



Storage Systems

Technology & Planning 2024



KWB storage technology

Efficient and economic heating operations

KWB storage tanks stand for highest quality and permit a perfect and highly efficient heat management. We recommend installing an intelligent buffer storage tank that represents the energy centre of the heating system when installing a biomass heating system.



KWB EmpaTherm DHWC

The storage tank has a large output capacity and can thus quickly supply large quantities of domestic hot water. The KWB EmpaTherm is a quality product with a particularly long service life. Thanks to its high-quality enamelling (a type of glass coating on the inside of the storage tank), the EmpaTherm does not develop limescale. It is resistant against hard water, water conductivity and the pH value of the water.

KWB EmpaTherm advantages:

- ✓ Quickly meets large hot water demand
- ✓ Insensitive to fluctuating water quality
- ✓ Cleaning flange for easy maintenance



EmpaFresh fresh water module

With power levels 30 l/min and 40 l/min; wall-mounted or combinable with KWB EmpaCompact. With power levels 25 l/min and 80 l/min; wall-mounted only. The latter can be cascaded up to 160 l/min.



Hot water heat pump KWB EmpaAir

The plug-in ready domestic hot water heat pump KWB EmpaAir efficiently and comfortably provides hot water for up to 1 to 3-family houses. Hygienic drinking water generation is always ensured since it supplies high hot water temperatures of 65 °C with its efficient heat pump operation.

KWB EmpaAir advantages:

- ✓ Quick installation thanks to plug-in ready interior placement
- ✓ Hygienic hot water thanks to high storage tank temperatures
- ✓ Optimized photovoltaics own consumption thanks to an integrated solar interface
- ✓ Optionally available with additional heating register
- ✓ Available with air circulation or fresh air operation



Buffer storage tank KWB EmpaEco

The buffer storage tank is the energy centre in the heating room. It absorbs excessive heat and dispenses it when needed. With a sufficiently large capacity, it ensures a long and optimized service life for the biomass heating system.

KWB EmpaEco advantages:

- ✓ Perfect entry model
- ✓ Particularly efficient thanks to optimized insulation
- ✓ Optionally available with solar register as EmpaEco Solar
- ✓ Optionally available with strata charging system



KWB EmpaCompact stratified storage tank

The KWB EmpaCompact is a true energy centre and ensures a tidy heating basement. It can be quickly installed and contains a large part of the heating room installation on a footprint of just 1 m². The stratified storage tank increases the efficiency of your entire heating system, among other things, because the storage tank is insulated with high-quality fibre fleece and thus has very low radiation losses.

KWB EmpaCompact advantages:

- ✓ Energy centre on 1 m²
- ✓ Attached fresh water station (in two output capacities and optional circulation available) for hot water preparation
- ✓ Connection option for 2 heating circuits and solar group
- ✓ Several strata charging devices
- ✓ Optionally available with integrated solar register
- ✓ Optionally with an integrated strata charging system for 2 electric heating rods at 2 different heights for the use of excess solar energy



KWB EmpaWell corrugated tube stratified storage tank

With the KWB EmpaWell combination storage tank, you will always immediately have hot water available. The EmpaWell is equipped with a strata charging device. As a result the fresh water which flows through the buffer storage tank-integrated heat exchanger does not touch the heating water. The two are separated by a corrugated stainless steel pipe. The supply of the fresh water occurs without a pump and therefore without added energy costs.

KWB EmpaWell advantages:

- ✓ Ideal combination model
- ✓ High heat transfer and excellent insulation
- ✓ Optionally available with solar register as EmpaEco Solar



Buffer tank dimensioning



Information

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

Type	Recommended tank volume
KWB Easyfire EF2 (pellet heating system)	
KWB Multifire MF2 (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 Pelletfire ^{Plus} MF2 (pellet heating system)	
KWB Powerfire TDS (wood chip and pellet heating system)	
KWB Classicfire & KWB Combifire (log wood and pellet heating system)	Optimal: 16-litre buffer storage tank per litre fill room Minimum: 10-litre buffer storage 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]
Please take into account national, statutory and subsidy guidelines for buffer storage tank calculations.

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



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Storage Systems

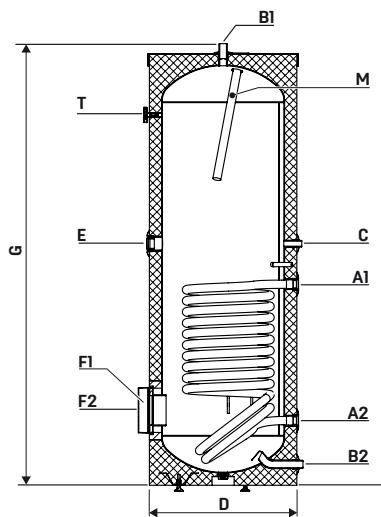
Storage



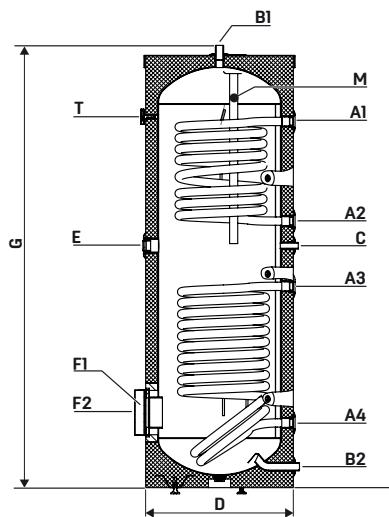
KWB EmpaTherm

DHWC

KWB EmpaTherm



KWB EmpaTherm Solar



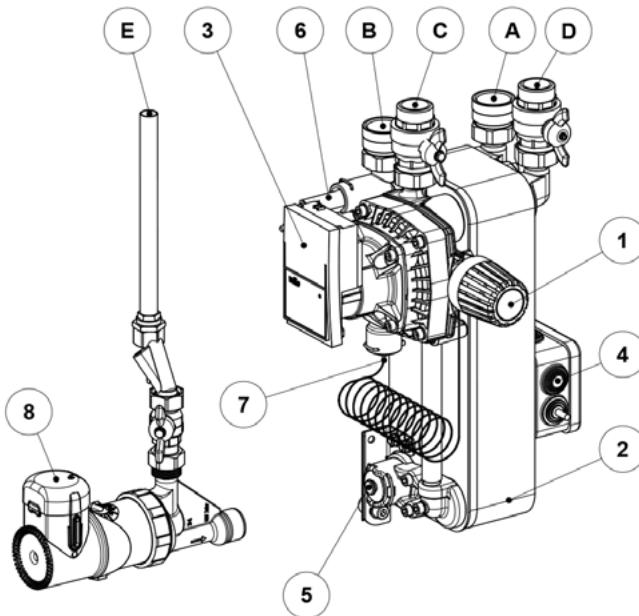
EmpaTherm	Position	Unit	EmpaTherm			EmpaTherm Solar	
			200	300	500	300	500
Nominal capacity	–	liter	200	300	500	300	500
Weight incl. insulation	–	kg	88	115	160	131	172
Permissible operating pressure	–	bar			10		
Permissible operating pressure register	–	bar			10		
Permissible operating temperature storage tank	–	°C			95		
Register area at the top	–	m ²	–	–	–	1,00	1,00
Register content at the top	–	liter	–	–	–	5,9	6,2
Register area at the bottom	–	m ²	0,91	1,40	2,00	1,40	2,00
Register content ant the bottom	–	liter	5,0	8,9	12,6	8,9	12,6
Magnesium anode						✓	
Thermometer	T	–				✓	
Connections							
Heating system forward flow 1" internal thread	A1	mm	638	818	966	1488	1465
Heating system return flow 1" internal thread	A2	mm	263	263	221	1083	1150
Solar system forward flow 1" internal thread	A3	mm	–	–	–	818	930
Solar system return flow 1" internal thread	A4	mm	–	–	–	263	370
Circulation (3/4" outer thread for type 200/300, 1" for type 500)	C	mm	803	983	1265	983	1040
Inflow cold water 1" outer thread	B2	mm	85	85	55	85	85
Outflow warm water 1" outer thread	B1	mm	1340	1797	1856	1797	1838
Electric heating system 6/4" internal thread	E	mm	803	983	1041	983	1095
Flange diameter	–	–	180	180	180	180	180
Flange medium height	–	mm	305	305	370	305	370
Energy							
Energy efficiency class according to Commission Delegated Regulation (EU) 812/2013	–	–				B	
Heat loss	–	W	57	67	79	67	79
Heat loss [W] according to EN 12897 (measured)	–	kWh/24h	1,37	1,61	1,90	1,61	1,90
Performance number DIN 4708 for register at the top	–	–	–	–	–	1,8	3,7
Performance number DIN 4708 for register at the bottom	–	–	4,0	9,2	17,7	7,5	15,0

Dimensions for transport and placement

Dimensions	EmpaTherm 200 / 300 / 500	EmpaTherm Solar 300 / 500
Diameter with insulation	610 / 610 / 760	610 / 760
Unobstructed door width for placement in designated space (with insulation)	615 / 615 / 765	615 / 765
Total height (with insulation)	1.340 / 1.797 / 1.838	1.797 / 1.838
Tilting dimensions without insulation	1.440 / 1.860 / 1.965	1.860 / 1.965

KWB EmpaFresh 30

Fresh water module

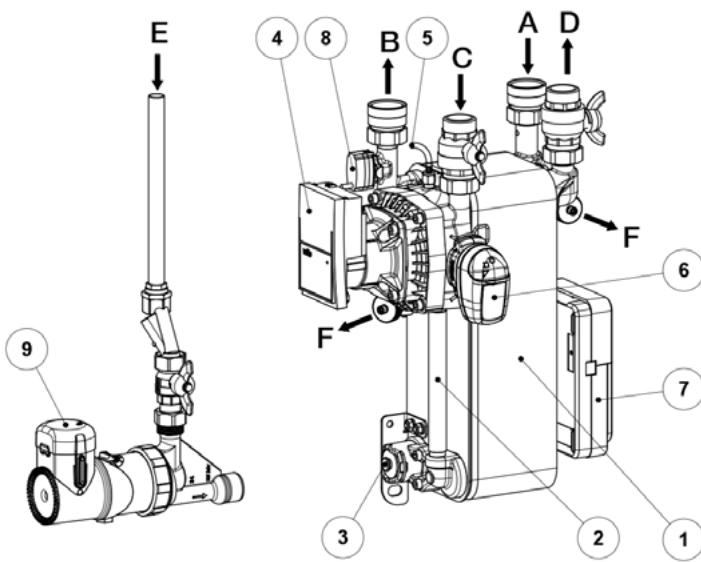


Legend

1	Temperature selecting head
2	Plate heat exchanger
3	Primary pump Yonos PARA HU 25/7,0 PWM 1W
4	Power box
5	Push-in connection for circulation unit
6	Flow switch
7	Helical sensor
8	Optional circulation unit with pump and electronic return flow thermostat (for pulsed or timed operating mode)
A	Cold water 1" female
B	Hot water 1" female
C	Buffer forward flow 1" male
D	Buffer return flow 1" male
E	Circulation 1/2" female

KWB EmpaFresh 40

Fresh water module



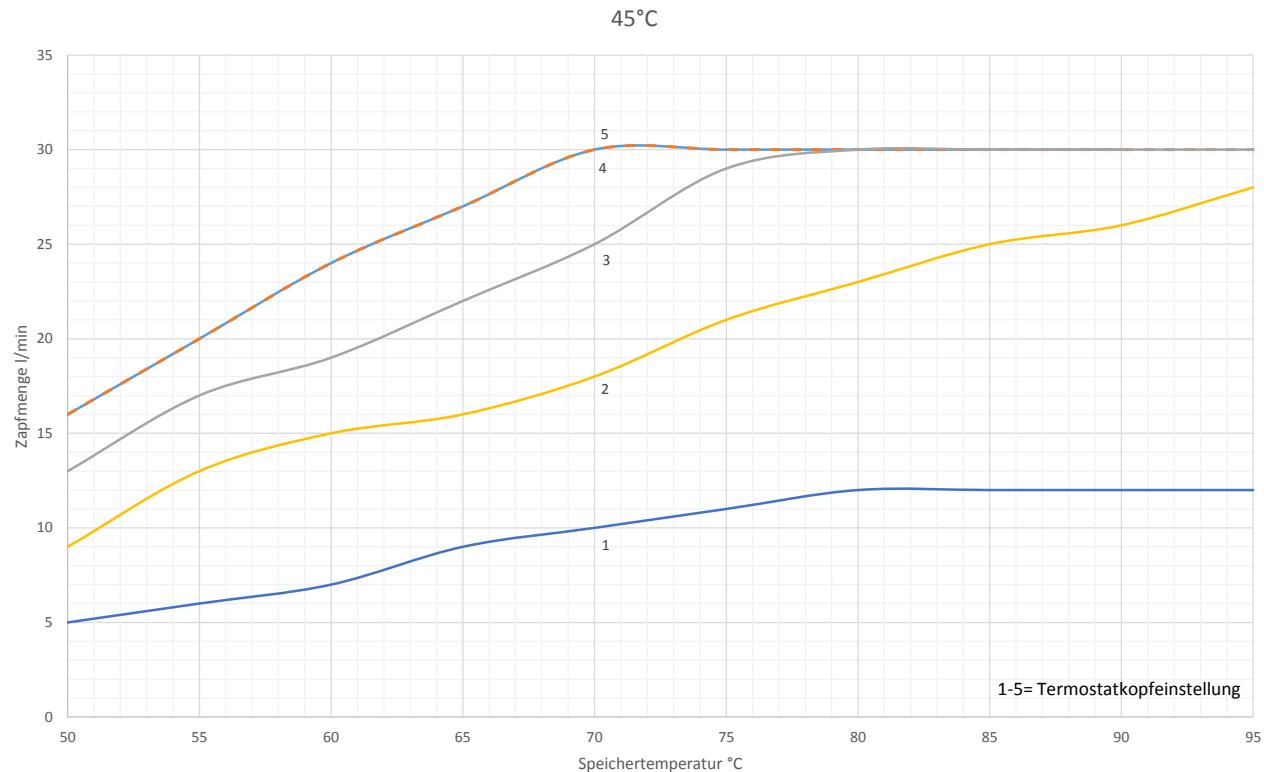
Legend

1	Plate heat exchanger
2	Bypass pipe for admixture from the middle zone
3	Push-in connection for circulation unit
4	Primary pump Yonos PARA HU 25/7,0 PWM 1W
5	PT1000 temperature sensor
6	Super flow valve
7	FRESH Control
8	Flow sensor
9	Optional circulation unit with pump and electronic return flow thermostat (for pulsed or timed operating mode)
A	Cold water 1" female
B	Hot water 1" female
C	Buffer forward flow 1" male
D	Buffer return flow 1" male
E	Circulation 1/2" female
F	Flush connection

