Cascade Solutions

Technology & Planning 2025

Cascade systems

KWB multi-boiler systems with benefits that you won't find anywhere else

The heat supply based on climate-neutral fuels, such as wood chips or pellets, is increasingly implemented through multi-boiler systems. These cascade solutions have certain advantages for the operator:

- They are fail-safe in case of an incident.
- They permit safe planning of maintenance work.
- Exhaust gas lines can potentially be combined.
- Material-protecting distribution of the overall heat supply to the individual boilers by the KWB boiler master-and-slave circuit.
- Infinitely variable modulation in broad performance ranges with activation of an external boiler for peak load operation, if required.
- Advantages regarding space requirements and placement of the system in existing heating and storage rooms.
- High flexibility during the planning of newly to be built heating and storage rooms.
- Network interface to the online connection of the system via PC or mobile phone/tablet.
- The KWB boiler master-and-slave circuit can control up to 8 KWB biomass heating systems in one system in a modulating manner. Theoretically, this allows an output of up to 2,4 MW. In addition, an external heat generator, e.g. for covering peak loads, can be activated.
- Heating circuits in the heat network can be networked via bus cables and controlled using external heating management modules.

A good heating system only delivers as much performance as required

KWB multi-boiler systems function in a modulating manner, are fail-safe and efficient.

Perfectly modulated

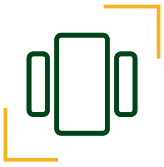
Perfect modulating and buffer management for efficient and material-saving operations.

Up to 8 KWB boilers plus one external boiler.

KWB's modular and easily transportable system

Careful transportation of individual boiler components into the basement.

- Low weight of individual components
- Small dimensions
- Door width for Easyfire 70 cm
- Door width for Pelletfire 80 cm



Compact design

- Flexible use of the planned heating room space
- Various planning options
- Optimal room utilization during renovation
- Container versions F90/T30 are also possible

Proposed configuration

Combination options

All KWB pellet heating system from 8 to 300 kW are suitable for the cascade solution in screw operation.

For this, it is possible to implement the various fuel extraction options in pellet or wood chip operations:
- Each boiler has its own fuel extraction
- A large storage for every 2 boilers

All KWB pellet heating systems from 8 to 135 kW are suitable for the cascade solution in suction operation.

For this, it is possible to implement the various fuel extraction options in pellet operations:
- Each boiler has its own fuel extraction
- A large storage for every 2 boilers with joint / separate fuel extraction
- Several boilers with several storages, rooms or fabric tanks, implementation with a suction switch unit

All combinations can, as a rule, be integrated into the planning of existing buildings or buildings that are to be newly built. Alternatively, an implementation with a reinforced concrete container is always possible.

Boiler master-and-slave circuit

Compatible with
KWB Comfort 3
KWB Comfort 4

The KWB boiler master-and-slave circuits are used for systems with several boilers in order to control the order of utilization of the boilers to meet the heat requirements in a heat distribution system.

It is possible to operate a boiler cascade comprising between 2 and up to 8 boilers and additionally a peak-load boiler. The cascade may contain both boilers with Comfort 4 control as well as Comfort 3 control – also in mixed installations. Precondition is a central buffer storage tank with 5 temperature sensors.

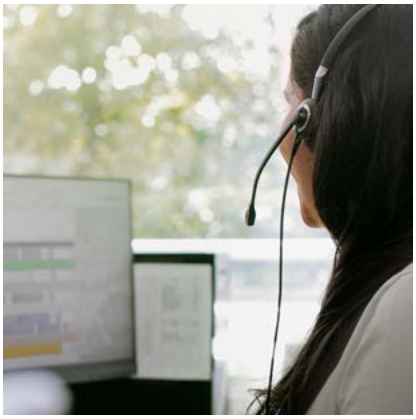
Boilers with Comfort 4 control and Powerfire boilers (with Comfort 3) are requested in a modulating manner via Modbus connection. External boilers are requested via a switch contact.

* Boilers of any heating system manufacturers

KWB after-sales services

in cascade operations

- ✓ Full maintenance contracts with a term of 10 years
- ✓ Online monitoring – system care provided by KWB
- ✓ Ash removal and heating room inspection
- ✓ Certified ash disposal
- ✓ Storage room monitoring
- ✓ System optimisation



Overview of cascade systems

The prices listed below are pure list price aggregations, only referring to boiler and control system. These configurations cannot be ordered as a package and must be individually configured together with the respective fuel extraction.

