Hydronic Kits
VKB

Hydronic systems
VKB 2.0

The VKB 2.0 units are buffer storage tanks with accessories (without circulation pump) designed in order to significantly reduce the set-up time for the conditioning and cooling devices.

With all hydraulic components which are indispensable for the correct functioning of the hydraulic circuit for the distribution of chilled water. The components can be coupled with all kind of water coolers. The units consist of an insulated buffer tank, an expansion vessel, a safety valve, a deaerator, a fill/drain valve and a manometer.

The VKB 2.0 units are enveloped in a supporting structure in a galvanized steel and powder coated panels and base. They are designed to guarantee an easy inspection and maintenance of the components. The tank, which is hydraulically inserted between the cooling station and the fan-coils, makes the water content in the entire installation increase, by increasing the pause between the shutdown of the compressor and the next start-up. In this way, the number of start-ups is significantly reduced, which improves the life span and performance of the compressor. The broad range of storage tanks makes it possible to meet every requirement. Every unit is assembled in our factory and tested to guarantee our trustworthiness.

Tank insulated with anti-condensate elastomer

Available versions

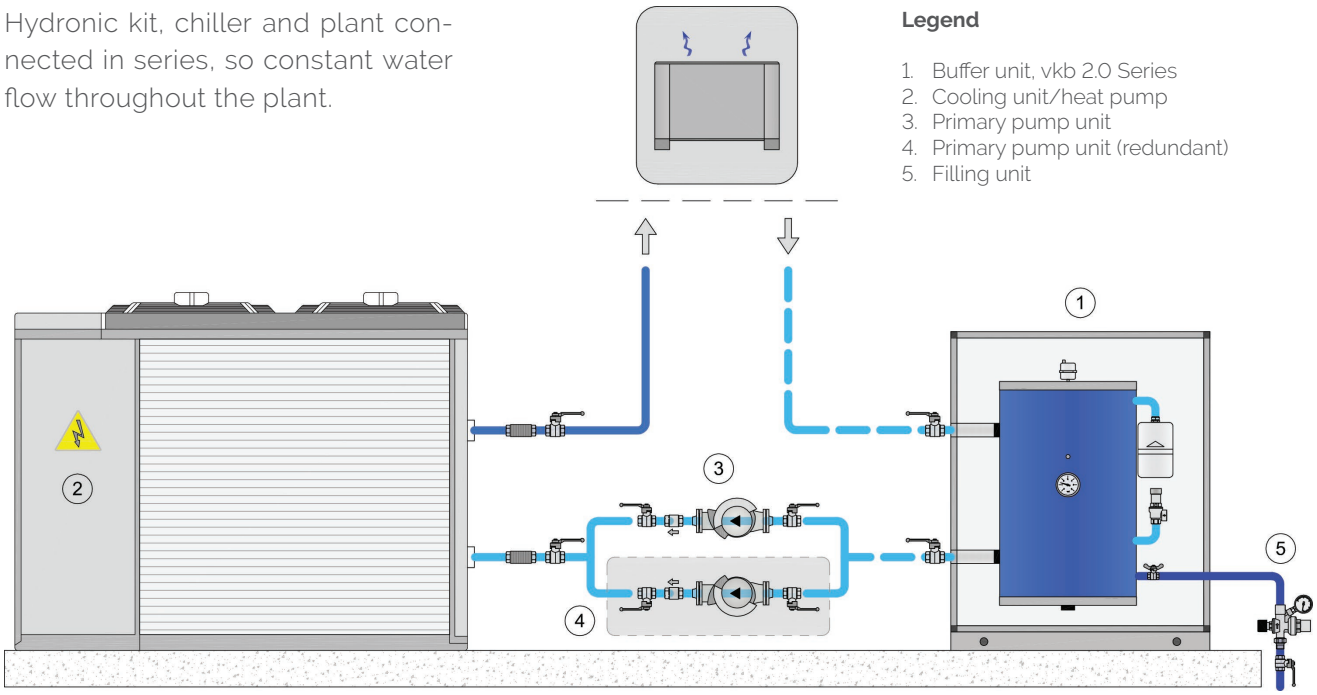
VKB 2.0 is available in the following sizes: 250, 500, 1000 and 1500 litres.

