KWB
Energy. Thought further.

Hydraulics Equipment

Technology & Planning 2026

Required hydraulic structural conditions

Boiler placement

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

Hydraulics

For pellets, it is necessary to have a return flow inlet temperature of at least 50 °C (TDS: 55 °C); otherwise, there is an increased risk of corrosion, which also has the effect of voiding the warranty. The boiler control can activate a mixer controller for a return flow boost. KWB provides suitable fittings to increase the return flow temperature. The heating system must generally feature a pressure-less distribution system (switch, distributor, load-balancing tank, buffer ...) and a safety group that complies with the relevant regulations (e.g. according to ÖNORM EN 12828 or EN 303). A safety group is also required by regulation. Attention: The return-flow temperature boost of the KWB Easyfire type EF2 is already integrated – the required 2-way valve with servo motor is included in the scope of delivery and must be connected by a licensed installer of heating and electrical systems. Instead of the 2-way valve, it is also possible to implement a return flow boost using the PWM pump which is available from KWB.

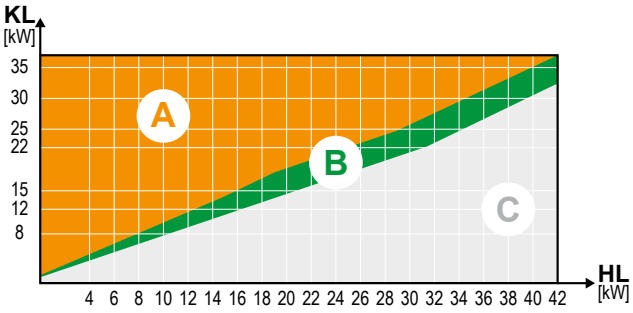
KWB also recommends the installation of an intelligent buffer tank storage when installing a biomass heating system, which can be considered the energy centre of the heating system. This saves heating costs due to lower fuel consumption, increases the annual efficiency coefficient as well as the profitability of the heating system and ensures perfect system solutions and lower emissions. The reason for this is that the heating system is focused on the coldest time of the year, this type of performance, however, is rarely needed and, especially in transition periods, barely utilised. This leads to frequent burner starts, which has a negative effect on fuel consumption and the entire service life of the heating system. A buffer or a load balancing tank is absolutely mandatory in the event of:

- Oversizing: When the rated boiler performance exceeds the heat requirement of the entire building by 50%, you will need a buffer tank (this is often the case when buildings are subsequently enlarged or in low-energy houses). In the event of such dimensioning, a large portion of the operating time the boiler will run under the boiler's smallest modulation degree.
- Very small heating loads in summer / during transition periods, e.g. when only one or two heating units are used during transition periods in summer in a heating network without block charge, ...
- If parts of the heat dissipation system are frequently switched off or in the event of a high passive solar contribution
- In case of large demand for hot water, e. g. hotels, showers in sports facilities, large multi-family houses
- In case of demand peaks for hot water in the morning, e.g. in production facilities, schools
- Integration of a solar power heating system or a log wood boiler
- Multi-boiler systems (boiler master-and-slave circuits)

There are two options to prevent safety devices protecting against overheating from tripping when all heat consumers are switched off: either through a phased consumer switch-off or by ensuring »

sufficient afterrun in the consumer circuits with sufficient load.

The use of a KWB Easyfire type EF2 requires a buffer storage tank of sufficient size, if the average building heating load is more than 20% less than the rated boiler performance. The average building heating load is calculated based on the standard building heating load minus the maximum load.



The following graphic representation may assist with your planning.

KL: Boiler output
HL: Heating load of the building
A: Buffer tank required
B: No buffer tank required
C: Next larger boiler possible

Always use a buffer storage tank if using a KWB Classicfire and KWB Combifire! Please see additional specifications in the table in module „L".

Your installer can advise you with regard to the water connection!

Components of acoustically-insulated water connections must be impermeable to oxygen; otherwise there is an increased risk of corrosion, which also has the effect of voiding the guarantee and warranty.

If plastic pipes for floor heating systems or district heating pipes are connected, it is necessary to integrate a limiting thermostat for the boiler circuit pump to provide additional protection against excessive temperatures.

Thermal discharge safety valve

The thermal discharge safety valve is used to protect against the boiler overheating and opens at a temperature of 95°C. The boilers of the series Classicfire, Combifire, PelletfirePlus, Multifire and Powerfire require a thermal discharge safety valve. It can be ordered separately from KWB.

Solar system / domestic hot water heat pump integration

A solar system makes a biomass heating system even more efficient. In summer and in the transition period, it heats up domestic hot water and heating water, depending on the design. This saves on fuel and preserves the biomass boiler.

The utilization of a domestic hot water pump is also interesting, particularly in combination with a log wood boiler. As a result, refilling wood is not necessary in summer. The heat pump thereby uses the boiler room air or also outside air if desired.

Information

With respect to the condition of the boiler water, VDI 2035 or ÖNORM H 5195 T1 and T2 must be strictly complied with, otherwise there is a risk of corrosion, which may void the warranty and guarantee services. Regarding corrosion, it is necessary to keep an eye on the water conductivity aside from strictly avoiding oxygen entering into the system.

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.

Design parameters

Dimensioning of the diaphragm-type expansion tanks

In the table below, you will find the optimum sizes of the diaphragm-type expansion tanks in relation to the respective boiler output.

Note: Safety valve 3,0 bar to 90°C forward flow temperature (to maintain suction pressure).