KWB Easyfire pellet heating system

Scope of delivery: Boiler prepared for connection to the selected fuel extraction, incl. wheelable ash box, return flow boost with PWM pump, balancing valve, KWB Comfort 4 control system with Comfort Online interface, boiler master-and-slave control with safety box, control of buffer and DHW management and 2 heating circuits.

Option: partially automated cascade – log wood/pellets

Scope of delivery: 2 pellet boiler units and 1 log wood unit, pellet boiler prepared for connection to the suction-fuel extraction, incl. wheelable ash box, respectively, return flow boost, balancing valve, KWB Comfort 4 control system with Comfort Online interface, boiler master-and-slave control with safety box and required licenses, control of buffer and DHW management and 2 heating circuits.

Overview of cascade systems

Pellet heating system KWB Pelletfire^{Plus}

Scope of delivery: Pellet boiler KWB Pelletfire^{Plus}, incl. internal return flow boost, heat exchanger cleaning Silent, fuel recognition Plus, exhaust gas recirculation, brushless suction turbine in suction operations, KWB Comfort 4 control system with Comfort Online interface, boiler master-and-slave control with safety box, control of buffer and DHW management and 2 heating circuits.

KWB Powerfire pellet heating system

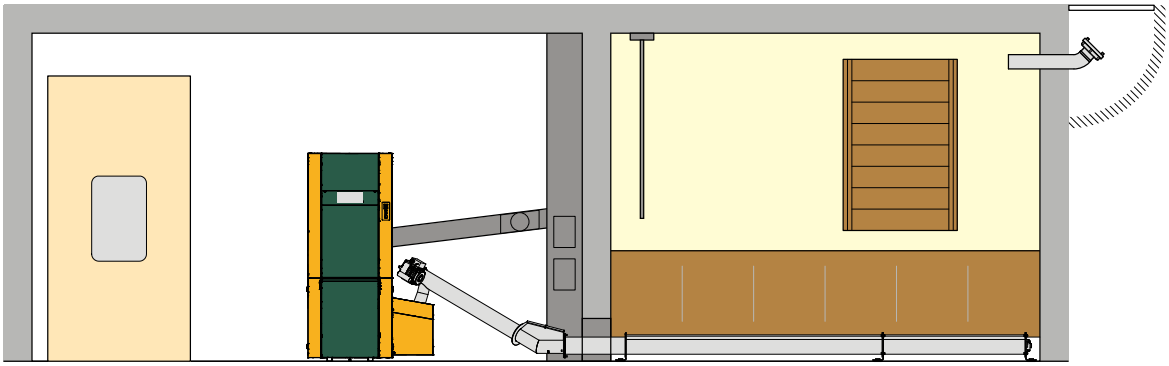
Scope of delivery: Pellet boiler KWB Powerfire, incl. exhaust gas recirculation, ash extraction into a 240l ash bin, KWB Comfort 3 control with network card for connection to the Comfort Online platform, heating management module Autonomous, boiler master-and-slave control with safety box and required licenses, control of buffer and DHW management and 2 heating circuits.

Additional cascade solutions for output up to 2,4 MW upon request.
Can control up to 8 KWB boilers plus one external boiler.
Your KWB contact partner will be happy to provide you with more details.

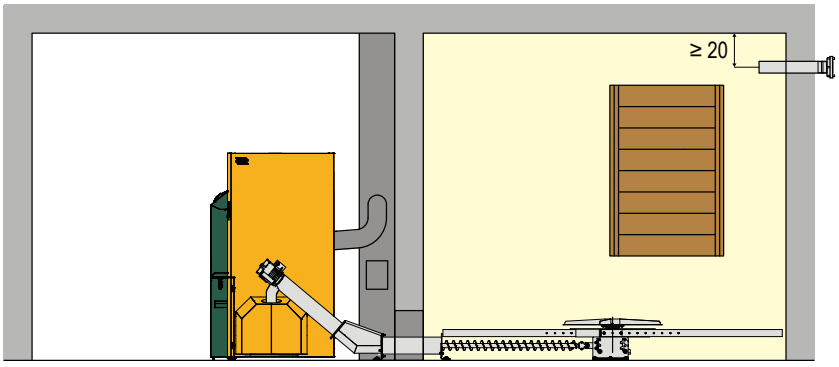
Cascade solution in screw operation

For this option, a separate fuel extraction will need to be configured for each boiler.

