

Technology and planning

## KWB POWERFIRE

Wood chip and pellet heating system

*We provide  
energy  
for life!*



valid as of March 2015

# KWB POWERFIRE

Wood chip and pellet heating system 130-300 kW

*Quiet power package for reliable heating*

[www.kwb.net](http://www.kwb.net)

clean<sup>+</sup> **EFFICIENCY**  
Combustion technology

# Valuable Partnership

**M**ore 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.



## Content

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### Introduction

- 2 Preface & Contents
- 3 The company KWB
- 4-5 **KWB Powerfire**: Quiet power package for reliable heating
- 6-7 Our **advantages** – your **benefit**
- 8-9 **Easy** operation



### Conveyor systems and installation examples

- 10-11 KWB Stirrer
- 12 Conveyor systems for type TDS 130–150 kW
- 13 Conveyor systems for type TDS 200\*-300 kW
- 14 Conveyor systems for moving floors
- 15-22 Installation examples



### Installation and maintenance

- 23-31 Installation and connecting dimensions

### Technical specifications

- 32-33 Overview in table format
- 34-38 Required structural conditions
- 39 Guarantees and warranties





**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.



# QUIET POWER PACKAGE

Due to its special features, the **KWB Powerfire** is suitable for the heat supply of regional district heating networks, commercial companies as well as multi-storey and residential buildings. The **KWB Powerfire** is also very flexible with respect to the fuel to be used. Its broad fuel flexibility is very impressive.



## Broadband lambda probe

Exact oxygen measuring, high level of efficiency

## Cyclone combustion chamber

Innovative, optimized flow dynamics, efficient fly ash separation, low emissions

## Perfect combustion

Thanks to a revolving grate combustion system with a staged primary air supply as well as a downstream cyclone combustion chamber.



## Quiet and energy-efficient

The mechanical systems' smart design enables smooth operating conveyor systems and high-quality drive technology.

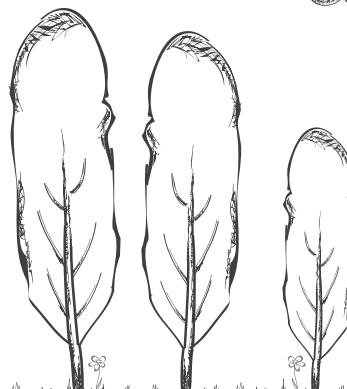
## Revolving grate system

Robust, quiet ember bed, optimal gasification conditions, self-cleaning

## Exhaust gas circulation

Required for TDS 130-300 for fuels with a water content < 20% (pellets and dry wood chips)





### Heat exchanger

Compact construction, high efficiency, effective fly-ash separation

### KWB Comfort 3 control

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



### Highly efficient turbulators

Ensure optimal heat exchanger cleaning, low exhaust temperatures and a consistently high efficiency level.



### Exhaust gas circulation

For an optimal level of efficiency, low emissions, guaranteed durable system protection with dry fuels.

### Automatic ash removal

Integrated fill level monitoring; ash removal in container (240l) optionally possible

# OUR ADVANTAGES

## KWB POWERFIRE INNOVATIONS



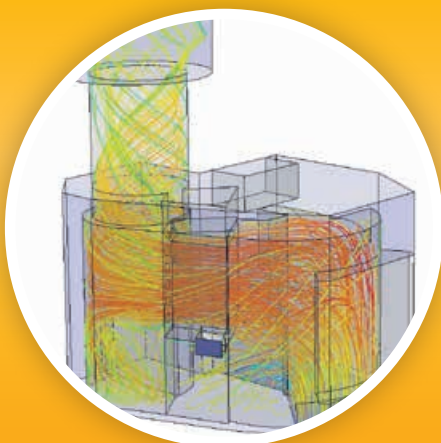
### Efficient due to a high efficiency of the systems

The installed special springs in the heat exchanger ensure optimal heat exchange and low exhaust gas temperatures.



### Easy installation

Even boilers of this power class are easily integrated and quickly installed thanks to the modular structure of the system.



### Clean because of optimal burnout

The cyclone post-combustion ensures a perfect turbulence of the exhaust gases and a complete burnout.



### Clean because of particle separation

**clean<sup>+</sup> EFFICIENCY** The combination of KWB Powerfire and E-Filter reduces the fine dust value to below 10 mg/Nm<sup>3</sup> (13% O<sub>2</sub>) and thus falls below all current dust limit values - even during measurements in the field!

# YOUR BENEFITS

## QUIET POWER PACKAGE FOR RELIABLE HEATING



### Convenient emptying of ash:

The pellet and wood chip heating system offers fully automatic heat exchanger ash removal into moveable ash containers. This results in increased convenience due to longer intervals between emptying and very little time spent on removing the ash.



### Easy maintenance

The burner unit is extendable when in maintenance mode and thanks to this feature ensures easy maintenance and shorter standstill periods over the long term.



### High fuel flexibility

Suitable for dry, small sized fuels up to large-sized fuel types, ash rich wood chip fuels with increased water content.



### Excellent system efficiency

Optimal fuel utilization, low minimum power consumption and high degree of system efficiency ensure optimal profitability.

# 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.

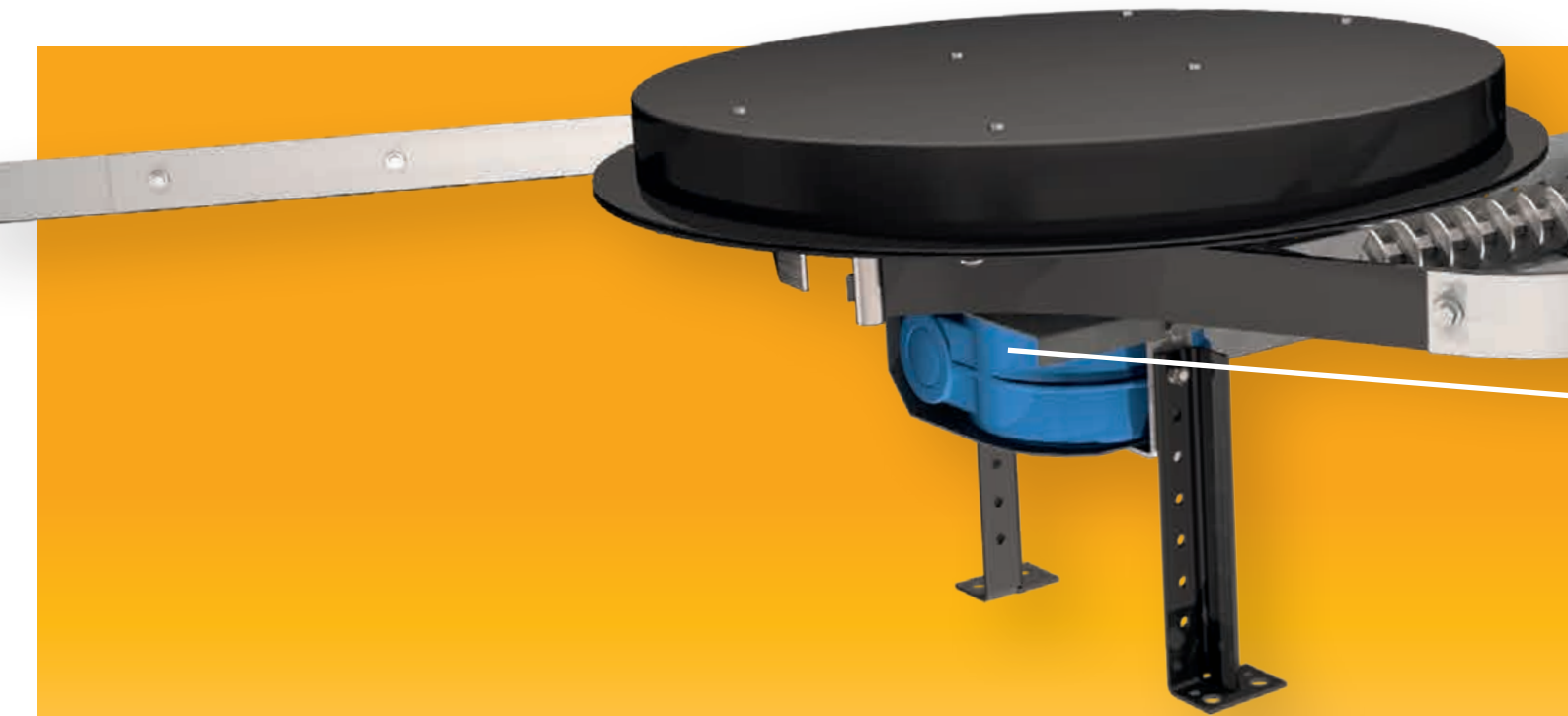
# KWB STIRRER

## 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

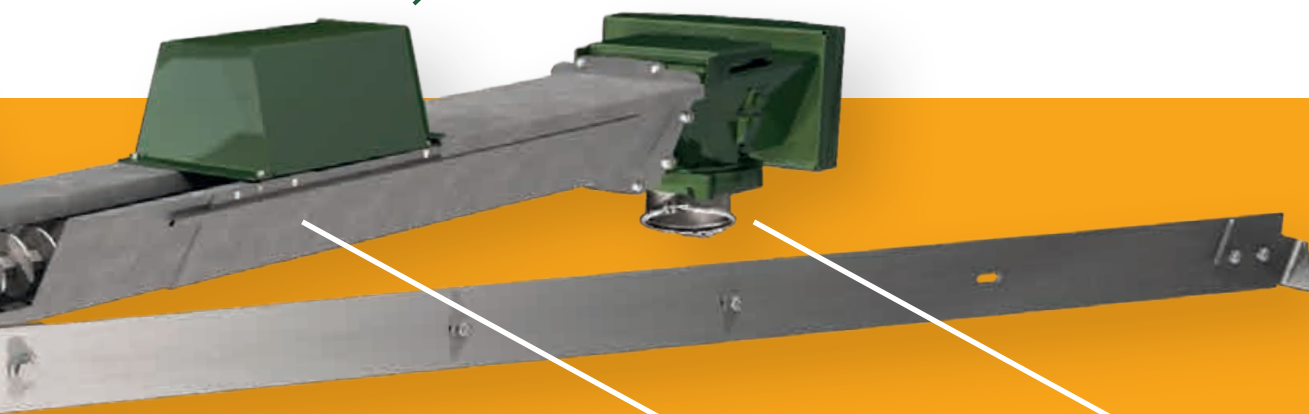
- ✓ **Long service life and high wear resistance** of the screw thanks to stainless steel spirals in the feed area and a maintenance-free, double sealed heavy duty gear unit in trough form.
- ✓ **No buoying upwards of the conveyor screw** in the channel due to an optimised channel shape.
- ✓ **No overfilling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

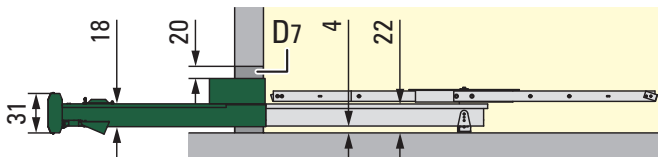
A deep filling chamber ensures enough space for long and coarse wood chips

# TYPE TDS 130–150 kW

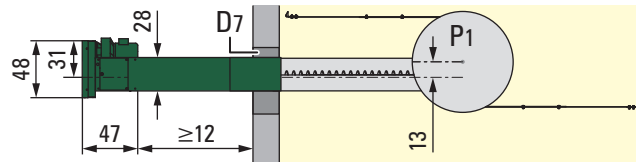
## Floor-level rotary-blade stirrer

Depending on requirements, the floor-level rotary blade 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). The floor-level rotary-blade stirrer can be utilized for operation with wood chips up to 150 kW and with exclusive pellet operation up to 300 kW.

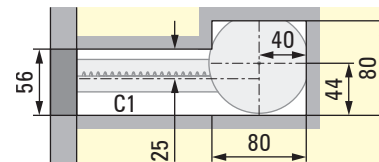
### Outline



### Ground plan



Floor openings  
(when the conveyor systems is lowered into the ground)

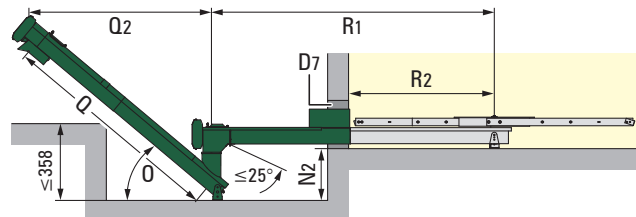


## Ascending screw

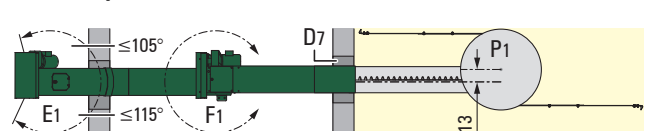
Two ascending screw models are available in case of a difference in the levels between storage room and heating room or when the stirrer is installed horizontally: The **ascending screw with upward transfer** (only for pellets up to 150kW boiler capacity) as well as the **ascending screw with downward transfer** (possible up to 150 kW for wood chips and 300 kW for pellets).

## Ascending screw with downward transfer

### Outline



### Ground plan



## Legend

<b>C1</b>	It must be possible to dismantle the inclined floor or false floor for about up to 30 cm around the channel!
<b>D7</b>	Wall duct 56x60 cm: seal after installation, channel must be acoustically decoupled
<b>E1</b>	Pivot range (connection to the fire shutter)
<b>F1</b>	Free rotation
<b>N2</b>	Shaft depth: 0°–25°: ≥45 cm, 26°–35°: ≥50 cm, 36°–45°: ≥60 cm
<b>O</b>	Incline: 0°–≤45°

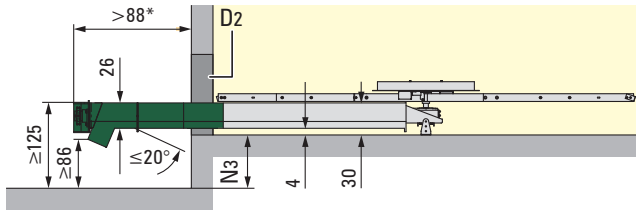
<b>P1</b>	Diameter of the stirrer cover plate: spring blade stirrer: Ø85 cm, articulated blade stirrer: Ø110 cm. Diameter of the stirrer: spring blade stirrer: Ø2.5 m, 3.0 m, 3.5 m, 4.0 m (4.5 m only for pellets), articulated blade stirrer: Ø4.0 m, 4.5 m, 5.0 m, 5.5 m
<b>Q</b>	Screw length (from the connecting point: head piece to fire shutter): 130–150 kW: Up to 15°: ≤12 m; 15°–45°: ≤6 m; 200–300 kW: Up to 15°: ≤10 m; 15°–40°: ≤5 m
<b>Q2</b>	45°: ≤4.39 m, 15°: ≤11.60 m
<b>R1</b>	Screw length: up to 15°: ≤12 m; 15°–25°: ≤6 m
<b>R2</b>	Screw length open

# TYPE TDS 200-300 kW

## Floor-level rotary-blade stirrer

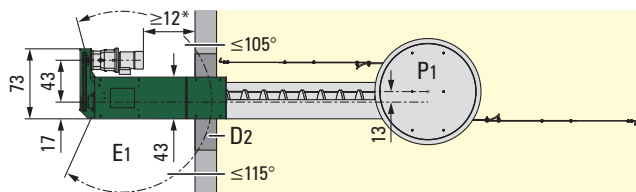
A separate screw channel with conveying screw was developed to meet the requirements of the KWB Powerfire 200-300 kW, which is characterised by special robustness and resistance to wear. In combination with the KWB stirrer, it is possible to implement stirrer diameters ranging from 2.5 to 5.5 m.