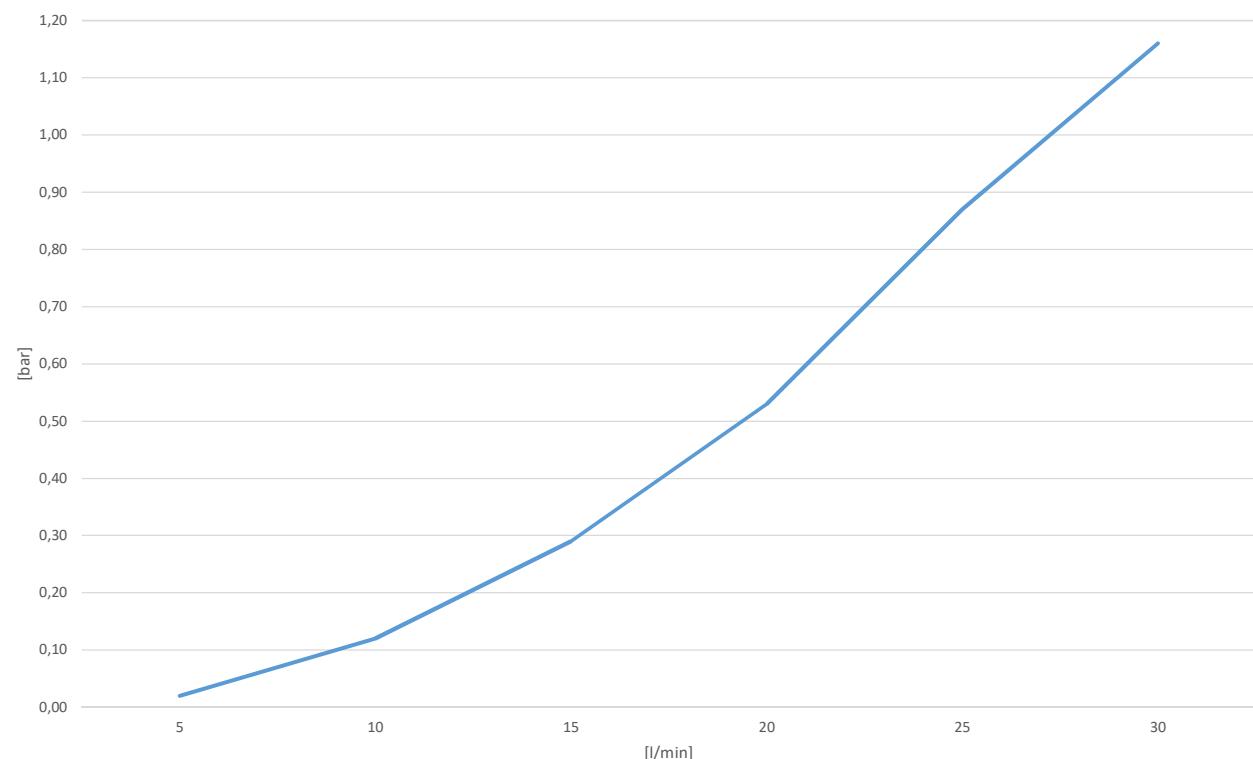
KWB EmpaFresh 30

Calculation diagrams

Water



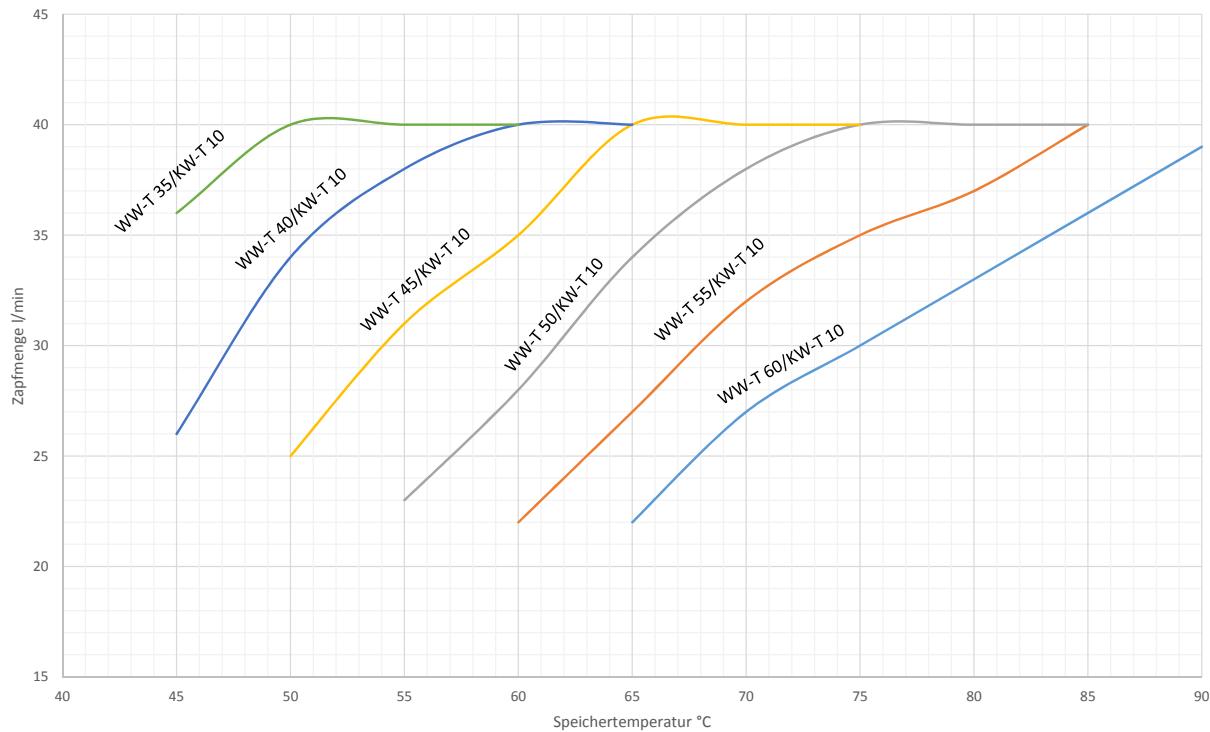
Pressure loss



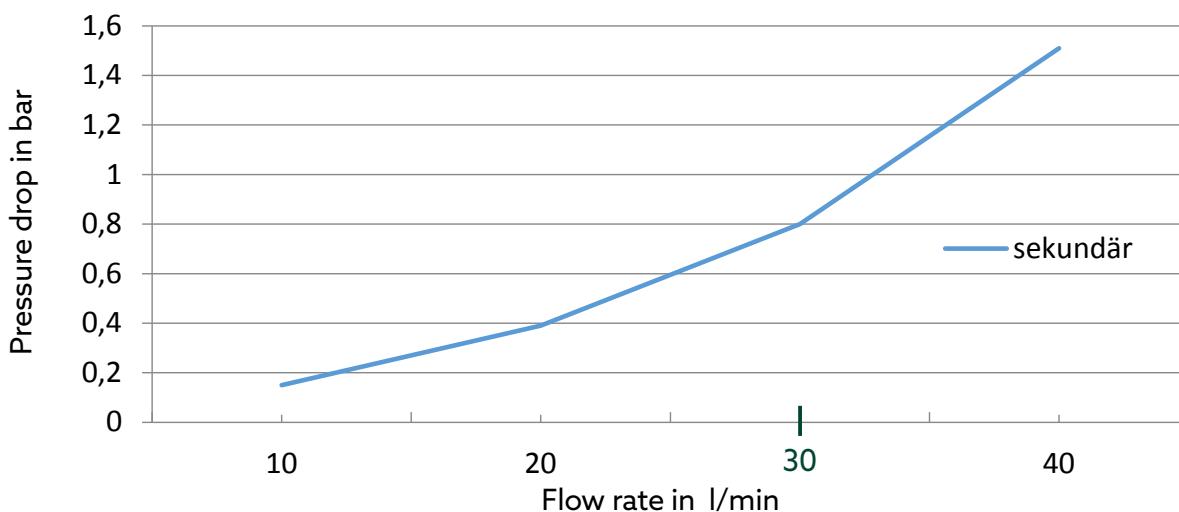
KWB EmpaFresh 40

Calculation diagrams

Water



Pressure loss



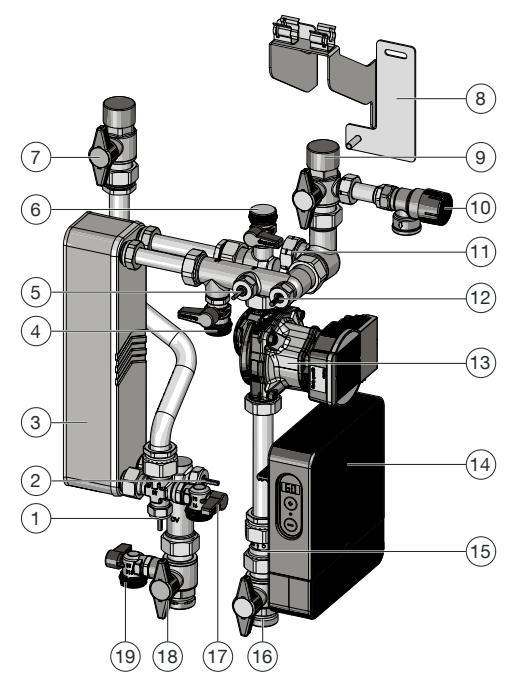
KWB EmpaFresh

Technical data

KWB EmpaFresh	Unit	30	40	40 stainless steel
Tapping capacity	l/min	30	4 - 40	4 - 40
plate heat exchange	plates	29,0	41,0	41,0
Width x Height x Depth	mm		400 x 800 x 302	
Cover	-		✓	
Weight	kg	17	20	20
Connections				
Cold water (A) internal thread	inch		G 1	
Hot water (B) internal thread	inch		G 1	
Buffer forward flow (C)	inch		G 1	
Buffer return flow (D)	inch		G 1	
Circulation (E)	inch		G 1/2	
Flush connection (F)	-		-	
minimum operating temperature	°C		2	
maximum operating temperature	°C		95	
maximum operating pressure				
DHW	bar		10	
Heating system	bar		3	
Charging pump PARA HU 25/7-50/iPWM	✓		✓	
Charging pump	-		230 V / 50 Hz	
Speed	rmp		800 - 4650	
Power consumption	W		3 - 45	
nominal current	A		0,028 - 0,44	
circulation pump	✓		✓	
circulation pump	-		230 V / 50 Hz	
Power consumption	W		27,3	
Effective rated current (RMS)	A		0	
Super flow valve	-	-	✓	✓
Power supply	-	-	12V DC	12V DC
Power consumption	W	-	0,6	0,6
nominal current	A	-	0,5	0,5
Limit values for substances in water				
PH value (taking the SI index into account)	-	7 - 9	7 - 9	6 - 10
Saturation index SI (Delta ph value)	-	-0,2 < 0 < +0,2	-0,2 < 0 < +0,2	-
Total hardness	°dH	6 - 15	6 - 15	6 - 15
Conductivity	µS/cm	10 - 500	10 - 500	-
Filterable substances	mg/l	< 30	< 30	< 30
Free chlorine	mg/l	< 0,5	< 0,5	< 0,5
Hydrogen sulfide (H2S)	mg/l	< 0,05	< 0,05	-
Ammoia (NH3/NH4+)	mg/l	< 2	< 2	-
sulphate	mg/l	< 100	< 100	< 300
Hydrogen carbonate	mg/l	< 300	< 300	-
Hydrogen carbonate / sulphate	mg/l	> 1,0	> 1,0	-
sulfide	mg/l	< 1	< 1	< 5
nitrate	mg/l	< 100	< 100	-
nitrite	mg/l	< 0,1	< 0,1	-
Iron, dissolved	mg/l	< 0,2	< 0,2	-
manganese	mg/l	< 0,1	< 0,1	-
Free aggressive carbonic acid	mg/l	< 20	< 20	-

