ÖNORM M7137 to prevent an increased CO concentration. The vents in storage rooms with a capacity up to 30 tons must lead to the outside. This is ensured by ventilated filling nozzles (available from KWB) that lead out into the open. **Filling nozzles that do not lead to the open air must not be ventilated!** In this case, ventilation must be ensured through a separate ventilation opening in the storage room (ventilation cross section $\geq 200 \text{ cm}^2$). This ventilation opening must be configured so that no dust can escape during the air-injection process and that the ventilation is operational after the filling of the storage (and not covered by pellets, or other debris). Care must be taken to ensure that no rainwater can penetrate into the pellet storage via the ventilation openings. To remove the risk of a carbon monoxide build up in storage rooms with a capacity of more than 30 tons, one of the following two options must be selected:

- A work organisation system that is combined with a natural or mechanical ventilation based on carbon monoxide sensors, or
- A state of the art forced ventilation system

Chimney

Due to the high boiler efficiency, the chimney design should be resistant to moisture. A moisture resistant chimney design means that there will be no moisture penetration or damage to the brickwork, although the temperature level in the exhaust gas path is permanently below the exhaust gas dew point (see DIN 18160). The approximate values for the chimney diameter are stated in the specifications. These apply to the respective size of the system based on the average structural conditions, meaning: effective

chimney height 8–10 m, 1.5 m smoke tube length, 2 segment bends at 90° each, 1 contraction, 1 T connection at 90°. You must comply with the specifications in the cross-section diagrams provided by the chimney manufacturer. If conditions differ or are less favourable in terms of space, it is necessary to carry out a chimney calculation according to DIN 13384. KWB provides an electronic data entry sheet for this purpose. Upon request, KWB will provide the chimney calculation based on the information provided on the form. This is a chargeable service. The local expert for these issues is your responsible chimney sweep. It is advisable to involve your chimney sweep during the planning phase as he is the one who will have to issue the acceptance certificate for the exhaust gas system.

Installing the heating system

Placement of the heating system

To be performed exclusively by qualified, trained personnel of KWB or KWB associates. Licensed heating and electrical installers must connect the heating system to the chimney, water and electrical system; this must be verified for numerous reasons, e.g. in order to be eligible for subsidies.

Smoke tube connection on the chimney

If not already required by local regulations, we recommend that a draft limiter and a blowback flap be built into the smoke tube, or chimney side wall, and arranged in such a manner as to exclude any danger to persons. Keep the smoke tube as short as possible. The smoke tube must be insulated and connected, and should at least ascend slightly towards the chimney, preferably with an inclination of less than 45°. The smoke tube should be thermally insulated and feature suitable, easily accessible cleaning openings. The chimney connection should be 20 mm larger than the smoke tube diameter. In this way, it is possible to integrate a suitable acoustic transmission decoupler between the smoke tube and the chimney. The KWB system is by default equipped with an induced draught fan.

Water connection

When using wood chips, the return flow inlet temperature into the boiler must be at least 55 °C, when using pellets at least 50 °C, otherwise there is an increased risk of corrosion, which also has the effect of voiding the guarantee and warranty. To increase the temperature of the return flow, the boiler control unit can activate a mixing controller. For systems to 60 kW the return flow boost can also be executed via a thermal control valve. Suitable fittings to increase the return flow temperature are available from KWB. With the exception of cases where the return flow temperature is maintained by a mixing pump of KWB, the heating system must feature a pressureless distribution system (switch, distributor, load balancing tank, buffer, thermal regulator, etc.) and a safety group that complies with the relevant regulations (e.g. according to ÖNORM EN 12828

or EN303). KWB recommends the installation of an intelligent buffer tank storage when installing a biomass heating system, which can be considered the energy centre of the heating system. As a result, the owner saves on heating costs due to lower fuel consumption, increases the annual efficiency coefficient as well as the profitability of the heating system and ensures perfect system solutions and lower emissions. The reason for this is that the heating system is focused on the coldest time of the year, this type of performance, however, is rarely needed and especially in transition periods, barely utilised. This leads to frequent burner starts, which has a negative effect on fuel consumption and the entire service life of the heating system. The effect is comparable to the stop and go traffic on the road. As a rule, a pellet heating system, however, does not need a buffer storage tank, we recommend it, for the aforementioned reasons. In exceptional cases, a buffer or load balancing storage tank is required:

