

Hydronic Kits

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Hydronic kit

The VKB 2.0, HPT and HP 2.0 units are meant to optimize the performance of heating and cooling installations and to reduce the installation time.

The units have an integrated system, which contains all the needed components for an efficient functioning of the hydraulic circuit (or for the distribution of chilled water).

They are designed, pre-assembled and every unit is tested in our factory. In this way we guarantee quality in our products and a fast and simple installation. The kits are available with a broad range of Pump/Tank combinations which can be used with any kind of cooling device or heat pump.

The units are made of materials and finished in a certain way which makes it possible to install outdoor. They can be customized according to the client's specific requirements.

Advantages

- ✓ Easy installation
- ✓ All units are tested
- ✓ Pre-assembled system
- ✓ Fast installation
- ✓ Excellent dimensions
- ✓ Low energy consumption



HPT
Unit with tank, pump
and accessories



VKB 2.0
Unit with tank
and accessories



HP 2.0
Unit with pump
and accessories



The units are in accordance with the directives emitted by the European Union and labelled with the CE mark.



In accordance with the ErP directive
Efficient usage of energy



Pre-assembled accessories
and tested for a fast and
secure installation

Tank units for chilled water

Hydronic systems: HPT



Carbon steel tank and tubes insulated with anti-condensate elastomer

TESTED



The HPT units are hydraulic units with buffer tanks designed to reduce the production time of conditioning and cooling systems. They can be equipped with all different kinds of water coolers.

The HPT units are made of:

- carbon steel tank and tubes insulated with anti-condensate elastomer
- Centrifugal single or double pump with a shut-off valve
- Switchboard with possibility to alternate the pumps with every start-up (2 pump version), to start-up the backup pump in case of breakdown (2 pump version), magnetothermic protection, cleaned contact to signalise the distance between the pumps, protection category IP55
- Expansion vessel
- Safety valve
- Deaerator
- Manometer
- Fill-up/drain valve
- Base and self-supporting panels made of galvanized and coated steel sheets, suitable for outdoor installations.

Available versions

The broad range of pump-tank combinations makes it possible to meet all requirements. Numerous versions are available: with a single or a double pump and with tanks with a capacity of 100, 200, 300, 500, 750, 1000, 1500 and 2500 litres.