Type	Static height: ≤ 5 meters System pressure at 10°C / 1.0 bar Adjustable pre-pressure: 0.7 bar			Static height: ≤ 10 meters System pressure at 10°C / 1.5 bar Adjustable pre-pressure: 1.2 bar		
	Without buffer	With buffer (KWB recommendation)	Buffer (KWB recommendation)	Without buffer	With buffer (KWB recommendation)	Buffer (KWB recommendation)
KWB Classicfire 1 type CF1 15/20 kW	X	MAG 150 l	1.000 l	X	MAG 150 l	1.000 l
KWB Classicfire 2 type CF2 18–38 kW	X	MAG 400 l	3.000 l	X	MAG 400 l	3.000 l
KWB Combifire 2 type CF2 18–38 kW	X	MAG 400 l	3.000 l	X	MAG 400 l	3.000 l
KWB Easyfire 1 type EF1 10–20 kW	MAG 35 l	MAG 80 l	500 l	MAG 35 l	MAG 80 l	500 l
KWB Easyfire 2 type EF2 8–15 kW	MAG 35 l	MAG 80 l	500 l	MAG 35 l	MAG 80 l	500 l
KWB Easyfire 2 type EF2 22 kW	MAG 80 l	MAG 80 l	500 l	MAG 80 l	MAG 80 l	500 l
KWB Easyfire 2 type EF2 25–38 kW	MAG 80 l	MAG 100 l	800 l	MAG 80 l	MAG 100 l	800 l
KWB Pelletfire^{Plus} type MF2 45–75 kW	MAG 80 l	MAG 150 l	1.000 l	MAG 80 l	MAG 150 l	1.000 l
KWB Pelletfire^{Plus} type MF2 95–100 kW	MAG 100 l	MAG 200 l	1.500 l	MAG 100 l	MAG 200 l	1.500 l
KWB Multifire type MF2 20–70 kW	MAG 80 l	MAG 150 l	1.000 l	MAG 80 l	MAG 150 l	1.000 l
KWB Multifire type MF2 80–100 kW	MAG 100 l	MAG 200 l	1.500 l	MAG 100 l	MAG 200 l	1.500 l

Information

KWB stratified and buffer storage tanks may be placed in a row directly next to each other!

Buffer tank dimensioning

Type	Recommended tank volume
KWB Easyfire 2 type EF2 (pellet heating system) KWB Multifire type MF2 (wood chip and pellet heating system) KWB Pelletfire^{Plus} type MF2 (pellet heating system) KWB Powerfire TDS (wood chip and pellet heating system)	Optimal: buffer tank volume = 1,5 litres * kW * 400 / K Minimum: buffer tank volume = 1,0 litres * kW * 400 / K
KWB Classicfire & KWB Combifire type CF2 (log wood and pellet heating system)	Optimal: 16-litre buffer storage tank per litre fill room Minimum: 10-litre buffer tank per litre fill room

kW = rated power of the boiler in [kW] K ... temperature difference between buffer tank charging start/end (t_{Max} - t_{Min}) in Kelvin [K]

National deviation Switzerland: Automatic wood-fired boilers up to 500 kW nominal heat output: buffer volume min. 25 l/kW (except: pellet boilers for up to 70 kW); subsidy policy Germany: Pellet and wood chip 30 l/kW buffer volume, wood chip 55 l/kW buffer volume

DHWC dimensioning

Household size	Recommended KWB hot water storage system
3–4 persons	KWB EmpaTherm (Solar) 300 litres
5–6 persons	KWB EmpaTherm (Solar) 500 litres

Parameters for return flow boost

For boiler circuit pump and return flow temperature boost KWB Combifire, KWB Classicfire CF1, CF2 and CF1.5

Spread ΔT across the boiler		Minimum required volume flow V – recommended return flow temperature boost set from the KWB product line[1]					
		10		15		20	
Boiler output		V	Article number	V	Article number	V	Article number
[kW]	kW boost operation[2]	[m³/h]		[m³/h]		[m³/h]	
KWB Classicfire type CF1 Recommended return flow temperature boost: RFB group / Kvs 12							
15 20	up to 25	2,15	24-2001424	1,43	24-2001424	1,10	24-2001424
KWB Classicfire type CF1.5 and CF2, KWB Combifire type CF2 Recommended return flow temperature boost: RFB group / Kvs 12							
18 / 22 28 / 30 32 38	up to 38	3,27	24-2001424	2,18	24-2001424	1,63	24-2001424

[1] The recommendation applies to standard situations - heat generator in the heating room
[2] During boost operation, a peak output of 25 kW or 38 kW is reached. Accordingly, the return flow boost must be adjusted to the peak output of 25 kW or 38 kW.

For boiler circuit pump and return flow temperature boost KWB Easyfire 1

	Minimum required volume flow V – recommended return flow temperature boost set from the KWB product line[1]								
Spread ΔT across the boiler	10			15			20		
Recommended return flow temperature boost		Valve / Kvs 9	Charge valve unit with pump		Valve / Kvs 9	Charge valve unit with pump		Valve / Kvs 9	Charge valve unit with pump
Boiler output [kW]	V [m³/h]	Article number	Article number	V [m³/h]	Article number	Article number	V [m³/h]	Article number	Article number
10	0,86	24-2001093	24-2002437	0,57	24-2001093	24-2002437	0,43	24-2001093	24-2002437
15	1,29	24-2001093	24-2002437	0,86	24-2001093	24-2002437	0,64	24-2001093	24-2002437
20	1,72	24-2001093	24-2002437	1,15	24-2001093	24-2002437	0,86	24-2001093	24-2002437

[1] Our recommendation applies to standard conditions – heat generator in the heating room

Volume flow KWB Easyfire EF2

Spread ΔT across the boiler	10 K	15 K	20 K	25 K	30 K
Boiler output [kW]	V [m³/h]	V [m³/h]	V [m³/h]	V [m³/h]	V [m³/h]
8	0,69	0,46	0,34	0,28	0,23
12	1,03	0,69	0,52	0,41	0,34
15	1,29	0,86	0,64	0,52	0,43
22	1,89	1,26	0,95	0,76	0,63
25	2,15	1,43	1,07	0,86	0,72
30	2,58	1,72	1,29	1,03	0,86
35	3,01	2,00	1,50	1,20	1,00
38	3,26	2,17	1,63	1,30	1,09

Parameters for return flow boost

Pre-assembled return flow temperature boost KWB Pelletfire[Plus]