Accessories

See pag. 116 for the list of available accessories

Hydronic systems
VKB 2.0 Layout 1 STANDARD

Hydronic kit, chiller and plant connected in series, so constant water flow throughout the plant.

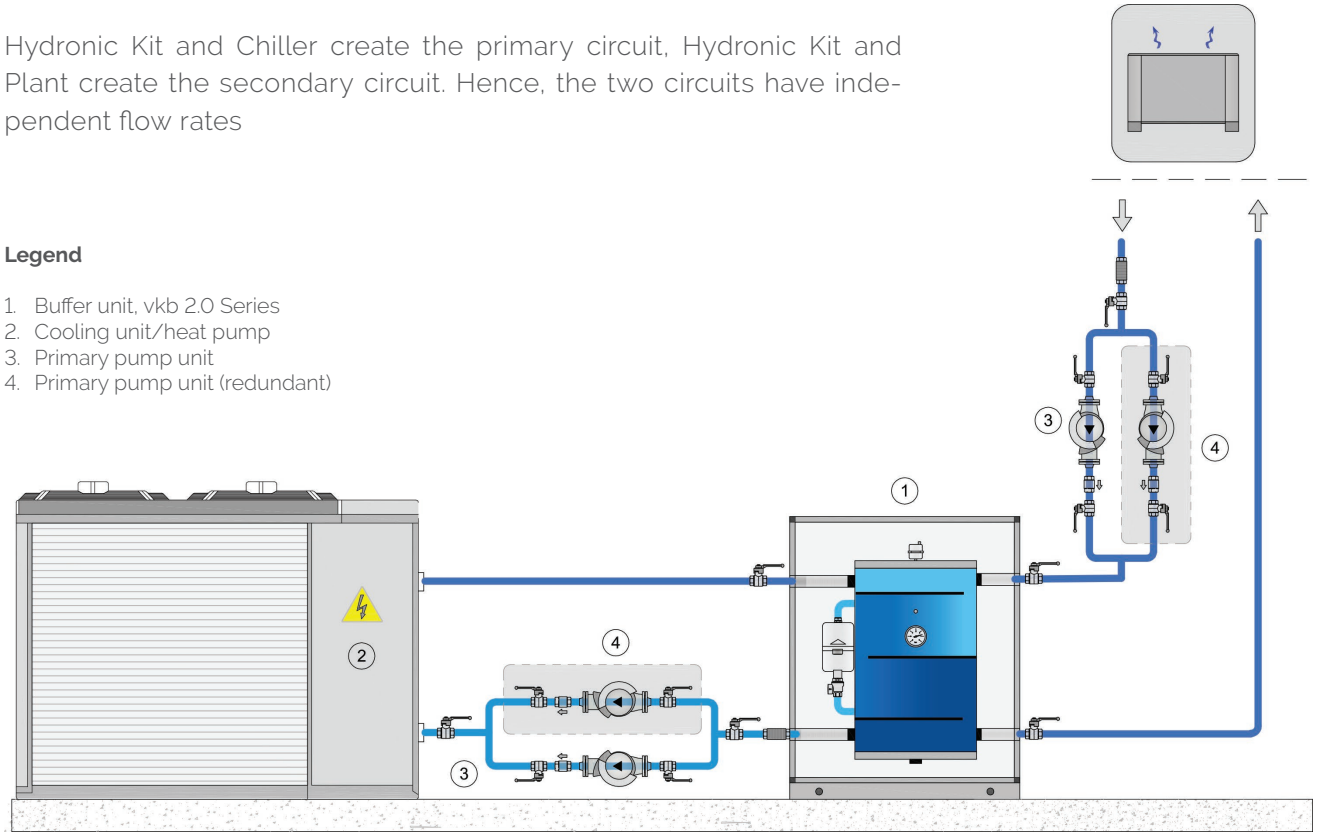


Legend

1. Buffer unit, vkb 2.0 Series
2. Cooling unit/heat pump
3. Primary pump unit
4. Primary pump unit (redundant)
5. Filling unit