KWB EmpaFresh X25

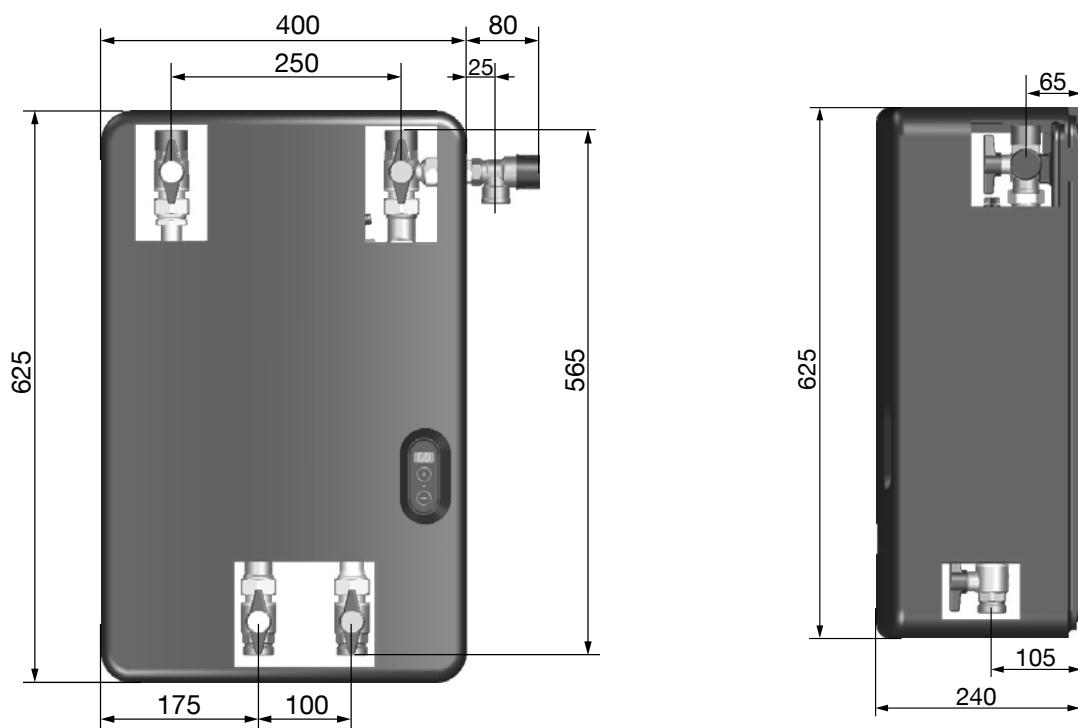
Fresh water module



Legend

- | | |
|----|--|
| 1 | Temperature sensor, hot drinking water S2 |
| 2 | Temperature sensor, storage tank circuit S1 |
| 3 | Heat exchanger |
| 4 | Boiler filling and emptying ball valve, cold drinking water |
| 5 | Volume flow sensor, drinking water circuit VTY 20 |
| 6 | Boiler filling and emptying storage tank circuit, return flow |
| 7 | Shut-off ball valve, hot drinking water |
| 8 | Wall bracket |
| 9 | Shut-off ball valve, cold drinking water |
| 10 | Safety valve, drinking water circuit (10 bar) |
| 11 | Connection, circulation line |
| 12 | Temperature sensor, cold drinking water/circulation S3 |
| 13 | Circulating pump, storage tank circuit |
| 14 | Control |
| 15 | Back-flow preventer in storage tank circuit |
| 16 | Shut-off ball valve, storage tank circuit, return flow |
| 17 | Boiler filling and emptying ball valve, hot drinking water |
| 18 | Shut-off ball valve, storage tank circuit, forward flow |
| 19 | Boiler filling and emptying storage tank circuit, forward flow |

Dimensions for installation



All dimensions in mm



KWB EmpaFresh X25

Technical data

KWB EmpaFresh	Einheit	X25	X25 vollversiegelt
Allgemein			
Breite x Höhe x Tiefe	mm	400 x 625 x 240	400 x 625 x 240
Gewicht	kg	13,0	13,0
max. Betriebsdruck Brauchwasser	bar	10,0	10,0
max. Betriebsdruck Heizung	bar	3,0	3,0
max. Betriebstemperatur	°C	95,0	95,0
Umgebungstemperatur	°C	2-35	2-35
elektrischer Anschluss Regler	-	100-240V (50-60Hz)	100-240V (50-60Hz)
Anschlüsse			
Primärkreis & Sekundärkreis (Außengewinde flachdichtend)	Zoll	G 1 AG	G 1 AG
Zirkulation (Außengewinde flachdichtend)	Zoll	G 1 AG	G 1 AG
KFE-Spül- und Befüllungskugelhähne (Außengewinde für Schlauchverschraubung)	Zoll	G 3/4 AG	G 3/4 AG
Speicherkreis			
Medium Heizungswasser	✓	✓	✓
kv-Wert	m3/h	2,67	2,67
Ladepumpe (Wilo Para 15-130/8-75/LIN-9)	✓	✓	✓
Leistungsaufnahme im Betrieb (Landepumpe)	W	75	75
Trinkwasserkreis			
Medium Trinkwasser	✓	✓	✓
Schüttleistung (bei $\Delta T = 20K$)	l/min	1-25	1-25
kv-Wert	m3/h	1,88	1,88
Sicherheitsventil	bar	10	10
Allgemein Temperaturbereich	°C	20-75	20-75
im Regler voreingestellt	°C	20-60	20-60
Zirkulationspumpe (Ecocirc PRO 13-3/940 RU)	✓	✓	✓
Materialien			
Amaturen Messing / entzinkungsbeständiges Messing / Rotguss	✓	✓	✓
Dichtung EPDM	✓	✓	✓
Isolierung EPP	✓	✓	✓
Rohre Edelstahl 1.4404	✓	✓	✓
Wärmeübertrager: Plattenmaterial Edelstahl 1.4401 / Anschlüsse 1.4404 /	✓	✓	-
Wärmeübertrager: Plattenmaterial Edelstahl 1.4401 / Anschlüsse 1.4404 /	✓	-	✓
Lot Kupfer / Sealix Vollversiegelung			

Anforderungen an die Wasserqualität

Inhaltsstoffe	Konzentration (mg/l oder ppm)	Kupfer	Kupfer vollversiegelt
Chloride (Cl^-) bei 60 °C	< 100 100 - 150 > 150	+	+
Hydrogencarbonat (HCO_3^-)	< 70 70 - 300 > 300	0 +	+
Sulfat (SO_4^{2-})	< 70 > 70	+	+
HCO_3^- / SO_4^{2-}	< 1.0 > 1.0 < 50 $\mu S/cm$	+	+
Elektrische Leitfähigkeit bei 20°C	50 - 500 $\mu S/cm$ < 0.0	+	+
pH	6.0 - 7.5 7.5 - 9.0 9.0 - 9.5 > 9.5	0 +	+
Generell erhöht ein niedriger pH-Wert (unter 6) das Korrosionsrisiko und ein hoher pH-Wert (über 7,5) reduziert das Korrosionsrisiko.	0 +	0 +	+
Freies Chlor (Cl_2)	< 1 > 1 < 2	+	+
Ammonium (NH_4^+)	2 - 20 > 20	0 -	+
Schwefelwasserstoff (H_2S)	< 0.05 > 0.05 < 5	+	+
Freies (aggressiv) Kohlendioxid (CO_2)	5 - 20 > 20 < 100 > 100	0 - +	+
Nitrat (NO_3^-)	> 100	0	+

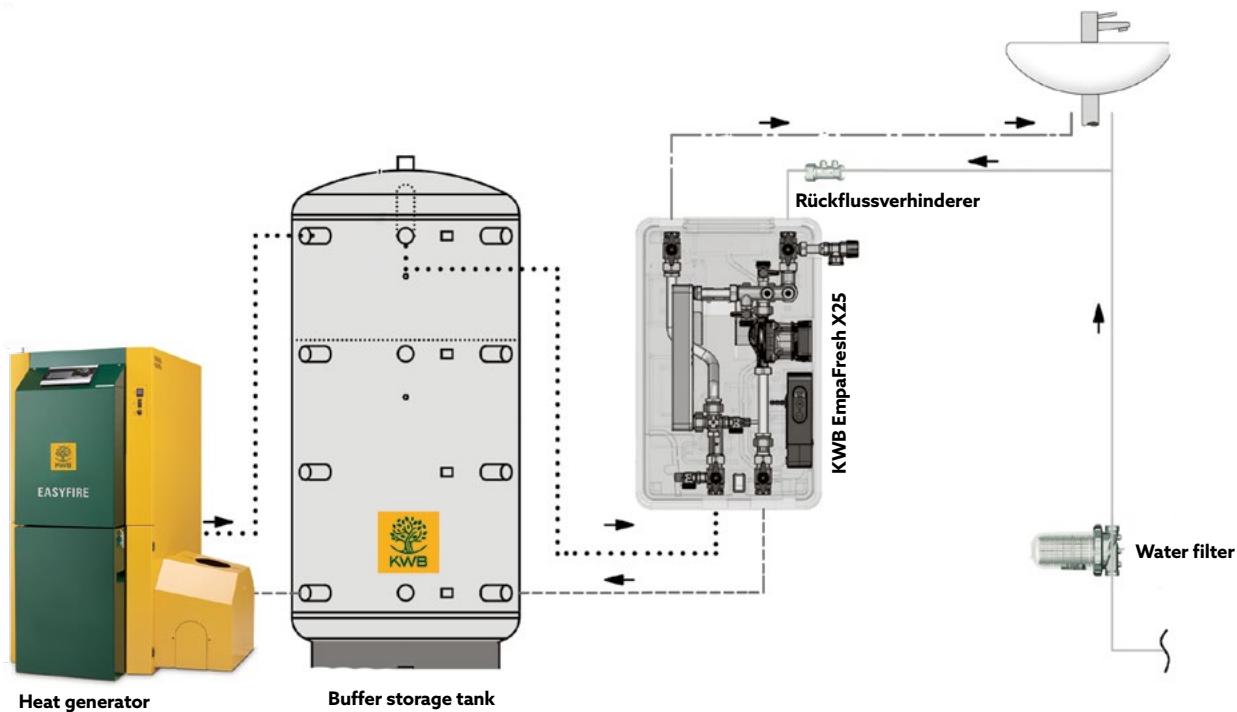
* ... + Gute Beständigkeit unter normalen Bedingungen