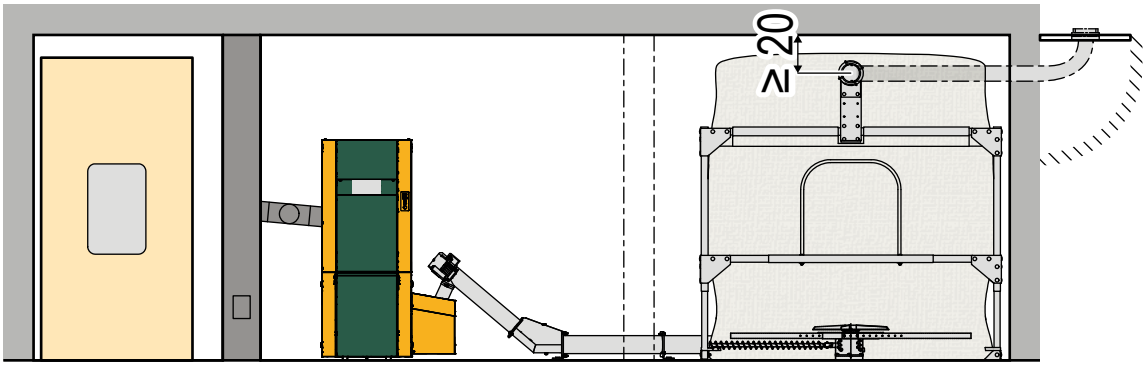
Pellet screw with sloping floor



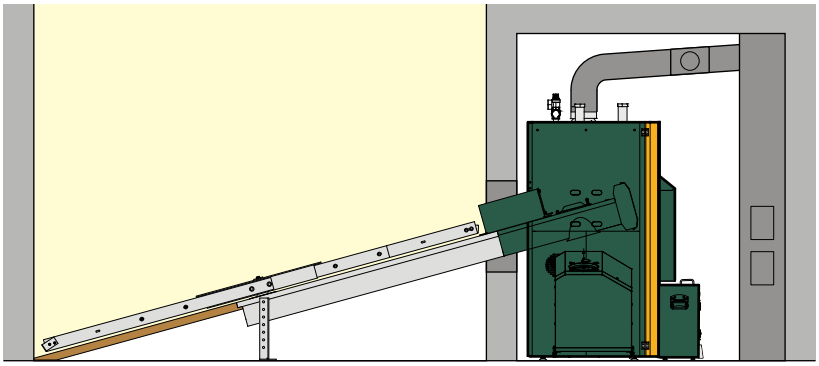
KWB Pellet Stirrer Plus



KWB Pellet Big Bag and elbow screw



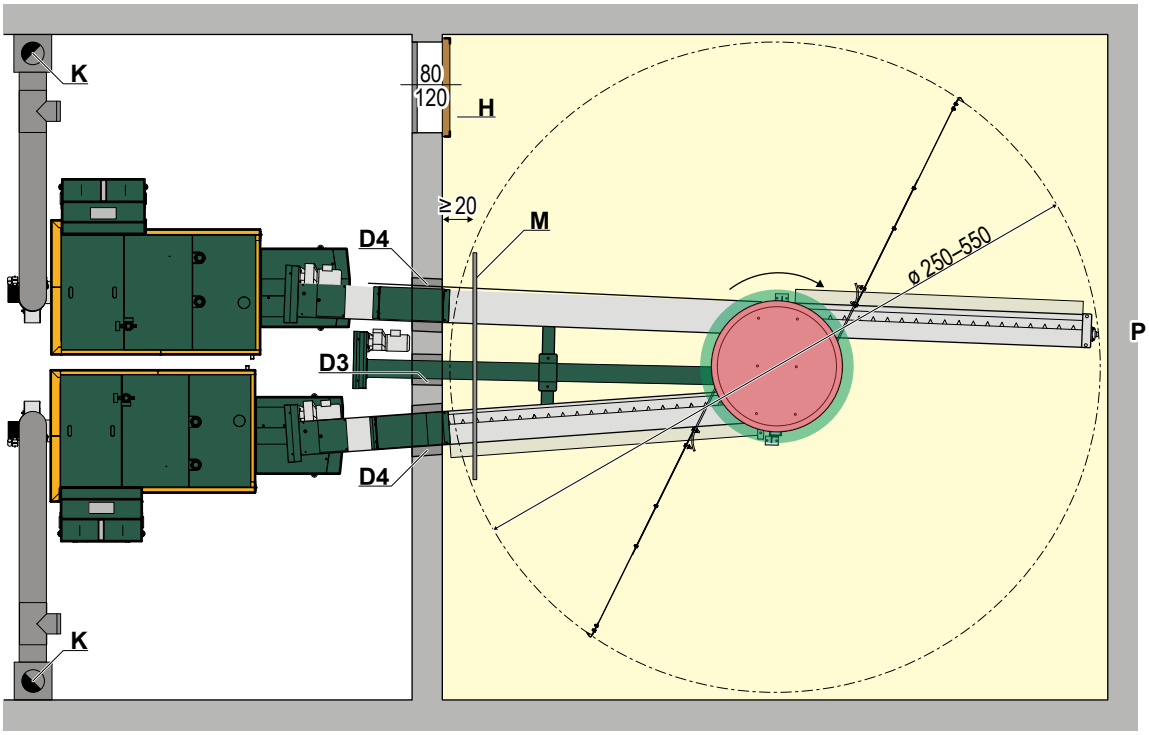
Stirrer with conveyor channel and direct connection



All dimensions in cm I Width x Height

Stirrer with y-shaped conveyor channel and direct connection

Parallel screw operations for two boilers and one fuel extraction.



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

D3	Wall duct 50 × 50 cm; seal after installation; the channel must be acoustically decoupled (at least 2 cm acoustic insulation)
D4	Wall duct 60 × 60 cm; seal after installation; the channel must be acoustically decoupled (at least 2 cm acoustic insulation)
H	Hatch: Protective door boards for pressure relief