Hydronic systems
VKB 2.0 Layout 2 SPECIAL VERSION

Hydronic Kit and Chiller create the primary circuit, Hydronic Kit and Plant create the secondary circuit. Hence, the two circuits have independent flow rates



Legend

1. Buffer unit, vkb 2.0 Series
2. Cooling unit/heat pump
3. Primary pump unit
4. Primary pump unit (redundant)

Hydronic systems
VKB 2.0

VKB 2.0 Description of the main components

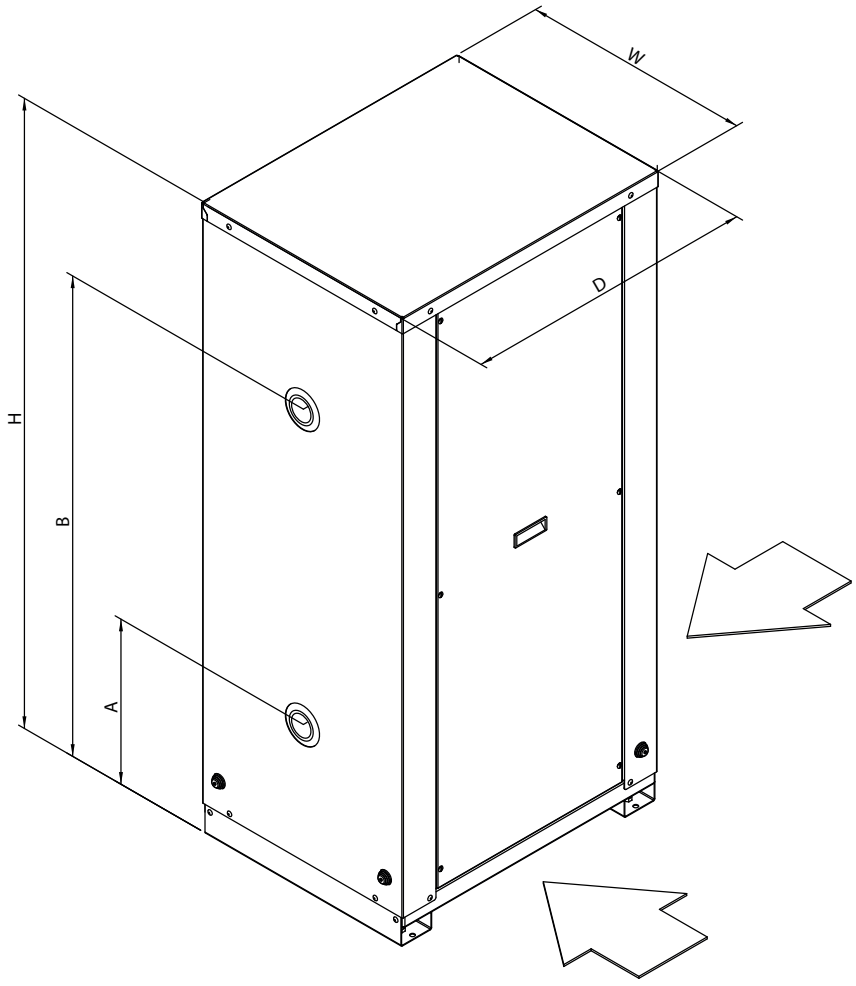
- **Storage tank**
  The storage tank is made of varnished carbon steel plates and is insulated with closed cell elastomer . This type of insulation, guarantees an excellent resistance to condensate formation.
- **Fill up valve**
  This valve refills the hydraulic circuit in the demand peak phase as well as during normal functioning.
- **Safety valve**
  Calibrated at 3 bar and with canalised drain. It protects the unit from possible overpressure.
- **Automatic valve for air drain**
  Placed on the upper part of the unit, it drains air from the unit.
- **Drain valve**
  It drains air from the lowest point of the tank to make drainage possible.
- **Supporting structure**
  The base is made of thick steel plates varnished. Thebasement and panels are made in galvanized steel and powder coated which are resistant to atmospheric agents. All this makes it possible for the VKB 2.0 to be installed in non-technical spaces and in places exposed to atmospheric agents.
- **Expansion vessel**
  Supplied with a membrane, preloaded nitrogen and with dimensions that can absorb varying volumes of liquid derived from the various temperatures.
- **Manometer**
  This device is placed on the tank and indicates the internal pressure.