0 Korrasion kann auftreten

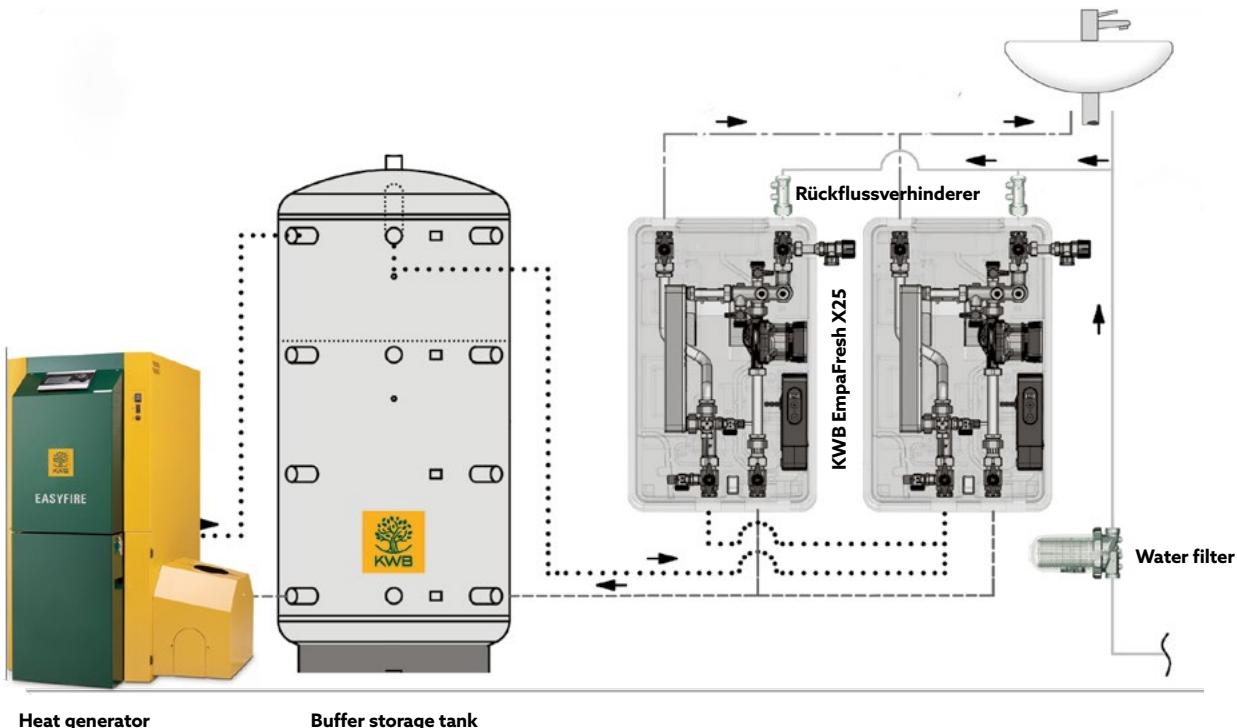
- Verwendung nicht empfohlen

System diagram EmpaFresh X25

One buffer storage tank and one fresh water station



Cascade with one buffer storage tank and two fresh water stations



Legend

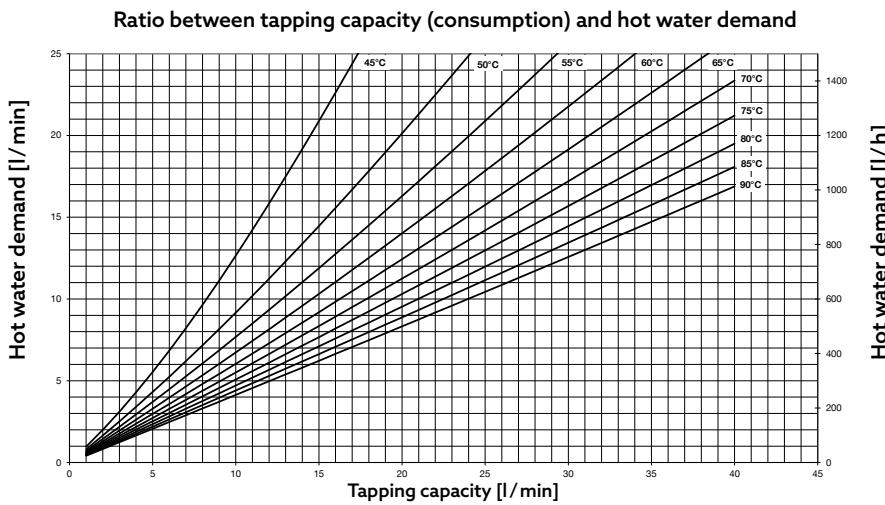
.....	Storage tank circuit, forward flow
- - -	Storage tank circuit, return flow
—	Cold drinking water
- - -	Hot drinking water



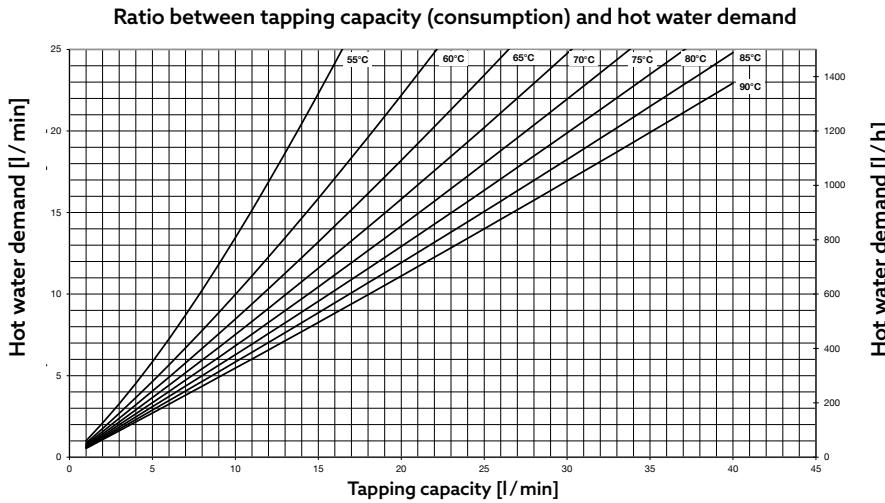
KWB EmpaFresh X25

Calculation diagrams

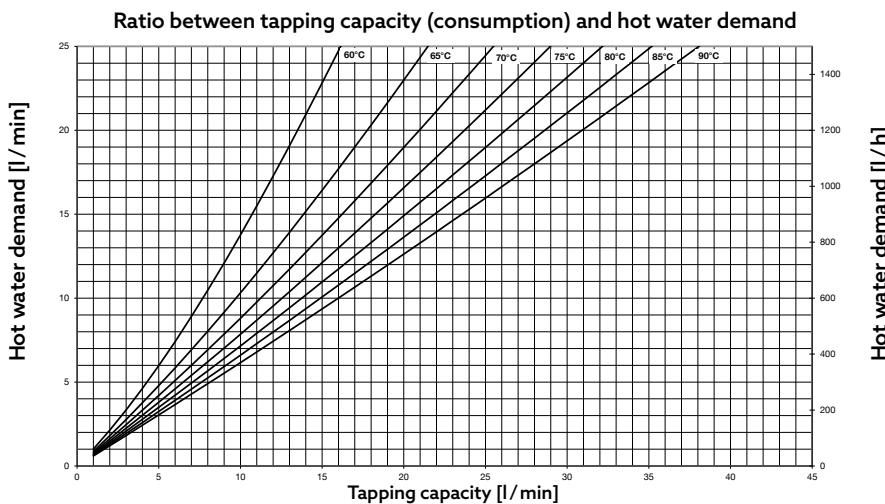
Drinking water heating
10°C to 45°C



Drinking water heating
10°C to 55°C



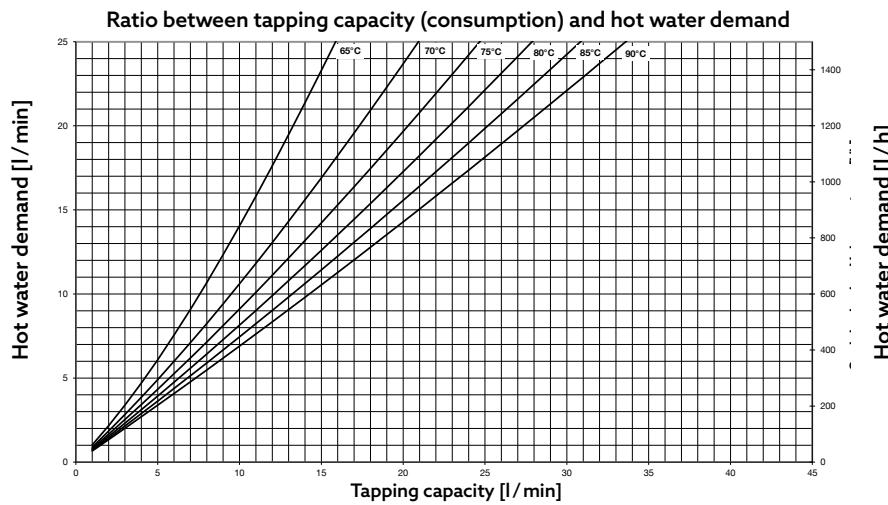
Drinking water heating
10°C to 60 °C



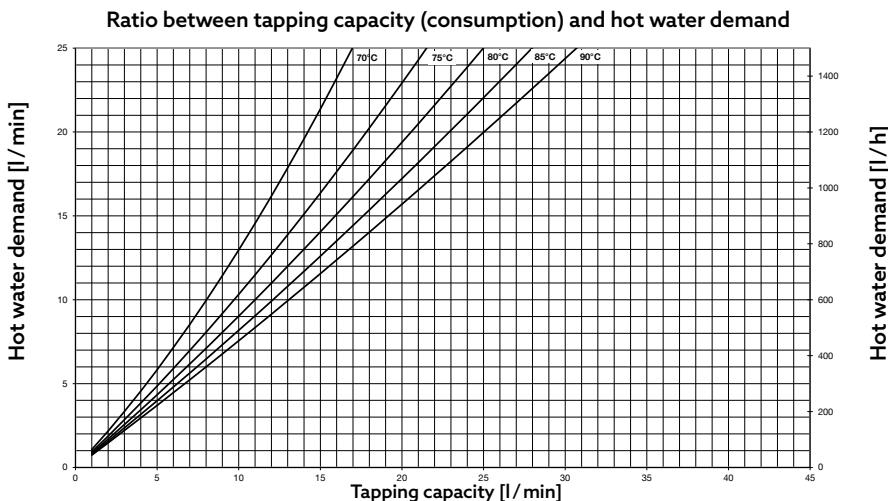
KWB EmpaFresh X25

Calculation diagrams

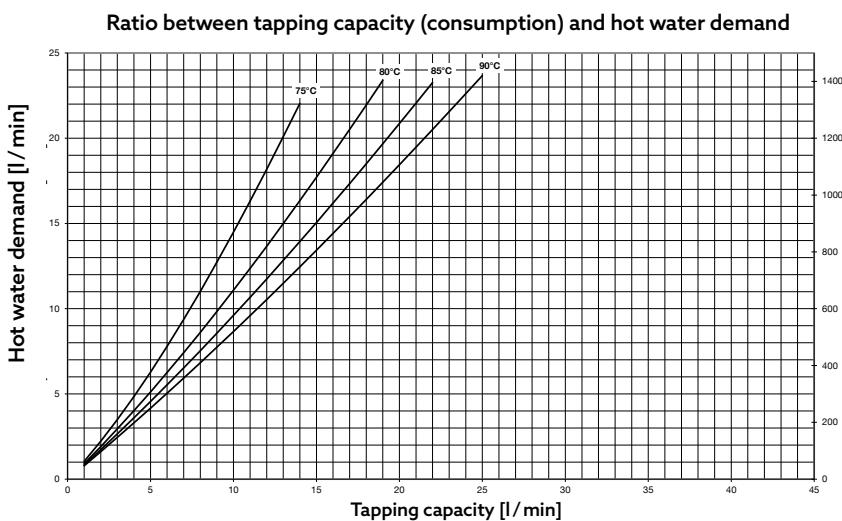
Drinking water heating
10 °C to 65 °C



Drinking water heating
10 °C to 70 °C



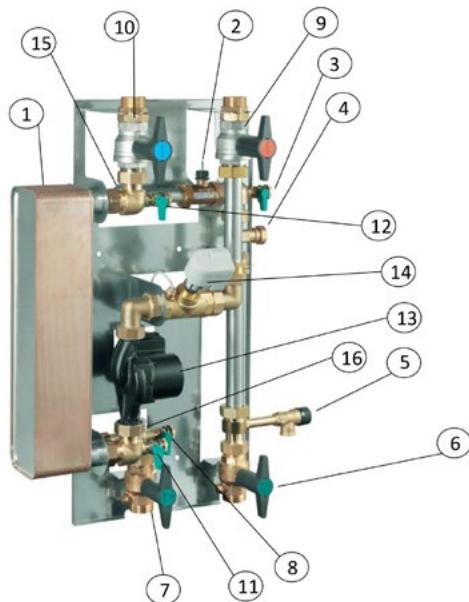
Drinking water heating
10 °C to 75 °C



Notes

KWB EmpaFresh X80

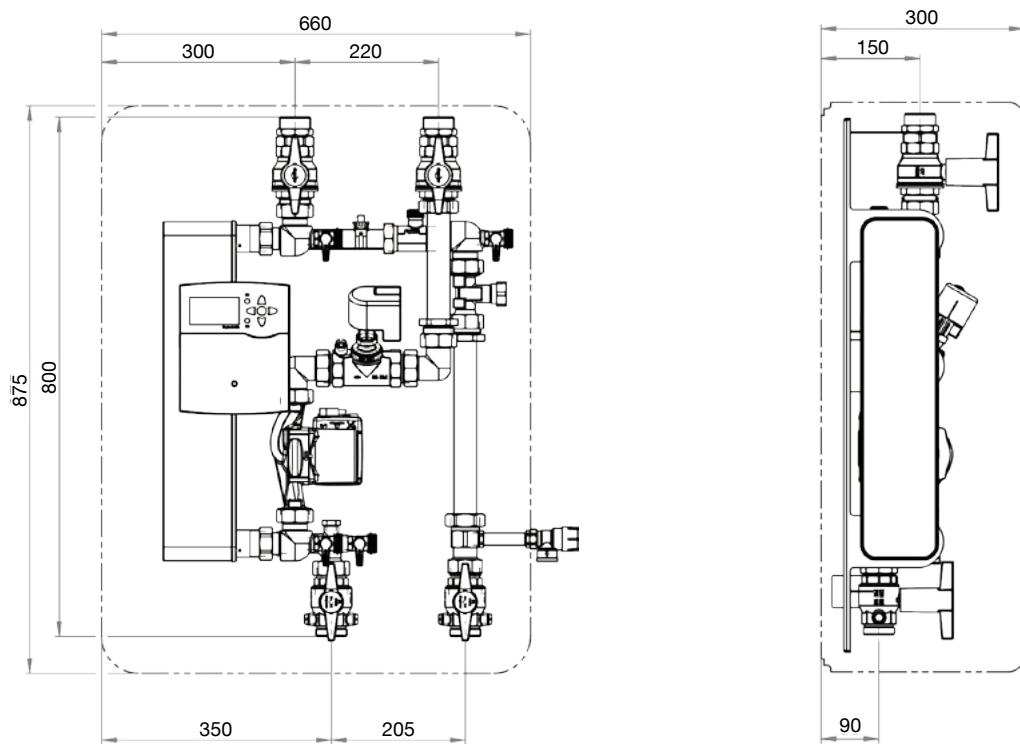
Fresh water module



Legend

- | | |
|----|---|
| 1 | Plate heat exchanger |
| 2 | Volume flow sensor drinking water circuit |
| 3 | Flush, fill, emptying connection with ball valve (cold drinking water) |
| 4 | Connection circulation line |
| 5 | Safety valve drinking water circuit (10 bar) |
| 6 | Shut-off ball valve, cold drinking water |
| 7 | Shut-off ball valve, hot drinking water |
| 8 | Flush, fill, emptying connection with ball valve (hot drinking water) |
| 9 | Shut-off ball valve forward flow storage circuit |
| 10 | Shut-off ball valve return flow storage circuit |
| 11 | Flush, fill, emptying connection with ball valve (storage circuit forward flow) |
| 12 | Flush, fill, emptying connection with ball valve (storage circuit return flow) |
| 13 | Circulating pump, storage circuit |
| 14 | Throttle valve, with temperature sensor storage circuit |
| 15 | Temperature sensor (cold drinking water/circulation) |
| 16 | Temperature sensor (hot drinking water) |

