



KWB

Energy. Thought further.

Technology & Planning

KWB Powerfire type TDS2

Canada CSA version

Valid as of 1.4.2026



KWB Powerfire type TDS2

Wood chip and pellet heating system 500 kW



Wood chip and pellet heating system – split design to simplify placement and installation

KWB combustion system

- Seal-welded combustion chamber cover with high-quality fire clay cladding on the inside, external boiler insulation made up of coated sheet steel cassettes clad with mineral wool
- Self-cleaning feed grate to prevent the formation of slag and to transport the ash into the drop shaft
- Automatic ash rake under the grate to minimise the amount of maintenance work
- Air-cooled grate components made of high temperature-resistant cast iron
- Stoker with conveyor screw with water-cooled infeed channel, design optionally includes fire shutter or cellular wheel sluice (pellet boiler design only available with cellular wheel sluice)
- Electric hot air ignition
- Speed-controlled combustion air fan including control of the primary, secondary and tertiary combustion air via servomotor-controlled progressive rotary valve



KWB heat exchanger

- Two-sided attachment option for the upright 3-draught pipe heat exchanger, incl. automatic cleaning of the heating area
- Exhaust gas recirculation (AGR) provided as standard for highest system protection and low emissions

KWB ash removal system

- Screw used for the automatic grate ash extraction to the side into selectable ash containers
- Screws used for the automatic removal of ash from the heat exchanger into 2 x 25 l ash containers
- Accumulative ash removal into a centralised container possible (see options)
- Suitable for the automatic combustion of wood chips P16S-P31S/class A1, A2, water content up to 40% (max. 50% with restricted partial load) as per EN ISO 17225-4, and wood pellets D06/class A1 as per EN ISO 17225-2

Control system comprising:

- Boiler control system with switch cabinet made of steel plate with main switch and cooling fan, for wall mounting or as standing cabinet (optional)
- Control of all drive units and sensors of the boiler system, including fuel extraction, modular expandable system
- Boiler control unit with large touchscreen display
- Lambda control with broadband sensor
- Combustion chamber temperature control
- Underpressure-controlled draught fan (optional added value equipment available)
- Control of boiler circuit pump and return flow mixer incl. immersion sensor



Connection of the KWB Powerfire TDS2 to a Comfort 4 heat management network:

The KWB Powerfire is linked to the Comfort 4 heat management module autonomously through a Modbus TCP connection. This module controls the entire heat distribution and storage and operates the Powerfire boiler in a performance-modulating manner. Optional remote monitoring/control of the heating system via smartphone, tablet, PC or for a GLT connection (via Modbus TCP).

Optional extra-charge items

- 300 l ash trough or 240 l ash bin (both loaded from below)
- Ash collection screw
- Cover cooling unit
- Relevant ignition
- Ignition air flush



KWB Powerfire type TDS2

Technology & Planning

Transport dimensions & weights

Transport recommendations:

- Unobstructed door width of 1.75 x 2.75 m
- Depending on structural requirements, e.g. 2-leaf fire door EI₂ 30-C
- Lifting devices and transport equipment with load capacity of min. 5 required
- Required paths and unobstructed entry opening must be planned in detail

There are a variety of options for **removing ash** from the system, depending on the level of convenience (weight, equipment) and emptying frequency. The following generally applies: the longer the preferred emptying intervals, the larger and heavier the full ash containers will be for the relevant transport equipment (forklift truck, tractor with loader, etc.) and suitable routes. This is why the logistics for the ash disposal (free movement and routes, type of emptying/manipulation) must be taken into consideration when planning the system.

Designation		TDS2 500		
		Length	Width	Height
Minimum room height	cm	-	-	335
Retort insertion dimensions L x W x H	cm	280	150	228
Heat exchanger installation dimensions L x W x H	cm	151	141	254
Retort weight incl. fireclayed	kg	4,900		
Heat exchanger weight	kg	2,220		
Fly ash container 25 l, empty / full	kg	15 / 30		
Ash bin 240 l, empty / full	kg	40 / 200		
Ash trolley 300 l, empty / full	kg	125 / 330		
Hinged floor container 330 l, empty / full	kg	100 / 325		
Hinged floor container 1000 l, empty / full	kg	220 / 870		

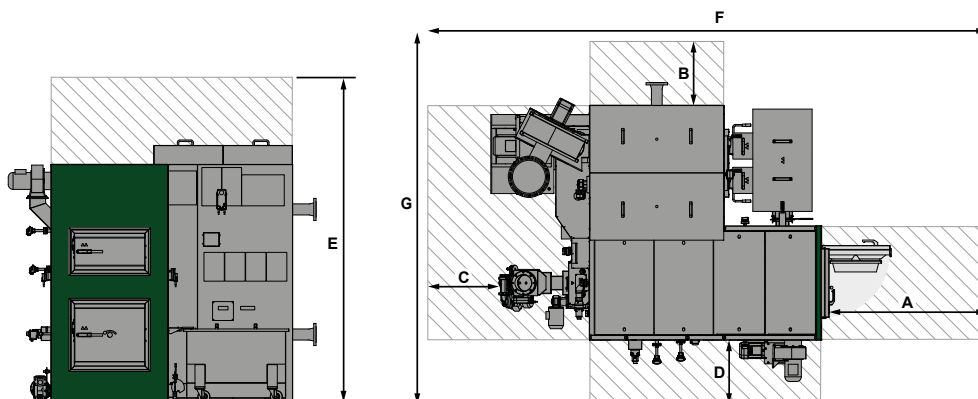
Boiler dimensions



Legend

[cm]		TDS2 500
H1	Boiler height incl. insulation	266
H2	Stoker height incl. burn back protection system	93
H3	Exhaust pipe connection height	207.50
H4	Return flow connection height	71
H5	Forward flow connection height	200
B1	Total width incl. attachments	299
B2	Wide boiler incl. insulation	249.50
B3	Wide ash container retort	116.5
L1	Total length incl. attachments	359.50
L2	Length of ash container retort	63
L3	Stoker unit length	105