Accessories

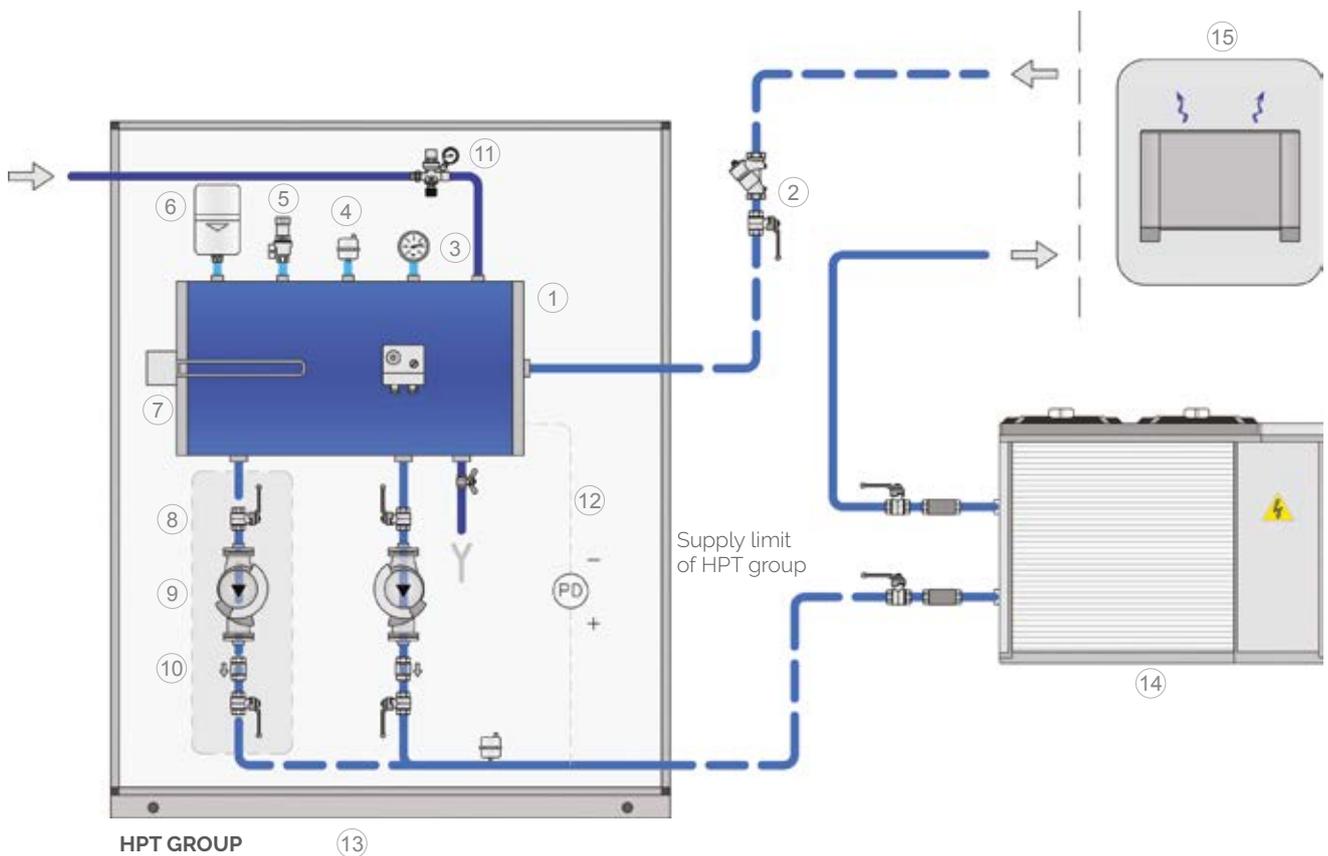
For the accessories list see pag. 104

HPT hydronic systems

Layout 1 - STANDARD

Layout 1 Features: Hydronic kit, chiller and system connected in series, hence the water flow is constant throughout the plant.

NOTE: All HPT Fiorini standard kit kits are Layout 1



Legend

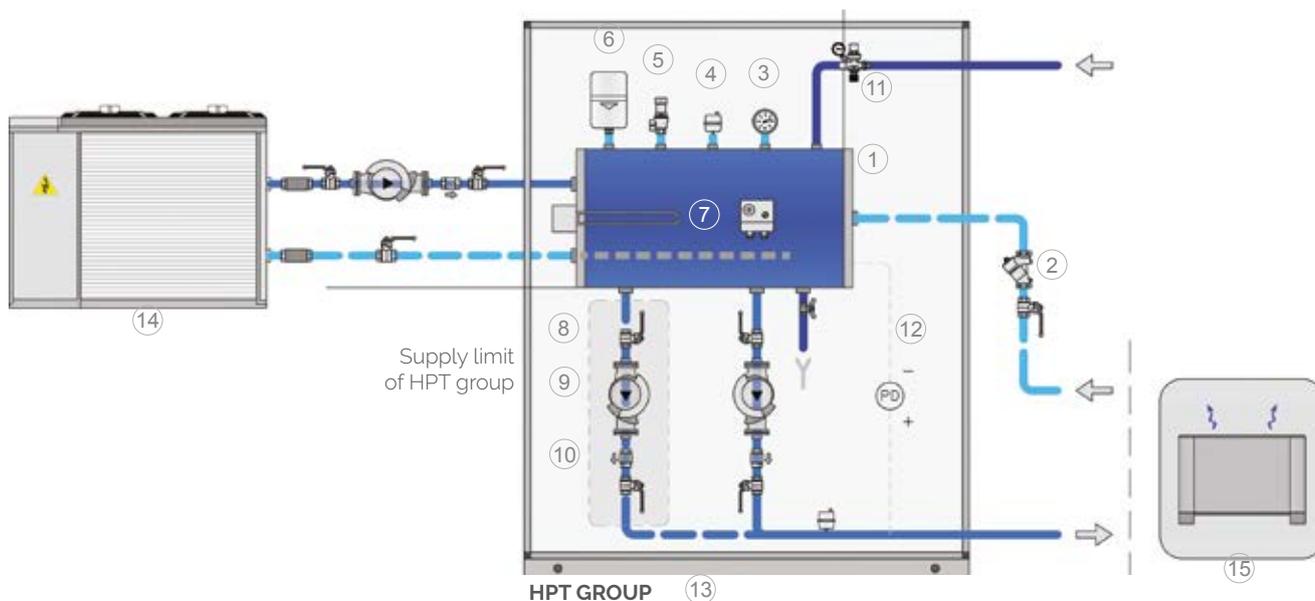
1. Storage tank
2. Y filter. Optional, supplied non-assembled
3. Manometer
4. Deaerator
5. Safety valve
6. Expansion vessel
7. Kit with electric anti-freeze resistance and anti-freeze thermostat (optional)
8. On-off valve
9. Circulator
10. Check valve (only version with 2 pumps)
11. Automatic filling unit
12. Differential pressure switch (optional)
13. Self-supporting wooden structure for outside placement
14. Chiller
15. Device

HPT hydronic system

Layout 2 - SPECIAL VERSION

Layout 2 Features: Hydronic Kit and Chiller create the primary circuit, Hydronic Kit and Plant create the secondary circuit. Hence, the two circuits have independent flow rates.