K	• Keep access to the chimney free: at least 60 cm • Exhaust 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 ≥ 50 cm from the side walls and ≥ 20 cm from the ceiling.

Notes	• Provide ventilation of the heating room sized 5 cm² / kW or ≥ 400 cm². • Take the ceiling load / static loads into account! • Mount the drives outside of the storage room. • Strictly comply with local fire safety regulations and structural regulations! • Maintain the legally prescribed distances to flammable materials!

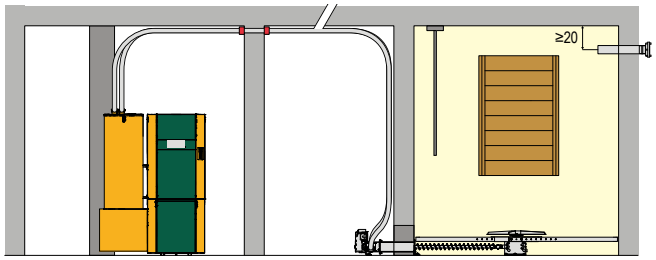
You can find more details and prices in module "D".

All dimensions in cm I Width x Height

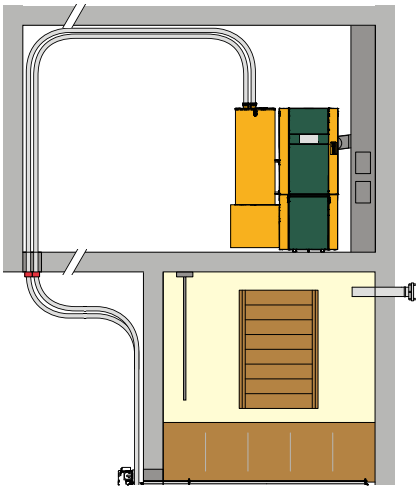
Cascade solution with suction operation

For this option, a separate fuel extraction will need to be configured for each boiler.