Maintenance area & minimum room dimensions



Legend

[cm]	TDS2 500
A	100
B	50
C	50
D	95
E	335
F	500
G	400

KWB Powerfire type TDS2

Technical data

TDS2	Unit	TDS2 500	
		Pellet	Wood chips
Rated power	kW	499	499
Partial load	kW	149,7	149,7
Boiler efficiency at rated power	%	93,6	93,4
Boiler efficiency at partial load	%	91,9	95,7
Fuel thermal output at rated power	kW	533,1	534,3
Fuel thermal output at partial load	kW	162,9	156,4
Flue gas loss at rated power	%	5,2	4,5
Flue gas loss at partial load	%	3,6	3,1
Radiation loss, rated power	%	1,5	0,3
Radiation loss, partial load	%	3,8	2,3
Boiler class according to EN 303-5:2012	–	5	5
Water side			
Water content	l	1040	1040
Water connection diameter flow/return (flange)	–	DN 100 PN16	DN 100 PN16
Water connection for thermal safety valve	inch	3/4 AG	3/4 AG
Thermal safety valve: temperature ¹⁾	°C	10	10
Thermal safety valve: pressure ¹⁾	bar	2	2
Boiler filling and emptying at the burner (internal thread)	inch	2	2
Heat exchanger ventilation	inch	1/2	1/2
Water-side resistance at 20 K ²⁾	mbar	8,5	8,5
Water-side resistance at 10 K ²⁾	mbar	27,4	27,4
Minimum boiler inlet temperature	°C	60	60
Operating temperature standard	°C	90	90
Operating temperature optional	°C	95	95
Operating temperature optional	°C	98	98
Maximum permitted temperature	°C	110	110
Maximum operating pressure	bar	6	6
Flue-gas side (data for chimney design)			
Combustion chamber temperature	°C	900–1100	900–1000
Delivery pressure at rated power / partial load	mbar	0,05 0,02	0,05 0,02
Induced draught required	–	✓	✓
Exhaust-gas temperature at rated power / partial load	°C	140 110	140 110
Exhaust-gas connection height (boiler side)	mm	2.075	2.075
Exhaust-gas connection diameter	mm	350	350
Exhaust gas recirculation connection diameter	mm	180	180
Chimney design: moisture-resistant	–	✓	✓
Exhaust-gas mass flow at rated power ³⁾ M30, 12% O ₂	kg/s	0,44	0,53
Exhaust-gas volume at rated power ³⁾ M30, 12% O ₂	Nm ³ /h	1867	2249
Fuel according to ISO 17225-2 / 17225-4			
Maximum water content ⁴⁾	–	M10	M35 M40 ⁴⁾ M50 ⁴⁾
Maximum fuel size	–	D06 A1	P16S - P45S
Ash			
Grate ash trolley standard 300 l	l	300	
Ash container heat exchanger (2 pcs.)	l	25	



KWB Powerfire type TDS2

Technical data

TDS2	Unit	TDS2 500	
Electrical system			
Connection: 5-pin	–	400 V _{AC} 50 Hz C35 A	400 V _{AC} 50 Hz C35 A
Unit switch and main switch: present	–	✓	✓
Electrical power consumption NL/PL	W	1570 / 880	2080 / 940
Auxiliary power consumption at rated power	W	1.110	1.321
Auxiliary power consumption at partial load	W	380	329
Standby power	W	24	24
Weights			
Heat exchanger incl. cleaning grille	kg	2.200	
Burner housing incl. chamotte	kg	2.700	
Flame pipe incl. chamotte	kg	2.220	
Stoker trough	kg	8.470	
Test report			
Test report no.	–	23-IN-AT-UW-OÖ_EX-048/3	
Test report date	-	22.05.2023	
Inspection report No.	-	23-IN-AN-UW-OÖ-EX-048/13	
Inspection report date	-	30.05.2023	
Fuel		Pellet	Wood chips
O ₂ content rated power	Vol.-%	4,92	4,21
O ₂ content partial load	Vol.-%	8,36	9,11
O ₂ content rated power	Vol.-%	15,20	15,90
O ₂ content partial load	Vol.-%	12,10	11,20
Ref. 10 % O₂ dry (EN 303-5)			
CO at rated power	mg/Nm ³	6	<2
CO at partial load	mg/Nm ³	24	89
NOx at rated power	mg/Nm ³	133	77
NOx at partial load	mg/Nm ³	142	62
OGC at rated power	mg/Nm ³	<3	<1
OGC at partial load	mg/Nm ³	<3	<1
Dust at rated power (Values with dust filter according to BAFA/ACTECO)	mg/Nm ³	19 (1,4)	16 (1,4)
Dust at partial load (Values with dust filter according to BAFA/ACTECO)	mg/Nm ³	14 (1,4)	6 (<1)
Ref. 13 % O₂ dry (EN 303-5)			
CO at rated power	mg/Nm ³	4	<2
CO at partial load	mg/Nm ³	17	65
NOx at rated power	mg/Nm ³	96	56
NOx at partial load	mg/Nm ³	103	45
OGC at rated power	mg/Nm ³	<2	<1
OGC at partial load	mg/Nm ³	<2	<1
Dust at rated power (Values with dust filter according to BAFA/ACTECO)	mg/Nm ³	14 (1)	12 (1)
Dust at partial load (Values with dust filter according to BAFA/ACTECO)	mg/Nm ³	10 (1)	4 (<1)
Ref. mg/MJ (acc. §15a-BVG Austria)			
CO at rated power	mg/MJ	3	<1
CO at partial load	mg/MJ	12	44
NOx at rated power	mg/MJ	66	38
NOx at partial load	mg/MJ	70	31
OGC at rated power	mg/MJ	<1	<1
OGC at partial load	mg/MJ	<2	<1
Dust at rated power (Values with dust filter according to BAFA/ACTECO)	mg/MJ	10 (<1)	8 (<1)
Dust at partial load (Values with dust filter according to BAFA/ACTECO)	mg/MJ	7 (<1)	3 (<1)