	Volume flow V – usable conveyance height [m WS = meter water column]									
Spread ΔT across the boiler	10			15			20			
Boiler output [kW]	V [m³/h]	usable conveyance height [m WS]	Article number	V [m³/h]	usable conveyance height [m WS]	Article number	V [m³/h]	usable conveyance height [m WS]	Article number	Kvs [m³/h]
45	3.87	–	–	2.58	2.5	24-2000969	1.93	4.7	24-2000969	10
50	4.30	–	–	2.87	1.4	24-2000969	2.15	3.5	24-2000969	10
55	4.73	–	–	3.15	–	24-2000969	2.36	3.2	24-2000969	10
65	5.59	–	–	3.73	–	–	2.79	0.7	24-2000969	10
70	6.02	2.4	24-2000970	4.01	5.1	24-2000970	3.01	6.4	24-2000970	20
75	6.45	1.8	24-2000970	4.30	4.8	24-2000970	3.22	6.0	24-2000970	20
95	8.17	1.7	24-2000972	5.45	6.0	24-2000972	4.08	7.9	24-2000972	20
100	8.60	2.1	24-2000971	5.73	6.0	24-2000971	4.30	7.8	24-2000971	32
108	9.29	1.3	24-2000971	6.19	5.5	24-2000971	4.64	7.5	24-2000971	32
115	9.89	0.6	24-2000971	6.59	4.8	24-2000971	4.94	7.0	24-2000971	32
135	11.61	–	–	7.74	3.3	24-2000971	5.80	6.0	24-2000971	32

Parameters for boiler circuit pump and return flow temperature boost

	Minimum required volume flow V - recommended return flow temperature boost set from the KWB product line											
Spread ΔT across the boiler	10				15				20			
		Recommended return flow temperature boost				Recommended return flow temperature boost				Recommended return flow temperature boost		
Boiler output [kW]	V [m³/h]	Article number	Kvs [m³/h]	Pressure loss across the completely open valve [mbar]	V [m³/h]	Article number	Kvs [m³/h]	Pressure loss across the completely open valve [mbar]	V [m³/h]	Article number	Kvs [m³/h]	Pressure loss across the completely open valve [mbar]
45	3.87	24-2000344	18	46	2.58	24-2000343	12	46	1.93	24-2000343	12	26
50	4.30	24-2000345	24	32	2.86	24-2000343	12	32	2.15	24-2000343	12	32
55	4.73	24-2000345	24	39	3.15	24-2000344	18	31	2.36	24-2000343	12	39
65	5.58	24-2000345	24	54	3.72	24-2000344	18	43	2.79	24-2000343	12	54
70	6.01	24-2000345	24	63	4.01	24-2000345	24	28	3.01	24-2000344	18	28
75	6.44	24-2000264	40	26	4.30	24-2000345	24	32	3.22	24-2000344	18	32
95	8.16	24-2000264	40	42	5.44	24-2000345	24	51	4.08	24-2000345	24	29
100	8.59	24-2000264	40	46	5.73	24-2000345	24	57	4.30	24-2000345	24	32
108	9.28	24-2000264	40	54	6.19	24-2000264	40	24	4.64	24-2000345	24	37
115	9.88	–	–	–	6.59	24-2000264	40	27	4.94	24-2000345	24	42
135	11.60	–	–	–	7.73	24-2000264	40	37	5.80	24-2000264	40	21

Parameters for return flow boost

For pre-assembled return flow temperature boost KWB Multifire

	Volume flow V – usable conveyance height [m WS = meter water column]									
Spread ΔT across the boiler	10			15			20			
Boiler output [kW]	V [m³/h]	usable conveyance height [m WS]	Article number	V [m³/h]	usable conveyance height [m WS]	Article number	V [m³/h]	usable conveyance height [m WS]	Article number	Kvs [m³/h]
20	1.72	5.3	24-2000968	1.15	7.3	24-2000968	0.86	8.3	24-2000968	10
30	2.58	2.4	24-2000968	1.72	5.3	24-2000968	1.29	7.1	24-2000968	10
40	3.44	–	–	2.29	3.4	24-2000969	1.72	5.3	24-2000969	10
45	3.87	–	–	2.58	2.5	24-2000969	1.93	4.7	24-2000969	10
50	4.30	–	–	2.87	1.4	24-2000969	2.15	3.5	24-2000969	10
60	5.16	3.6	24-2000970	3.44	5.8	24-2000970	2.58	6.9	24-2000970	20
65	5.59	3.0	24-2000970	3.73	5.4	24-2000970	2.79	6.5	24-2000970	20
70	6.02	2.4	24-2000970	4.01	5.1	24-2000970	3.01	6.4	24-2000970	20
80	6.88	1.2	24-2000970	4.59	4.2	24-2000970	3.44	5.9	24-2000970	20
100	8.60	2.1	24-2000971	5.73	6.0	24-2000971	4.30	7.8	24-2000971	32
108	9.29	1.3	24-2000971	6.19	5.4	24-2000971	4.64	7.5	24-2000971	32
120	10.32	–	–	6.88	4.4	24-2000971	5.16	6.9	24-2000971	32