Dimensions for installation



All dimensions in mm



KWB EmpaFresh X80

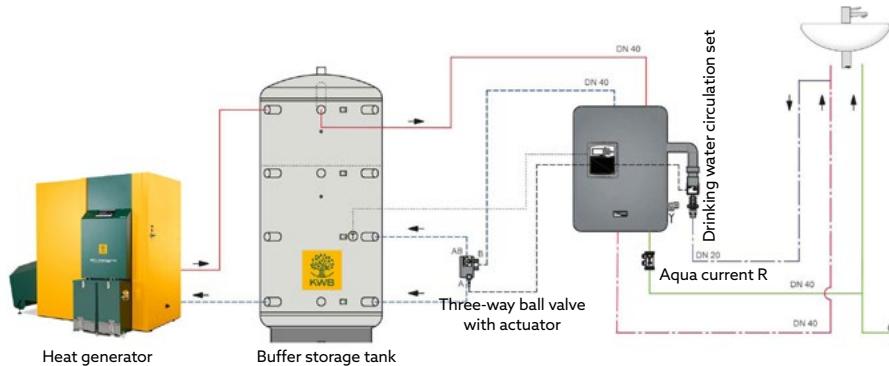
Technical data

KWB EmpaFresh	Unit	X80 Stainless steel
Plate heat exchanger	Plates	46
Width x Height x Depth	mm	660 x 875 x 300
Nominal width	-	DN 32
Weight	kg	42,0
Max. operating pressure, domestic hot water	bar	10
Max. operating pressure, heating	bar	3
Max. operating temperature	°C	95
Ambient temperature	°C	2-35
Max. power consumption station (control)	W	960
Electrical connection	-	230 V / 50 Hz
Connections		
Primary circuit & secondary circuit (male thread, flat sealing)	Inch	Thread 1 1/2 male
Circulation (male thread, flat sealing)	Inch	Thread 1 male
KFE flushing and filling ball valves (male thread for hose screw connection)	Inch	Thread 3/4 male
Storage tank circuit		
Medium heating water	✓	✓
kv value	-	6.9
Charging pump Grundfos UPML 25-105 PWM	✓	✓
Power consumption during operation (charging pump)	W	3-140
Drinking water circuit		
Medium drinking water	✓	✓
Output capacity (at $\Delta T = 20K$)	l/min	1-80
kv value	-	6.6
Safety valve	bar	10
General temperature range	°C	20-75
Pre-configured in the control	°C	20-60
Circulation pump Wilo Yonos PARA Z 15/7.0 RKC 130	✓	✓
Materials		
Fittings brass / dezincification-resistant brass / red brass	✓	✓
EPDM seal	✓	✓
EPP insulation	✓	✓
Pipes, stainless steel 1.4404	✓	✓
Heat exchanger, stainless steel 1.4401 / brazing solder, copper / Sealix fully sealed	✓	✓
Water quality requirements		
Contents	Concentration (mg/l or ppm)	Stainless steel heat exchanger soldered with: Copper, fully sealed*
Chloride (Cl^-) at 60 °C	< 100 100 - 150 > 150 < 70	+
Hydrogen carbonate (HCO_3^-)	70 - 300 > 300 < 70 > 70	+
Sulphate (SO_4^{2-})	< 1.0 > 1.0	+
HCO_3^- / SO_4^{2-}	< 50 $\mu S/cm$ 50 - 500 $\mu S/cm$ > 500 $\mu S/cm$	+
Electrical conductivity at 20°C	< 6.0 6.0 - 7.5 7.5 - 9.0 9.0 - 9.5 > 9.5 < 1 > 1 < 2	+
pH Generally a low pH value (under 6) increases the corrosion risk and a high pH value (above 7.5) reduces the corrosion risk.	> 20 < 0.05 > 0.05 < 5 5 - 20 > 20 < 100 > 100	+
Free chlorine (Cl_2)	> 1 < 1 > 1 < 2	+
Ammonium (NH_4^+)	2 - 20 > 20	+
Hydrogen sulphide (H_2S)	< 0.05 > 0.05 < 5 5 - 20 > 20	+
Free (aggressive) carbon dioxide (CO_2)	< 100 > 100	+
Nitrate (NO_3^-)	> 100	+

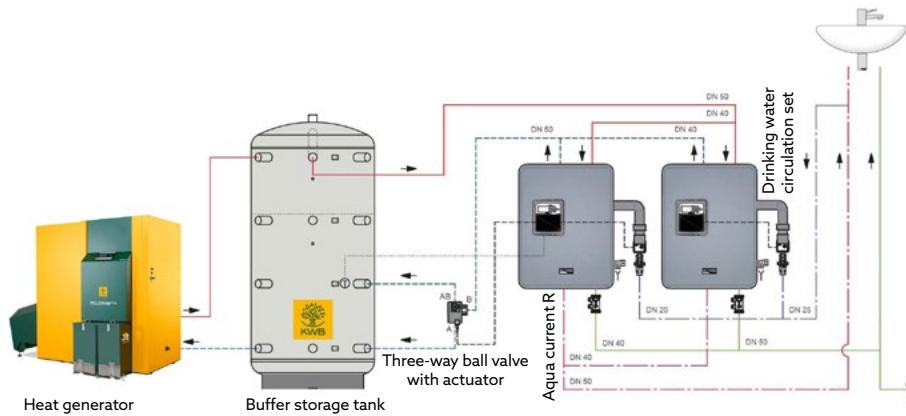
* ... + Good resistance under normal conditions - corrosion may occur - Use not recommended

System diagram EmpaFresh X80

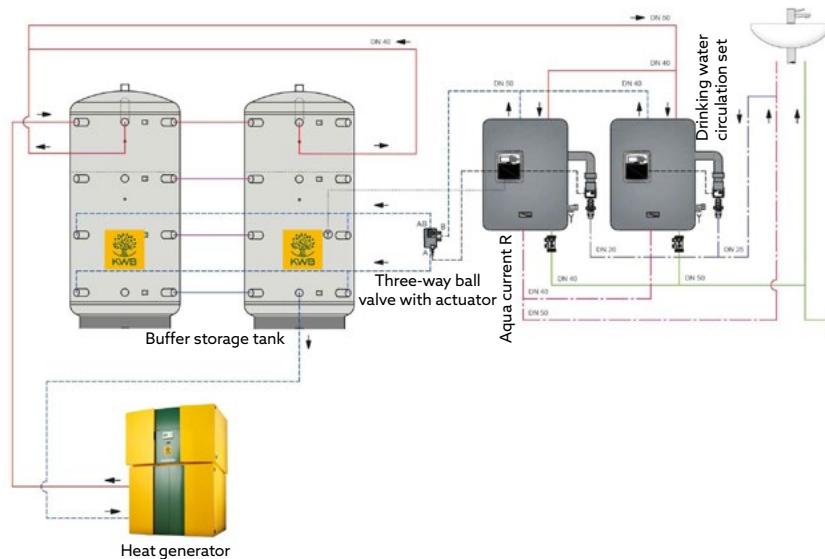
One buffer storage tank and one fresh water station



Cascade with one buffer storage tank and two fresh water stations



Cascade with two buffer storage tanks and two fresh water stations



Legend

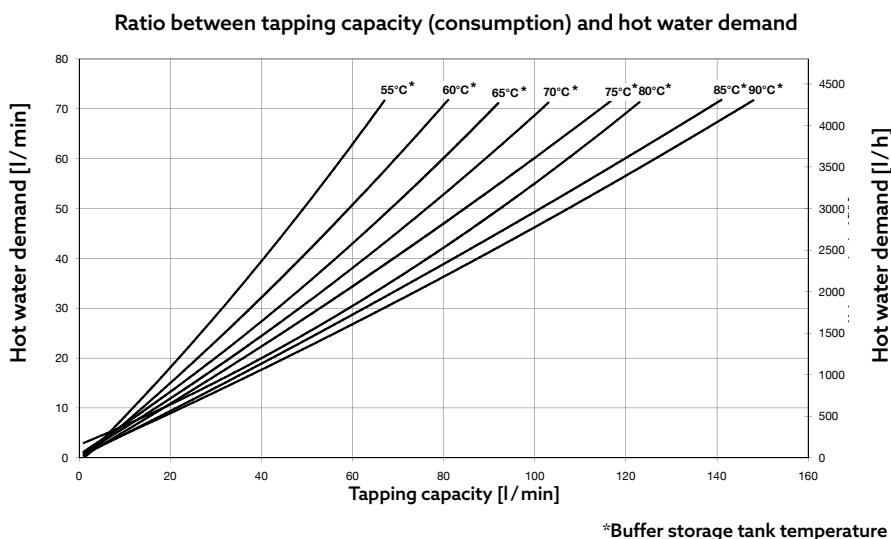
—	Heating forward flow
—	Heating return flow
—	Cold drinking water
—	Hot drinking water

—	Drinking water circulation
→	Flow direction
···	Temperature sensor
···	Relay output