- Oversizing: When the rated boiler output exceeds the entire building heat requirements by 50%, you will need a buffer storage tank (this is often the case when buildings are enlarged or in the case of low energy houses. In the event of such dimensioning, a large portion of the operating time the boiler will run under the boiler's smallest modulation degree. When using the buffer storage tank, the boiler can be operated in the preferred load range.
- Very small heating loads in summer/during transition periods, e.g. when only the bathroom is heated in summer/the transition period, the operation of only one or two heating units during transition periods, domestic hot water preparation in summer in a heating network without block charge, ...
- If parts of the heat dissipation system are frequently switched off or in the event of a high passive solar contribution
- In case of large demand for warm water, e.g. hotels, show-ers in sports facilities, large multi-family houses
- To cover peak periods in the morning, e.g. in production fa-cilities or schools
- After integration of a solar power heating system or a log-wood boiler
- Multi-boiler systems (boiler master-and-slave circuits)

Your installer can advise you specifically with regard to the water connection. Components of acoustically-insulated water connections must be impermeable to oxygen; otherwise there is an increased risk of corrosion, which also has the effect of voiding the guarantee and warranty. If plastic pipes for floor heating systems or district heating pipes are connected, it is necessary to integrate a limiting thermostat for the boiler circuit pump to provide additional protection against excessive temperatures. With respect to the condition of the boiler water, VDI 2035 and ÖNORM H 5195 T1 and T2

must be unconditionally complied with; otherwise there is a risk of corrosion, which may void the guarantee and warranty. In terms of corrosion on the one hand you must not get oxygen brought in the system on the other hand take care on the electrical conductivity of the heating water. To prevent deposits caused by chalk and corrosion sludge we recommend installing a dirt separator in the return flow as well as a micro-bubble resorber in the forward flow.

Electrical connections of the KWB Multifire system

The entire system internal wiring is executed in the factory or is executed plug ready by installation personnel. On site, only a licensed electrical installation company should execute the mains connection and the boilers external cabling, and in the case of a network, the bus cabling of the heating circuit expansion modules and for the room control units.

Required connections to be provided by customer:

- CEE socket supply 5-pole (L1/L2/L3/N/PE), with fault current protection switch and overvoltage arrester for the house distribution board (recommended as lightning protection), 400 V_{AC} line protection switch 13 A, type C
- Danger switch "emergency stop" (230 V_{AC}, cable cross section at least 1.5 mm²)
- If using KWB Comfort SMS: outlet 230 V_{AC}
- If using fuel extractor modules: per module 1 CEE socket 5-pole (L1/L2/L3/N/PE), 400 V_{AC}

Outputs:

Floating contacts with max. 2 A switched current, 230 V_{AC}

- Fault warning output.
Combined fault warning contact (e.g. for remote warning through telephone dialling).
 - Fault 1: NC contact to indicate faults.
 - Fault 2: NO contact to indicate faults.
- Power (the following options are also possible as alternatives):
NO, configurable for:
 - Burner operation display (modulation between partial load and nominal load).
 - Boiler master-and-slave circuit to request a second boiler.
 - Fuel extractor for common stirrer drive.
- Smoke extractor.
 - NO contact for activating an external smoke extractor.
 - The boiler is released by the controller of the external smoke extractor via external 1 (floating contact).

Inputs:

24 V_{DC} supply to connect floating contacts.

- External 1: To switch on the boiler (e. g. when using a smoke extractor).
If this input is not used, it must be short-circuited.
- External 2: Multifunction input.
 - Heating to desired 2: To request the boiler with the

* in accordance with ÖNORM EN 13501

second boiler temperature desired temperature or as a request contact for external third party controls (request duration should be at least 30 minutes).

- For holiday remote control (does not work with external boiler request).

- Emergency stop switch:
Connection of the emergency stop switch (in accordance with applicable regulation TRVB H 118)

Power Converter is only suitable for the KWB Multifire with max. 1 conveyor system motor. The KWB Power Converter is pre-wired internally, but must be connected to the boiler and the mains during installation.

Consisting of:

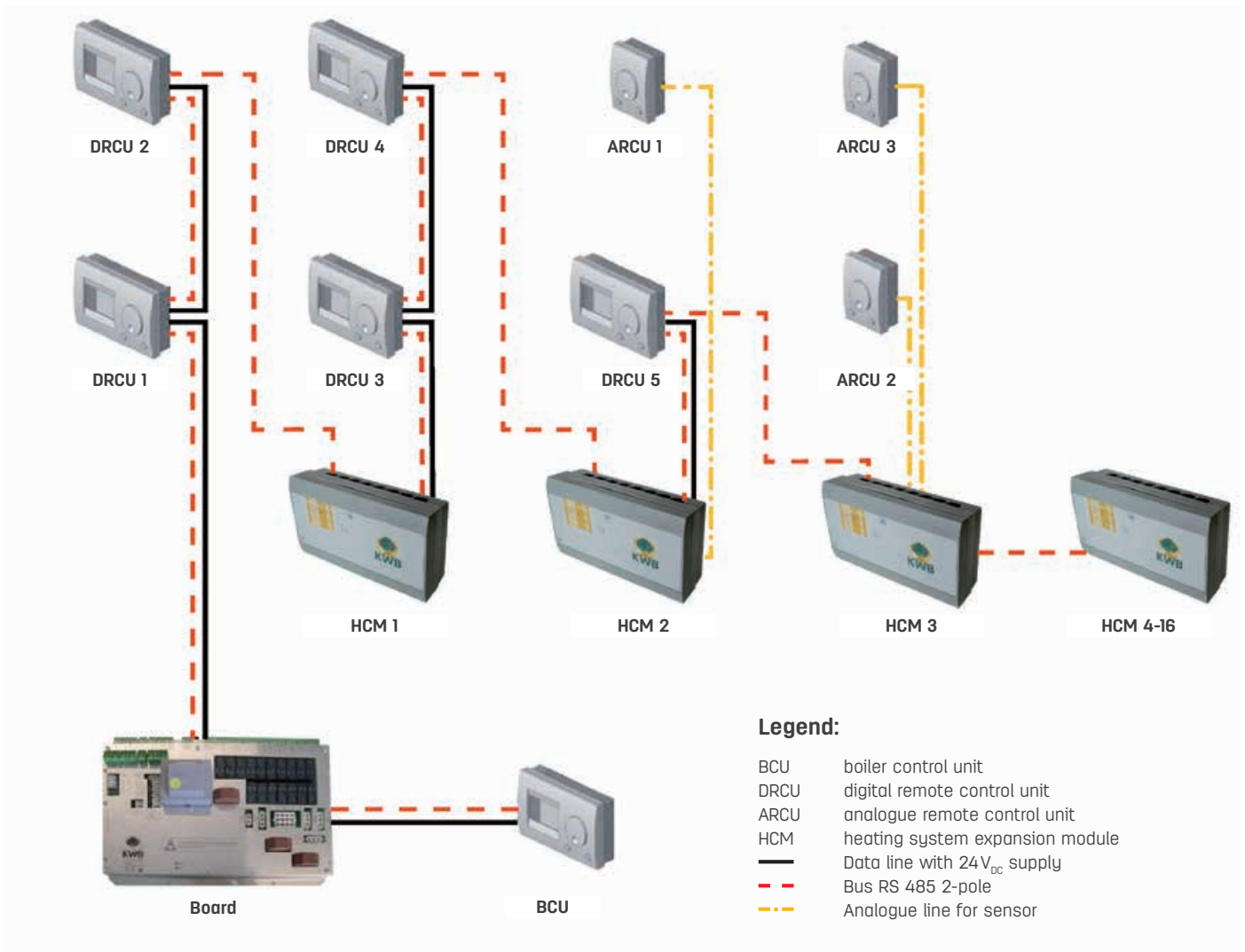
- Switch box for wall mounting
- 3 frequency converters (main drive motor, heating exchange motor and conveyor system motor)
- Activation electronics

KWB Power Converter

A KWB Power Converter is necessary to be able to operate KWB Multifire heating systems in 230V networks. The KWB

Bus system – conditions

- Bus cable: CAT.5e, S/FTP; 4 × 2 × AWG 24, maximum length 850m, for underground installation: CAT.5e, 4 × 2 × 0.5 mm².
- Laid out in a separate conduit (not together with 230/400 V_{AC}).
- Network stations in one line (no branches, no ring).
- If the boiler control unit in the room is used, it is necessary to install an empty base with bus connector CAT.5e (not possible in combination with the KWB Comfort SMS).
- Max. 2 digital remote control units after a heating circuit expansion module or heating-system master board are supplied with voltage. Each heating circuit module must be powered with 230V and 50Hz mains voltage for the heating circuit module itself and for any connected DRCUs, pumps and mixer servomotors.
- For each heating circuit, an analogue remote control unit (no bus station) can be used independent of the bus stations. Wiring is the same as for a room sensor.



GUARANTEES AND WARRANTIES

From warranty
too full
guarantee

OUR STANDARDS



**Statutory
warranty**



**Heat exchanger
guarantee**



**Spare part
delivery guarantee**

ADDITIONAL PACKAGES



Maintenance agreement

- ✓ 3 year guarantee
- ✓ We will remind you annually
- ✓ Cost saving as compared to individual maintenance



Guarantee Pass

- ✓ 6 year guarantee
- ✓ On all spare/wearing parts
- ✓ Service during replacement of spare/wearing parts free of charge as part of maintenance



The carefree package

- ✓ Calculable fixed costs
- ✓ The all inclusive package

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