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 M30, 12% O₂

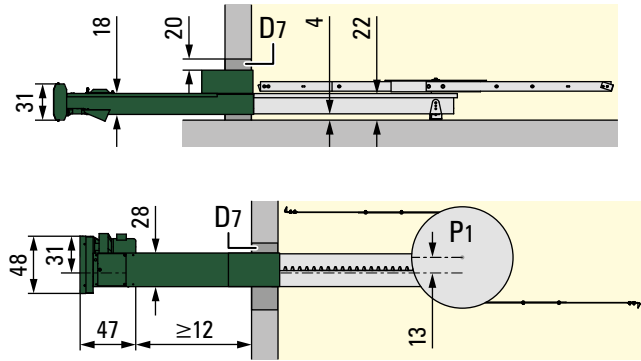
⁴⁾ Wood chips: Part-load operation only possible to a limited extent with M40/M50

Conveyor system M

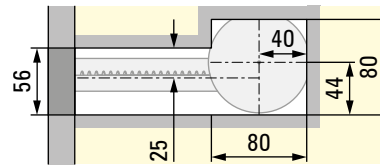
Floor-level stirrer

The floor-level stirrer is available in two different designs depending on requirements: As a spring-blade rotary stirrer (stirrer diameter: from 2.5 to 4.0 m) and as articulated rotary-blade stirrer (from 4.0 to 5.5 m stirrer diameter).

Standard channel

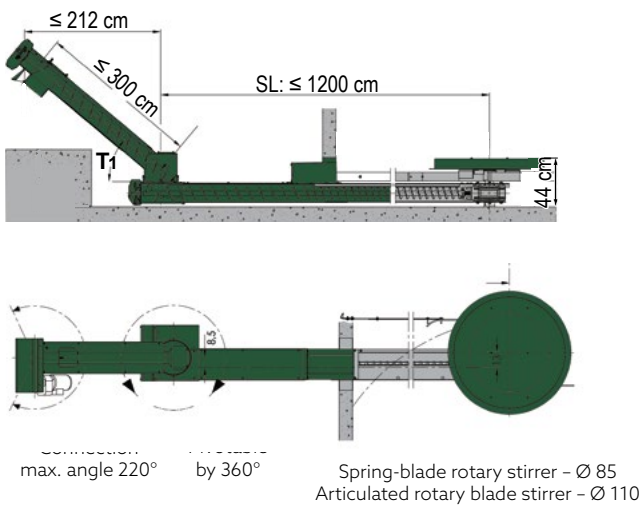


Cutouts for the floor
(if the conveyor system is installed in the floor)

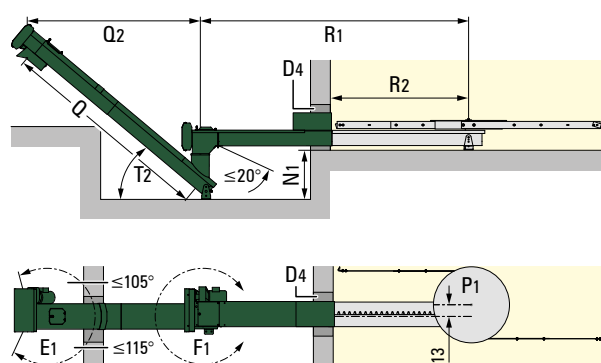


Ascending screw with upward transfer

Wood chips: up to 100 kW boiler output possible;
pellets: up to 300 kW boiler output possible



Ascending screw with downward transfer



Combine suction conveying only with spring-blade rotary stirrer!