NOTE: Pump unit supplied only on one of the two circuits.



Legend

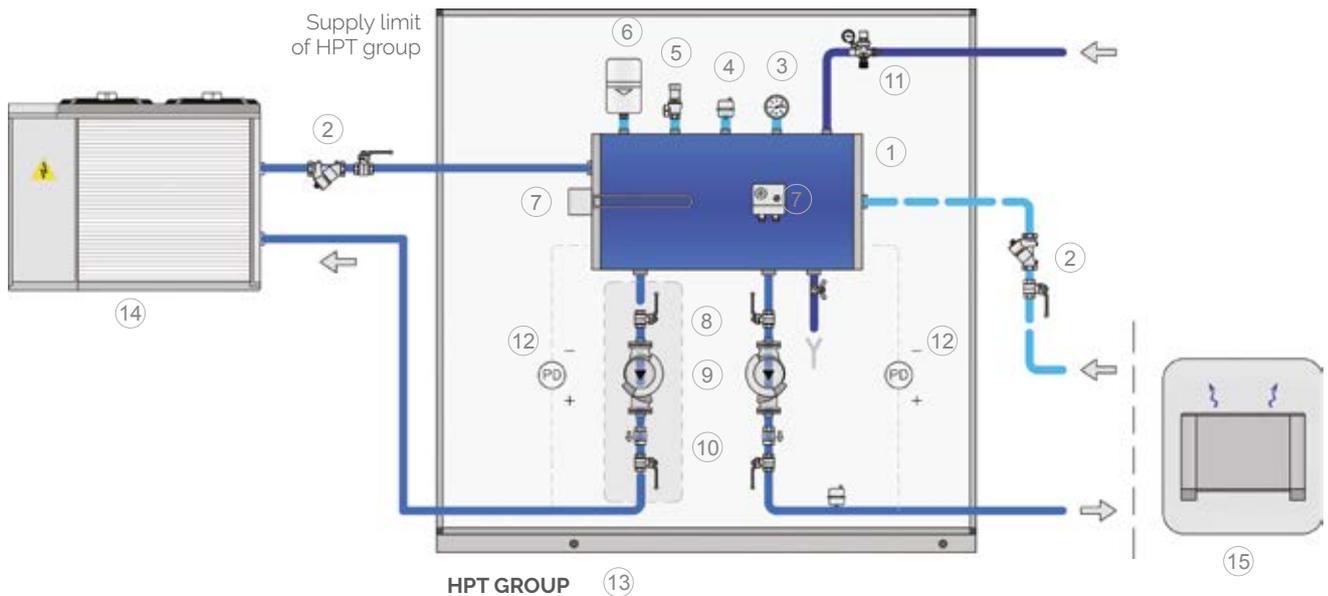
1. Storage tank
2. Y filter. Optional, supplied non-assembled
3. Manometer
4. Deaerator
5. Safety valve
6. Expansion vessel
7. Kit with electric anti-freeze resistance and anti-freeze thermostat (optional)
8. On-off valve
9. Circulator
10. Check valve (only version with 2 pumps)
11. Automatic filling unit
12. Differential pressure switch (optional)
13. Self-supporting wooden structure for outdoor placement
14. Chiller
15. Device

HPT hydronic system

Layout 3 - SPECIAL VERSION

Layout 3 features: Hydronic Kit and Chiller create the primary circuit, Hydronic Kit and the system create the independent secondary circuit. Then the two circuits have independent flow rates.

NOTE: Pump assembly supplied on both circuits.