Parameters for boiler circuit pump and return flow temperature boost

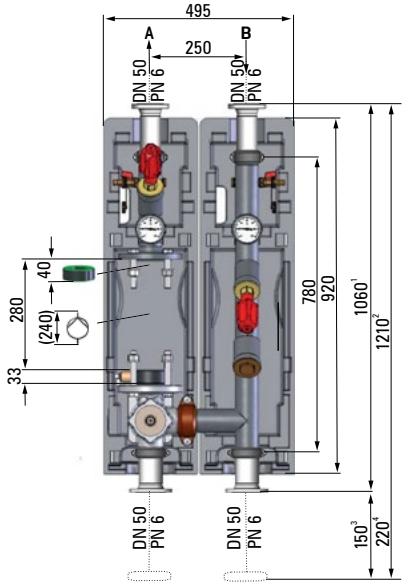
	Minimum required volume flow V – recommended return flow temperature boost set from the KWB product line											
Spread ΔT across the boiler	10					15				20				
		Recommended return flow temperature boost					Recommended return flow temperature boost				Recommended return flow temperature boost			
Boiler output [kW]	V [m³/h]	Article number	Kvs [m³/h]	Pressure loss across the completely open valve [mbar]	V [m³/h]	Article number	Kvs [m³/h]	Pressure loss across the completely open valve [mbar]	V [m³/h]	Article number	Kvs [m³/h]	Pressure loss across the completely open valve [mbar]
20	1.72	24-2000343	12	21	1.15	–	–	–	0.86	–	–	–
30	2.58	24-2000343	12	46	1.72	24-2000343	12	21	1.29	–	–	–
40	3.44	24-2000344	18	36	2.29	24-2000343	12	36	1.72	24-2000343	12	21
45	3.87	24-2000344	18	46	2.58	24-2000343	12	46	1.93	24-2000343	12	26
50	4.30	24-2000345	24	32	2.86	24-2000343	12	57	2.15	24-2000343	12	32
60	5.16	24-2000345	24	46	3.44	24-2000344	18	36	2.58	24-2000343	12	46
65	5.58	24-2000345	24	54	3.72	24-2000344	18	43	2.79	24-2000343	12	54
70	6.01	24-2000345	24	63	4.01	24-2000345	24	28	3.01	24-2000344	18	28
80	6.87	24-2000264	40	30	4.58	24-2000345	24	36	3.44	24-2000344	18	36
100	8.59	24-2000264	40	46	5.73	24-2000345	24	57	4.30	24-2000345	24	32
108	9.28	24-2000264	40	54	6.19	24-2000264	40	24	4.64	24-2000345	24	37
120	10.31	–	–	–	6.87	24-2000264	40	30	5.16	24-2000345	24	46

Parameters for return flow boost

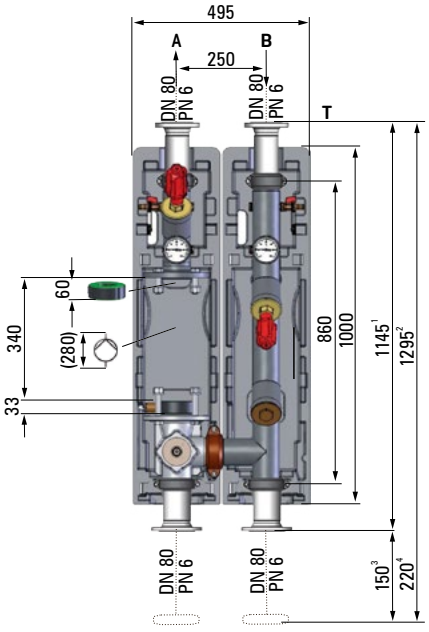
Return flow temperature boost sets KWB Powerfire

Spread ΔT across the boiler	Volume flow V – usable conveyance height [m WS = meter water column]											
	10				15				20			
Boiler output [kW]	V [m³/h]	usable conveyance height [m WS]	Article number	Kvs [m³/h]	V [m³/h]	usable conveyance height [m WS]	Article number	Kvs [m³/h]	V [m³/h]	usable conveyance height [m WS]	Article number	Kvs [m³/h]
150	12,90	2,6	24-2002532	40	8,60	3,8	24-2002531	40	6,45	6,0	24-2002531	40
240	20,64	9,3	24-2002534	63	13,76	5,8	24-2002533	63	10,32	7,6	24-2002533	63
300	25,80	4,2	24-2002534	63	17,20	3,4	24-2002533	63	12,90	6,4	24-2002533	63

KWB Powerfire 150 kW



KWB Powerfire 240 / 300 kW



Legend

A	return (cold water)
B	flow (hot water)

Dimensions

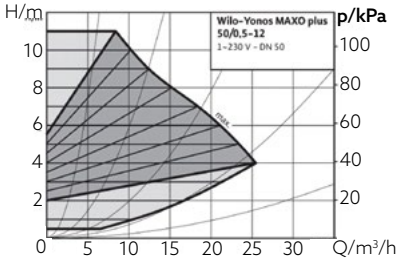
TDS 150	495x366x920
TDS 240 / 300	495x419x1.000

[1] tolerance installation length: -0/+3 mm per clamp coupling, and axial deviation up to 2°
[2] with wall bracket
[3] wall bracket
[4] wall distance

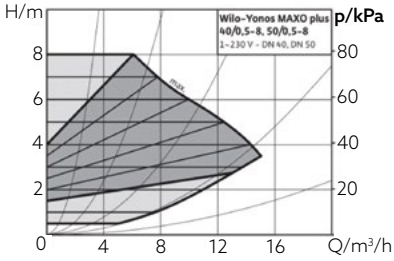
All dimensions in mm
Length x Width x Height