Legend

D4	Wall duct 60 x 60 cm: Seal after installation; the channel must be acoustically decoupled (Ø2 cm acoustic insulation)
N1	Height difference: 0°-25°: ≥ 45 cm, 26°-35°: ≥ 50 cm 36°-45°: ≥ 60 cm
SL	Screw length conveyor channel maximally 12 m (install horizontally!)
T1	Angle when pellets are used 35°-45°
T2	Angle when pellets are used: 0°-40° (45° with channel insert)
P1	Diameter of the stirrer cover plate: Spring-blade rotary stirrer: Ø 85 cm, articulated rotary blade stirrer: Ø 110 cm. Diameter of the stirrer: Spring-blade rotary stirrer: Ø 2.5 m, 3.0 m, 3.5 m, 4.0 m (4.5 m only for pellets), articulated rotary blade stirrer: Ø 4.0 m, 4.5 m, 5.0 m, 5.5 m

E1	Swing range ascending screw; max. angle to the KWB Multifire 220°
F1	Free rotation
Q	Screw length (from connection point head section drop shaft to the fire shutter): Up to 15°: ≤ 12 m; 15°-40°: (45° with channel insert): ≤ 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

All dimensions in cm | Width x Height

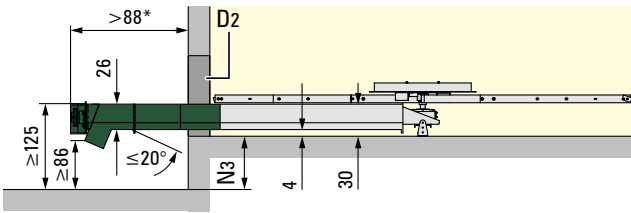
Conveyor system L

Floor-level stirrer



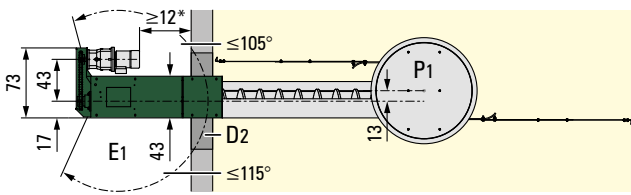
Can be realised for
Wood chip and pellet operation
Compatible with
KWB Powerfire type TDS 240/300 kW
KWB Powerfire type TDS2 500 kW

Drawing



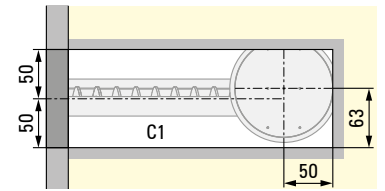
Plan the depression very carefully and ensure precise execution during construction. Deviating natural dimensions and planning errors can cause massive problems and additional costs when installing the fuel extractor.

Plan view



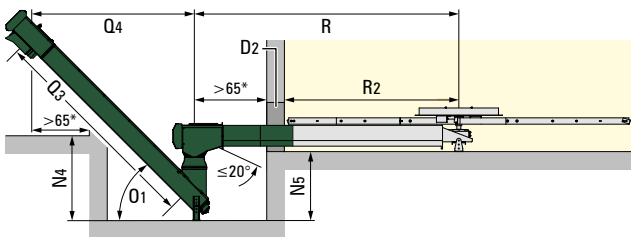
Separate stirrer drive required for KWB Powerfire type TDS2 500 kW**

Cutouts for the floor (if the conveyor system is installed in the floor.)

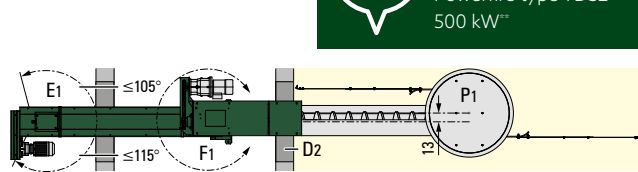


Ascending screw with downward transfer for 240 - 500 kW

Drawing



Plan view



Separate stirrer drive required for KWB Powerfire type TDS2 500 kW**

* Plan an additional ≥ 25 cm distance to the rear wall if the fuel extractor will 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.
 ** See TDS2 installation examples.

Legend

C1	It must be possible to dismantle the sloping or false floor for up to 30 cm around the channel.		
D2	Wall duct 100 x 80 cm: Seal after installation and acoustically decouple channel.		
E1	Pivot range (connection to the fire shutter)		
F1	Free rotation		
N3	Trough depth: ≥ 93 cm		
N4	$0^\circ: \leq 82$ cm, $40^\circ: \leq 720$ cm		
N5	Trough depth: 87 cm (depending on the incline)		
O1	Incline: $0^\circ - \leq 40^\circ$		
P1	Diameter of the stirrer cover plate: Spring-blade rotary stirrer: $\varnothing 85$ cm, articulated rotary blade stirrer: $\varnothing 110$ cm. Diameter of the stirrer: Spring-blade rotary stirrer: $\varnothing 2.5$ m, 3.0 m, 3.5 m, 4.0 m (4.5 m only for pellets), articulated-blade rotary stirrer: $\varnothing 4.0$ m, 4.5 m, 5.0 m, 5.5 m		
Q3	Screw length (from the connection point: head section drop shaft to fire shutter): $0^\circ - 20^\circ: 0 - 8$ m (0.4 kW motor) $20^\circ - 40^\circ: 0 - 5$ m (0.4 kW motor) $0^\circ - 20^\circ: 8 - 12$ m (1.1 kW motor) $20^\circ - 40^\circ: 5 - \leq 12$ m (1.1 kW motor)		
Q4	Limitation: You must use the same motor for the conveyor screw and ascending screw. Use 1.1 kW motor protection control (Art. no. 13-1000655) for the 1.1 kW motor.		
R	≤ 949 cm (for screw length 12 m, 40°)		
R2	Screw length: $0 - 6$ m (0.4 kW motor) $6 - \leq 10$ m (1.1 kW motor)		
R2	Screw length open		