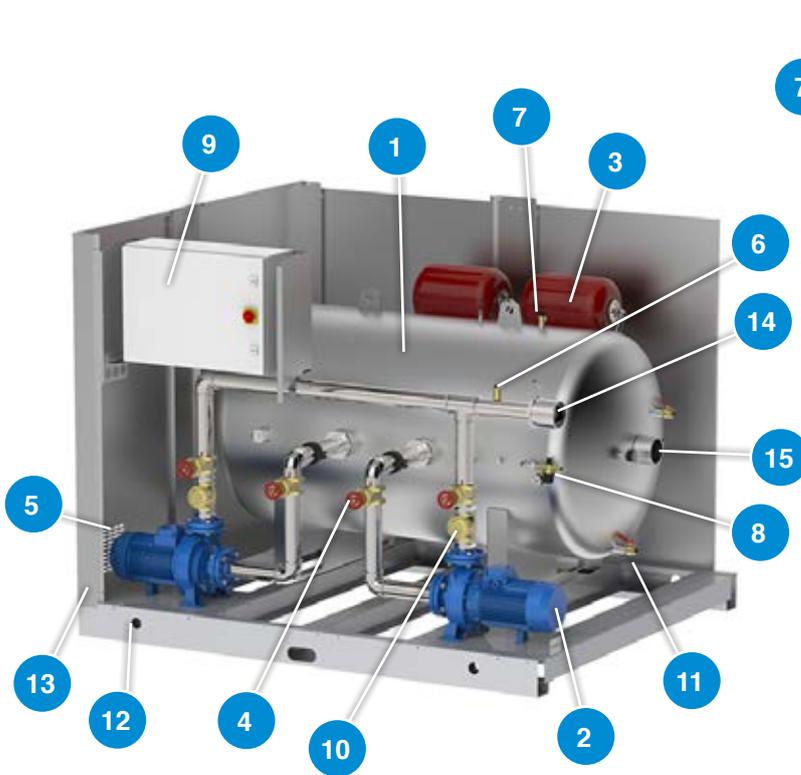
Legend

1. Storage tank
2. Y filter. Optional, supplied non-assembled
3. Manometer
4. Deaerator
5. Safety valve
6. Expansion vessel
7. Kit with electric anti-freeze resistance and anti-freeze thermostat (optional)
8. On-off valve
9. Circulator
10. Check valve (only version with 2 pumps)
11. Automatic filling unit
12. Differential pressure switch (optional)
13. Self-supporting wooden structure for outside placement
14. Chiller
15. Device

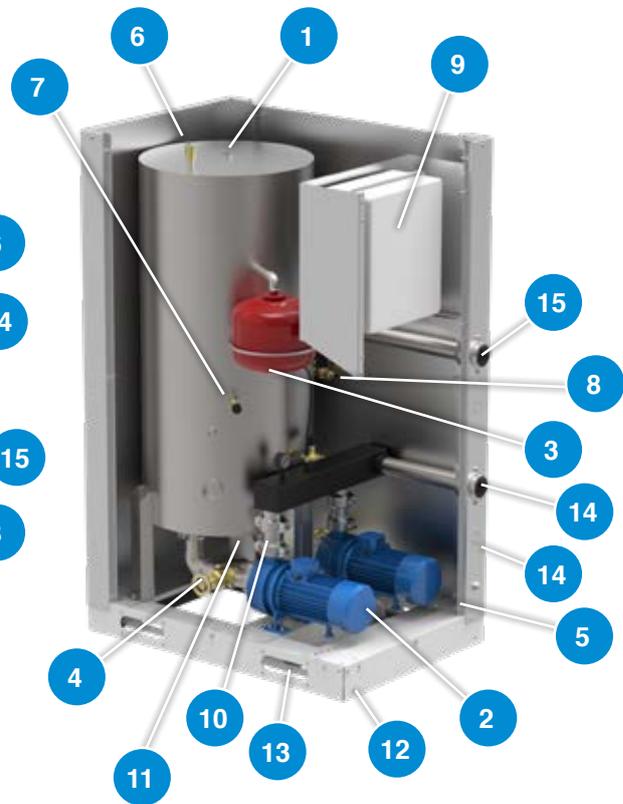
Hydronic systems

HPT: components

Horizontal HPT



Vertical HPT



Components

- 1 Tank
- 2 Circulator
- 3 Expansion vessel
- 4 On-off valve
- 5 Automatic ventilation system
- 6 Pressure relief valve
- 7 Safety valve
- 8 Automatic filling unit
- 9 Switchboard
- 10 Control valve (version with 2 pumps)
- 11 Drain
- 12 Anchoring point (4-6 holes m12/ ø14)
- 13 Inlet power grid
- 14 Water outlet
- 15 Water inlet