### Outline

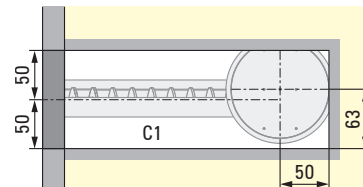


**Make sure to plan the recess very carefully and ensure exact implementation during construction! Deviations in natural measures and planning errors may lead to massive problems and additional costs during the installation of the fuel extraction!**

### Ground plan

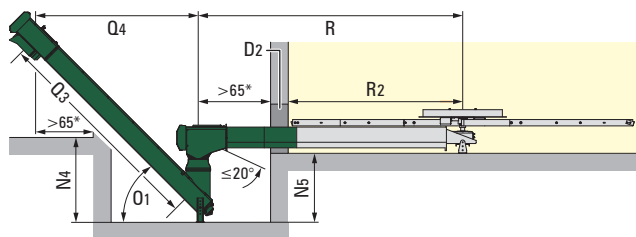


Floor openings (when the conveyor systems is lowered into the ground)

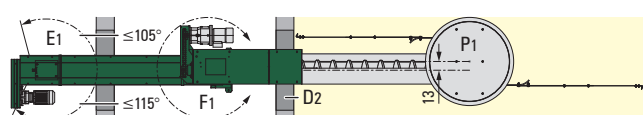


## Ascending screw with downward transfer for 200-300kW with wood chip operation

### Outline



### Ground plan



\* Include an additional  $\geq 25$  cm distance to the rear wall in the plan if the fuel extractor is to be installed diagonally (NOT flush with the system)! You should also include a sufficient number of openings and free spaces in the walls and ceilings – otherwise, it will not be possible to move the system into the room, to install and maintain it!

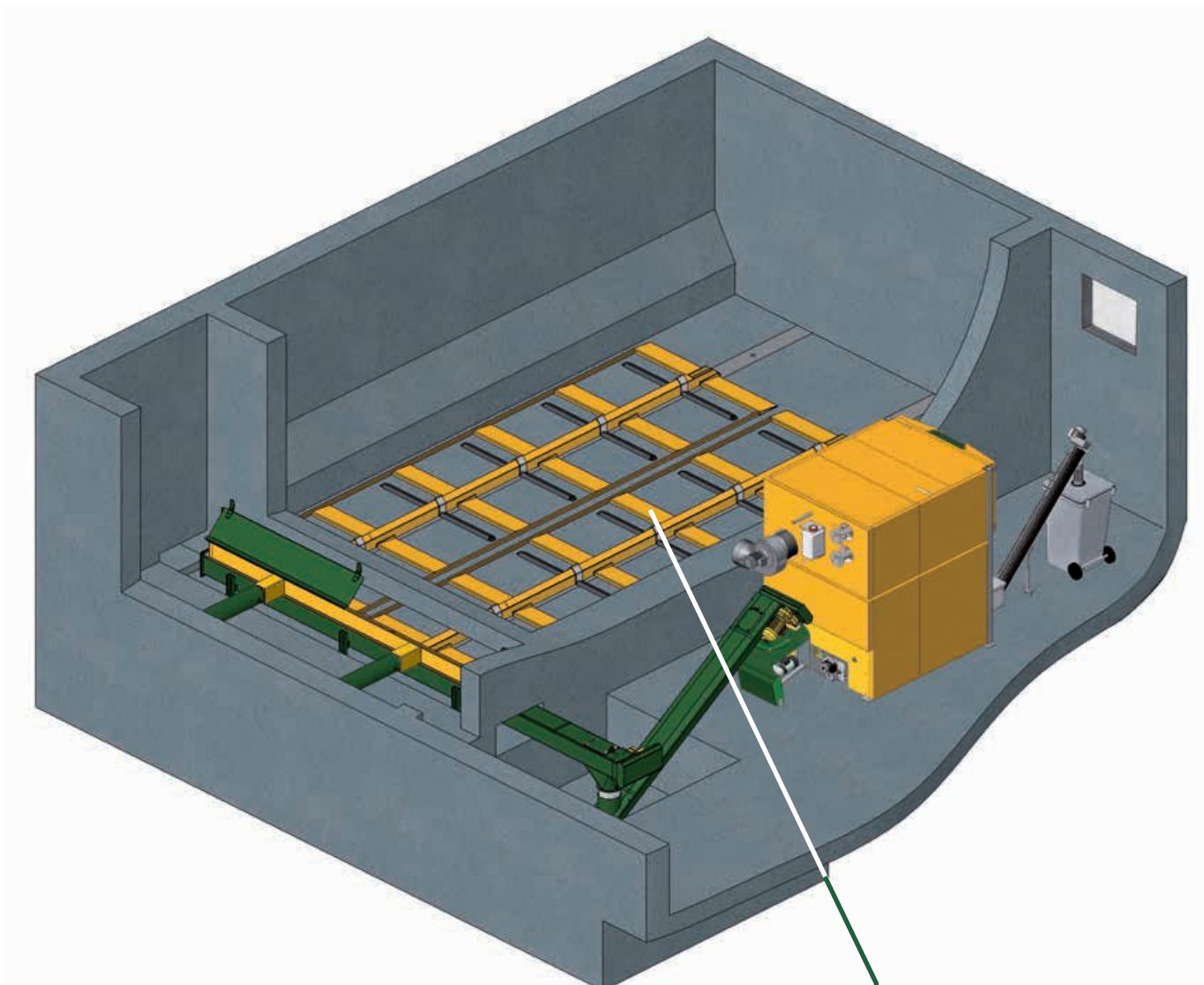
## Legend

<b>C1</b>	It must be possible to dismantle the sloping or false floor for up to 30 cm around the channel!
<b>D2</b>	Wall duct 100x80 cm: seal after installation, the channel must be acoustically decoupled
<b>E1</b>	Pivot range (connection to the fire shutter)
<b>F1</b>	Free rotation
<b>N3</b>	Shaft depth: $\geq 93$ cm
<b>N4</b>	$0^\circ: \leq 82$ cm, $40^\circ: \leq 720$ cm
<b>N5</b>	Shaft depth: 87 cm (depending on the incline)
<b>O1</b>	Incline: $0^\circ - \leq 40^\circ$
<b>P1</b>	Diameter of the stirrer cover plate: spring blade stirrer: $\varnothing 85$ cm, articulated blade stirrer: $\varnothing 110$ cm. 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

<b>Q3</b>	Screw length (from connection point: head piece drop shaft to the fire shutter): $0^\circ - 20^\circ$ : 0–8 m (0.75 kW motor) $20^\circ - 40^\circ$ : 0–5 m (0.75 kW motor) $0^\circ - 20^\circ$ : 8–12 m (1.5 kW motor) $20^\circ - 40^\circ$ : 5– $\leq 12$ m (1.5 kW motor)
<b>Q4</b>	Restriction: The same motor must be used for the conveyor screw and ascending screw! Use 1.5 kW motor protection control (Art. no. 13-1000655) for the 1.5 kW motor! $< 949$ cm (for a screw length of 12 m, $40^\circ$ )
<b>R</b>	Screw length: 0–6 m (0.75 kW motor) 6– $\leq 10$ m (1.5 kW motor)
<b>R2</b>	Screw length open

# Type 200-300 kW

with sliding floor



**Filling the storage room**  
quick and simple

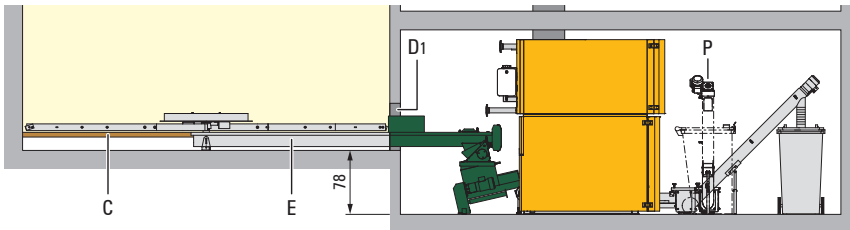


# TYPE 130-300 kW

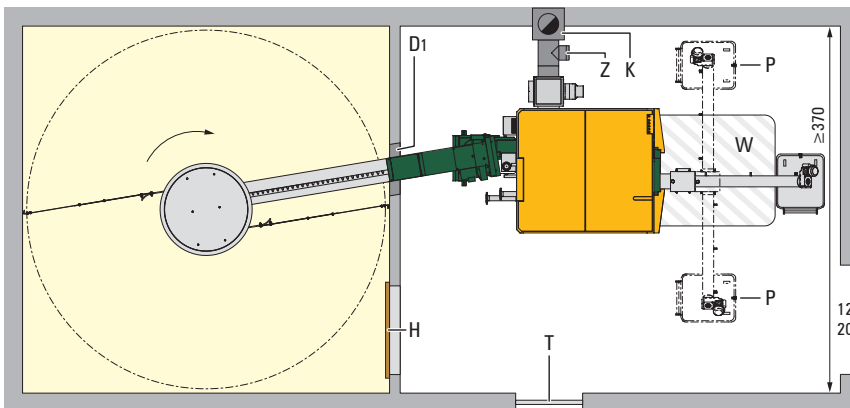
with fuel extractor from adjacent storage room and ash removal into an external ash container

## Installation example 130-150 kW

### Outline

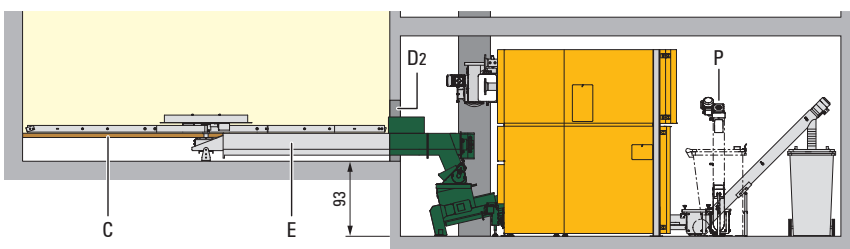


### Ground plan



## Installation example 200-300 kW

### Outline



## Legend

<b>A</b>	Emergency stop switch: Boiler NOT de-energised, but combustion stopped – heat dissipation continues!
<b>C</b>	False floor: rear ventilation recommended
<b>D1</b>	Wall duct 60x65 cm: seal after installation, channel must be acoustically decoupled
<b>D2</b>	Wall duct 100x80 cm: seal after installation, channel must be acoustically decoupled
<b>E</b>	Conveyor channel: recessed in the false floor

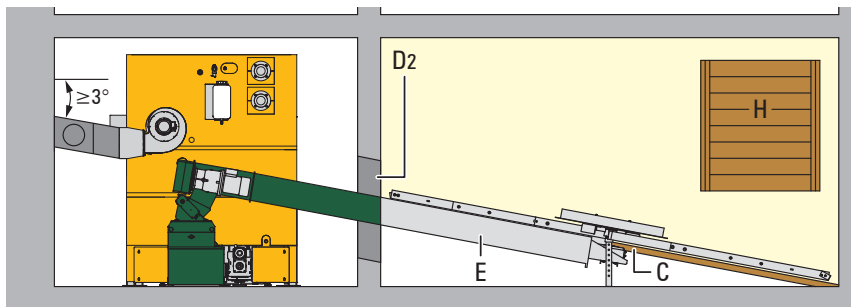
<b>F</b>	Fire extinguisher
<b>H</b>	Protective door boards for pressure relief
<b>K</b>	Chimney: smoke tube and chimney models according to "Technical specifications" table
<b>P</b>	Alternative position of the ash container
<b>T</b>	Window: ventilation: 5 cm <sup>2</sup> per kW
<b>W</b>	Maintenance area
<b>Z</b>	Energy-saving damper: installation with blowback flap

\* Recommended door dimensions. The recommended door dimensions for a system installation when the system is in a dismantled state are 1x2 m (with a surcharge).  
 EI90 according to ÖNORM EN 13501, EI, 30-C according to ÖNORM EN 13501, E30 according to ÖNORM EN 13501  
 The boiler and storage rooms must be built according to TRVB H118 guidelines as described in the chapter "General Constructional Conditions", and/or according to local building regulations!

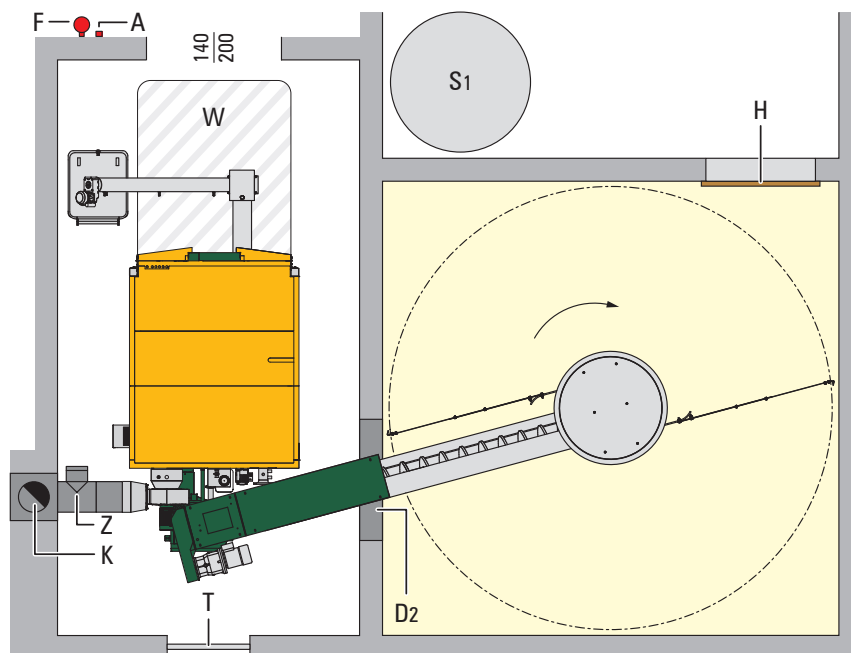
# Type 200-300 kW

with fuel extractor from adjacent storage room and ash removal into an external ash container

## Outline



## Ground plan



## Legend

<b>A</b>	Emergency stop switch: Boiler NOT de-energised, but combustion stopped – heat dissipation continues!	<b>H</b>	Protective door boards for pressure relief
<b>C</b>	False floor: rear ventilation recommended	<b>K</b>	Chimney: smoke tube and chimney models according to "Technical specifications" table
<b>D2</b>	Wall duct 100x80 cm: seal after installation, channel must be acoustically decoupled	<b>S1</b>	Buffer storage tank: as load balancing buffer: $\geq 6000l$ . For pure accumulator operation: $\geq 8000l$
<b>E</b>	Conveyor channel: recessed in the false floor	<b>T</b>	Window: ventilation: $5 \text{ cm}^2$ per kW
<b>F</b>	Fire extinguisher	<b>W</b>	Maintenance area
		<b>Z</b>	Energy-saving damper: installation with blowback flap

REI90 according to ÖNORM EN 13501, E1, 30-C according to ÖNORM EN 13501, E30 according to ÖNORM EN 13501

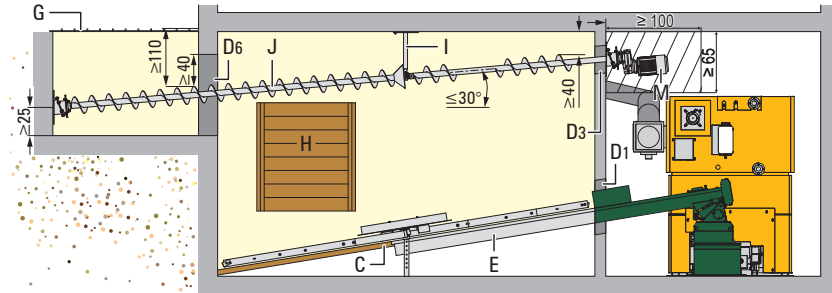
The boiler and storage rooms must be built according to TRVB H118 guidelines as described in the chapter "General Constructional Conditions", and/or according to local building regulations! A dead floor - as shown in the installation examples - should also be provided.