Fuel pouring heights

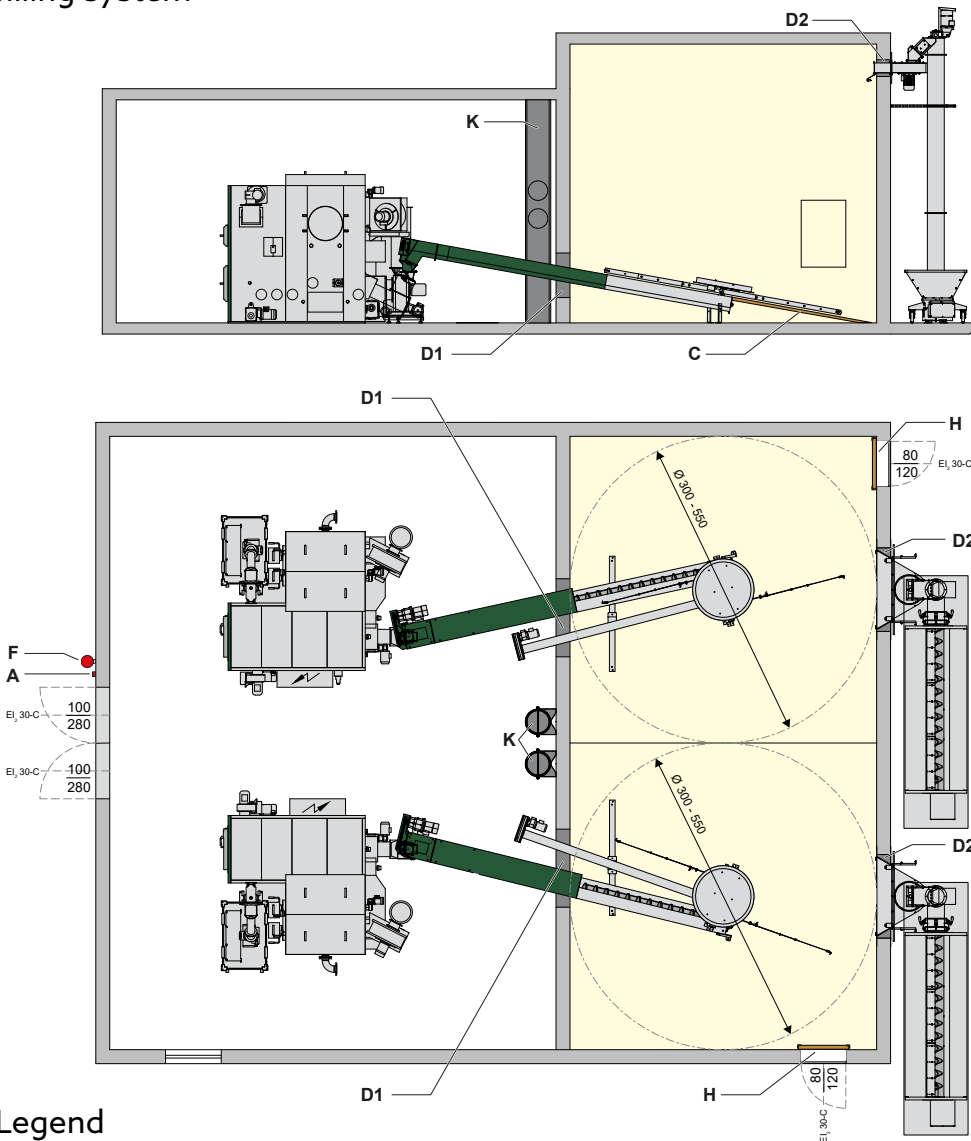
For the use of the spring-blade rotary stirrer or articulated rotary blade stirrer, the maximum pouring height for pellet operation is 3 m. The pouring height for wood chip operation is a stirrer diameter of 1.5. Greater pouring heights only upon request. Please comply with the DIN EN ISO 20023 standard when designing the pellet storage.

All dimensions in cm | Width x Height

Installation examples

KWB Powerfire type TDS2 500 kW

Conveyor system for double boiler systems with wood chip operations and a BBSV bunker filling system



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 ventilation and acoustic decoupling are recommended)
D1	Wall duct 140 × 80 cm; seal after installation; the channel must be acoustically decoupled (at least 2 cm acoustic insulation)
D2	Wall duct 150 × 30 cm with 300 mm installation frame; 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 • Keep access to the chimney free: at least 60 cm • Exhaust gas pipe and chimney model according to "Technical data" table • Install energy-saving damper with blowback flap
M	Ricochet protection mat
P	Ventilated filling nozzles (injection & suction nozzles). Place the injection connector in the middle of the room and the suction nozzle ≥ 50 cm to the side of the injection connector in the direction of the storage room door. The suction nozzle should always be cut as short as possible inside, almost flush with the wall (it must still be possible to mount the earthing clamp!). Both nozzles should be attached at a distance of ≥ 50 cm from the side walls and ≥ 20 cm from the ceiling.