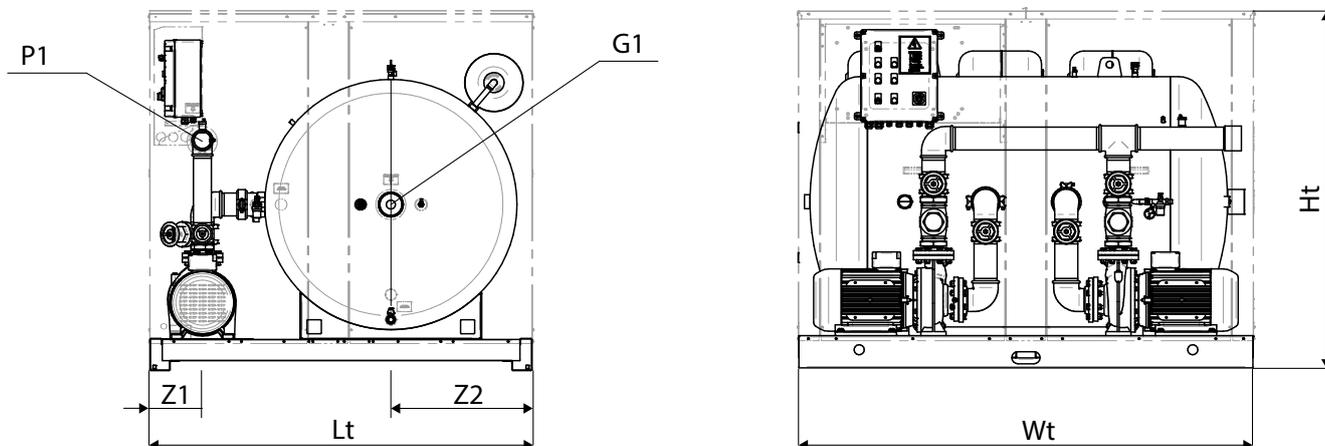
Components

- 1 Tank
- 2 Circulator
- 3 Expansion vessel
- 4 On-off valve
- 5 Automatic ventilation system
- 6 Pressure relief valve
- 7 Safety valve
- 8 Automatic filling unit
- 9 Switchboard
- 10 Control valve (version with 2 pumps)
- 11 Drain
- 12 Inlet power grid
- 13 Jacking points
- 14 Water outlet
- 15 Water inlet

Hydronic systems

HPT: dimensions and connections

Horizontal version



Horizontal HPT dimensions

Capacity l	Wt mm	Lt mm	Ht mm	P1 mm	G1 mm	Z1 mm	Z2 mm	G1 inch	P1 inch
300	1504	1120	1265	738	490	212	388	2 1/2	2 1/2
500	1504	1120	1265	738	490	212	388	2 1/2	2 1/2
750	2044	1200	1510	940	604	185	440	3"	3"
1000	2044	1200	1510	940	604	185	440	3"	3"
1500	2260	1900	1782	1145	829	262	703	4"	4"
2500	2260	1900	1782	1145	829	262	703	4"	4"