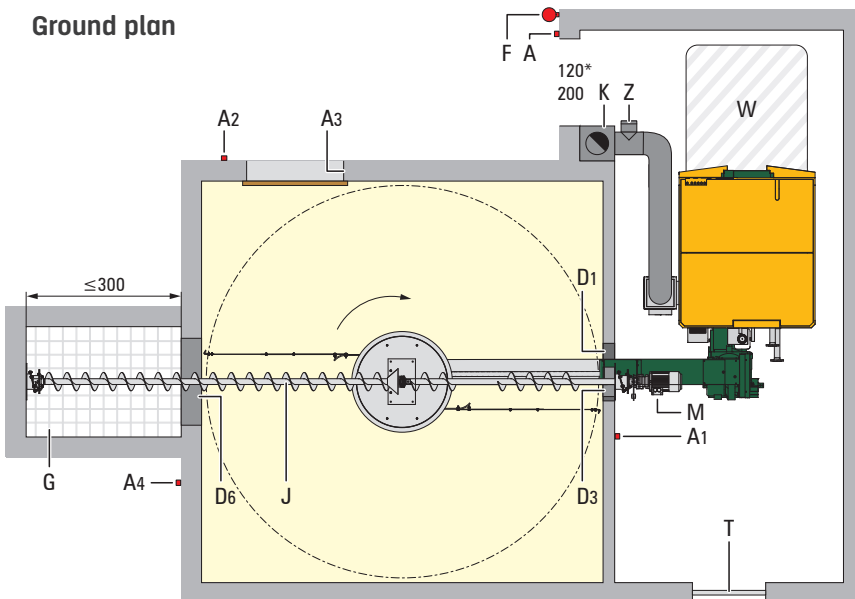
# TYPE 130–150 kW

with conveyor system from adjacent storage room and filling screw

## Outline



## Ground plan



## Legend

<b>A</b>	Emergency stop switch: Boiler NOT de-energised, but combustion stopped – heat dissipation continues!	<b>E</b>	Conveyor channel: recessed in the false floor
<b>A1</b>	Emergency stop switch or push button: at the motor	<b>F</b>	Fire extinguisher
<b>A2</b>	Emergency stop switch or push button with key: at the door to the fuel storage room	<b>G</b>	Protective grille: mesh width: 15x15 cm, thickness: ≥1cm
<b>A3</b>	Door contact end switch: on the door frame to the fuel storage room	<b>H</b>	Protective door boards for pressure relief
<b>A4</b>	Emergency stop switch + ON button + OFF button: At the operator station at the filling shaft	<b>I</b>	Intermediate bearing (filling screws exceeding 8 m require 2 intermediate bearings)
<b>C</b>	False floor: rear ventilation recommended	<b>J</b>	Filling screw
<b>D1</b>	Wall duct 60x65 cm: seal after installation, channel must be acoustically decoupled	<b>K</b>	Chimney: smoke tube and chimney models according to "Technical specifications" table
<b>D3</b>	Wall duct Ø 10 cm: seal after installation, channel must be acoustically decoupled	<b>M</b>	Drive motor: must be outside of the burner chamber storage room
<b>D6</b>	Wall duct ≥80x80 cm: seal after installation, channel must be acoustically decoupled	<b>T</b>	Window: ventilation: 5 cm <sup>2</sup> per kW
		<b>W</b>	Maintenance area
		<b>Z</b>	Energy-saving damper: installation with blowback flap

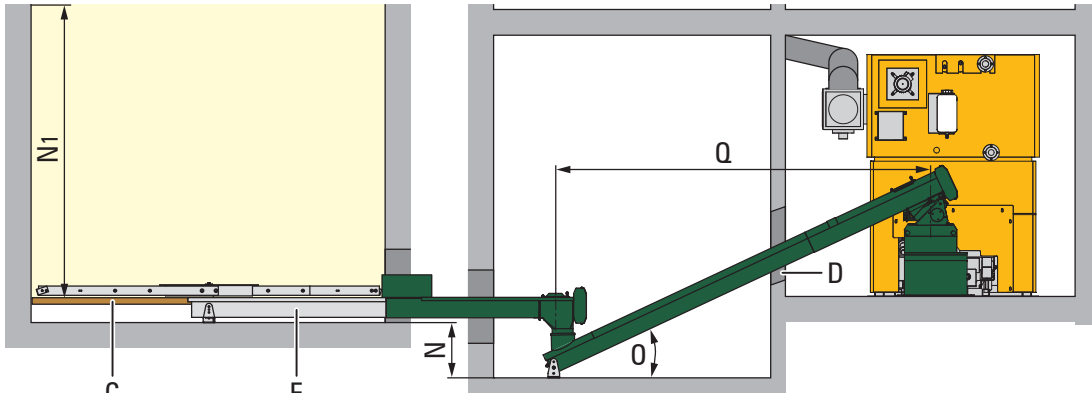
\* Recommended door dimensions. The recommended door dimensions for a system installation when the system is in a dismantled state are 1x2 m (with a surcharge). REI90 according to ÖNORM EN 13501, EI, 30-C according to ÖNORM EN 13501, E30 according to ÖNORM EN 13501

The boiler and storage rooms must be built according to TRVB H118 guidelines as described in the chapter "General Constructional Conditions", and/or according to local building regulations!

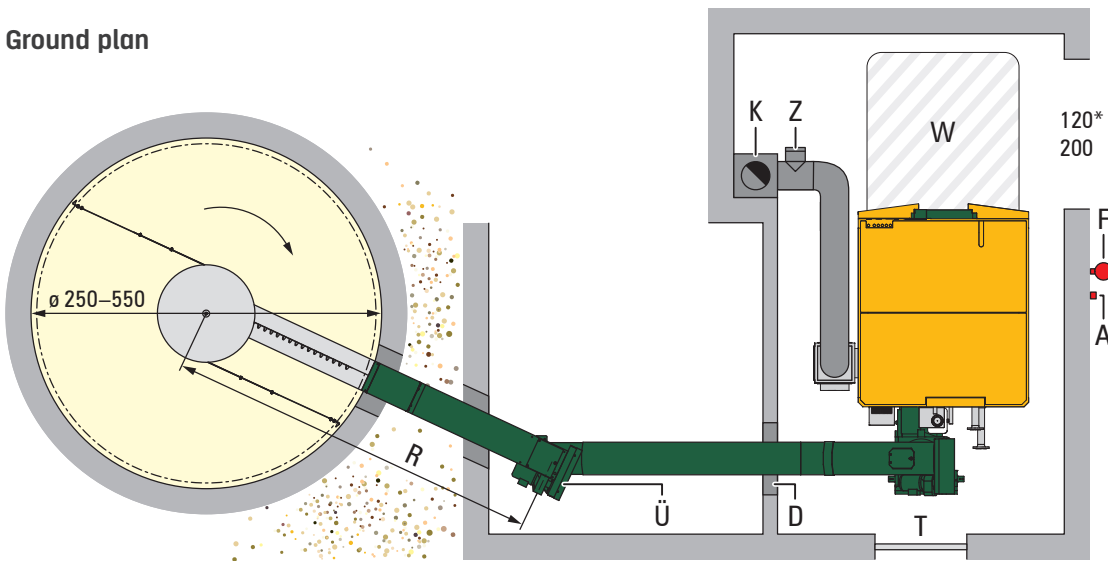
# TYPE 130–150 kW

with fuel extractor from storage room below and ascending screw with downward transfer

Outline



Ground plan



## Legend

<b>A</b>	Emergency stop switch: Boiler NOT de-energised, but combustion stopped – heat dissipation continues!	<b>NI</b>	Dumping height upon request (depends on width, length and fuel)
<b>C</b>	False floor: rear ventilation recommended	<b>O</b>	Incline: 0°–≤45°
<b>DI</b>	Wall duct 60x65 cm: seal after installation, channel must be acoustically decoupled	<b>Q</b>	45°: ≤ 439 cm, 15°: ≤ 1,160 cm
<b>E</b>	Conveyor channel: recessed in the false floor	<b>R</b>	Screw length: ≤ 1200 cm
<b>F</b>	Fire extinguisher	<b>T</b>	Window: ventilation: 5 cm <sup>2</sup> per kW
<b>K</b>	Chimney: smoke tube and chimney models according to "Technical specifications" table	<b>U</b>	Transfer station: include maintenance area in planning
<b>N</b>	Height difference: up to 25°: ≥45 cm, 26°–35°: ≥50 cm, 36°–45°: ≥60 cm	<b>W</b>	Maintenance area
		<b>Z</b>	Energy-saving damper: installation with blowback flap

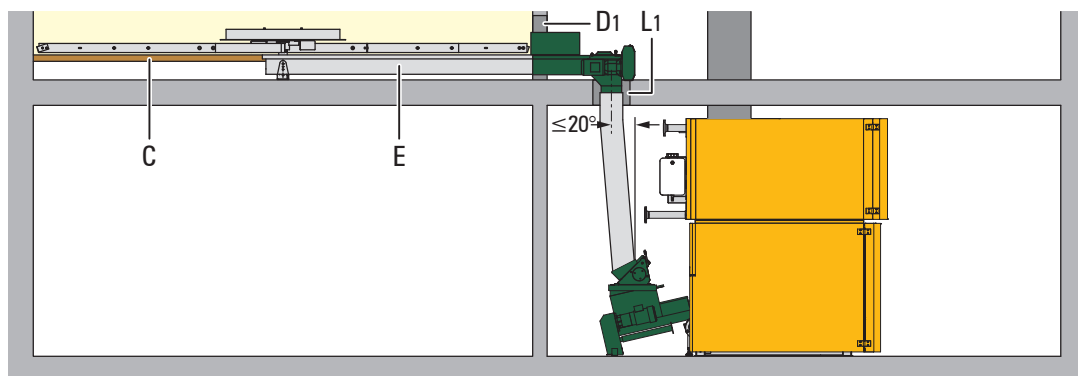
\* Recommended door dimensions. The recommended door dimensions for a system installation when the system is in a dismantled state are 1x2 m (with a surcharge). REI90 according to ÖNORM EN 13501, EI, 30-C according to ÖNORM EN 13501, E30 according to ÖNORM EN 13501

The boiler and storage rooms must be built according to TRVB H118 guidelines as described in the chapter "General Constructional Conditions", and/or according to local building regulations! For long components, allow sufficient free space (for installation, disassembly and maintenance). Openings in the ceiling or in the wall may be necessary.

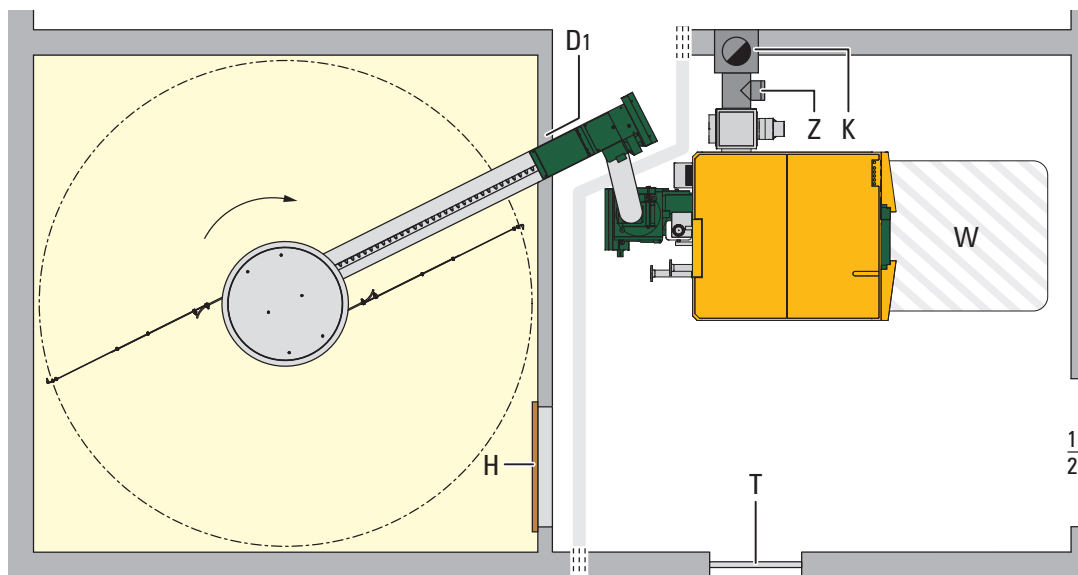
# TYPE TDS 130–150 kW

with conveyor system from storage room above

## Outline



## Ground plan



## Legend

<b>A</b>	Emergency stop switch: Boiler NOT de-energised, but combustion stopped – heat dissipation continues!
<b>C</b>	False floor: rear ventilation recommended
<b>D1</b>	Wall duct 60x65 cm: seal after installation, channel must be acoustically decoupled
<b>E</b>	Conveyor channel: recessed in the false floor
<b>F</b>	Fire extinguisher

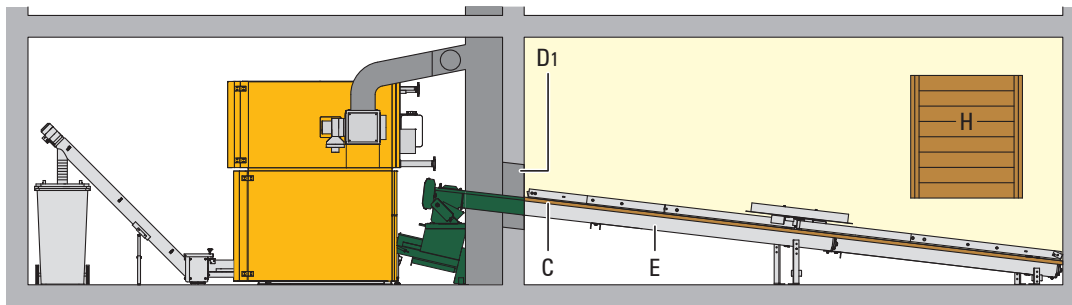
<b>K</b>	Chimney: smoke tube and chimney models according to "Technical specifications" table
<b>L1</b>	Ceiling duct 30x30 cm: seal after installation, channel must be acoustically decoupled
<b>T</b>	Window: ventilation: 5 cm <sup>2</sup> per kW
<b>W</b>	Maintenance area
<b>Z</b>	Energy-saving damper: installation with blowback flap

\* Recommended door dimensions. The recommended door dimensions for a system installation when the system is in a dismantled state are 1x2m (with a surcharge). REI90 according to ÖNORM EN 13501, EI, 30-C according to ÖNORM EN 13501, E30 according to ÖNORM EN 13501. The boiler and storage rooms must be built according to TRVB H118 guidelines as described in the chapter "General Constructional Conditions", and/or according to local building regulations!