Characteristic values for boiler circuit pumps KWB Powerfire 150 kW

Wilo-Yonos MAXO plus 10 K pump

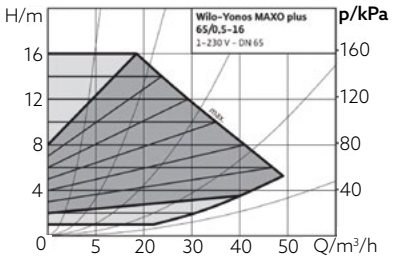


Wilo-Yonos MAXO plus 15 – 20 K pump

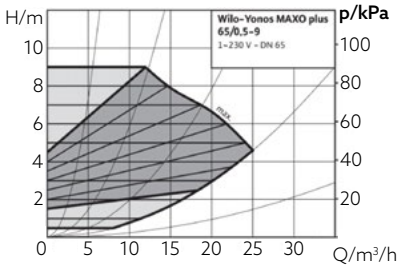


Kennlinien für Kesselkreispumpen KWB Powerfire 240 / 300 kW

Wilo-Yonos MAXO plus 10 K pump



Wilo-Yonos MAXO plus 15 – 20 K pump



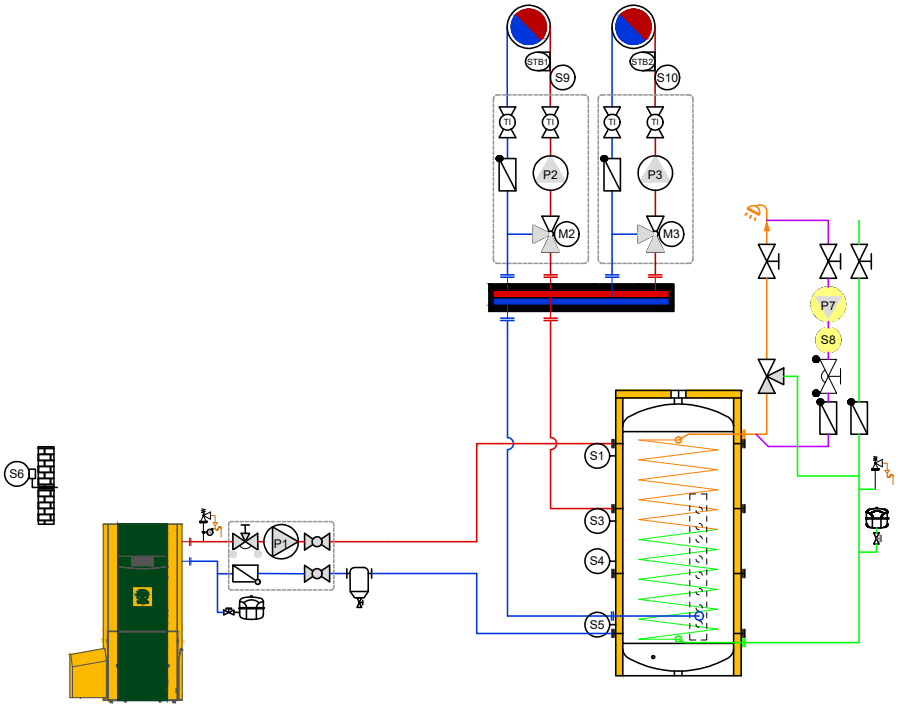
Sample hydraulic systems

KWB Easyfire with Empawell buffer storage tank

Information

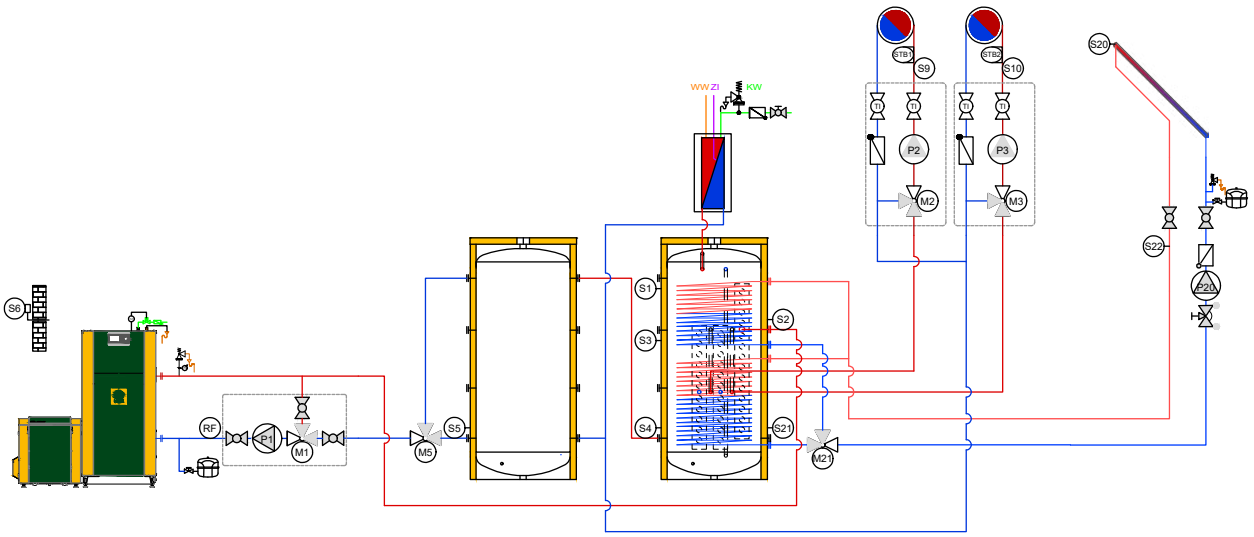
Your KWB contact partner will be happy to provide you with additional hydraulic diagrams

With 2 heating circuits and PWM pump for return flow boost and buffer filling

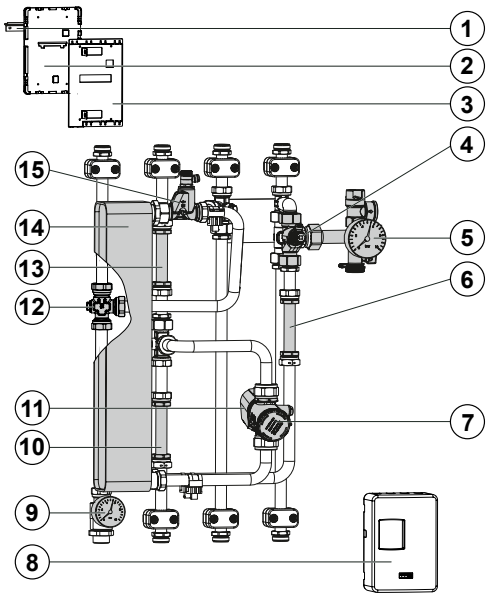


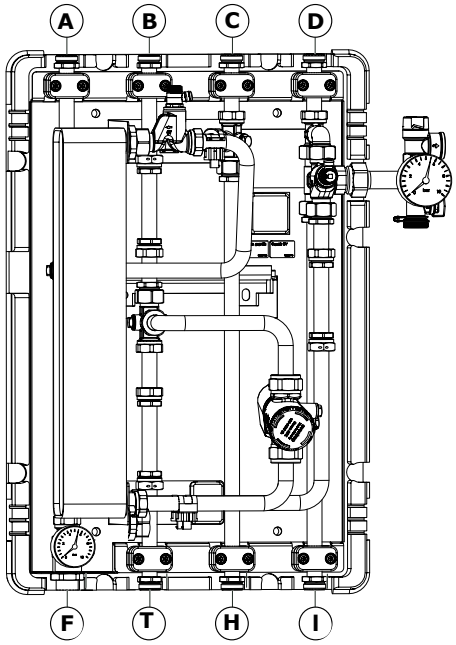
KWB Combifire wit solar and EmpaCompact

With 2 heating circuits, return flow boost, switch valve for an effective integration of the solar system