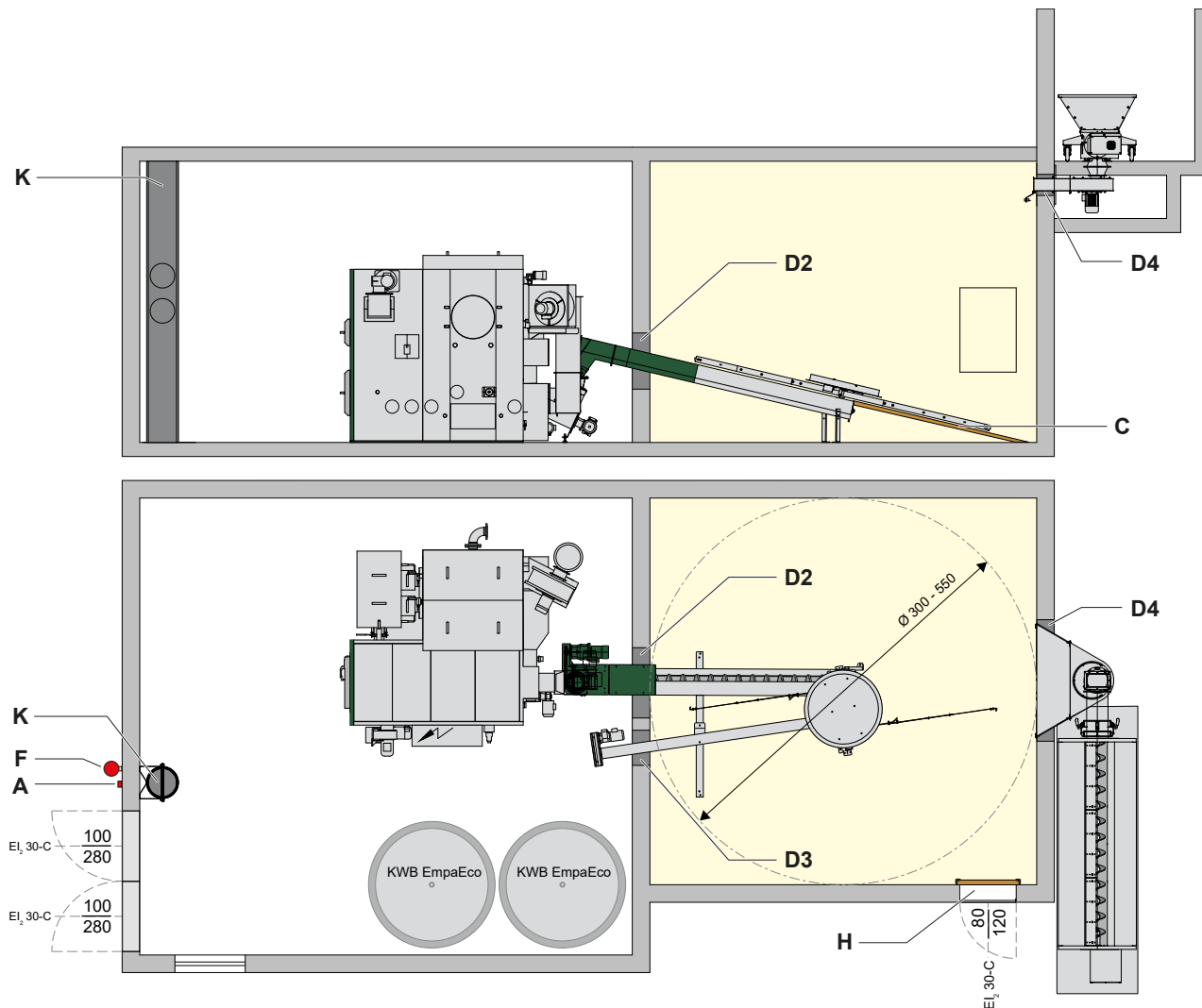
Notes	<ul style="list-style-type: none"> • Ventilation of the heating room: 5 cm²/kW or ≥ 400 cm² must be ensured. • Take the ceiling load/static loads into account. • Mount the drives outside of the storage room • Local fire safety regulations and other requirements must be observed. • Maintain the legally prescribed distances to flammable materials.
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All dimensions in cm | Width x Height

Installation examples

KWB Powerfire type TDS2 500 kW

Conveyor system for wood chip operations with a BBSU bunker filling system



Legend

A	Emergency-stop switch: Boiler NOT de-energised, but combustion stopped – heat dissipation continues.	K	Chimney • Keep access to the chimney free: at least 60 cm • Exhaust gas pipe and chimney model according to "Technical data" table • Install energy-saving damper with blowback flap
C	False floor optional – it is possible to install the conveyor channel in a recess in the floor. (Rear ventilation and acoustic decoupling are recommended)	M	Ricochet protection mat
D2	Wall duct 100 × 80 cm; seal after installation; the channel must be acoustically decoupled (at least 2 cm acoustic insulation)	P	Ventilated filling nozzles (injection & suction nozzles). Place the injection connector in the middle of the room and the suction nozzle ≥ 50 cm to the side of the injection connector in the direction of the storage room door. The suction nozzle should always be cut as short as possible inside, almost flush with the wall (it must still be possible to mount the earthing clamp!). Both nozzles should be attached at a distance of ≥ 50 cm from the side walls and ≥ 20 cm from the ceiling.
D3	Wall duct 50 × 50 cm; seal after installation; the channel must be acoustically decoupled (at least 2 cm acoustic insulation)		
D4	Wall duct 185 × 30 cm with 600 mm installation frame; 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		