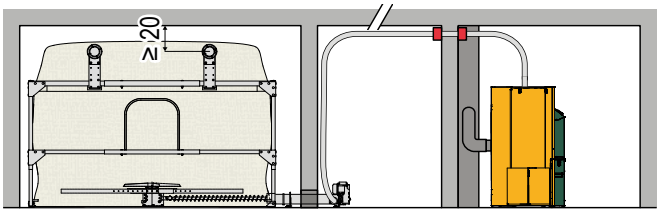
KWB Pellet Stirrer Plus with suction conveyor



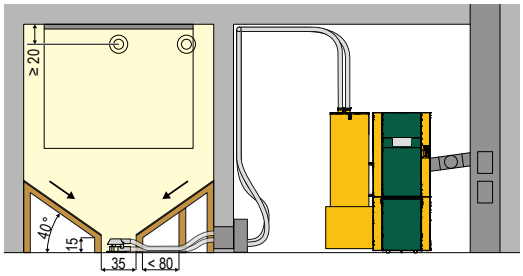
Conveyor screw with suction conveyor



KWB Pellet Big Bag with suction conveyor



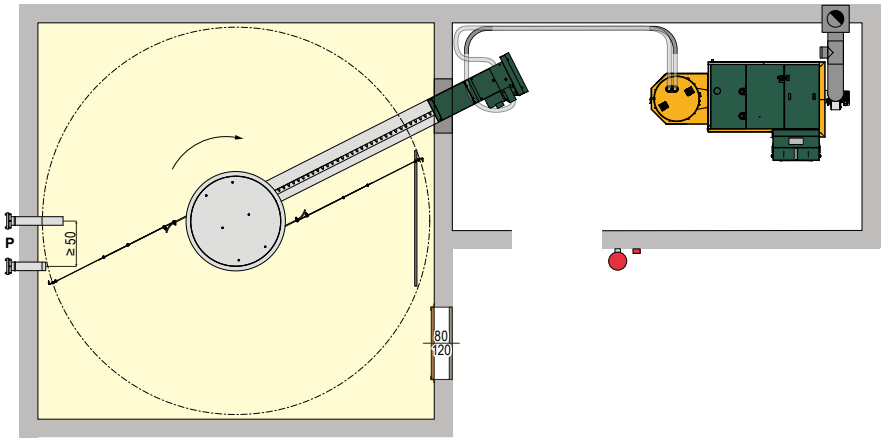
KWB sampling probes with suction conveyor (only to 65 kW)



Combine suction conveyor only with spring-blade rotary stirrer!

Stirrer M with suction conveyor

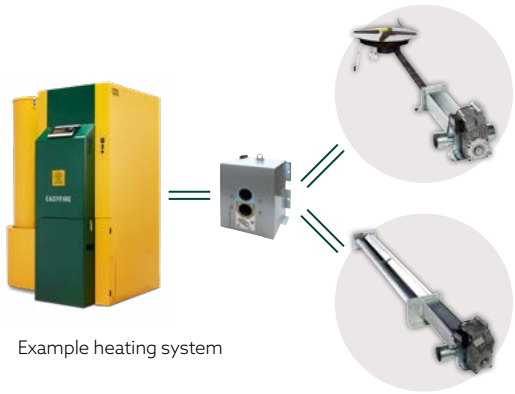
In this version, it is possible to configure the fuel extraction for up to 2 boilers.



Switching in the suction area

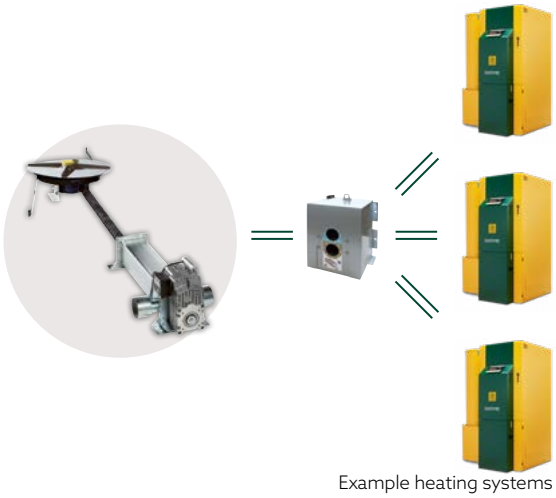
In this version, several boilers in pellet operation can be configured with several fuel extractions.

When using a KWB switch unit, one boiler can use up to 3 pellet storages with suction operations.