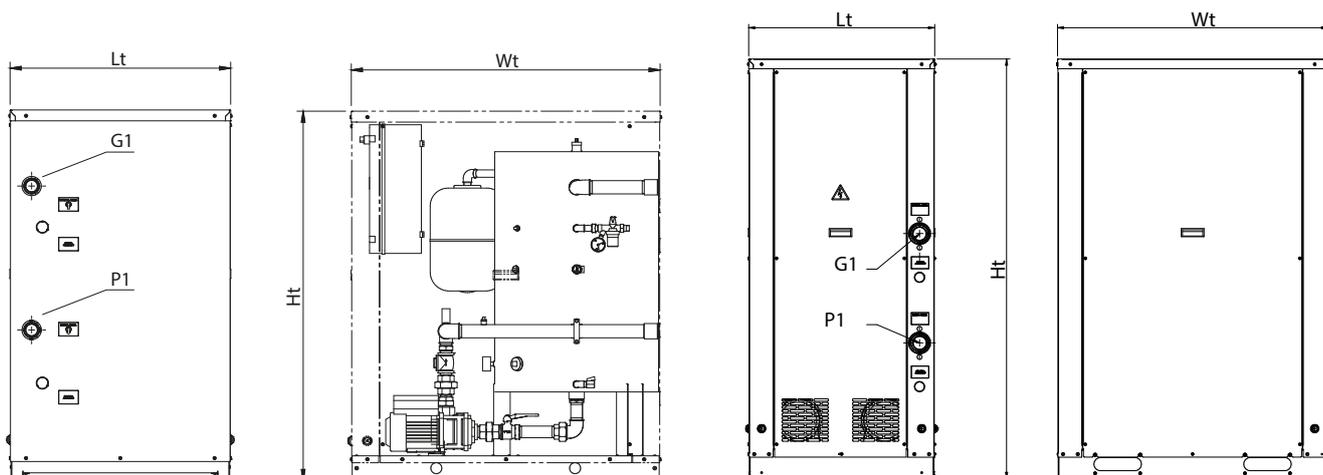
Couplings legend

G1	From plant threaded connection
P1	To energy source threaded connection

Vertical version

HPT 100-200

HPT 300



Vertical HPT dimensions

Capacity l	Wt mm	Lt mm	Ht mm	P1 mm	G1 mm	P1 inch	G1 inch
100	1120	800	1350	546	1002	1 1/2	1 1/2
200	1120	800	1350	546	1072	1 1/2	1 1/2
300	1100	760	1726	558	1008	2 1/2	2 1/2

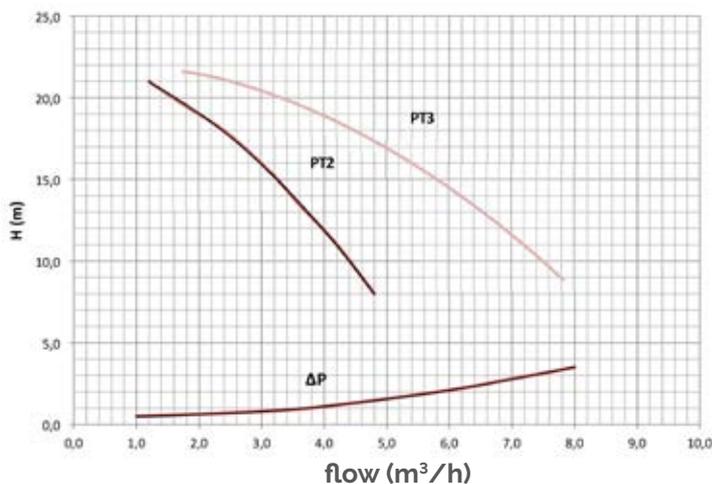
Couplings legend

G1	From plant threaded connection
P1	To energy source threaded connection

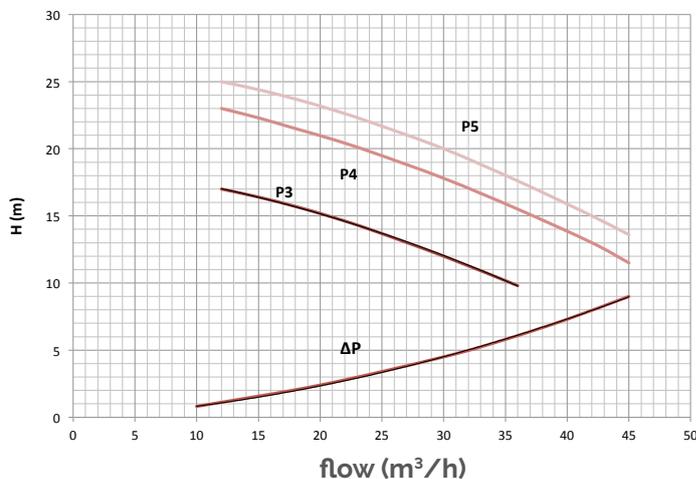
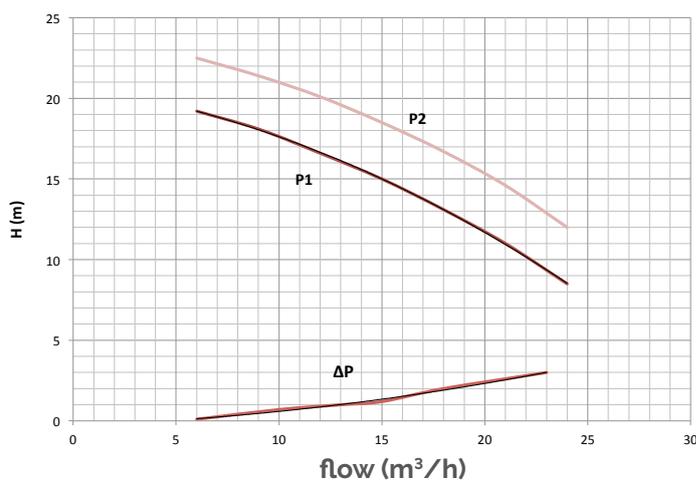
HPT hydronic systems