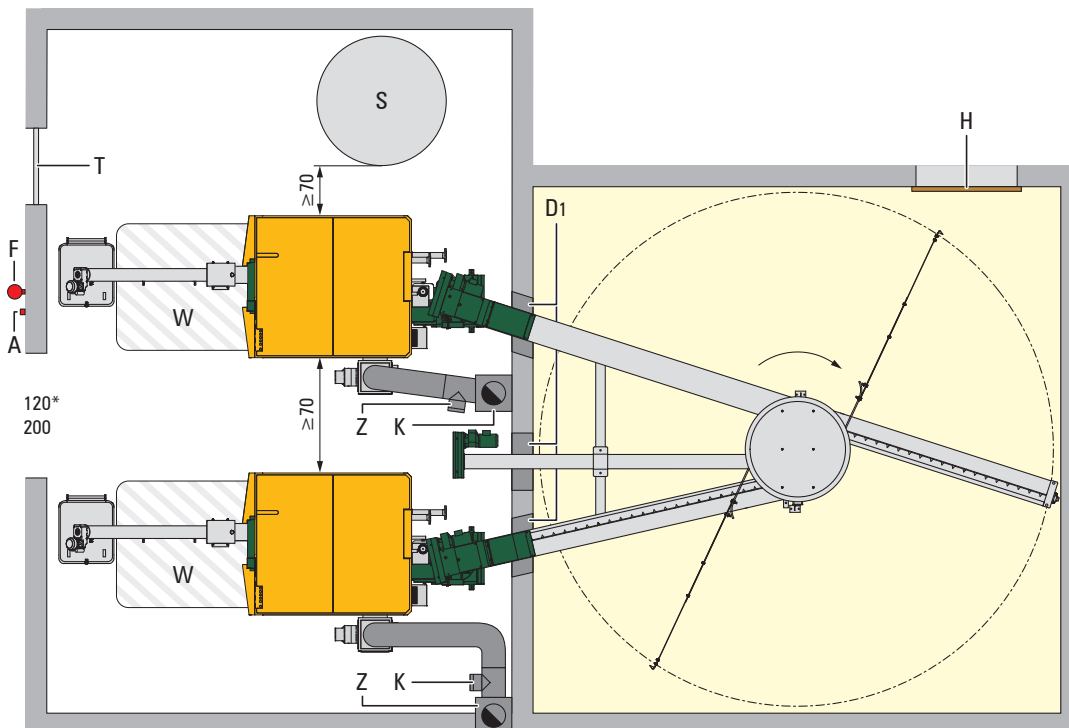
# TYPE TDS 130–150 kW

## Dual boiler system with one stirrer

### Outline



### Ground plan



### Legend

<b>A</b>	Emergency stop switch: Boiler NOT de-energised, but combustion stopped – heat dissipation continues!	<b>H</b>	Protective door boards for pressure relief
<b>C</b>	False floor: rear ventilation recommended	<b>K</b>	Chimney: smoke tube and chimney models according to "Technical specifications" table
<b>D1</b>	Wall duct 60x65 cm: seal after installation, channel must be acoustically decoupled	<b>S</b>	Buffer storage tank: as load balancing buffer: $\geq 6000\text{l}$ . For pure accumulator operation: $\geq 8000\text{l}$
<b>E</b>	Conveyor channel: recessed in the false floor	<b>T</b>	Window: ventilation: $5\text{ cm}^2$ per kW
<b>F</b>	Fire extinguisher	<b>W</b>	Maintenance area
		<b>Z</b>	Energy-saving damper: installation with blowback flap

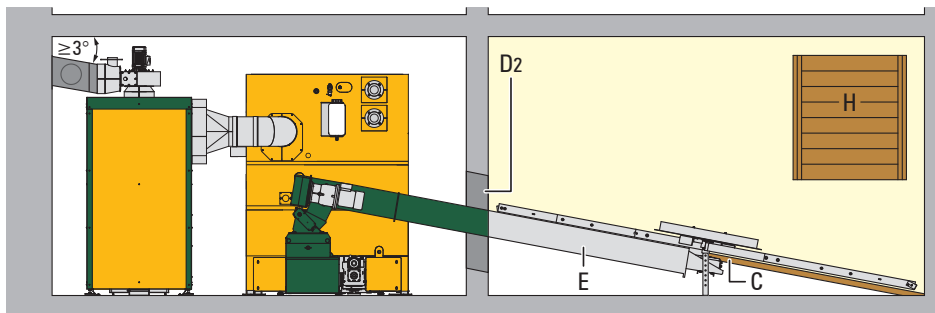
\* Recommended door dimensions. The recommended door dimensions for a system installation when the system is in a dismantled state are  $1 \times 2\text{ m}$  (with a surcharge). REI90 according to ÖNORM EN 13501, EI, 30-C according to ÖNORM EN 13501, E30 according to ÖNORM EN 13501

The boiler and storage rooms must be built according to TRVB H118 guidelines as described in the chapter "General Constructional Conditions", and/or according to local building regulations!

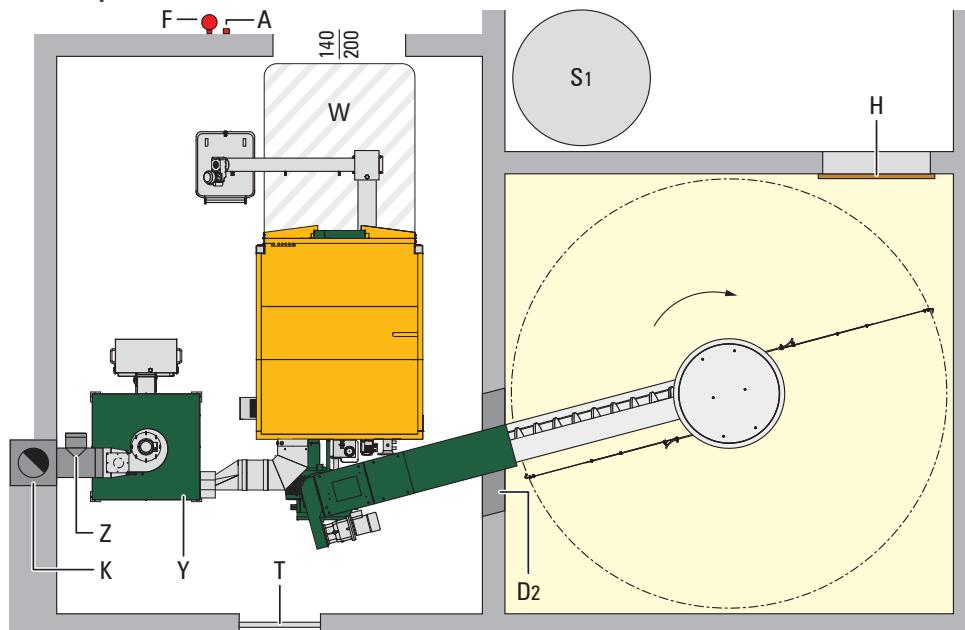
# TYPE TDS 200-300 kW

with fuel extractor from adjacent storage room and cyclone dust separator

## Outline



## Ground plan



## Legend

<b>A</b>	Emergency stop switch: Boiler NOT de-energised, but combustion stopped – heat dissipation continues!
<b>C</b>	False floor: rear ventilation recommended
<b>D2</b>	Wall duct 100x80 cm: seal after installation, channel must be acoustically decoupled
<b>E</b>	Conveyor channel: recessed in the false floor
<b>F</b>	Fire extinguisher
<b>H</b>	Protective door boards for pressure relief

<b>K</b>	Chimney: smoke tube and chimney models according to "Technical specifications" table
<b>S1</b>	Buffer storage tank: as load balancing buffer: $\geq 6,000$ l. For pure accumulator operation: $\geq 8,000$ l
<b>T</b>	Window: ventilation: $5 \text{ cm}^2$ per kW
<b>W</b>	Maintenance area
<b>Y</b>	Cyclone dust separator
<b>Z</b>	Energy-saving damper: installation with blowback flap

Cyclone weight (incl. ash trough, motor, screw): 346 kg

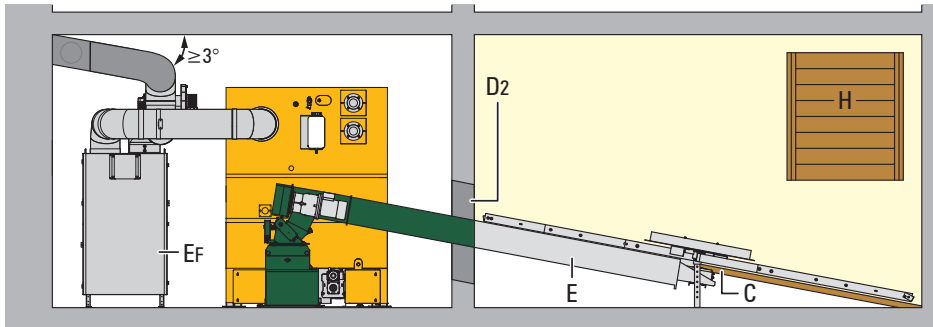
REI90 according to ÖNORM EN 13501, EI, 30-C according to ÖNORM EN 13501, E30 according to ÖNORM EN 13501

The boiler and storage rooms must be built according to TRVB H118 guidelines as described in the chapter "General Constructional Conditions", and/or according to local building regulations!

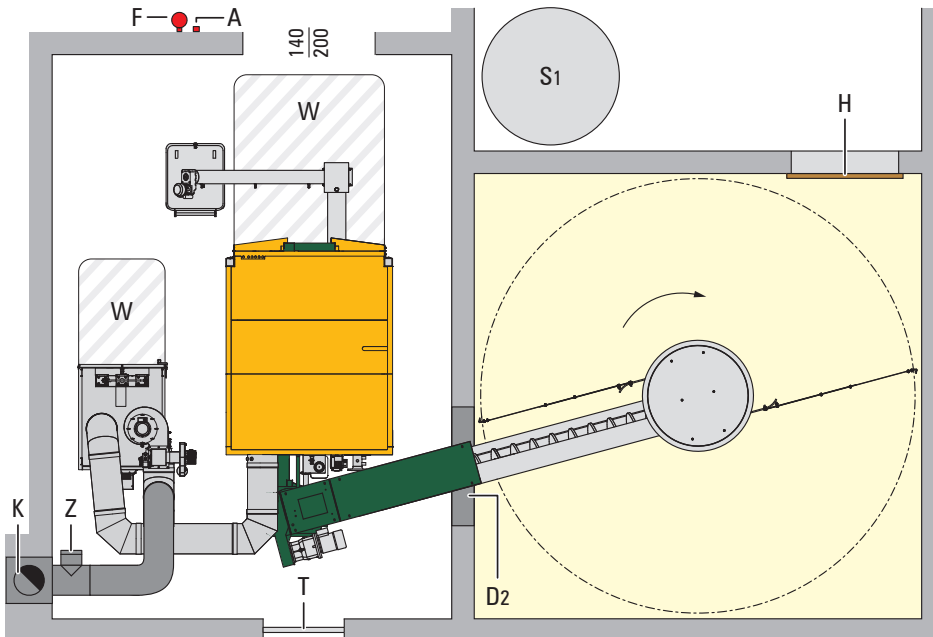
# TYPE TDS 200-300 kW

with conveyor system from adjacent storage room and E-Filter

## Outline



## Plan view



## Legend

<b>A</b>	Emergency stop switch: Boiler NOT de-energised, but combustion stopped – heat dissipation continues!	<b>H</b>	Protective door boards for pressure relief
<b>C</b>	False floor: rear ventilation recommended	<b>K</b>	Chimney: smoke tube and chimney models according to "Technical specifications" table
<b>D2</b>	Wall duct 100x80 cm: seal after installation, channel must be acoustically decoupled	<b>S1</b>	Buffer storage tank: as load balancing buffer: $\geq 6000$ l. For pure accumulator operation: $\geq 8000$ l
<b>E</b>	Conveyor channel: recessed in the false floor	<b>T</b>	Window: ventilation: $5 \text{ cm}^2$ per kW
<b>F</b>	Fire extinguisher	<b>W</b>	Maintenance area
<b>EF</b>	E-Filter	<b>Z</b>	Energy-saving damper: installation with blowback flap

REI90 according to ÖNORM EN 13501, EI, 30-C according to ÖNORM EN 13501, E30 according to ÖNORM EN 13501

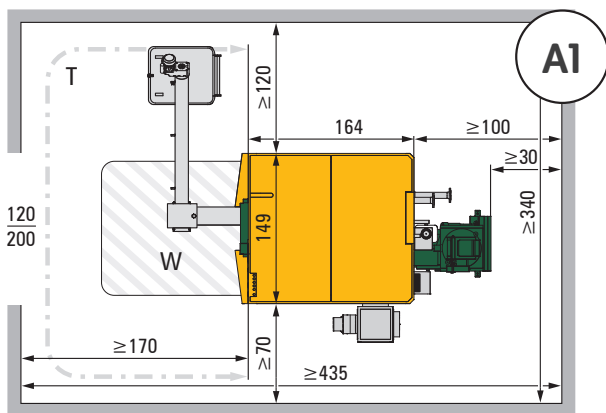
The boiler and storage rooms must be built according to TRVB H118 guidelines as described in the chapter "General Constructional Conditions", and/or according to local building regulations! A dead floor - as shown in the installation examples - should also be provided.

# Installation dimensions

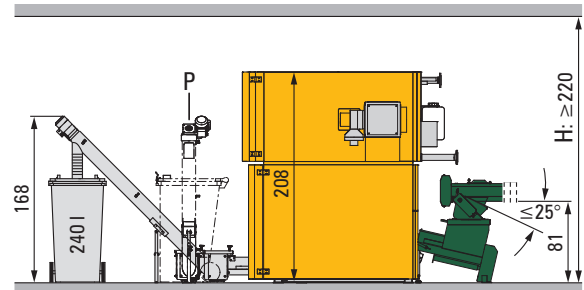
## Type TDS 130–150 kW

A minimum unobstructed door width of 1,20 m is necessary to be able to move the system into the room in a pre-assembled state. Door height should be 2 m. For a prompt and trouble free installation, it is necessary to inform KWB of the unobstructed door widths in the planning stage. Due to the weight of the ash container, a lifting device is recommended for stair access to the heating room.

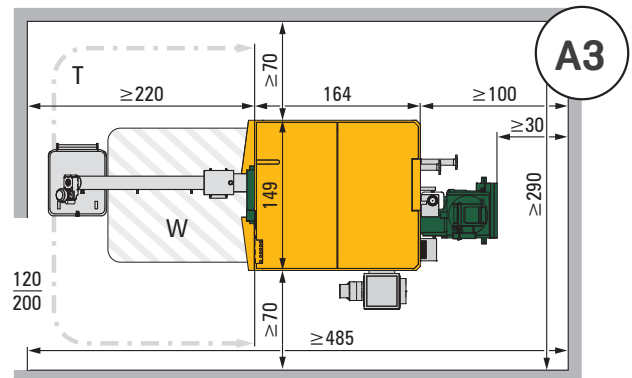
### Model A1: external ash container on the left



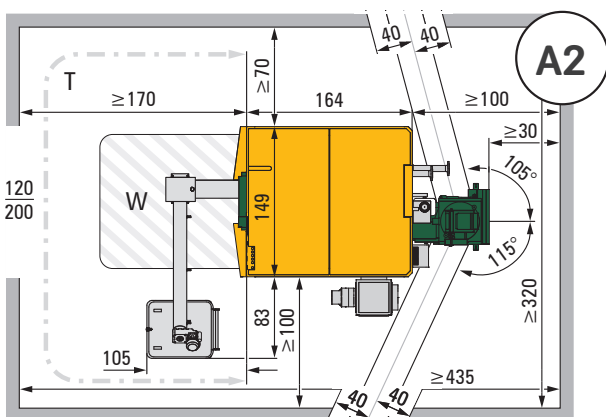
### Model: View from the right



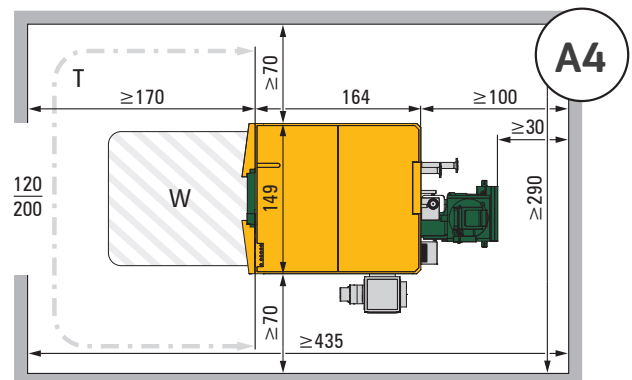
### Model A3: external ash container in front



### Model A2: external ash container on the right (with swing range of the conveyor system and wall duct)



### Model A4: internal ash container



## Legend

<b>H</b>	Room height: For room heights below 280 cm, the customer must provide suitable lifting tools (electrical forklift, wheel front loader, etc.).
<b>P</b>	Alternative position
<b>T</b>	Door area: valid for all models. The door must be in the drawn-in area – deviations require consultation with KWB! If the door is not directly in front of the system, the space requirement in front of the system increases to at least >220 cm.
<b>W</b>	Maintenance area

## Minimum room dimensions

	Ash-container position				
	Left	Right	Front	Internal	Any
<b>Version:</b>	A1	A2	A3	A4	
<b>Room width (W)</b>	340	320	290	290	370
<b>Room length (L)</b>	435	435	485	435	485
<b>Room height (H)</b>	220	220	220	220	220

REI90 according to ÖNORM EN 13501, EI, 30-C according to ÖNORM EN 13501, E30 according to ÖNORM EN 13501

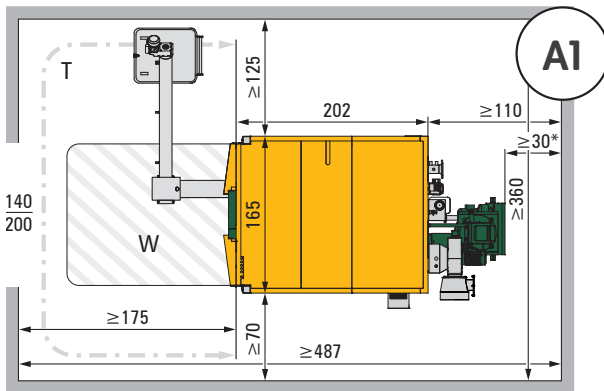
All distances stated are minimum dimensions and apply only to the installation variants shown! With regard to space requirements, please also pay attention to the smoke tube routing and chimney position – the space requirements for reducers and elbows may influence the minimum distances! It must be possible to detach the entire casing at any time.