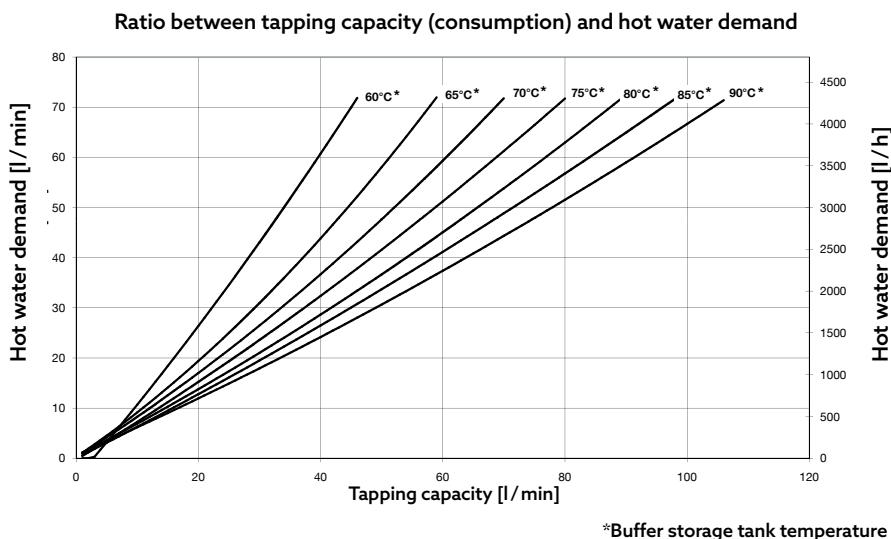
KWB EmpaFresh X 80

Calculation diagrams

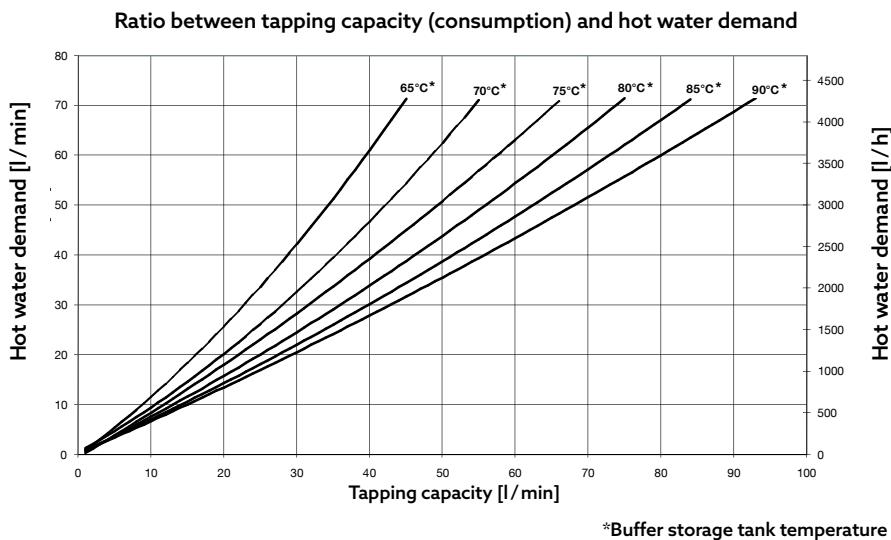
Drinking water heating
10°C to 45°C



Drinking water heating
10°C to 55°C



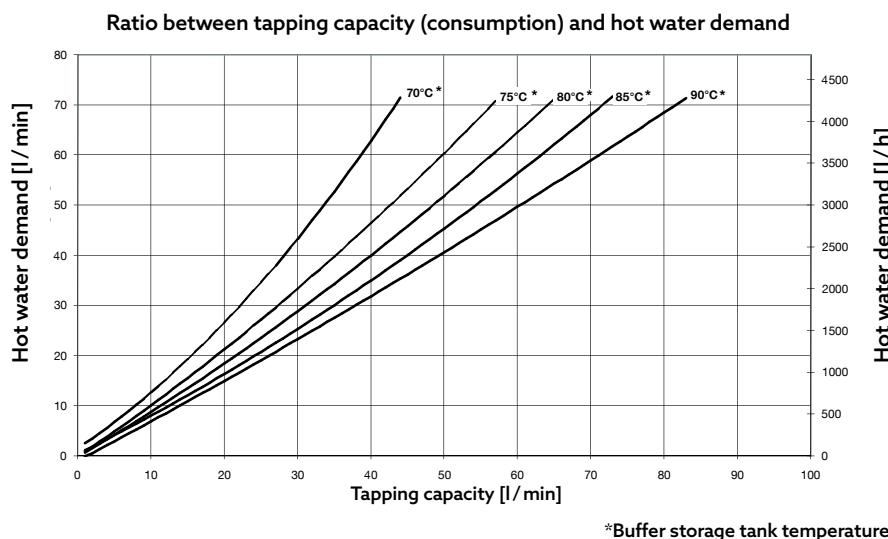
Drinking water heating
10°C to 60 °C



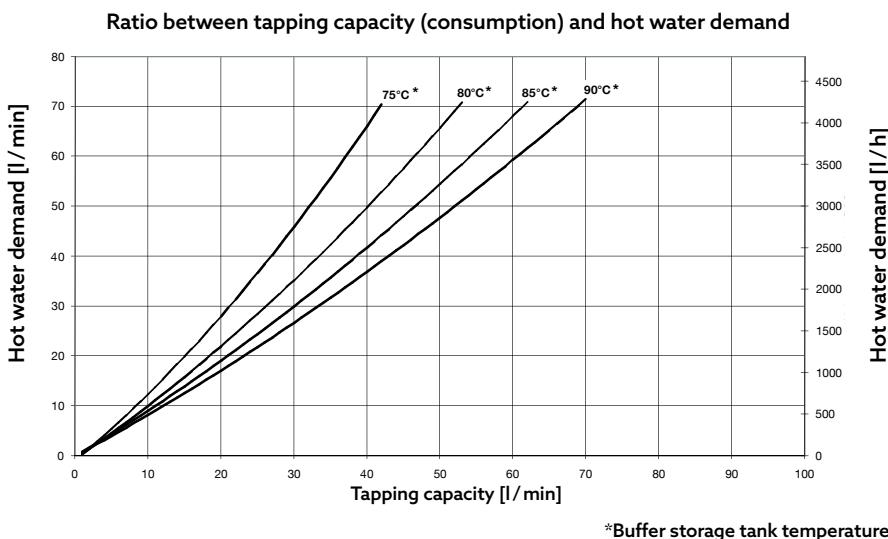
KWB EmpaFresh X80

Calculation diagrams

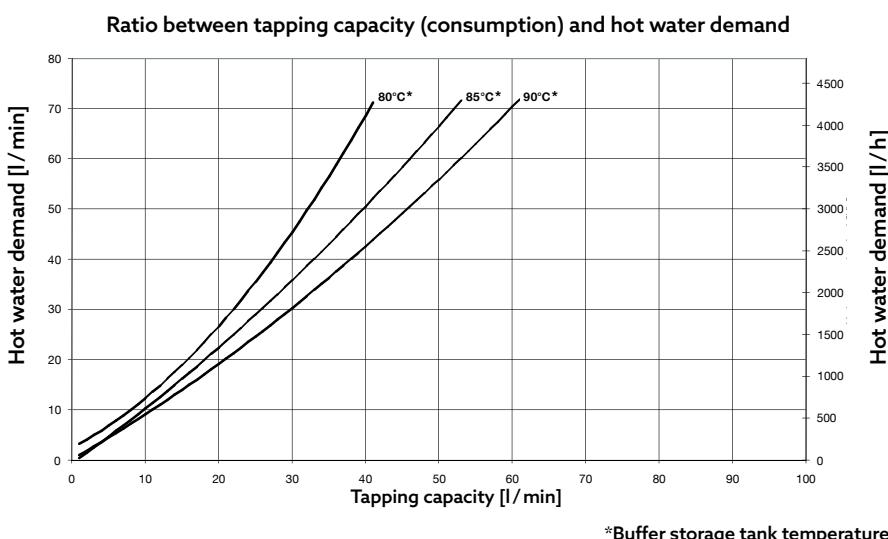
Drinking water heating
10°C to 65°C



Drinking water heating
10°C to 70°C



Drinking water heating
10°C to 75°C

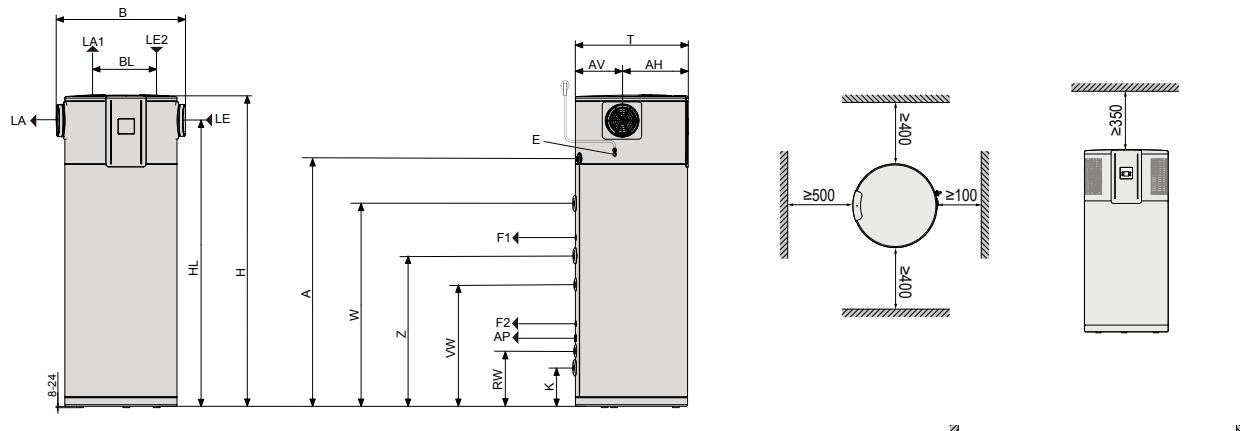


KWB EmpaAir domestic hot water heat pump

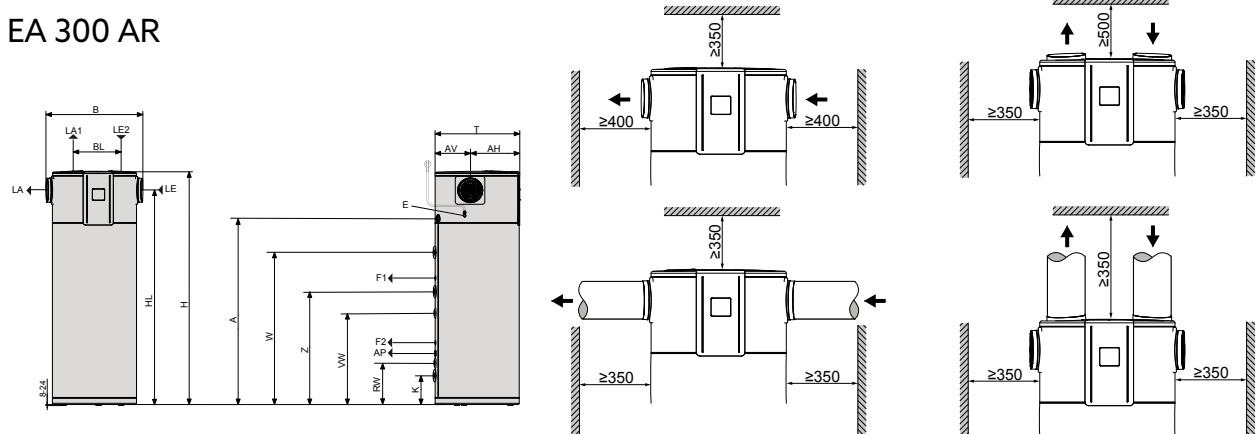
Installation and connecting dimensions

The minimum volume in which the KWB EmpaAir is installed must be 13m³.

EA 220 and EA 300 R



EA 300 AR



Legend

	EA 220	EA 300 R	EA 300 AR
B Total width	690	690	770
LA Air outlet DN200 (DN160 with supplied reducer)			200/160
LE Air inlet DN200 (DN160 with supplied reducer)			160
LA1 Air outlet optional DN160			160
LE2 Air inlet optional DN160			
HL Height middle air inlet/air outlet			1750
H Total height	1545	1905	1905
A Condensate discharge, male thread G 3/4"	1160	1525	1525
W Hot water discharge, male thread G 1"	880	1290	1290
Z Circulation, male thread G 1/2"	700	968	968
VW Heat generator forward flow female thread G1"	-	730	730
RW Heat generator return flow female thread G1"	-	325	325
K Cold water inflow male thread G1 "	240	220	220
T Depth			695
AV Distance front to middle air inlet/air outlet			290
AH Distance rear to middle air inlet/air outlet			405
E Routing electrical lines			
F1 Sensor heat generator optional Ø 9,6mm			
F2 Sensor heat generator Ø 9,6mm			
AP Cover production opening			

All dimensions in mm

KWB EmpaAir domestic hot water heat pump

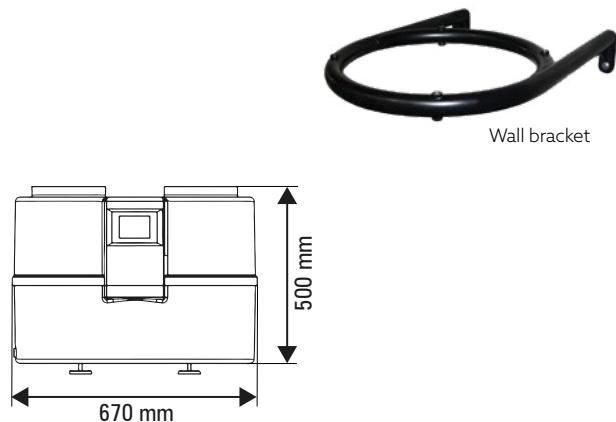
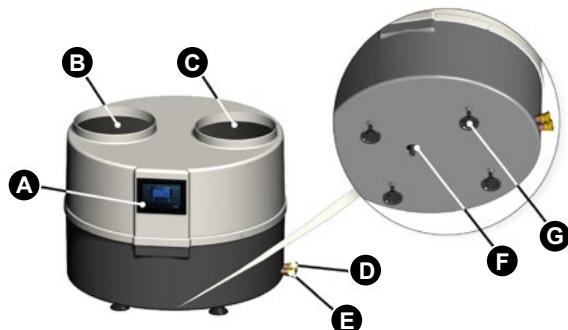
Technical data