	Components
1	Storage tank
2	Fill-up valve
3	Automatic safety valve
4	Drain
5	Supporting structure
6	Expansion vessel
7	Manometer
8	Predisposition for electrical resistance
9	Predisposition for thermostat

Hydronic systems
VKB 2.0

Capacity l	Vessel l	Vessel calibration bar	Safety valve bar	Couplings inch	W mm	D mm	H mm	A mm	B mm
250	12	1	3	2"	590	750	1600	420	1220
500	18	1,5	3	3"	750	1000	1850	420	1470
1000	25	1,5	3	4"	1100	1100	1850	610	1410
1500	2x25	1,5	3	4"	1200	1200	1950	650	1450

Capacity l	Code	Price	Dimensions mm	Weight kg
250	838050090X		590x750x1600	95,00
500	838050091X		750x1000x1850	155,00
1000	838050092X		1100x1100x1850	255,00
1500	838050016		1200X1200X1950	313,00



VKB 2.0 hydronic systems: Capacity of the circuit and the expansion vessel

Max water content in the device and dimensions of the expansion vessel

On chart 1 the max water volume in the hydraulic installation is indicated, compatible with the capacity of the expansion vessel and applicable to all VKB 2.0 models. The safety valve also has a start-up value (3 bar for all models). If the effective water content in the device, as well as in the storage tank, exceeds the operating conditions in the chart, another/second expansion vessel should be installed to take the added water volume.

Tav. 1

Model	Hydraulic height H	m	15	10
	Expansion vessel preload	bar	1,8	1,5
VKB 2,0 250 l	Circuit's max water content (1)	l	492	615
	Circuit's max water content (2)	l	315	394
VKB 2,0 500 l	Circuit's max water content (1)	l	708	885
	Circuit's max water content (2)	l	453	567
VKB 2,0 1000 l	Circuit's max water content (1)	l	984	1230
	Circuit's max water content (2)	l	630	788
VKB 2,0 1500 l	Circuit's max water content (1)	l	1968	2460
	Circuit's max water content (2)	l	1260	1576

Note: the expansion vessel is optional and should be ordered separately.

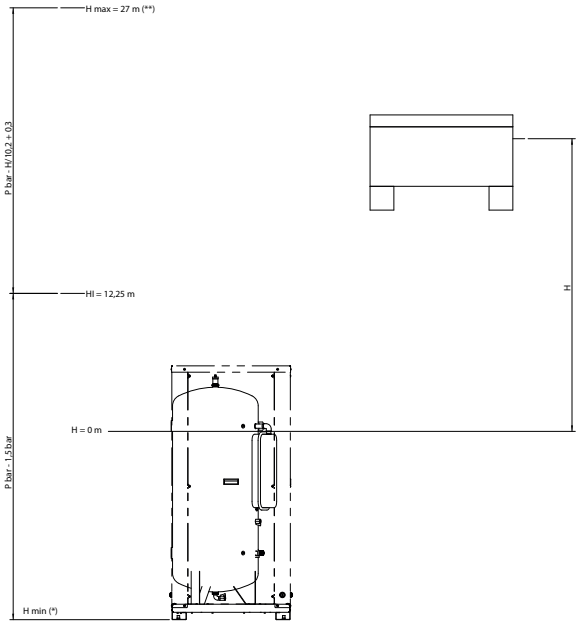
Condizioni operative:
(1) cooling
Min temp of fluid = 4°C
Max temp of fluid = 40°C
(2) heating (heat pump)
Min temp of fluid = 4°C
Max temp of fluid = 50°C