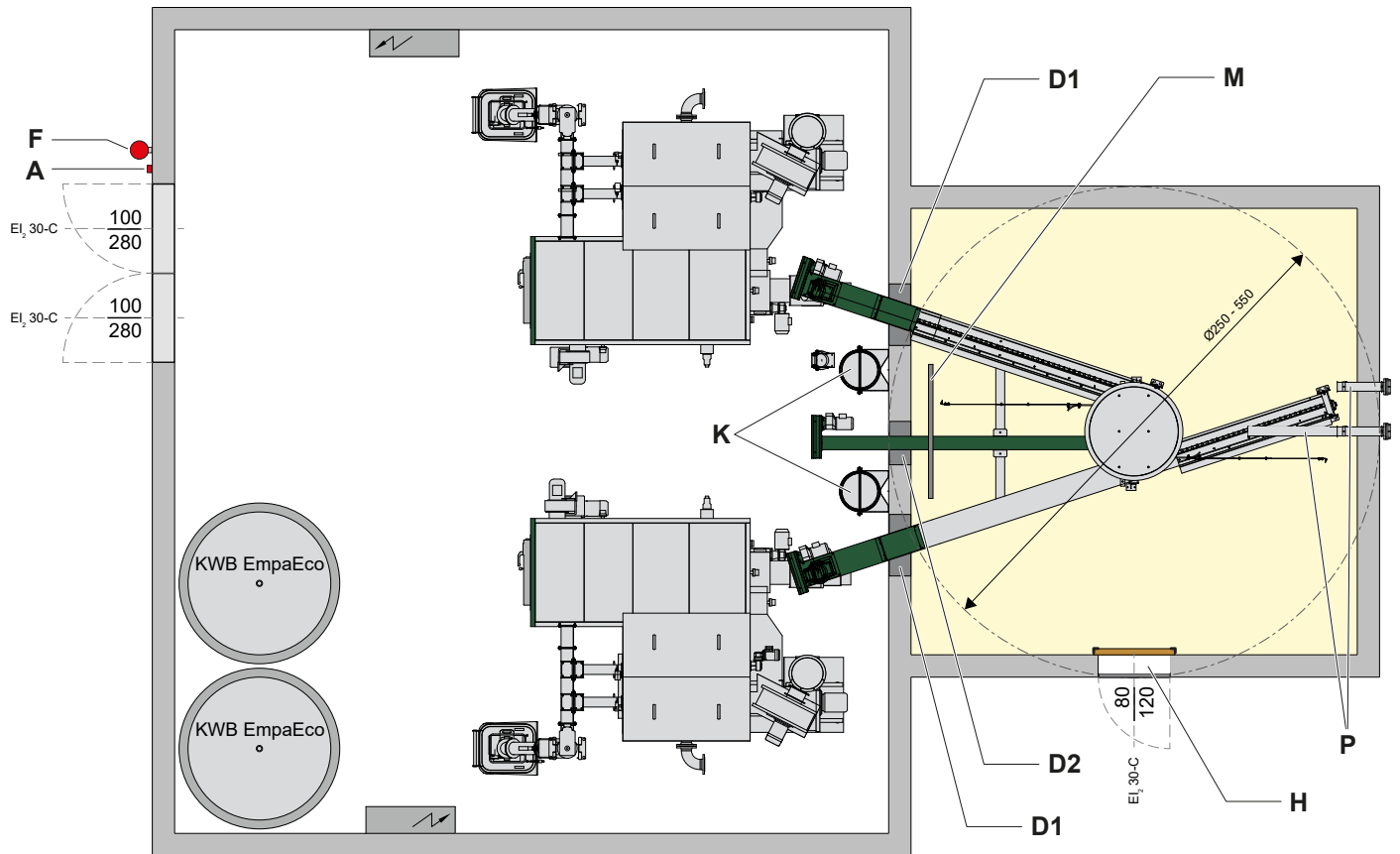
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All dimensions in cm | Width x Height

Installation examples

KWB Powerfire type TDS2 500 kW

Conveyor systems for double boiler systems in pellet operation



Planning advice: The Y-shaped conveyor channel has a short screw channel and a long screw channel where half of the channel is closed. The opening of the long channel must reach to under the stirrer disc, but remain in the green ring area (ring width 140 mm). It must not reach into the blocking zone (red area, diameter 820 mm).

Legend

A	Emergency-stop switch: Boiler NOT de-energised, but combustion stopped – heat dissipation continues.	K	Chimney • Keep access to the chimney free: at least 60 cm • Exhaust gas pipe and chimney model according to "Technical data" table • Install energy-saving damper with blowback flap
C	False floor optional – it is possible to install the conveyor channel in a recess in the floor. (Rear ventilation and acoustic decoupling are recommended)	M	Ricochet protection mat
D1	Wall duct 60 × 60 cm; seal after installation; the channel must be acoustically decoupled (at least 2 cm acoustic insulation)	P	Ventilated filling nozzles (injection & suction nozzles). Place the injection connector in the middle of the room and the suction nozzle ≥ 50 cm to the side of the injection connector in the direction of the storage room door. The suction nozzle should always be cut as short as possible inside, almost flush with the wall (it must still be possible to mount the earthing clamp!). Both nozzles should be attached at a distance of ≥ 50 cm from the side walls and ≥ 20 cm from the ceiling.
D2	Wall duct 50 × 50 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		