Prevalence and pressure loss curve

HPT-V 100-200



HPT 300-500

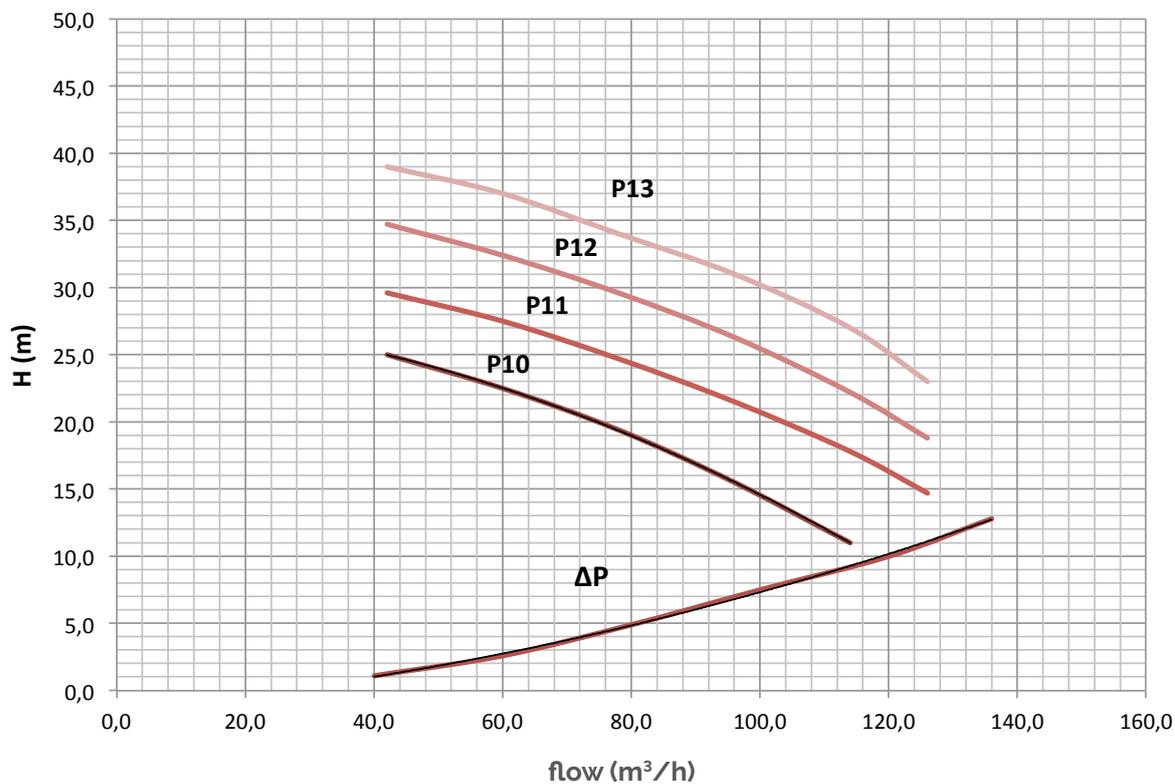
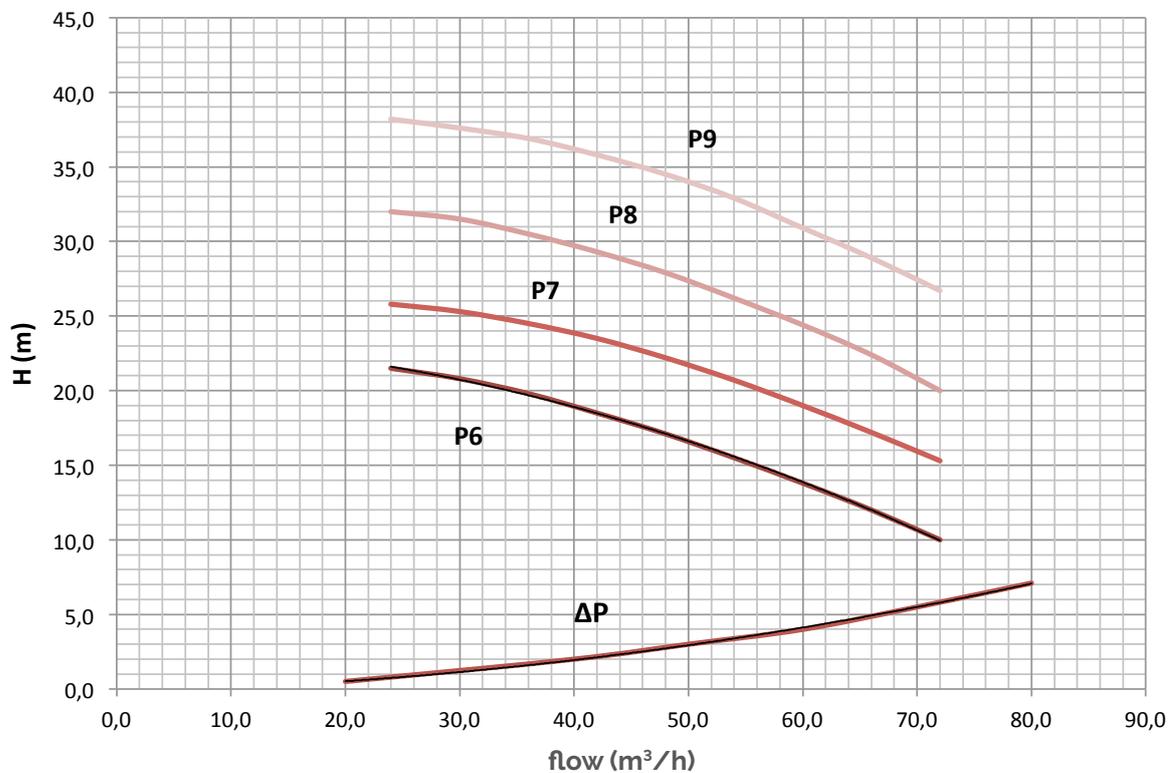