Tav. 2

Water/ glycol mix.	Water temperature max °C	Water temperature min °C	Correction factors	Reference value
10%	40	-2	0.507	(1)
10%	5	-2	0.686	(2)
20%	40	-4	0.434	(1)
20%	50	-4	0.604	(2)
30%	40	-6	0.393	(1)
30%	50	-6	0.555	(2)

Hydronic systems
VKB 2.0 preload of the expansion vessel

The expansion vessel, of all models, is preloaded with a standard value of 1.5 bar.
The value has to be adapted though to the height H of the device.
The formula used to calculate the preload value of the expansion vessel is:
P = (H /10.2)+0.3



Legend
H: height of the device in meters
P: preload of the expansion vessel in bar
Should the preload value be less than the standard value, no intervention has to be carried out. This means
that an installation with a height of less than 12.25 meters has a preload of 1.5 bar. In this case the operator
should only check the pressure value and not intervene.

Example
We take a height H of 15.3. The preload value is:
P = (15,3/10,2)+0,3= 1,8 bar

H: height of the device
Hmax: max height of the device
H1: height when the preload of the expansion vessel is the same as the standard value
* verify that the lowest point of the device can support the pressure
** verify that the highest point of the device does not exceed the max height H max=27 m.

Normal user's conditions

The VKB 2.0 hydronic group is designed to be incorporated into conditioning systems, normally coupled with a chiller or a heat pump.
The units are designed to work with water or ethylene glycol and water mixtures up to a maximum of 50%. For operation with percentages of higher glycols or with different fluids, you must consult our technical service.

The minimum operating temperature of the fluid is -10 ° C, of course with a mixture of water and glycol, while the maximum is 60 ° C. Special executions for operation with lower or higher temperature fluids are available on request.

The outdoor air temperature range is -20 ° C + 40 ° C. Again, special versions are available for operation outside the standard range.

The maximum working pressure of the group is 3 bars. Versions with maximum operating pressure are available on request. Also versions for open vessel operation (atmospheric pressure) can be made on request.

Hydronic systems
VKB 2.0 accessories

1 From threaded to flanged galvanized connections

The codes and prices below are for single piece.

Original connection	Transformed connection uni-en pn 16	Code	Price
1"1/2	DN 40	838081200X	
	DN 50	838081201X	
2"	DN 50	838081202X	
	DN 65	838081203X	
2"1/2	DN 65	838081204X	
	DN 80	838081205X	
3"	DN 80	838081206X	
	DN 100	838081207X	
4"	DN 100	838081208X	
	DN 125	838081209X	

2 From threaded to Victaulic galvanized connections

The codes and prices below are for single piece.

Original connection	Transformed connection	Code	Price
1"1/2	1"1/2	838081211X	
	2"	838081212X	
2"	2"	838081213X	
	2"1/2	838081214X	
2"1/2	2"1/2	838081215X	
	3"	838081216X	
3"	3"	838081217X	
	4"	838081218X	
4"	4"	838081219X	
	5"	838081220X	