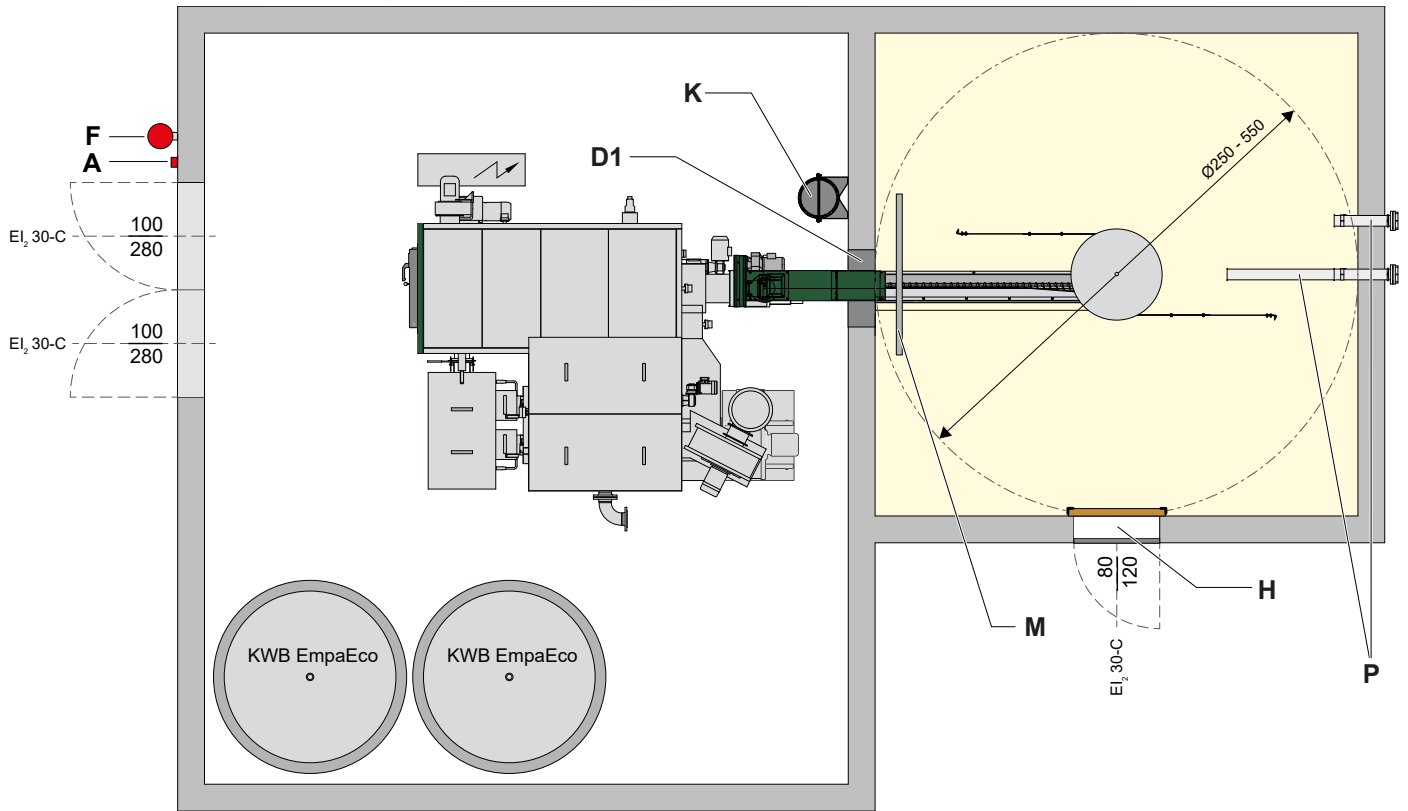
Notes	<ul style="list-style-type: none"> • Ventilation of the heating room: 5 cm²/kW or ≥ 400 cm² must be ensured. • Take the ceiling load/static loads into account. • Mount the drives outside of the storage room • Local fire safety regulations and other requirements must be observed. • Maintain the legally prescribed distances to flammable materials.
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All dimensions in cm | Width x Height

Installation examples

KWB Powerfire type TDS2 500 kW

Conveyor system in pellet operation



Legend

A	Emergency-stop switch: Boiler NOT de-energised, but combustion stopped – heat dissipation continues.	M	Ricochet protection mat
C	False floor optional – it is possible to install the conveyor channel in a recess in the floor. (Rear ventilation and acoustic decoupling are recommended)	P	Ventilated filling nozzles (injection & suction nozzles). Place the injection connector in the middle of the room and the suction nozzle ≥ 50 cm to the side of the injection connector in the direction of the storage room door. The suction nozzle should always be cut as short as possible inside, almost flush with the wall (it must still be possible to mount the earthing clamp!). Both nozzles should be attached at a distance of ≥ 50 cm from the side walls and ≥ 20 cm from the ceiling.
D1	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 <ul style="list-style-type: none"> • Keep access to the chimney free: at least 60 cm • Exhaust gas pipe and chimney model according to "Technical data" table • Install energy-saving damper with blowback flap 		

Notes	<ul style="list-style-type: none"> • Ventilation of the heating room: 5 cm²/kW or ≥ 400 cm² must be ensured. • Take the ceiling load/static loads into account. • Mount the drives outside of the storage room • Local fire safety regulations and other requirements must be observed. • Maintain the legally prescribed distances to flammable materials.
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All dimensions in cm | Width x Height

KWB Customer Service



Top technicians



Comprehensive service



In operation for you

We are at your service

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