KWB EmpaAir 220/300	Unit	EA 220	EA 300 R	EA 300 AR
Nominal capacity	l	220	291	291
Surface, heat exchanger	m ²	-	1,30	1,30
Application restrictions				
Hot water temperature max.	°C	65	65	65
Hot water temperature with emergency/additional heating max.	°C	65	65	65
Permissible hot water temperature in the storage tank max.	°C	-	70	70
Utilization limit heat source min. / max.	°C	+6/+42	+6/+42	-8/+42
Min. clearance in front of air connections / air duct at the installation location	mm	400	400	≤350/400
Min. clearance above air connections / air duct at installation location	mm	350	350	≤350/500
Installation location basic area min.	m ²	6	6	6
Installation location volume min.	m ³	13	13	13
Max. permissible operating overpressure cold/hot water	MPa	0,8	0,8	0,8
Performance specifications pursuant to EN 16147				
Nominal hot water temperature (EN 16147)	°C	55	55	55
Nominal load profile (EN16147)	-	L	XL	XL
Supply hot water temperature (EN 16147 / A15)	°C	52,7	52,5	-
Supply hot water temperature (EN 16147 / A14)	°C	-	-	54,3
Supply hot water temperature (EN 16147 / A7)	°C	54	52,6	54,3
Maximum useable hot water quantity 40 °C (EN 16147 / A15)	l	277	387	-
Maximum useable hot water quantity 40 °C (EN 16147 / A14)	l	-	-	399
Maximum useable hot water quantity 40 °C (EN 16147 / A7)	l	254	381	394
Heating time (EN 16147 / A15)	h	6,65	9,6	-
Heating time (EN 16147 / A14)	h	-	-	9,56
Heating time (EN 16147 / A7)	h	8,78	12,43	12,24
Power consumption, standby period (EN 16147 / A15)	kW	0,027	0,032	-
Power consumption, standby period (EN 16147 / A14)	kW	-	-	0,029
Power consumption, standby period (EN 16147 / A7)	kW	0,035	0,044	0,027
Coefficient of performance COP (EN 16147 / A15)	-	3,2	3,3	-
Coefficient of performance COP (EN 16147 / A14)	-	-	-	3,6
Coefficient of performance COP (EN 16147 / A7)	-	2,68	2,75	2,99
Heat output				
Medium heat output (EN 16147 / A15)	kW	1,6	1,6	-
Medium heat output (EN 16147 / A14)	kW	-	-	1,7
Medium heat output (EN 16147 / A7)	kW	1,3	1,3	1,3
Power consumption				
Medium power consumption heat pump (EN 16147 / A15)	kW	0,5	0,5	-
Power consumption emergency/additional heating	kW	1,5	1,5	-
Power consumption heat pump + emergency/additional heating max.	kW	2,15	2,15	2,15
Energetic data				
Energy efficiency class hot water preparation (load profile), internal air/outdoor air	-	A+ (L) / -	A+ (XL) / -	A+ (XL) / A+ (XL)
Electrical data				
Mains connection	-	1/N/PE ~ 220/230V 50Hz	1/N/PE ~ 220/230V 50Hz	1/N/PE ~ 220/230V 50Hz
Operating current max.	A	8,54	8,54	8,54
Starting current max.	A	23,44	23,44	23,44
Fusing	A	C16	C16	C16
Acoustic information				
Acoustic power level without air duct (EN 12102)	dB(A)	60	60	60
Acoustic power level with air duct (EN 12102)	dB(A)	-	-	52
Acoustic power level outside (outdoor air)	dB(A)	-	-	48
Medium acoustic power level in 1m distance free field without air duct	dB(A)	45	45	45
Medium acoustic power level in 1m distance free field with 4 m air duct	dB(A)	-	-	37
Versions				
Degree of protection of enclosure (IP)	-	IP24	IP24	IP24
Refrigerant	-	R134a	R134a	R134a
Refrigerant fill weight	kg	0,85	0,85	0,85
Power supply cable length approx.	mm	2000	2000	2000
Dimensions				
Weights, empty	mm	120	156	156
Height	mm	1501	1905	1905
Diameter	mm	690	690	690
Tilt dimensions	mm	1652	2026	2026
Tilting dimensions with packaging	mm	1895	2230	2244
Packaging unit dimensions height/width/depth	mm	1740/740/740	2100/740/740	2100/790/790
Connections				
Condensate connection	-	G 3/4	G 3/4	G 3/4 A
circulation connection	-			G 1/2 A
Water connection	-			G 1 A
Connection, heat exchanger	-	-	G 1	G 1
Values				
Type of anode: Impressed current anode	-		✓	
Air throughput	m ³ /h	550	550	350
Max. air duct length at 160/200 mm (incl. 3x 90° bends)	m	-	-	20/40
Available external compression	Pa	-	-	120

KWB EmpaAir Hydro Split 4.2

Installation and connecting dimensions

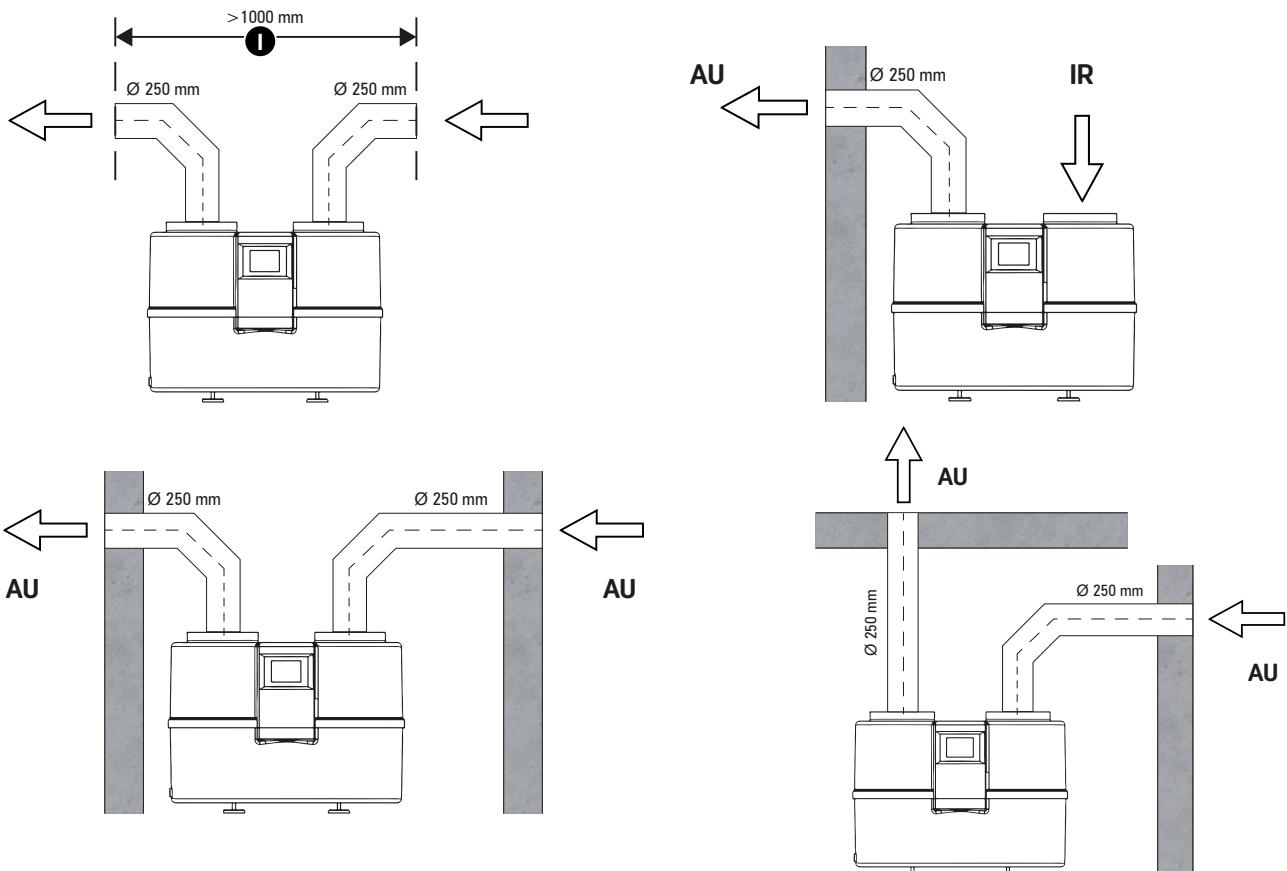
Hydro Split 4.2



Legend

A	Control unit
B	Air outlet (\varnothing 250 mm)
C	Air inlet (\varnothing 250 mm)
D	Flow (hot water outlet) 3/4" female thread

E	Return (cold water inlet) 3/4" female thread
F	Condensate drain connection (hose nozzle outer diameter: 16 mm)
G	Heat pump feet



Legend

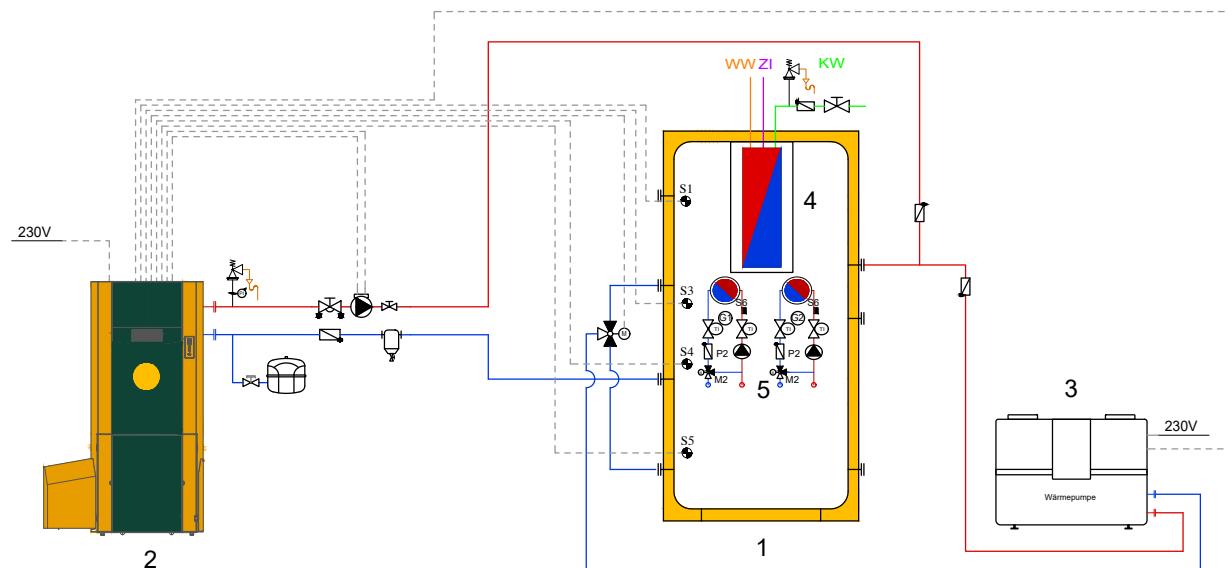
IR	Indoor
AU	Outdoor
I	Minimum distance between inlet and outlet opening: 1m

KWB EmpaAir Hydro Split 4.2

Technical data

KWB EmpaAir Hydro Split 4.2	Unit	Hydro Split 4.2
Scope of application		
Utilization limit heat source min./max.	°C	-7/+43
Max. Temperature of the hot water from the heat pump	°C	55
Max. Hot water temperature with electric immersion heater	°C	65
Performance specifications		
Energy efficiency class	-	A+
Load profile	-	XL
Nominal heat output A15/W10-55	KW	2,85
Air flow rate free blowing	m ³ / h	900
COP A15/W55 (PN-EN 16147:2017-04)	-	3,07
COP A20/W55	-	3,42
Refrigerant		
Refrigerant	-	R134a
GWP value	-	1430
Refrigerant charge	kg	0,8
Parameters of the heating circuit		
Recommended flow rate	m ³ /h	0,33 / 0,35
Maximum permissible pressure in the heating circuit	bar	6
Residual head of circulation pump	m	5,5
Electrical data		
Mains connection	-	1/N/PE ~ 220/230 V 50 Hz
Operating current max.	A	6,5
Starting current max.	A	30
Fusing		C8
Mains connection Length	m	1,5
Dimensions		
Weights	kg	53
Height	mm	500
Diameter	mm	670
Acoustic information		
Acoustic power level	dB(A)	57

Plant diagram EmpaAir Hydro Split 4.2



Legend

— Heating forward flow	1 KWB EmpaCompact
— Heating return flow	2 KWB Easyfire
— Cold water	3 KWB EmpaAir Hydro Split
— Hot water	4 KWB EmpaFresh
	5 KWB Heizkreisgruppen

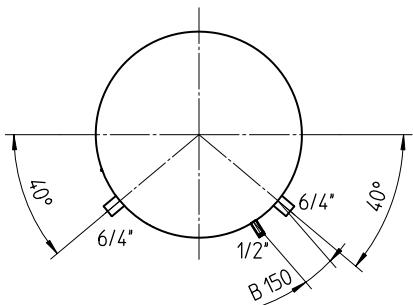
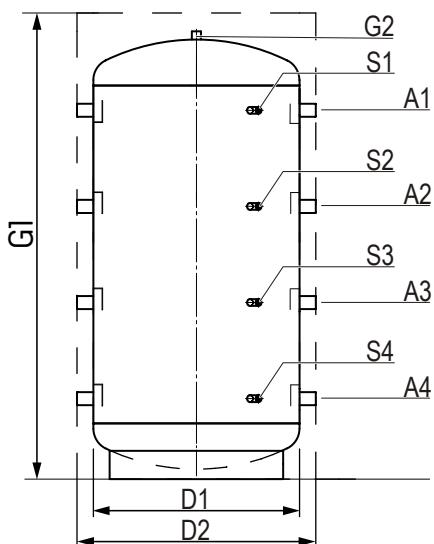
For further hydraulic circuits, see "Instructions for operation and assembly KWB Empa Air Hydro Split 4.2".