3 Electrical resistor

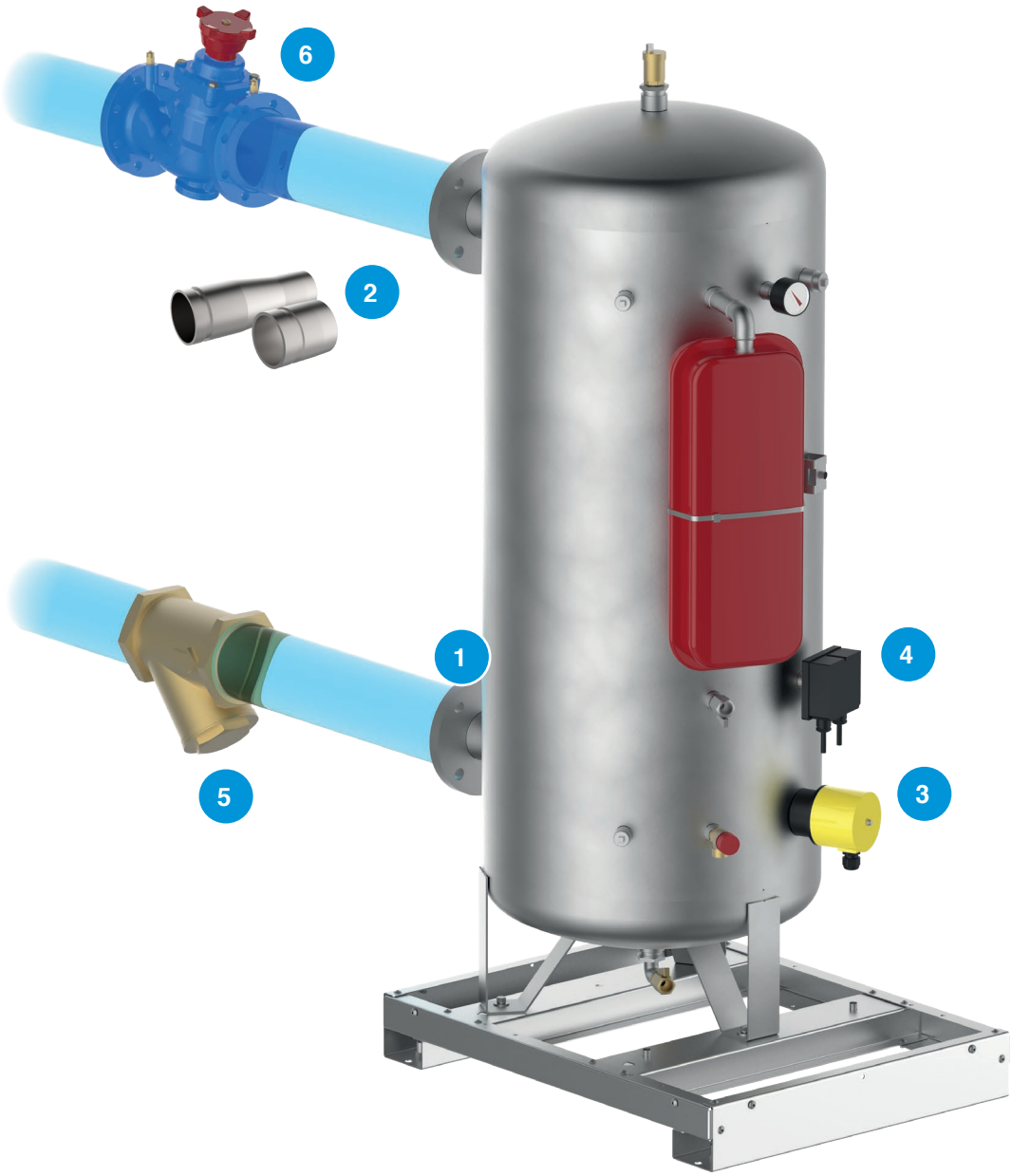
IP 65 Protection

Power W	Voltage V	Element number	Connection diameter inch	Length mm	Code	Price
1300	230/380	3	2"	220	824100008	
2000	230/380	3	2"	290	824100009	
3000	230/380	3	2"	340	824100010	
4000	230/380	3	2"	390	824100012	

4 Temperature controls

Description	Temperature range	Safety range	Code	Price
Thermostat	0 ÷ 90 °C	-	822010004	
Bithermostat	0 ÷ 90 °C	fix 100 °C	822010006	
Antifreeze Bithermostat	-30 ÷ 30 °C	0 ÷ 90 °C	822010007	

Hydronic systems
VKB 2.0 accessories



5 **Filter (special version)**
Mesh filter, with 1000 micron holes, can be placed outside the unit to protect the pumps from any impurities in the equipment.
see page: 131

6 **Balancing valves (special version)**
Valve can be connected externally to balance the flow within the circuit.
see page: 131

Tailored connections (special version)
Flangiate (in various materials), Victaulic (in various materials), Larger
see page: 131

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