House transfer station DN20

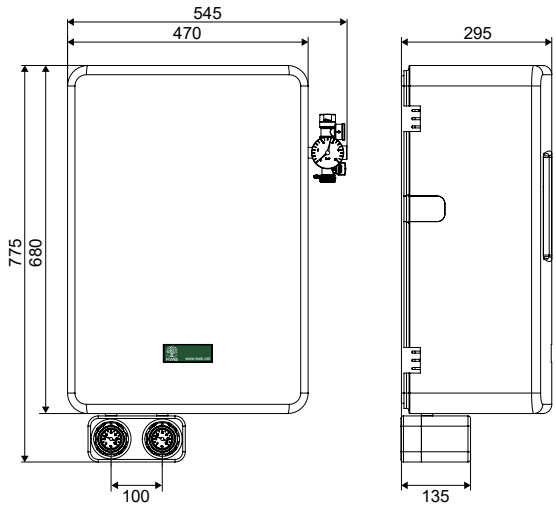


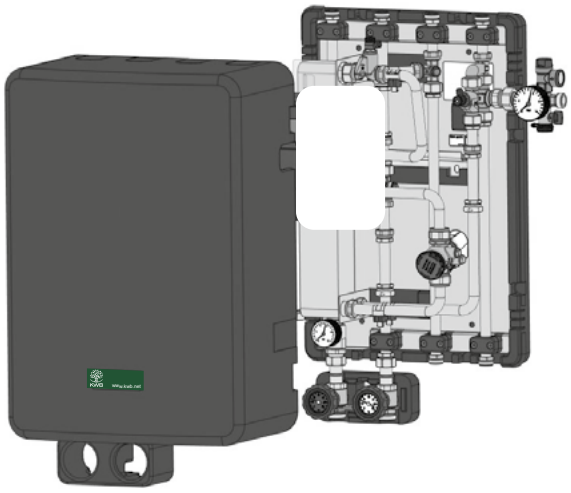


Legend

1	Wall bracket
2	Thermal insulation lower shell
3	Base plate
4	Strainer with vent valve
5	Safety group
6	Adapter for heat meter
7	Combined control and regulating valve Cocon QTZ
8	Thermal insulation upper shell
9	Manometer
10	Adapter for heat meter
11	Actuator
12	T-piece for mounting forward flow temperature sensor Heat meter (primary side)
13	Adapter for heat meter
14	Heat exchanger
15	Strainer with vent valve
A	Primary circuit forward flow (top connection)
B	Primary circuit return flow (top connection)
C	Secondary circuit forward flow (top connection)
D	Secondary circuit return flow (top connection)
F	Secondary circuit return flow (bottom connection)
T	Secondary circuit forward flow (bottom connection)
H	Primary circuit return flow (bottom connection)
I	Primary circuit forward flow (bottom connection)