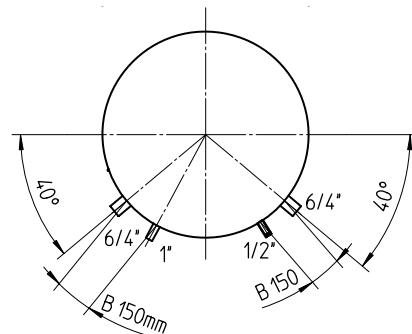
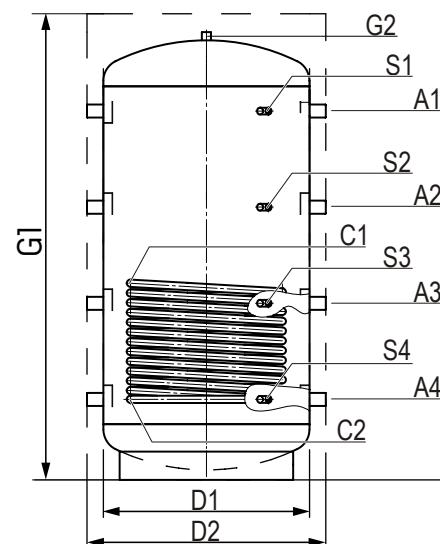
KWB EmpaEco

Buffer storage tank

KWB EmpaEco



KWB EmpaEco Solar



Dimensions for transport and placement

Dimensions	EmpaEco 500	EmpaEco 800	EmpaEco 1.000	EmpaEco 1.500
Diameter without/with insulation	650/850	790/990	790/990	1.000/1.200
Unobstructed door width for placement in designated space (without insulation)	655	795	795	1.005
Total height (with insulation)	1.725	1.785	2.135	2.235
Tilting dimensions without insulation	1.670	1.750	2.090	2.270

Dimensions	EmpaEco 2.000	EmpaEco 3.000	EmpaEco 4.000	EmpaEco 5.000
Diameter without/with insulation	1.100/1.300	1.250/1.450	1.400/1.600	1.600/1.800
Unobstructed door width for placement in designated space (without insulation)	1.105	1.255	1.405	1.605
Total height (with insulation)	2.465	2.681	2.754	2.855
Tilting dimensions without insulation	2.460	2.650	2.740	2.893

Dimensions	EmpaEco Solar 800	EmpaEco Solar 1.000	EmpaEco Solar 1.500	
Diameter without/with insulation	790/990	790/990	1.000/1.200	
Unobstructed door width for placement in designated space (without insulation)	795	795	1.005	
Total height (with insulation)	1.785	2.135	2.235	
Tilting dimensions without insulation	1.750	2.090	2.270	

KWB EmpaEco

Technical data Label B

EmpaEco (Energy efficiency class B)	Position	Unit	500	800	1000	800 Solar	1000Solar
Nominal capacity	-	liter	491	746	916	746	916
Weight incl. insulation	-	kg	111	142	154	173	196
Permissible operating pressure storage tank	-	bar	4	4	4	4	4
Permissible operating pressure solar register	-	bar	-	-	-	10	10
Permissible operating temperature storage tank	-	°C			95		
Permissible operating temperature solar register	-	°C	-	-	-	110	110
Register area Solar	-	m ²	-	-	-	2,4	3
Register content Solar	-	liter	-	-	-	15	19
Connections							
	A1	mm	1390	1430	1710	1430	1710
Height of the 8 heating system connections 6/4" internal thread	A2	mm	1010	1030	1250	1030	1250
	A3	mm	620	630	745	630	745
	A4	mm	220	260	310	260	310
Solar forward flow for KWB EmpaEco Solar 1" internal thread	C1	mm		-		845	1030
Solar return flow for KWB EmpaEco Solar 1" internal thread	C2	mm	-	-	-	260	310
Evacuation connection 6/4" internal thread	G2	mm	1640	1700	2050	1700	2050
	S1	mm	1390	1430	1710	1430	1710
Sensor sleeves with clamp springs	S2	mm	1010	1030	1250	1030	1250
	S3	mm	620	630	745	630	745
	S4	mm	220	260	310	260	310
Energy							
Energy efficiency class according to Commission Delegated Regulation (EU) 812/2013	-	-			B		
Heat loss [W] according to EN 12897 (measured)	-	W	83	95	103	95	103

Dimensions for transport and placement

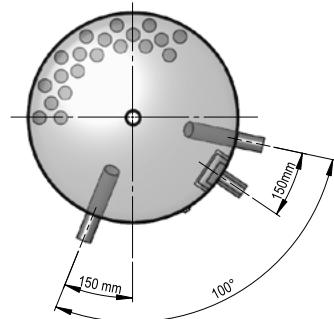
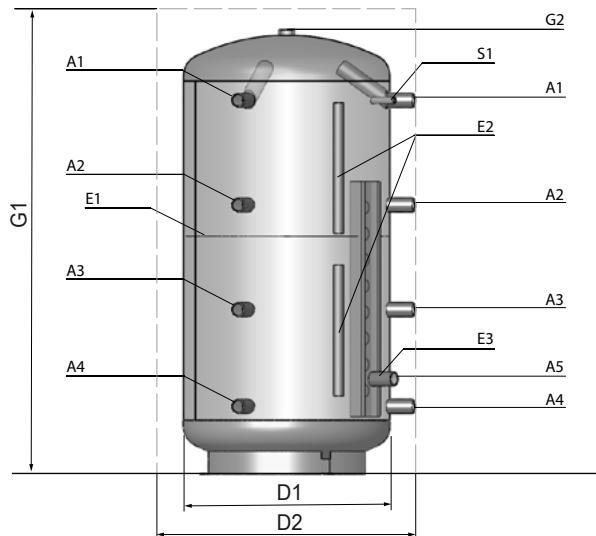
Dimensions for empaeco Label B	EmpaEco 500	EmpaEco 800	EmpaEco 1.000
Diameter without/with insulation	650/930	790/1.070	790/1.070
Unobstructed door width for placement in designated space (without insulation)	655	795	795
Total height (with insulation)	1.725	1.785	2.135
Tilting dimensions without insulation	1.670	1.750	2.090

Dimensions for Empaeco Label B	EmpaEco Solar 800	EmpaEco Solar 1.000
Diameter without/with insulation	790/1.070	790/1.070
Unobstructed door width for placement in designated space (without insulation)	795	795
Total height (with insulation)	1.785	2.135
Tilting dimensions without insulation	1.750	2.090

All dimensions in mm

KWB EmpaEco

Buffer storage tank with strata charging system



EmpaEco with strata charging device	Position	Unit	500	800	1000	1500
Nominal capacity	-	liter	491	746	916	1531
Weight incl. insulation	-	kg	87	105	122	210
Permissible operating pressure storage tank	-	bar	4	4	4	4
Permissible operating pressure solar register	-	bar			-	
Permissible operating temperature storage tank	-	°C			95	
strata plate	E1	-			✓	
Sensor channel	E2	-			✓	
Thermal return flow stratification device	E3	-			✓	
Connections						
Height of the 8 heating system connections	A1	mm	1390	1430	1710	1760
6/4" internal thread: EmpaEco 500 800 1.000 1.500	A2	mm	1010	1030	1250	1350
	A3	mm	620	630	745	825
	A4	mm	220	260	310	380
	A5	mm	320	365	415	480
Evacuation connection	G2	mm	1640	1700	2050	2150
6/4" internal thread: EmpaEco 500 800 1.000 1.500	S1	mm	1390	1430	1710	1760
Dimensions						
Diameter without / with insulation	D1 / D2	mm	650 / 850	790 / 990	790 / 990	1000 / 1200
Width without insulation for placement in designated space	-	mm	655	795	795	1005
Thickness of insulation coat	-	mm			100	
Thickness of insulation cover	-	mm			85	
Total height with insulation	G1	mm	1725	1785	2135	2235
Tilt dimension	-	mm	1670	1750	2090	2270
Energy						
Energy efficiency class according to Commission Delegated Regulation (EU) 812/2013	-	-			C	
Heat loss [W] according to EN 12897 (measured)	-	W	85	108	126	153

Dimensions for transport and placement

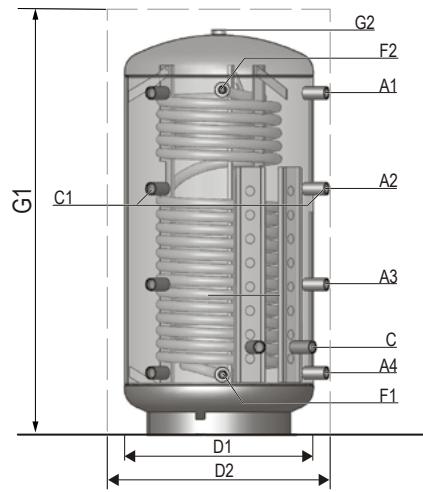
Dimensions for the EmpaEco with strata charging device	EmpaEco 500	EmpaEco 800	EmpaEco 1.000	EmpaEco 1.500
Diameter without/with insulation	650/850	790/990	790/990	1.000 / 1.200
Unobstructed door width for placement in designated space (without insulation)	655	795	795	1.005
Total height (with insulation)	1.725	1.785	2.135	2.235
Tilting dimensions without insulation	1.670	1.750	2.090	2.270

All dimensions in mm

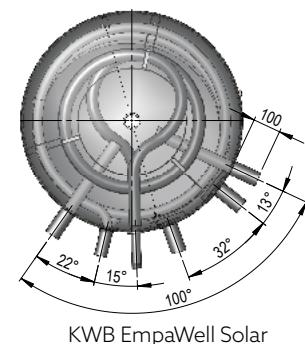
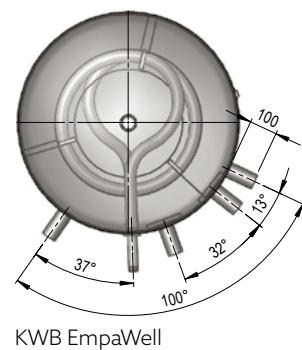
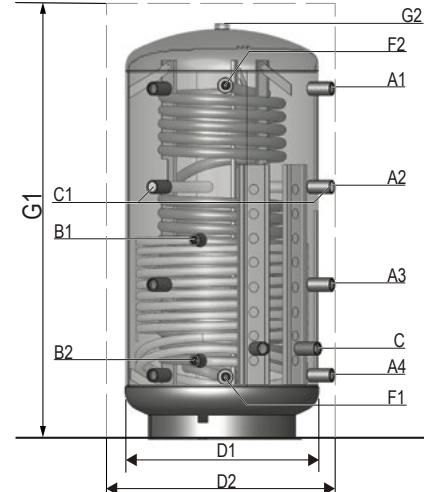
KWB EmpaWell

Corrugated tube stratified storage tank

KWB EmpaWell

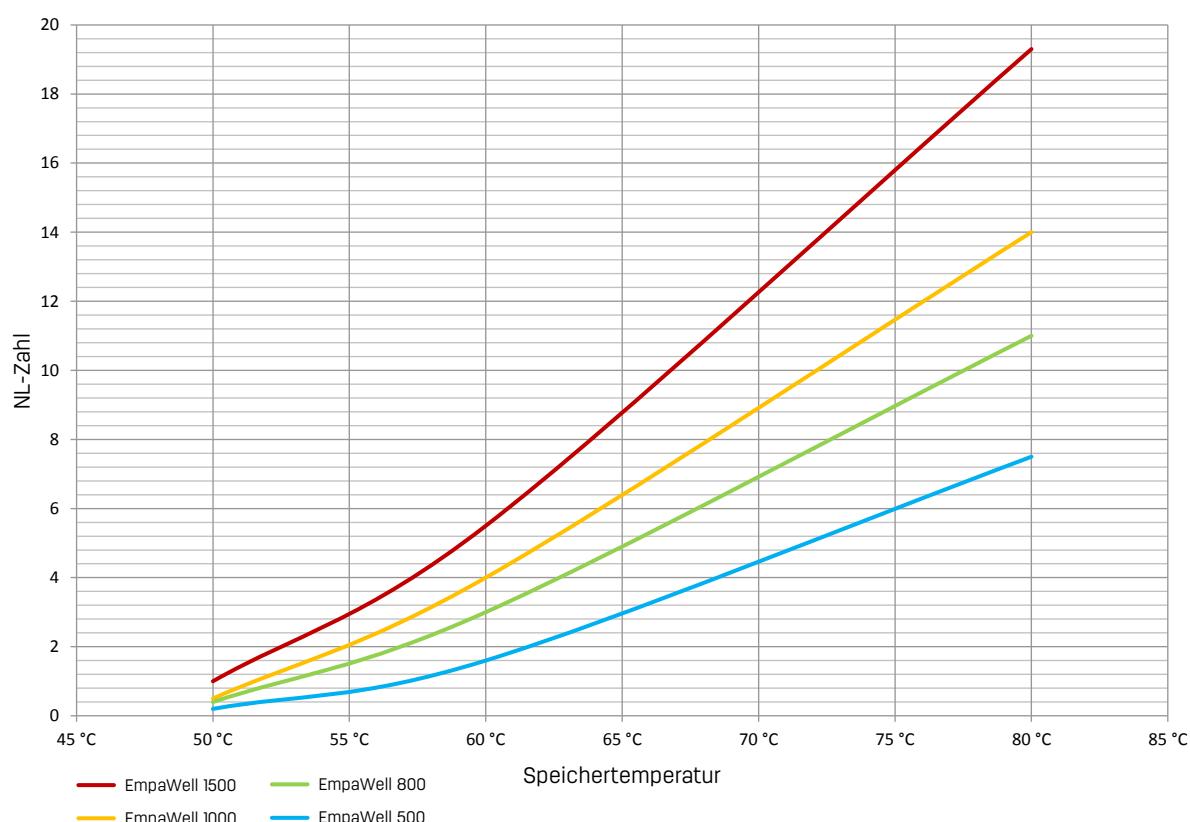


KWB EmpaWell Solar



The legends to the respective diagrams can be found on the next side.

Dimensioning: N_L figures for the KWB storage tank



All dimensions in mm

Notes