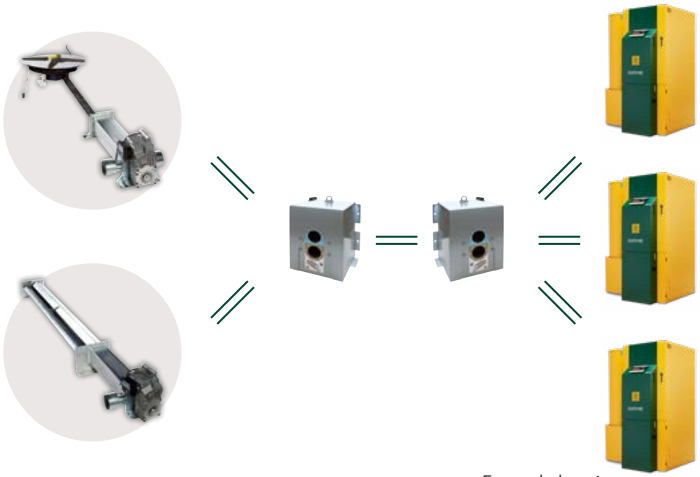
Example heating system

When using a KWB switch unit, up to 3 boilers with suction operations can use one pellet storage.



Example heating systems

When using a KWB switch unit, up to 3 boilers can use up to 3 pellet storages with suction operations.

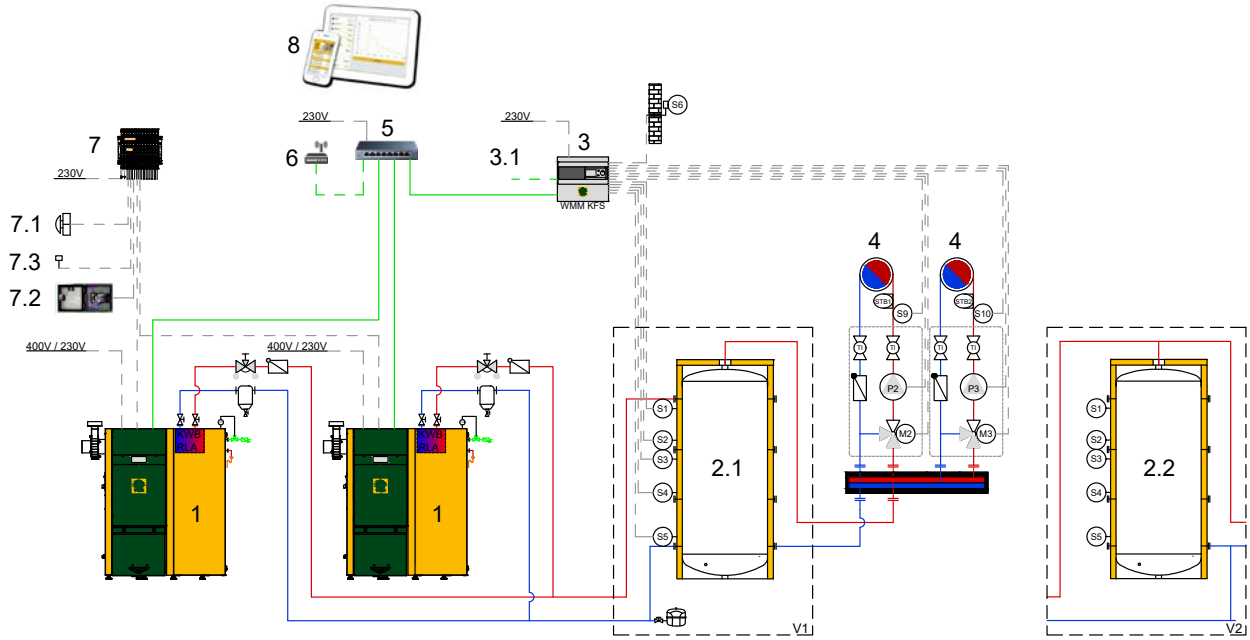


Example heating systems

Depending on the variant, 1 - 2 switch units are required.

Hydraulics

In the hydraulics schematics below, a cascade with 2 KWB biomass boilers ensures the heat supply. The cascade is equipped with a KWB boiler master-and-slave circuit, which also controls 2 heating circuits and the buffer management using the Autonomous function. Via the KWB ComfortOnline, the network can also be mapped in the internet for online monitoring. A safety box monitors the important functions in the heating room. The ModBus function in the control opens the path for a cooperation with an external central building control system.