Installation dimensions

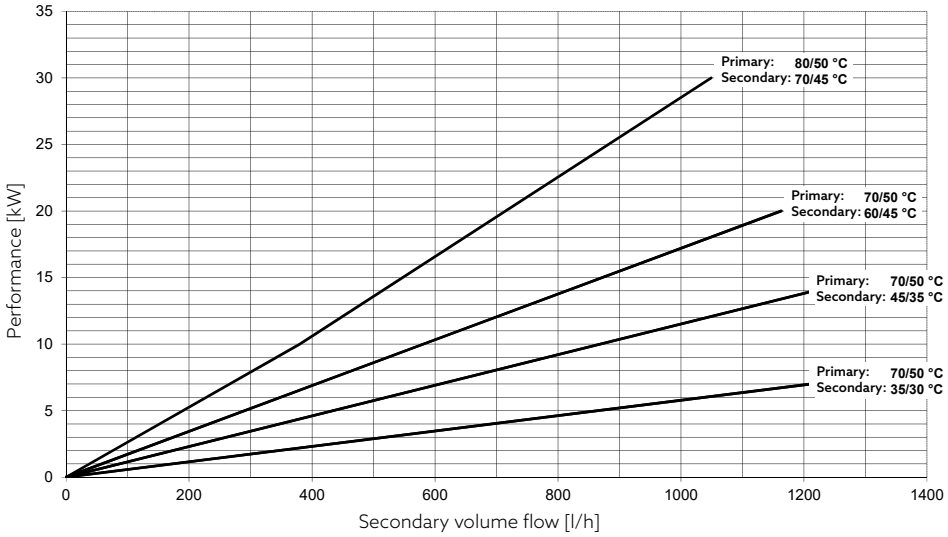




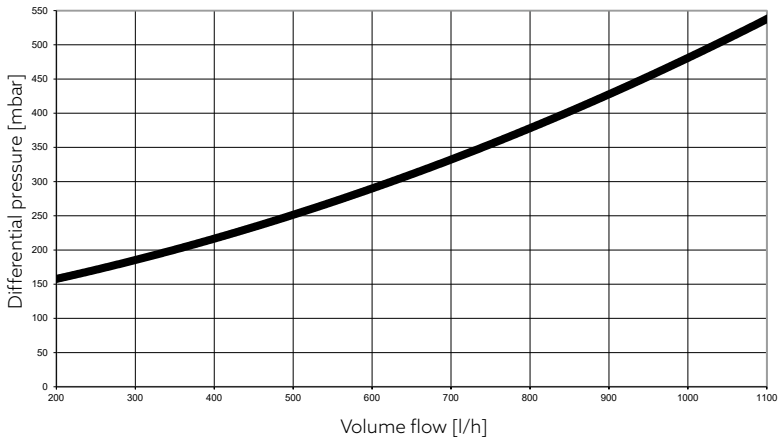
House transfer station DN20

Function overview

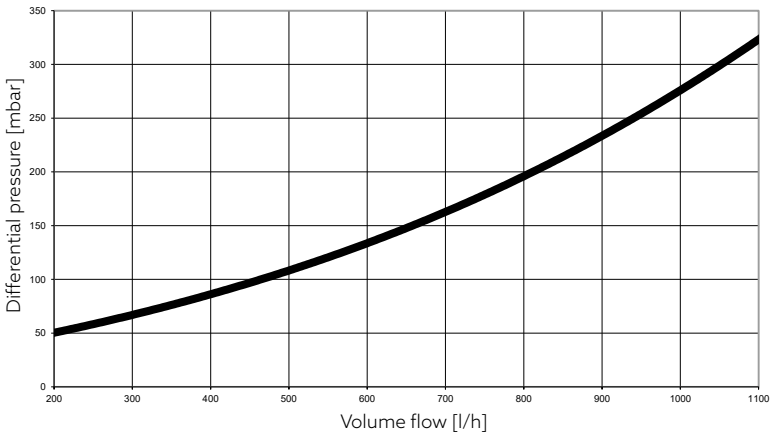
Performance chart



Primary circuit pressure loss



Secondary circuit pressure loss



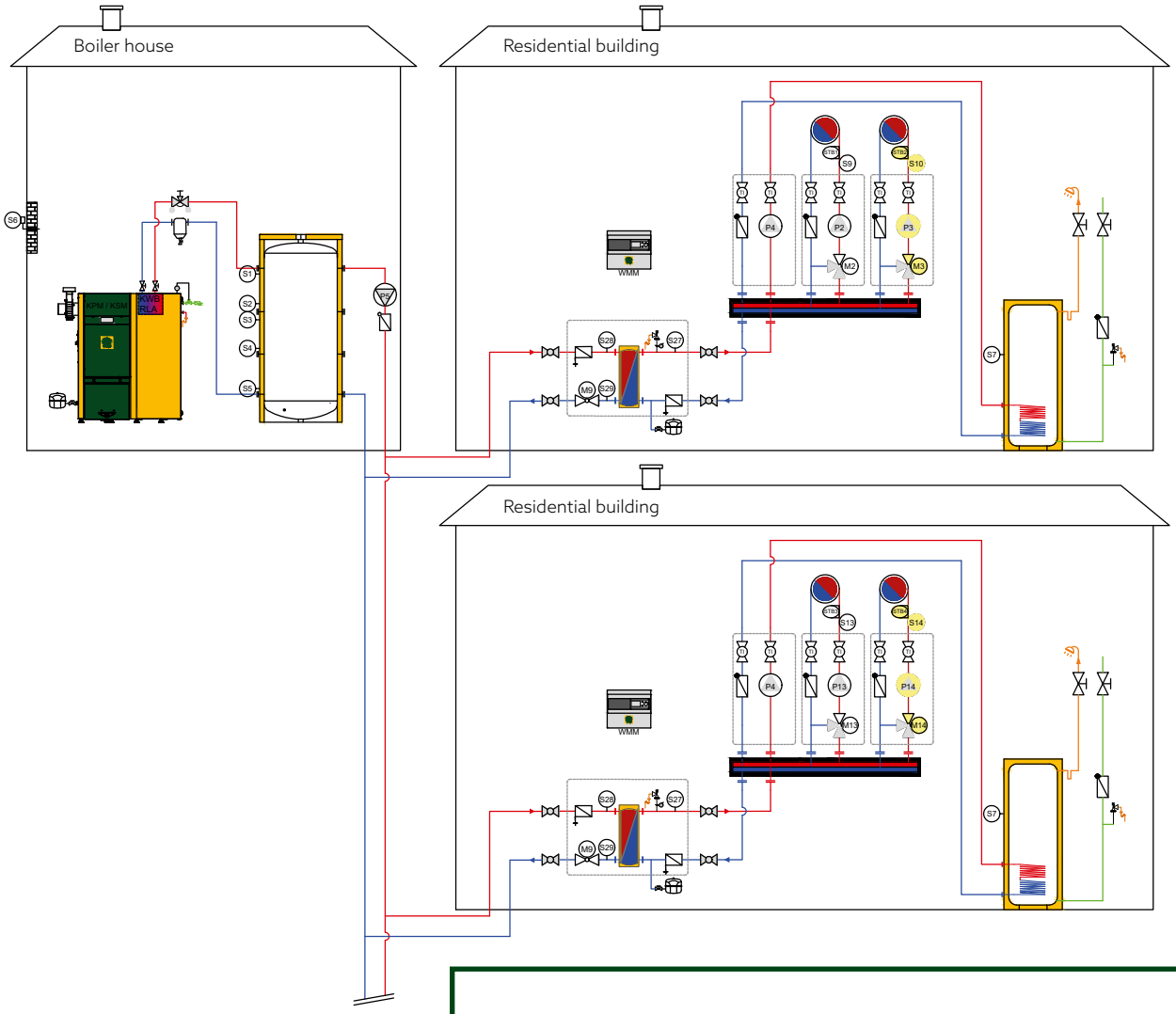
House transfer station DN20

Technical data

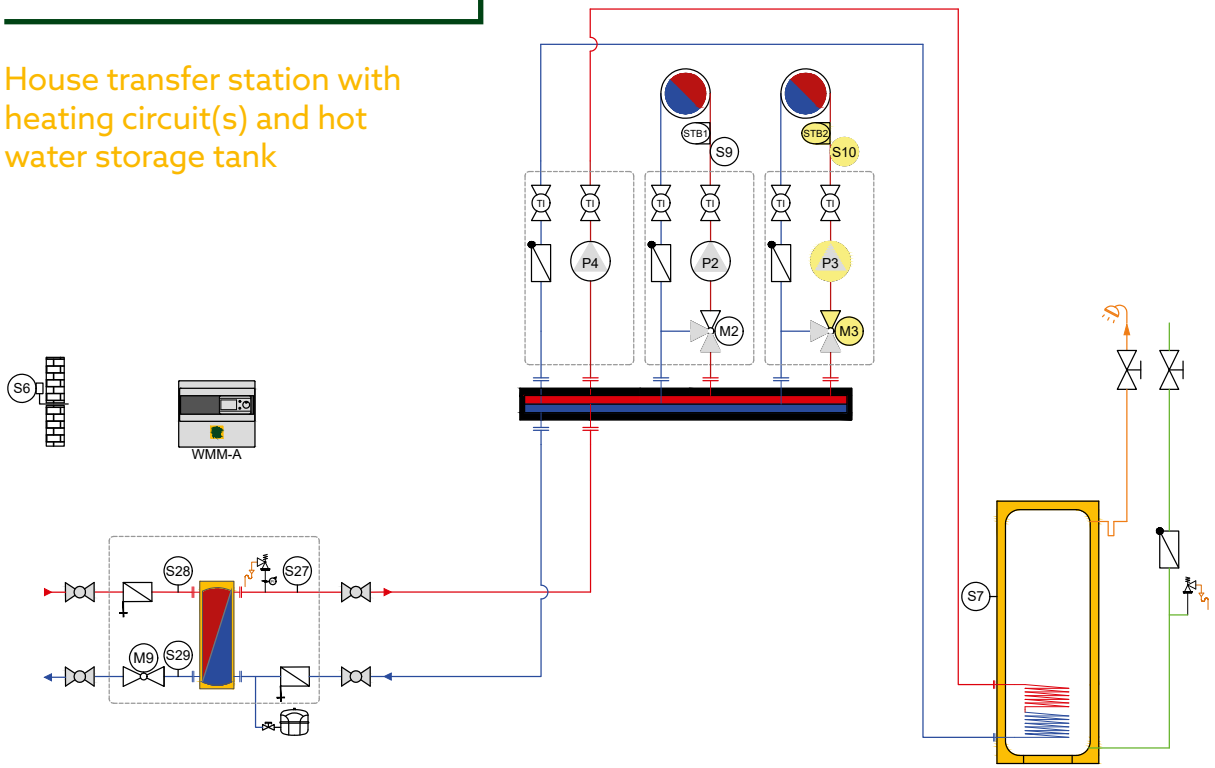
House transfer station	DN20
General information	
Nominal size	DN20
Max. operating temperature ts	95 °C
Max. operating pressure ps	10 bar
Min. operating pressure ps	1 bar
Max. primary differential pressure	4 bar
Ambient temperature T	2 - 35 °C
Empty weight	
House transfer station DN20	18.81 kg
Hydraulic performance data	
Secondary side safety valve	3 bar
Max. primary volume flow	1300 l/h
Manometer display range	0 - 10 bar
Operating media	Water / Water-glycol mixtures
Dimensions	
House transfer station DN20 (W x H x D)	545 x 775 x295 mm