# Installation dimensions

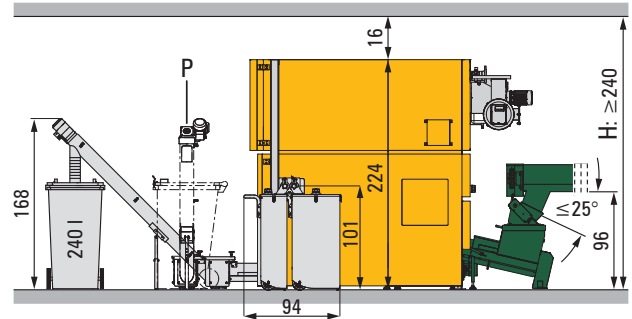
## Type TDS 200-300 kW

A minimum unobstructed door width of 1.40 m must be provided to be able to move the system into the room. The unobstructed door height must be 2 m. The unobstructed dimensions for the system to fit in case of a ceiling duct are 1.40 x 2.2 m. For a prompt and smooth installation, it is necessary to notify KWB of the unobstructed door widths in the planning stage. Due to the weight of the ash container, a lifting device is recommended for stair access to the heating room.

### Model A1: external ash container on the left

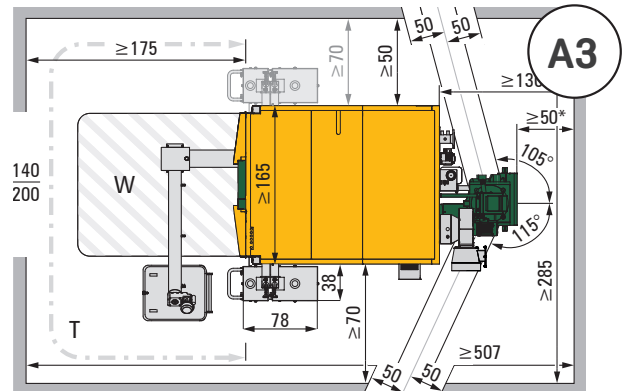


### Model: View from the right with heat exchanger ash removal in the comfort version

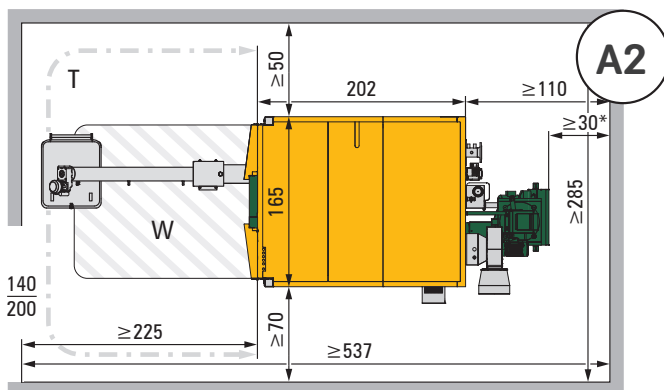


### Model A3: External ash container on the right and heat exchanger ash removal in the comfort version

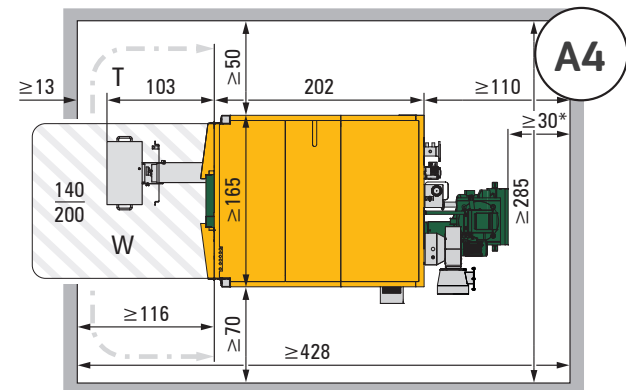
Wall duct for swing range of the conveyor system



### Model A2: External ash container in front



### Model A4: External, small ash container 66 l front



## Legend

<b>H</b>	Room height: For room heights below 280 cm, the customer must provide suitable lifting tools (electrical forklift, wheel front loader, etc.).
<b>P</b>	Alternative position
<b>T</b>	Door area: valid for all models. The door must be in the drawn-in area – deviations require consultation with KWB! If the door is not directly in front of the system, the space requirement in front of the system increases to at least $\geq 225$ cm.
<b>W</b>	Maintenance area

## Minimum room dimensions

	Minimum room dimensions of the ash container built-in variants (cm)				
	Ash-container position				
	Left	Front	Right	Front (66 l)	Any
<b>Version:</b>	A1	A2	A3	A4	
<b>Room width (W)</b>	360	285	285	285	370
<b>Room length (L)</b>	487	537	507	428	560
<b>Room height (H)</b>	240	240	240	240	240

\* If the conveyor system is installed diagonally (swing range:  $-105^\circ$  to  $+115^\circ$ ), the planning must include an additional clearance of  $\geq 20$  cm to the rear wall! Take the gear unit position and motor position into account.

REI90 according to ÖNORM EN 13501, EI, 30-C according to ÖNORM EN 13501, E30 according to ÖNORM EN 13501

All distances stated are minimum dimensions and apply only to the installation variants shown! With regard to space requirements, please also pay attention to the smoke tube routing and chimney position – the space requirements for reducers and elbows may influence the minimum distances! It must be possible to detach the entire casing at any time.

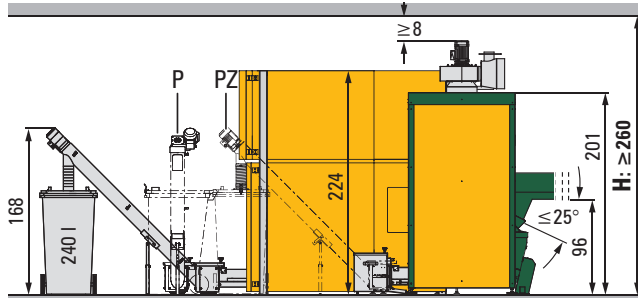


# Installation dimensions

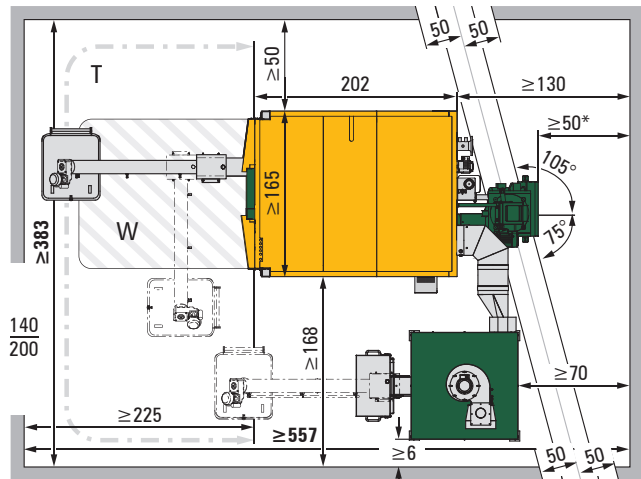
## Type TDS 200-300 kW with cyclone dust separator

### Model: Standard model with cyclone dust separator on the right

Outline

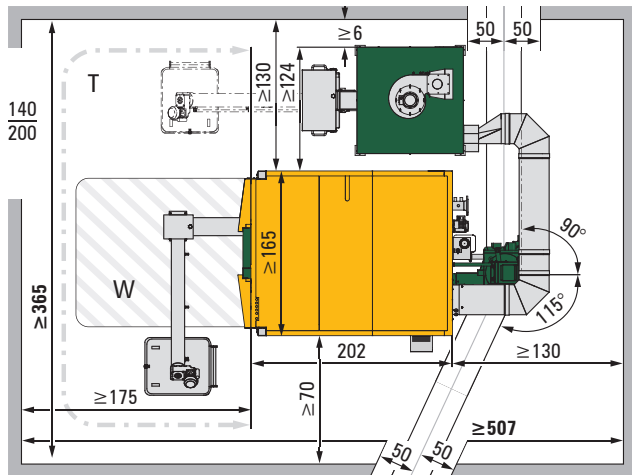


Ground plan



### Alternative model: Standard model with cyclone dust separator on the left

Plan view



### Legend

<b>H</b>	Room height: For room heights below 280 cm, the customer must provide suitable lifting tools (electrical forklift, wheel front loader, etc.).
<b>P</b>	Alternative position
<b>PZ</b>	Position 240 I ash container for cyclone dust separator

<b>T</b>	Door area: valid for all models. The door must be in the drawn-in area – deviations require consultation with KWB! If the door is not directly in front of the system, the space requirement in front of the system increases to at least ≥225 cm.
<b>W</b>	Maintenance area

\* If the conveyor system is installed diagonally (swing range: -105° to +115°), the planning must include an additional clearance of ≥20 cm to the rear wall!

Take the gear unit position and motor position into account.

REI90 according to ÖNORM EN 13501, EI, 30-C according to ÖNORM EN 13501, E30 according to ÖNORM EN 13501

All distances stated are minimum dimensions and apply only to the installation variants shown! With regard to space requirements, please also pay attention to the smoke tube routing and chimney position – the space requirements for reducers and elbows may influence the minimum distances! It must be possible to detach the entire casing at any time. The minimal room dimensions for the ash containers as displayed in the illustration. Individual planning is possible after consultation with KWB.

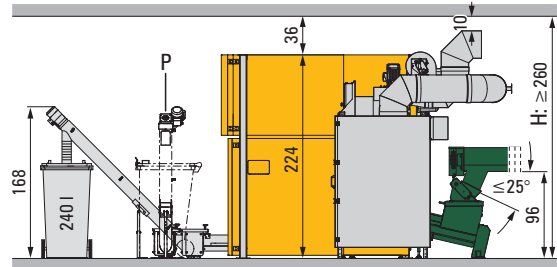
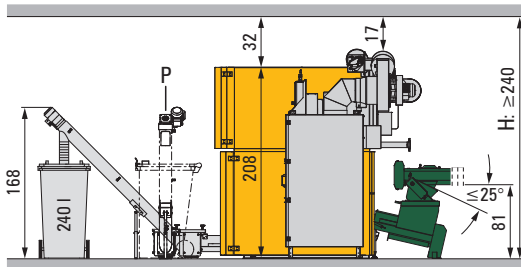
# Installation dimensions

Type TDS 150 kW with E-Filter

Type TDS 200-300 kW with E-Filter

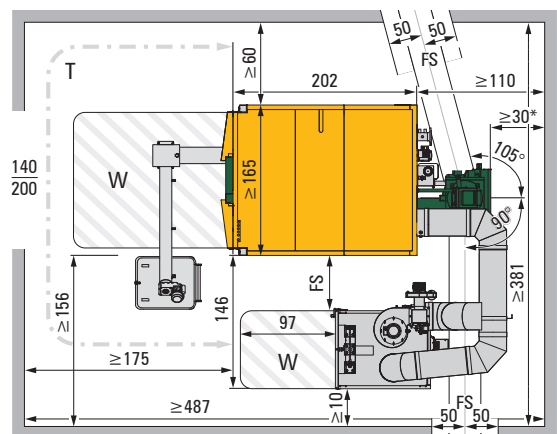
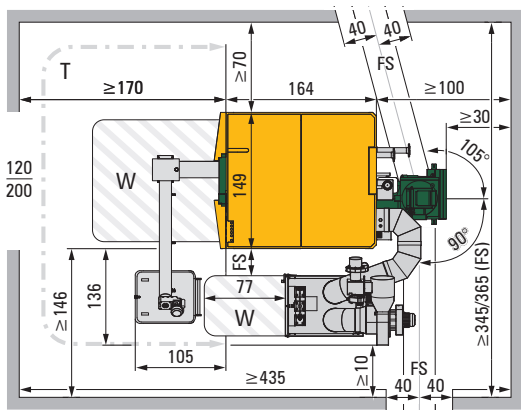
Model Standard model with E-Filter on the right

Model Standard model with E-Filter on the right



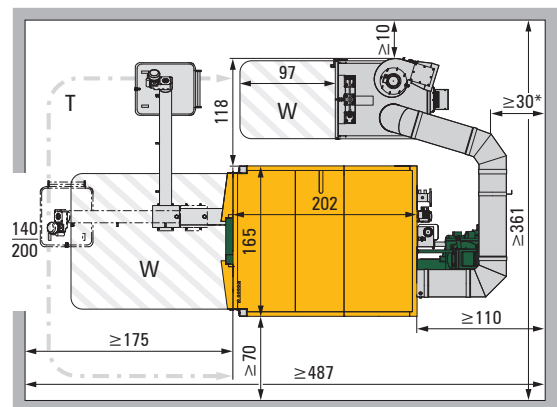
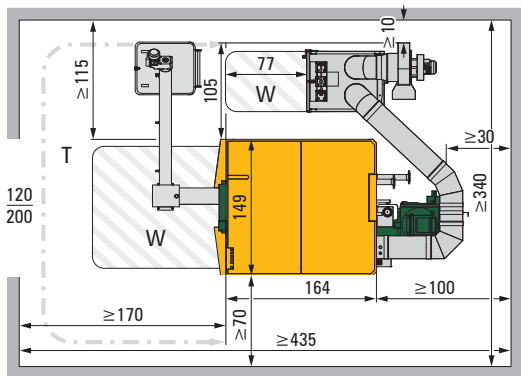
Model Standard model with E-Filter on the right

Model Standard model with E-Filter on the right



Model Standard model with E-Filter on the left

Model Standard model with E-Filter on the left



## Legend

<b>FS</b>	It is recommended to always place the conveyor system on the E-Filter side to keep open the access to the maintenance areas. In this case, the recommended distance between E-Filter and boiler is $\geq 40$ cm instead of $\geq 60$ cm.
<b>H</b>	If a bypass attachment is planned, the min. room height increases by $\geq 40$ cm.

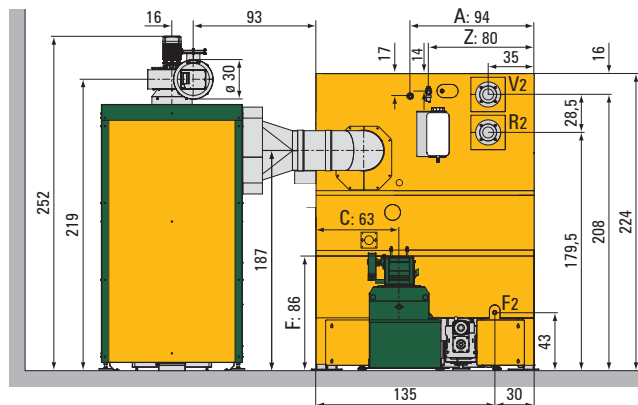
<b>P</b>	Alternative position
<b>T</b>	Door area: valid for all models. The door must be in the drawn-in area – deviations require consultation with KWB! If the door is not directly in front of the system, the space requirement in front of the system increases to at least $\geq 225$ cm.
<b>W</b>	Maintenance area

\* If the conveyor system is installed diagonally, the planning must include an additional clearance of  $\geq 20$  cm to the rear wall! Take the gear unit position and motor position into account. REI90 according to ÖNORM EN 13501, E1, 30-C according to ÖNORM EN 13501, E30 according to ÖNORM EN 13501  
 All distances stated are minimum dimensions and apply only to the installation variants shown! With regard to space requirements, please also pay attention to the smoke tube routing and chimney position – the space requirements for reducers and elbows may influence the minimum distances! It must be possible to detach the entire casing at any time. The minimal room dimensions for the ash containers as displayed in the illustration. Individual planning is possible after consultation with KWB.