Legend

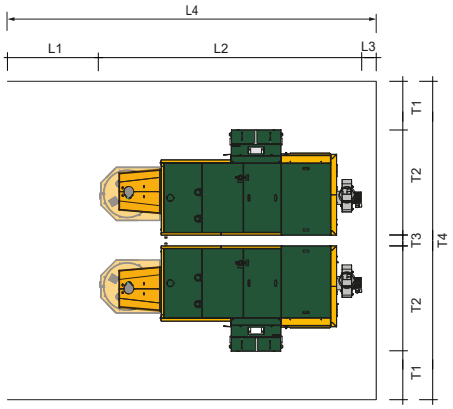
green	Bus cabling
red	Forward flow
blue	Return flow
dashed	Cabling provided on site
S1 – S5	Buffer tank temperature sensors
1	Biomass boiler
2.1	Buffer tank connection hydraulically decoupled
2.2	Buffer storage tank connection in load balancing
3	KWB heating management module Autonomous with boiler master-and-slave circuit and ModBus activation (licenses required)

3.1	Basic or Exclusive control units in living quarters, optionally per heating circuit
4	Controlled heat distribution
5	Ethernet switch
6	Internet (KWB equipment)
7	Safety box
7.1	Emergency stop
7.2	House connection box
7.3	Low water pressure switch
8	KWB Comfort Online, customer portal for online system monitoring

Compact installation dimensions

KWB Pelletfire^{Plus} and KWB Multifire

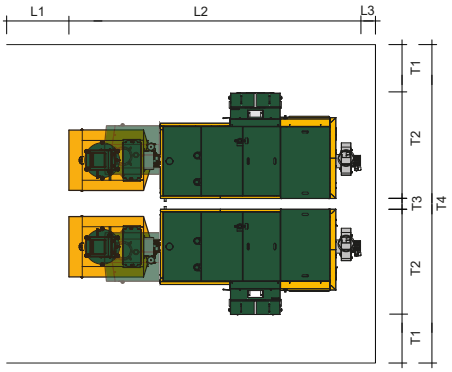
KWB Pelletfire^{Plus}



	KWB Pelletfire^{Plus}	45–65 kW		70–95 kW		100–135 kW	
		S	GS	S	GS	Model R S	Model R GS
L1	Free space	42	18	47	23	47	23
L2	Heating system length without filter	200	224	221	245	233	257
	Heating system length with filter	245	269	275	299	287	311
L3	Free space	7	7	7	7	7	7
L4	Minimum room length without filter	> 250	> 250	> 276	> 276	> 288	> 288
	Minimum room length with filter	> 295	> 295	> 330	> 330	> 342	> 342
T1	Free space	53	53	53	53	53	53
T2	Heating system depth	112	112	122	122	122	122
T3	Free space (with exhaust gas circulation: additional 20 cm)	11	11	11	11	11	11
T4	Total depth (with exhaust gas circulation: additional 20 cm)	341	341	361	361	361	361

S ... KWB Pelletfire^{Plus} type MF2 S GS ... KWB Pelletfire^{Plus} type MF2 GS

KWB Multifire



	KWB Multifire	20–50 kW		60–80 kW		100–120 kW	
		D	ZI	D	ZI	D	ZI
L1	Free space	42	18	47	23	47	23
L2	Heating system length without filter (P16S / P31S)	> 212 / –	> 252 / –	> 234 / > 243	> 247 / –	> 246 / > 255	> 286 / –
	Heating system length with filter (P16S / P31S)	258 / –	298 / –	290 / 299	328 / –	301 / 310	340 / –
L3	Free space	7	7	7	7	7	7
L4	Min. room length without filter (P16S / P31S)	> 254 / –	> 284 / –	> 276 / > 275	> 306 / –	> 288 / > 287	> 318 / –
	Min. room length with filter (P16S / P31S)	> 295	> 327	> 331	> 356	> 342	> 368
T1	Free space	53	53	53	53	53	53
T2	Heating system depth	112	112	122	122	122	122
T3	Free space (with exhaust gas circulation: additional 20 cm)	11	11	11	11	11	11
T4	Total depth (with exhaust gas circulation: additional 20 cm)	341	341	361	361	361	361

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