Connections to pipe network	
House transfer station DN20	Male thread G ¾ flat sealing
Ball valve connection set	Male thread G1 flat sealing
Electric performance data	
Actuator	Closed when without current, 24 V DC, control voltage 0-10 V
Material	
Armatures	Brass, red brass
Seals	Fibre materials; EPDM
Base plate	Galvanised steel
Thermal insulation	EPP
Heat exchanger	Plate material: Stainless steel 1.4401, connections: Stainless steel 1.4404, solder material: Copper
Pipes	Stainless steel 1.4404
Fittings	Stainless steel 1.4404

System diagram for house transfer station DN20

Example of a microgrid with KWB Multifire

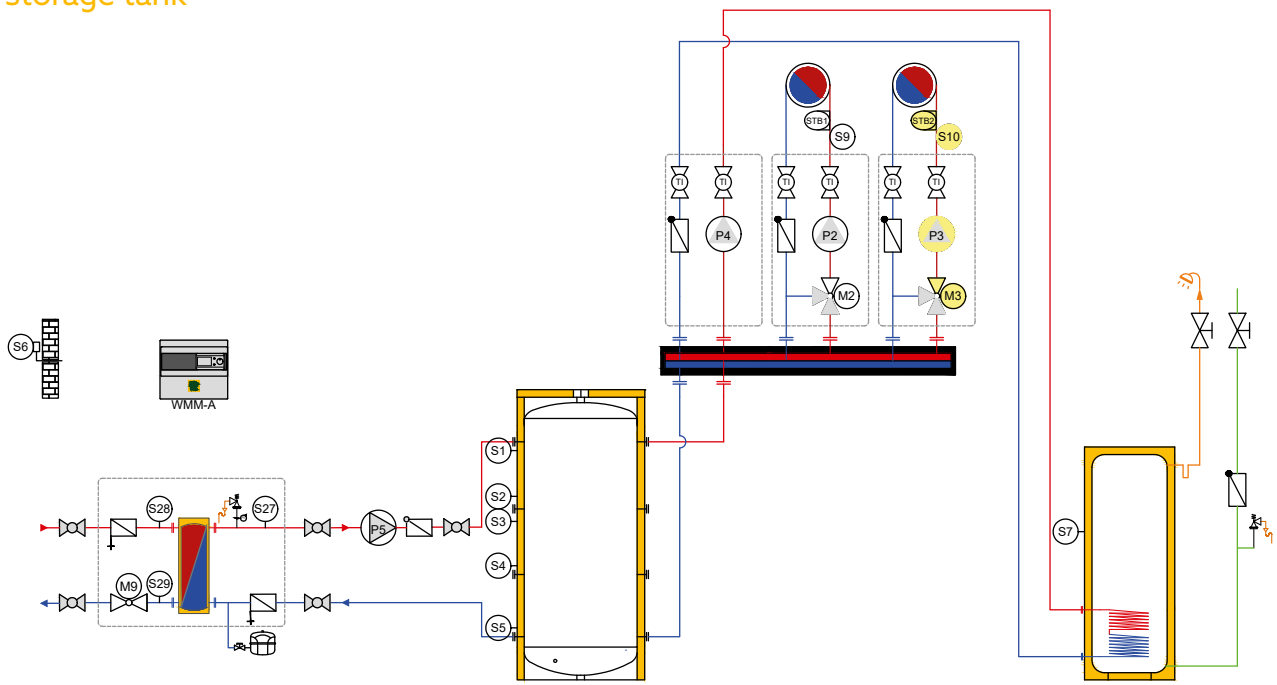


House transfer station with heating circuit(s) and hot water storage tank



System diagram for house transfer station DN20

House transfer station with buffer storage tank, with heating circuit(s) and hot water storage tank



House transfer station with hygienic storage tank and heating circuit(s)