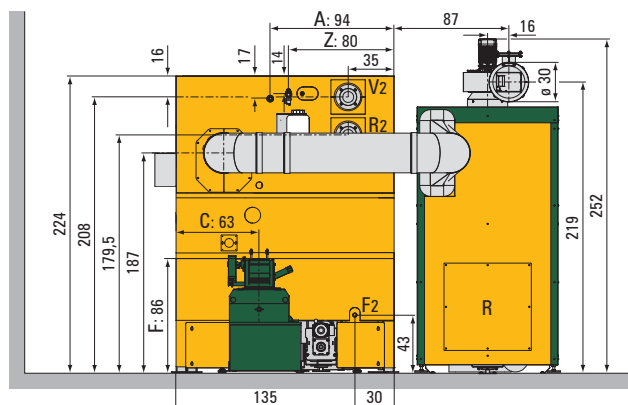
# Connecting dimensions

## Type TDS 200-300 kW with cyclone dust separator

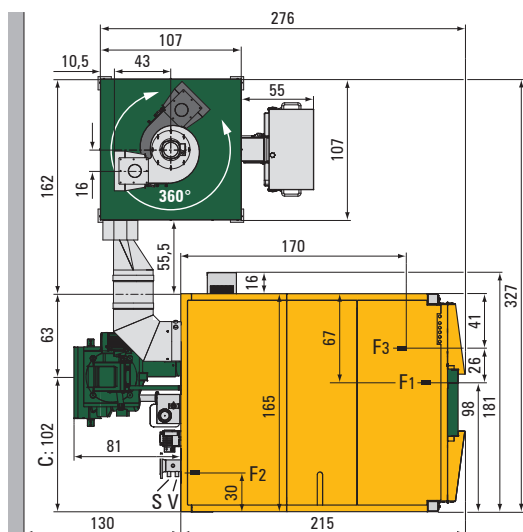
Model: Standard model with cyclone on the right



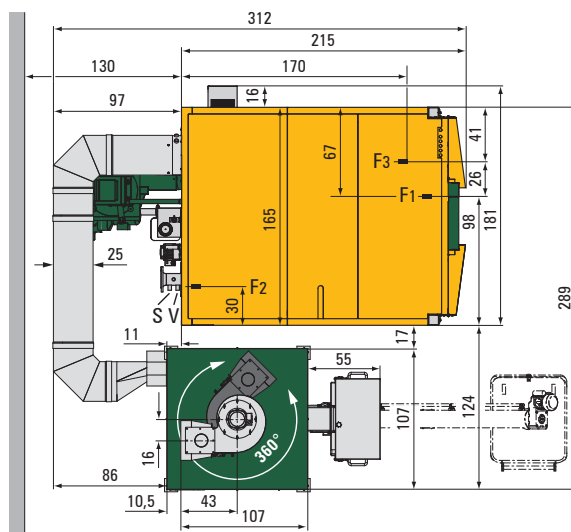
Model: Standard model with cyclone on the left



Model: Standard model with cyclone on the right



Model: Standard model with cyclone on the left



### Legend

<b>A</b>	Outflow for thermal safety valve 3/4" (internal thread)
<b>C</b>	Conveyor system axle
<b>F</b>	Conveyor system connection
<b>F1</b>	Boiler emptying point 3/4" (internal thread) - heat exchanger area (in front above the combustion chamber door)
<b>F2</b>	Boiler emptying point 3/4" (internal thread) - flame tube area
<b>F3</b>	Boiler filling and emptying point 3/4" (internal thread) - burner housing area (at the front under the combustion chamber doors)

<b>R</b>	Maintenance cover
<b>R2</b>	Return flow DN 80, PN 6
<b>S</b>	Sensor for safety boiler temperature limit
<b>V</b>	Sensor for forward flow temperature
<b>V2</b>	Forward flow DN 80, PN 6
<b>Z</b>	Inflow for thermal safety valve 3/4" (internal thread)

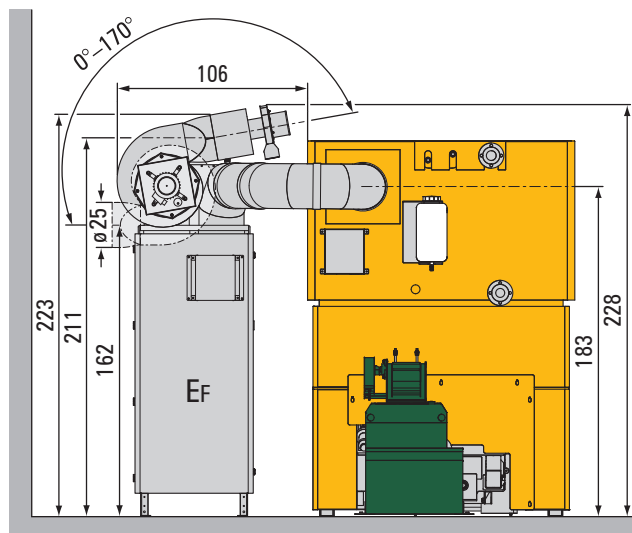
All illustrations are shown without the external ash removal system. All distances stated are minimum dimensions and apply only to the installation variants shown! With regard to space requirements, please also pay attention to the smoke tube routing and chimney position – the space requirements for reducers and elbows may influence the minimum distances! It must be possible to detach the entire casing at any time.



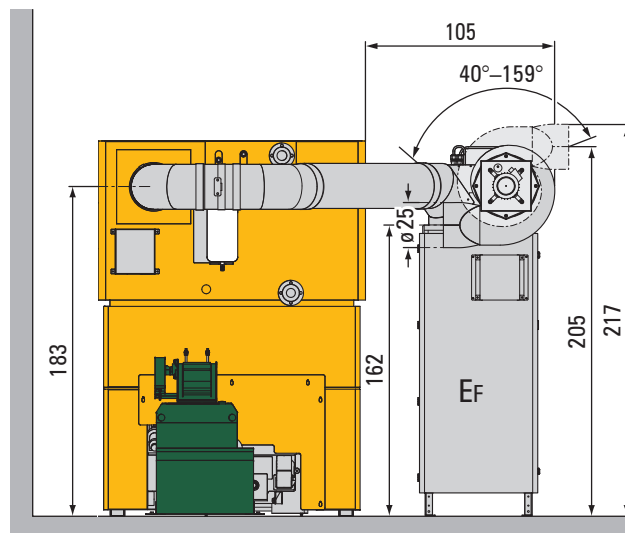
# Connection dimensions

## Type TDS 150 kW with E-Filter

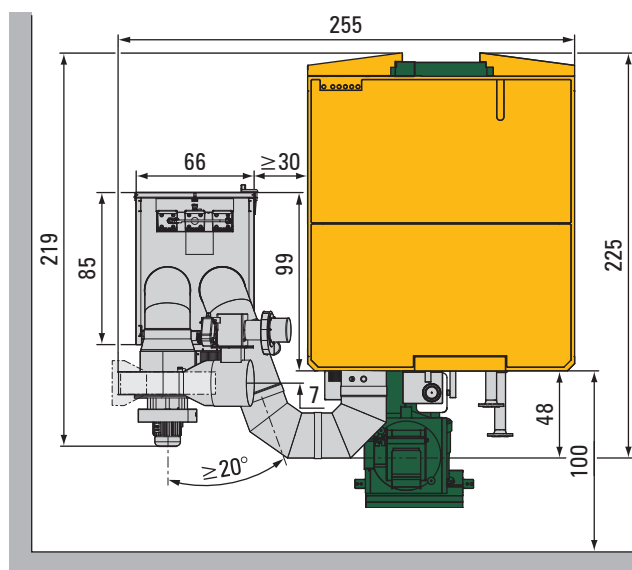
Model: Standard model with E-Filter on the right



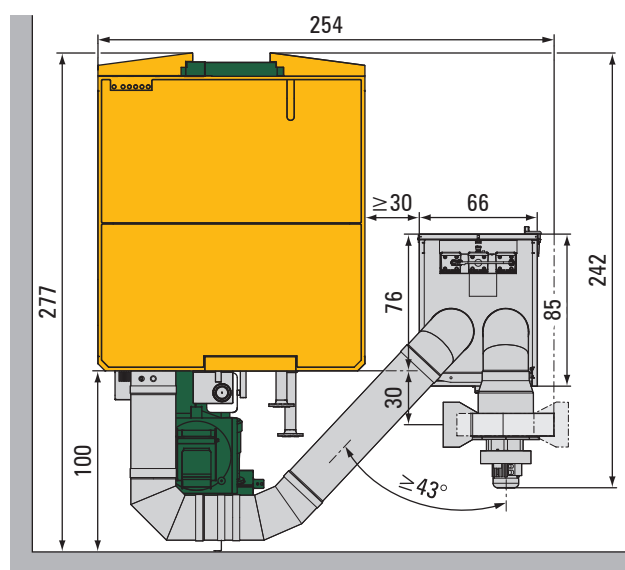
Model: Standard model with E-Filter on the left



Model: Standard model with E-Filter on the right



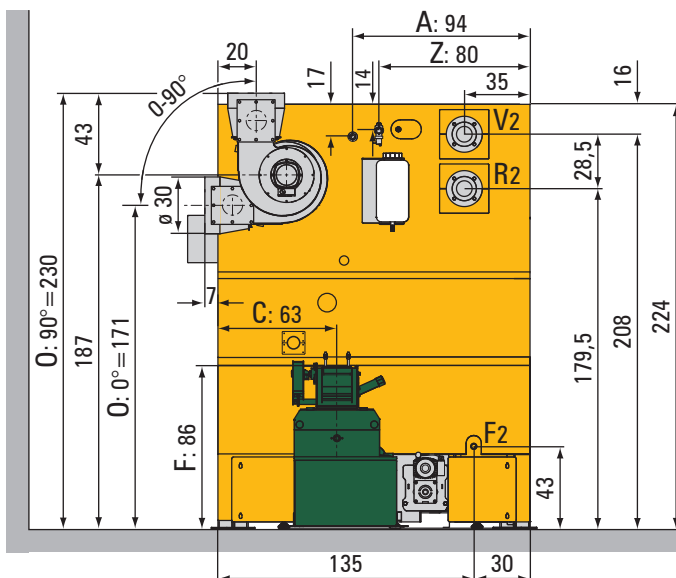
Model: Standard model with E-Filter on the left



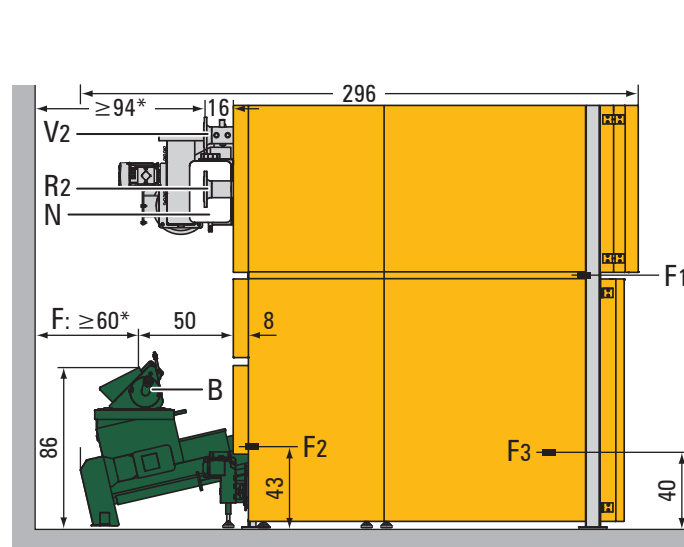
# Connection dimensions

## Type TDS 200-300 kW

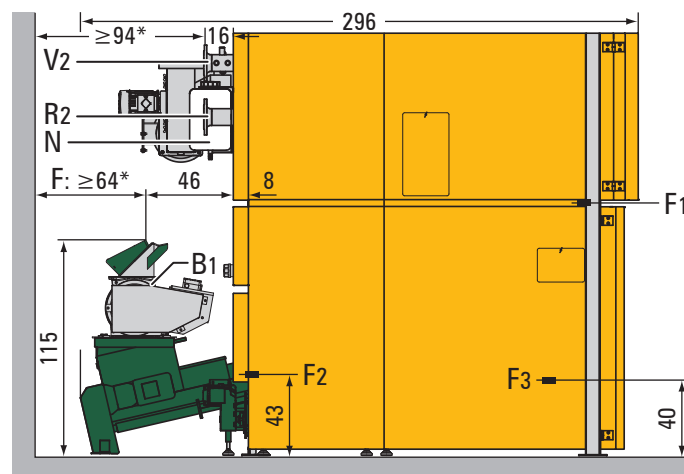
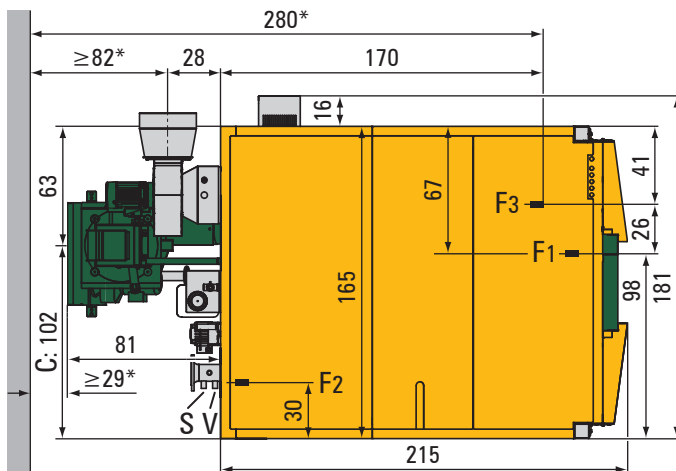
Outline



Side view



Plan view



### Legend

<b>A</b>	Outflow for thermal safety valve 3/4" (internal thread)	<b>N</b>	Emergency fire-extinguishing equipment
<b>B</b>	Fire shutter	<b>O</b>	Smoke tube
<b>B1</b>	Cellular wheel sluice (alternative to the fire shutter)	<b>R1</b>	Return flow DN 50, PN 6
<b>C</b>	Conveyor system axle	<b>R2</b>	Return flow DN 50, PN 6
<b>EF</b>	E-Filter	<b>S</b>	Sensor for safety boiler temperature limit
<b>F</b>	Conveyor system connection	<b>V</b>	Sensor for forward flow temperature
<b>F1</b>	Boiler emptying point 3/4" (internal thread) - heat exchanger area (in front above the combustion chamber door)	<b>V2</b>	Forward flow DN 80, PN 6
<b>F2</b>	Boiler emptying point 3/4" (internal thread) - flame tube area	<b>Z</b>	Inflow for thermal safety valve 3/4" (internal thread)
<b>F3</b>	Boiler filling and emptying point 3/4" (internal thread) - burner housing area (at the front under the combustion chamber doors)		

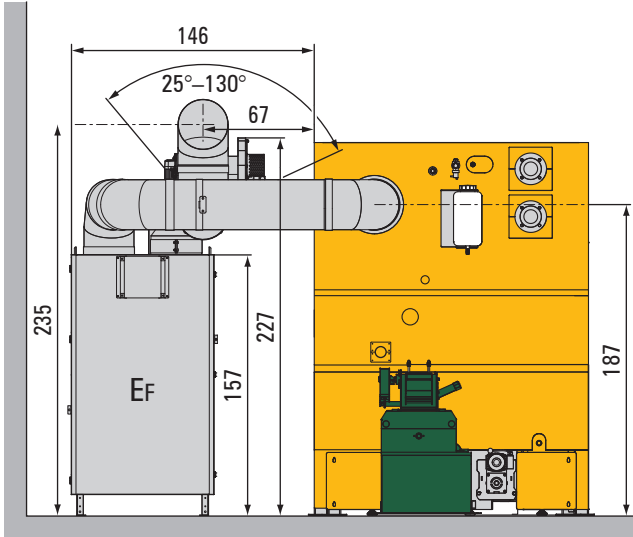
\* Conveyor system connection: The distance is valid if the conveyor system is installed horizontally and vertically with 0°. If the conveyor system is at an angle (-105° to +115° or -105° to +90° with E-Filter) and/or inclined (≤25°), the distance to the brickwork behind the installation must be increased by ≥20 cm.

All illustrations are shown without the external ash removal system. All distances stated are minimum dimensions and apply only to the installation variants shown! With regard to space requirements, please also pay attention to the smoke tube routing and chimney position – the space requirements for reducers and elbows may influence the minimum distances! It must be possible to detach the entire casing at any time.

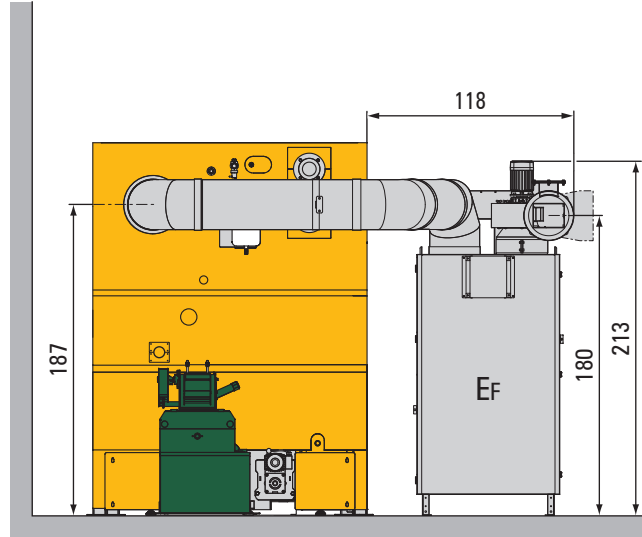
# Connection dimensions

## Type TDS 200-300 kW with E-Filter

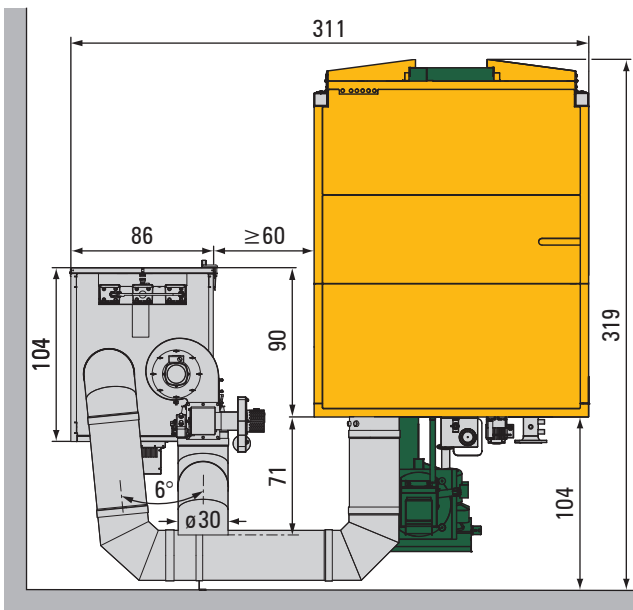
Model: Standard model with E-Filter on the right



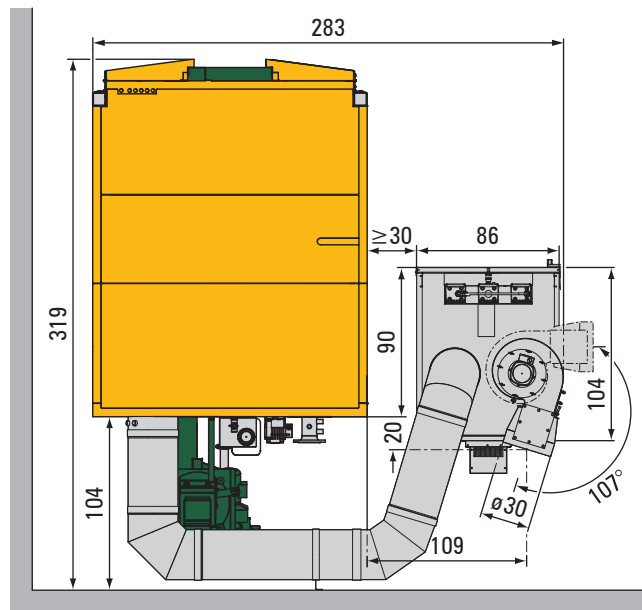
Model: Standard model with E-Filter on the left



Model: Standard model with E-Filter on the right



Model: Standard model with E-Filter on the left



# TECHNICAL SPECIFICATIONS

TDS	Unit	TDS 130		TDS 150		TDS 200 <sup>7</sup>		TDS 240		TDS 300	
		Pellet	Wood chips	Pellet	Wood chips	Pellet	Wood chips	Pellet	Wood chips	Pellet	Wood chips
Rated power	kW	130	130	150	150	199	199	245	245	300	300
Partial load	kW	39,0	39,0	45,0	45,0	59,7	59,7	73,5	73,5	73,5	73,5
Boiler efficiency at rated power	%	91,9	91,0	93,2	92,5	93,7	93,9	93,8	92,7	94,4	92,9
Boiler efficiency at partial load	%	91,6	90,6	92,1	92,4	91,6	91,8	93,4	91,8	93,4	91,8
Fuel thermal output at rated power	kW	141	143	161	162	212	212	261	264	318	323
Fuel thermal output at partial load	kW	43	43	49	49	65	65	79	80	79	80
Boiler class according to EN 303-5:2012	-	5	3	5	5	4	4	5	5	5	5
<b>Water side</b>											
Water content	l	295	295	295	295	610	610	610	610	610	610
Water connection diameter flow/return (flange)	-	DN 50 PN 6	DN 50 PN 6	DN 50 PN 6	DN 50 PN 6	DN 80 PN 6	DN 80 PN 6	DN 80 PN 6	DN 80 PN 6	DN 80 PN 6	DN 80 PN 6
Water connection for thermal safety valve	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
Thermal safety valve: temperature <sup>1</sup>	°C	10	10	10	10	10	10	10	10	10	10
Thermal safety valve: pressure <sup>1</sup>	bar	2	2	2	2	2	2	2	2	2	2
Boiler filling and emptying at the burner (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
Boiler emptying at the flame pipe (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
Boiler emptying at the heat exchanger (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
Water-side resistance at 20 K <sup>2</sup>	Pa mbar	26 2600	26 2600	28 2800	28 2800	15 1450	15 1450	22 2200	22 2200	32 3200	32 3200
Water-side resistance at 10 K <sup>2</sup>	Pa mbar	78 7800	78 7800	112 11200	112 11200	58 5750	58 5750	88 8800	88 8800	129 12900	129 12900
Boiler inlet temperature ≤w30	°C	55-70	55-70	55-70	55-70	55-70	55-70	55-70	55-70	55-70	55-70
Boiler inlet temperature >w30	°C	-	65-70	-	65-70	-	65-70	-	65-70	-	65-70
Working temperature/operating temperature	°C	90	90	90	90	90	90	90	90	90	90
Maximum permitted temperature	°C	95	95	95	95	95	95	95	95	95	95
Maximum operating pressure	bar	3,5	3,5	3,5	3,5	3,5	3,5	3,5	3,5	3,5	3,5
<b>Flue-gas side (data for chimney design)</b>											
Combustion chamber temperature	°C	900-1200	900-1000	900-1200	900-1000	900-1200	900-1000	900-1200	900-1000	900-1200	900-1000
Combustion chamber pressure	mbar	-0,2... -0,3	-0,2... -0,3	-0,2... -0,3	-0,2... -0,3	-0,2... -0,3	-0,2... -0,3	-0,2... -0,3	-0,2... -0,3	-0,2... -0,3	-0,2... -0,3
Delivery pressure at rated power / partial load	mbar	0,10 0,06	0,10 0,06	0,10 0,06	0,10 0,06	0,10 0,06	0,10 0,06	0,10 0,06	0,10 0,06	0,10 0,06	0,10 0,06
Induced draught required	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Exhaust-gas temperature at rated power / partial load	°C	160 80	160 80	160 80	160 80	160 80	160 80	160 80	160 80	160 80	160 80
Exhaust-gas connection height (boiler side)	mm	1.615	1.615	1.615	1.615	-	-	-	-	-	-
Exhaust-gas connection height: variant up	mm	-	-	-	-	1.970	1.970	1.970	1.970	1.970	1.970
Exhaust-gas connection height: variant right (pipe centre, 0-90° pivoting) <sup>8</sup>	mm	-	-	-	-	1.380	1.380	1.380	1.380	1.380	1.380
Exhaust-gas connection diameter	mm	250	250	250	250	300	300	300	300	300	300
Incline of the exhaust-gas pipe	°	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3	≥ 3
Recommended chimney diameter	mm	300	300	300	300	350	350	350	350	350	350
Chimney design: moisture-resistant	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		M10	M30 M45	M10	M30 M45	M10	M30 M45	M10	M30 M45	M10	M30 M45
Exhaust-gas mass flow at rated power <sup>3</sup>	kg/s	0,084	0,098 0,107	0,108	0,137 0,157	0,134	0,140 0,164	0,160	0,176 0,192	0,193	0,215 0,234
Exhaust-gas mass flow at partial load <sup>3</sup>	kg/s	0,025	0,029 0,032	0,031	0,038 0,044	0,041	0,046 0,050	0,048	0,055 0,060	0,048	0,055 0,060
Exhaust-gas volume at rated power <sup>3</sup>	Nm <sup>3</sup> /h	234	277 308	300	388 455	376	398 475	446	499 555	538	607 674
Exhaust-gas volume at partial load <sup>3</sup>	Nm <sup>3</sup> /h	70	83 93	87	130 180	115	131 145	133	155 173	133	155 173
<b>Fuel according to ISO 17225-2 / 17225-4</b>											
Maximum water content	-	M10	M45	M10	M45	M10	M45	M10	M45	M10	M45
Maximum fuel size	-	D89	P31S	D89	P31S	D89	P31S	D89	P31S	D89	P31S
Water content for type testing (fresh weight) <sup>4</sup>	kg/kg WB	0,084	0,222	0,04	0,223	0,082	0,223	0,056	0,322	0,059	0,317



TDS	Unit	TDS 130	TDS 150	TDS 200 <sup>7</sup>	TDS 240	TDS 300					
<b>Ash</b>											
Ash-container volume – fly-ash	l	23	23	23	23	20+44	20+44	20+44	20+44	20+44	20+44
Ash-container volume – grate-ash	l	66	66	66	66	66	66	66	66	66	66
Ash container, grate ash, full	kg	75	75	75	75	75	75	75	75	75	75
Ash-container volume, comfort version (optional)	l	-	-	-	-	66+125	66+125	66+125	66+125	66+125	66+125
Ash-removal system	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ash-container volume (optional)	l	240	240	240	240	240	240	240	240	240	240
Weight of ash container, full	kg	~265	~265	~265	~265	~265	~265	~265	~265	~265	~265
<b>Electrical system</b>											
Connection: 5-pin	-	400 V <sub>AC</sub> 50 Hz 16 A	400 V <sub>AC</sub> 50 Hz 16 A	400 V <sub>AC</sub> 50 Hz 16 A	400 V <sub>AC</sub> 50 Hz 16 A	400 V <sub>AC</sub> 50 Hz 16 A	400 V <sub>AC</sub> 50 Hz 16 A	400 V <sub>AC</sub> 50 Hz 16 A	400 V <sub>AC</sub> 50 Hz 16 A	400 V <sub>AC</sub> 50 Hz 16 A	400 V <sub>AC</sub> 50 Hz 16 A
Unit switch and main switch: present	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connected power boiler	W	3.010	3.010	3.010	3.010	3.600	3.600	3.600	3.600	3.600	3.600
Connected power total incl. fuel extractor	W	4.510	4.510	4.510	4.510	5.100	5.100	5.100	5.100	5.100	5.100
Auxiliary power consumption in trial operation at rated power <sup>5</sup>	kW <sub>el</sub> /MW <sub>th</sub>	2,00	3,10	1,43	2,23	1,53	3,11	1,68	2,16	1,44	1,93
Auxiliary power consumption in trial operation at partial load <sup>5</sup>	kW <sub>el</sub> /MW <sub>th</sub>	3,40	5,00	3,01	5,13	2,19	3,71	4,10	5,39	4,10	5,39
Auxiliary power consumption at rated power <sup>5</sup>	W	260	390	209	313	320	590	394	516	405	537
Auxiliary power consumption at partial load <sup>5</sup>	W	130	190	132	220	130	220	295	388	295	388
Standby power	W	29	29	29	29	29	29	29	29	29	29
<b>Weights</b>											
Heat exchanger incl. cleaning grille	kg	725	725	725	725	900	900	900	900	900	900
Burner housing incl. chamotte	kg	796	796	796	796	866	866	866	866	866	866
Flame pipe incl. chamotte	kg	-	-	-	-	965	965	965	965	965	965
Stoker trough	kg	113	113	113	113	137	137	137	137	137	137
Total weight (empty)	kg	1.634	1.634	1.634	1.634	2.868	2.868	2.868	2.868	2.868	2.868
Assembly case	kg	174	174	174	174	288	288	288	288	288	288
Weight of transport packaging (in each case)	kg	25	25	25	25	25	25	25	25	25	25
<b>Noise emissions<sup>6</sup></b>											
Normal operating noise at rated power	dB(A)	60	60	60	60	63	63	63	63	63	63
Operating peaks at rated power	dB(A)	68	68	68	68	65	65	65	65	65	65
<b>Test report</b>											
Test report no.	-	07-UW/Wels-EX-269/3	14-UW/Wels-EX-321/4	07-UW/Wels-EX-269/2	14-UW/Wels-EX-321/5	14-UW/Wels-EX-321/6					

**27.1.2015**

- 1 ... In acc. with EN 303-5; higher temperatur respectively lower minimum admission pressure available on request
  - 2 ... The water-side resistance is specified and determined in each case on the boiler interface (flange RF/FF)
  - 3 ... with reference to damp flue gas
  - 4 ... Wood chips: Provision of the rated power to M30, above there is a reduction in power dissipation.
  - 5 ... Measured values for the additional power requirement are understood to include KWB stirrer extractors incl. standard trough (NOT with sliding floor).
  - 6 ... The noise measurements were executed in normal operation with wood chips. Leq(A) at 1 m distance (ISO 11202:1995)
  - 7 ... Only available in the UK
  - 8 ... Values only for standard-boiler-configuration. NOT for cellular wheel sluice, cyclone or E-Filter (own dimensioned drawings)
- mg/Nm<sup>3</sup> ... Milligram per standard cubic meter (Nm<sup>3</sup>... under 1013 hectopascal at 0 °C)

Information regarding hydraulics requirements can be downloaded at [www.kwb.net](http://www.kwb.net)

# REQUIRED STRUCTURAL CONDITIONS

## Note

Please always comply with local statutory submission, construction and execution regulations that apply to you as a KWB system user! You can obtain these regulations, e.g., from the architect or competent authorities. Adherence to and verification of the local statutory regulations is a precondition for the validity of our guarantees and warranties and for your insurance coverage. KWB does not accept any liability, nor does it offer any guarantee or warranties for any type of constructional 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. For complex projects, KWB therefore urgently recommends to set up an on site visit of the competent KWB area manager. 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 bulletin No. 56 and No. 66, we recommend the configuration described below.

## Heating room

Concrete flooring, plain or tiled; height-adjustable boiler feet or shims can be used to compensate for minor irregularities. All materials for floors, walls, ceilings must be fire resistant in REI90\*; the boiler room door as fire door (EI<sub>2</sub>-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 (EI<sub>2</sub>-30-C\*). The heating room window must be non opening E30\*; non-closing opening for air intake of 5 cm<sup>2</sup> per kW of rated heating system power, but no less than 750 cm<sup>2</sup>. It is necessary to provide one ventilation opening near the floor and another ventilation opening near the ceiling; the supply air ducting must be routed directly into the open; if it crosses other rooms, the air duct must feature an REI90\*1 envelope; a protective grille with a mesh width < 5mm must be fitted on the outside of ventilation openings that lead into the open. There must be a permanently installed lighting and electrical supply to the heating system; light and a labelled emergency-stop switch of the heating system in an easily accessible location outside the boiler room in the vicinity of the boiler 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. Storage of inflammable materials in the boiler room outside the boiler system, storage container or hopper is not permitted; no direct connection to rooms where inflammable gases or liquids (garage) are stored. See the installation examples for the minimum clear door widths. Comply with the installation guidelines.

## 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 (see installation examples) for the screw channel between storage room and boiler room must be sealed such that it is fireproof (e.g. with rock wool). If a pumping car is used to fill the fuel storage room with wood chips or pellets, it is necessary to mount KWB-provided hose couplings and pipelines (to be earthed). If this filling method is chosen, it is necessary to seal the fuel storage room in a dust proof manner. The escaping air is removed through a second earthed pipeline and hose coupling, or it is blown off into the open air after passing 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 boilers 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 boiler room) is to be fitted at least ¾" or as DN 20 directly above the conduit of the fuel-extractor trough leading into the fuel storage room in the form of empty piping. The maximum filling height of the storage room must not exceed 1.5 times the stirrer diameter to ensure optimal fuel utilisation. 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 storage systems containing 50 to 200m<sup>3</sup> of wood chips for systems up to and including 400kW. If such a fuel-storage room is built next to fire-re-

\* in accordance with ÖNORM EN 13501

sistant 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 living quarters, an REI90\* enclosure/sheathing of the fuel-storage room is not necessary if the fire section is smaller than 500 m<sup>2</sup>. Fuel must be stored separately from other goods (e.g. by means of wooden planking). A manual-release extinguisher and an integrated extinguishing system must be installed. In the case of storing up to (and including) 200 m<sup>3</sup> 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 m<sup>2</sup>, both (a manual-release extinguisher and an integrated extinguisher) are necessary (see TRVB H 118). For storage rooms and silos that are continuously charged with chips or sawdust via suction, a sealing cellular wheel sluice (or equivalent device) must be installed in the drop shaft. Additional statutory safety and acceptance regulations apply. 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 m 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. In case of large storage facilities special legal regulations apply that were defined during the application for the building permit.

## 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 flue-gas path is permanently below the exhaust gas-gas dew point (see DIN 13384)! The standard 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 4705. 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.

## Installation of the boiler

### Boiler set up

To be performed exclusively by qualified, trained personnel of KWB or KWB associates. The boiler system is assembled and installed ready to plug in, site conditions permitting, otherwise it is dismantled before installation and then assembled ready to plug in, in the boiler room. Due to the considerable weight of the boiler, it is recommended to prepare the transport route beforehand, e.g. place boards or panels on tiled floors. Ensure that the route is level and the ground is stable. Licensed heating and electrical fitters must connect the boiler 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 and induced draught fan

As a general rule, the dimensions of the smoke tube connection between boiler and chimney should be identical to the connection on the boiler. The chimney connection must be at least as high as the smoke-pipe connection on the boiler. Keep the smoke tube as short as possible. The smoke tube must be insulated and should be routed upward toward the chimney, at an angle of less than 45°, preferably with an inclination of at least 3%, and connected. A draft limiter and a blowback flap are to be built into the smoke tube or chimney side wall and arranged in such a way as to exclude any danger to persons. 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 equipped with a negative-pressure controlled induced draught fan by default.

### Hydraulic integration

The return flow inlet temperature into the boiler must be at least 55°C, otherwise there is an increased risk of corrosion, which also has the effect of voiding the guarantee and warranty. A mixer controller for a return flow boost is activated by the boiler control. KWB provides suitable fittings to increase the return flow temperature. The heating system must be equipped with a pressureless distribution system (switch, distributor, load-balancing tank, buffer tank). To dissipate excess heat a thermal safety valve is installed that must be integrated in accordance with the diagram. Moreover, the safety devices prescribed for closed hot water heating systems (in accordance with ÖNORM EN 12828 or ONÖRM EN 303) must be installed by the party installing the hydraulic system.

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 warranty. Regarding corrosion, it is necessary to keep an eye on the water conductivity aside from strictly avoiding oxygen entering into the system. The water conductivity must not be greater than 500 µS/cm for copper-brazed heat exchangers. To prevent deposits caused by limescale and rust mud, we recommend the installation of a mud strainer in the return flow and a microbubble trap in the forward flow. A sufficiently dimensioned buffer tank (see buffer tank dimensions on this page) is required if the continuous heating capacity requirement does not continuously exceed minimum boiler capacity (see technical specifications), and consistent capacity operation of at least 60 minutes with an average degree of modulation of 50% (e.g. summer operation, transition time) cannot be maintained. This also applies for dual biomass boiler systems or integration of a log wood boiler. To prevent safety devices that protect against overheating from tripping when switching off all heat consumers, either a phased consumer switch-off must occur, or you must ensure sufficient afterrun of consumer circuits with sufficient load. Also, a buffer tank may be required in case of solar integration, depending on the system concept. Special consulting provided by your installer/heating engineer or planner!

### Electrical connections

The connection to the mains supply is carried out via the boiler's main switch and must be installed in accordance with regulations (according to EN 60204-1 Electrical installation of machinery – general requirements). Mains connection: three-phase connection with neutral conductor (400 V<sub>AC</sub>, fuse rating 13 A, cable min. 1.5 mm<sup>2</sup>).

Required connections on the customer side: Euro power outlet 5-pole (L1/L2/L3/N/PE) 16 A with fault current protection switch all-current sensitive (type B) and lightning arrester type "2" at the distribution board of the house, magnetic field detection relay with emergency power supply and emergency-stop escape switch. Potential equalisation is recommended. If using KWB Comfort SMS: outlet 230 V<sub>AC</sub>.

### Outputs

Floating contacts with max. 2 A switched current, 230 V<sub>AC</sub>

#### Fault 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

request fuel extractor for common stirrer drive

#### Smoke extractor

- NO contact to activate an external smoke extractor
- The boiler is released by the controller of the external smoke extractor via external 1 (floating contact).

### Inputs

24 V<sub>DC</sub> supply to connect floating contacts

#### External 1:

- To switch on the boiler. This is where the danger switch, the "emergency stop switch" is connected. If this input is not used, it must be short-circuited.

#### External 2: multi-function input

- Heat to setpoint 2: To request the boiler with the second boiler setpoint temperature or as a request contact for external third-party control systems. In case of a separate control system, a sufficiently large buffer tank must be available in the boiler circuit or the follow-up time of sufficiently large consumer circuits (configured by means of separate control) must be guaranteed for at least 60 minutes by means of this separate control system.
- Holiday remote control: for holiday remote control (does not work with external boiler request).

\* in accordance with ÖNORM EN 13501

### Buffer tank dimensions - standard version

(without taking into account peak loads or boiler sequence control when operating multi-boiler systems)

**Optimal: buffer tank volume = 1.5 litres \* KW \* K**

**Minimum: buffer tank volume = 1.0 litres \* KW \* K**

KW ... rated power of the boiler in [KW]

K ... temperature difference between buffer tank charging start/end ( $t_{Max} - t_{Min}$ ) in Kelvin [K]

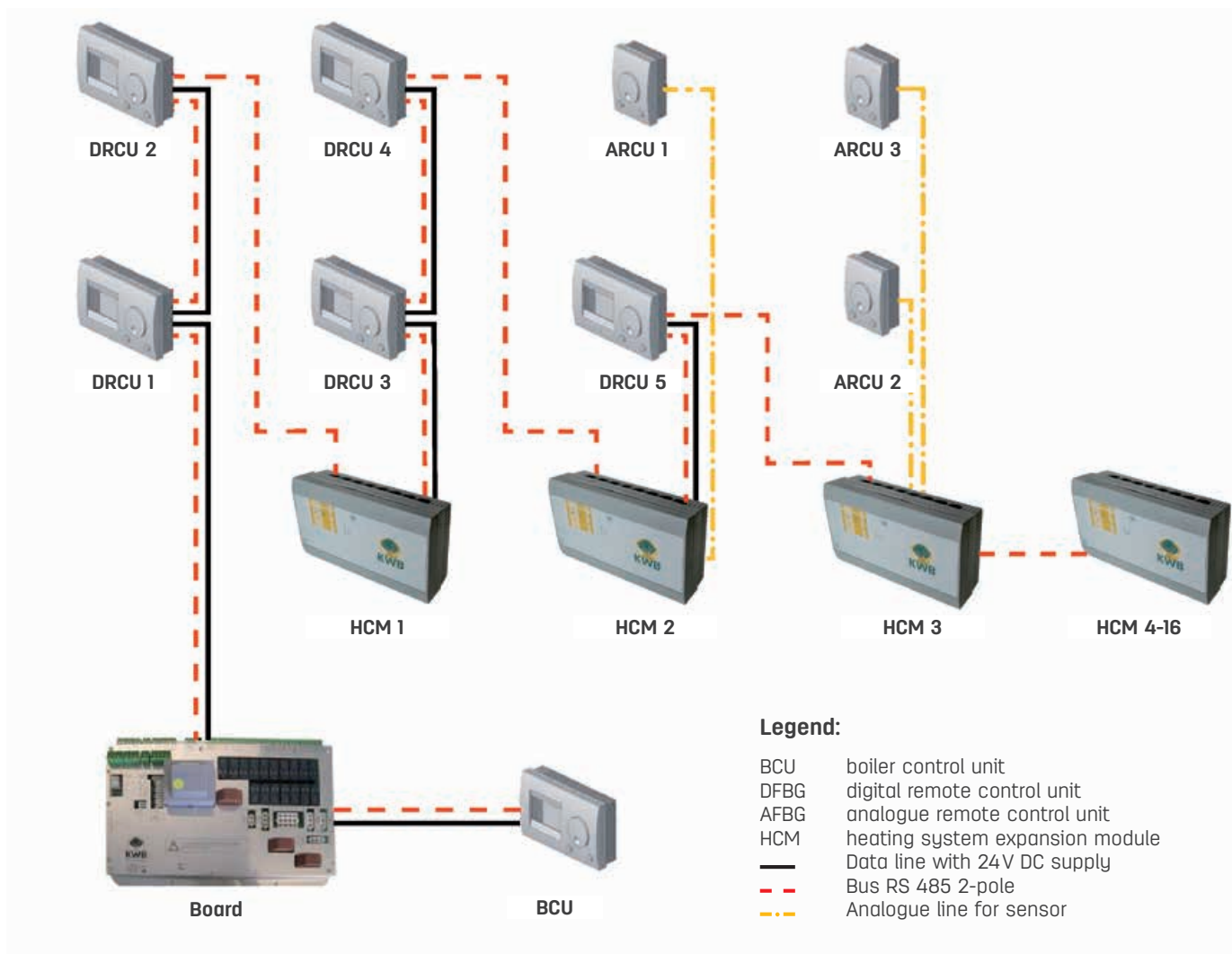
### Recommended parameters for boiler circuit pumps, control valves and return flow mixers

Boiler pumps - parameters		Control valve or return-flow mixer
Boiler power [kW]	min. Ø forward, return flow	Kvs [m <sup>3</sup> /h]
130	DN50	44
150	DN50	44
200*	DN80	63
240	DN80	63
300	DN80	63

\* Only available in the UK

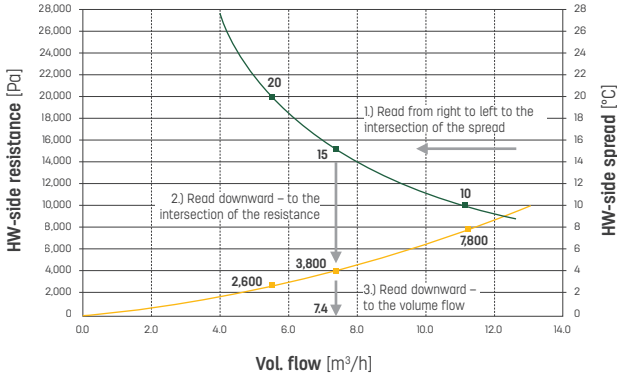
### Bus system – conditions

- Bus cable: CAT.5e, S/FTP; 4×2×AWG24, length max. 850 m; for underground installation: CAT.5e, 4×2×2×0.5 mm<sup>2</sup>.
- Laid out in a separate conduit (not together with 230 / 400 V<sub>AC</sub>).
- 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 230 V and 50 Hz 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.

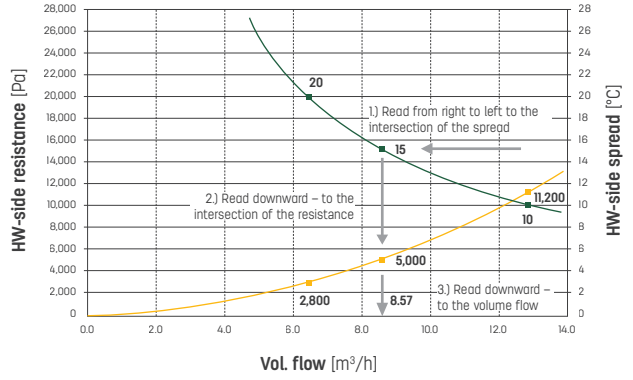


# Water-side resistance

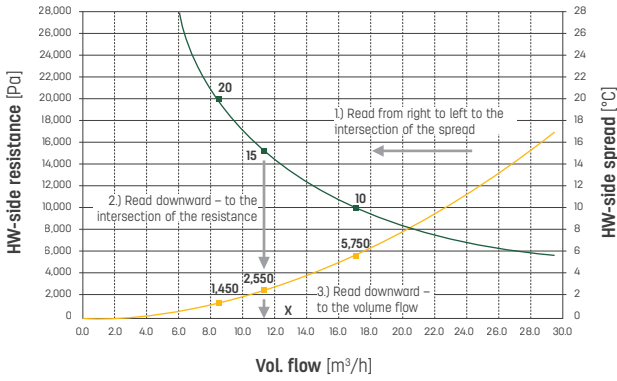
**TDS 130**



**TDS 150**

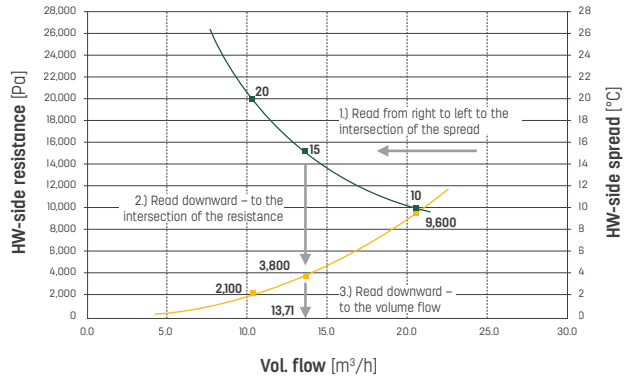


**TDS 200\***

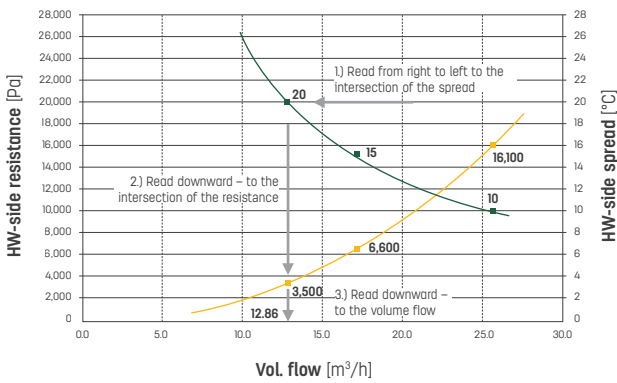


\* Only available in the UK

**TDS 240**



**TDS 300**



■ HW-side resistance  
— Potential (HW-side resistance)

■ HW-side spread  
— Potential (HW-side spread)

# 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

# KWB THE BIOMASS HEATING SYSTEM

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## TP Powerfire 2015 . Index 0

As at: March 2015, Subject to changes and subject to typographical and printing errors.

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