ΔP: pressure loss of the HPT unit

HPT hydronic systems

Prevalence and pressure loss curve

HPT 750-1000

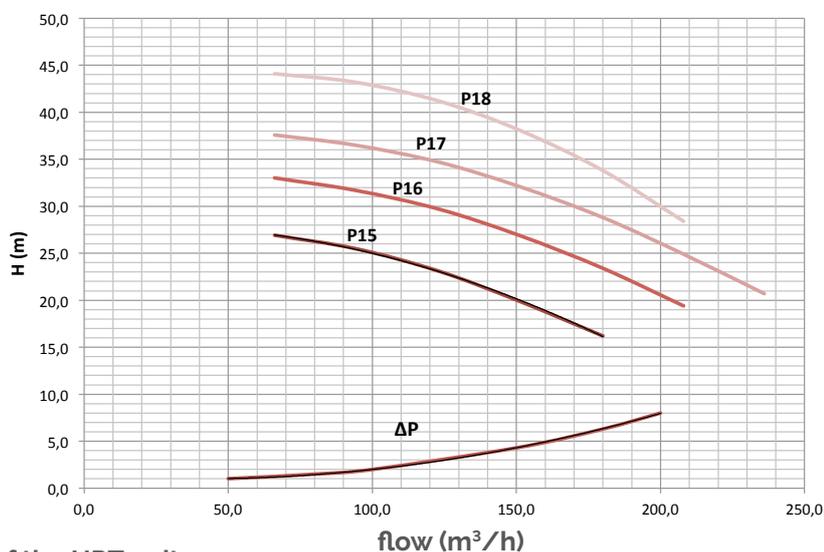
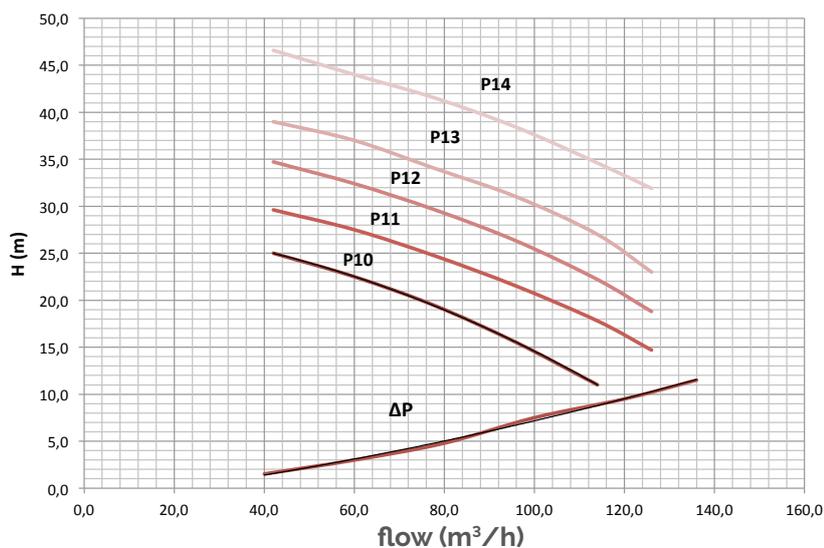
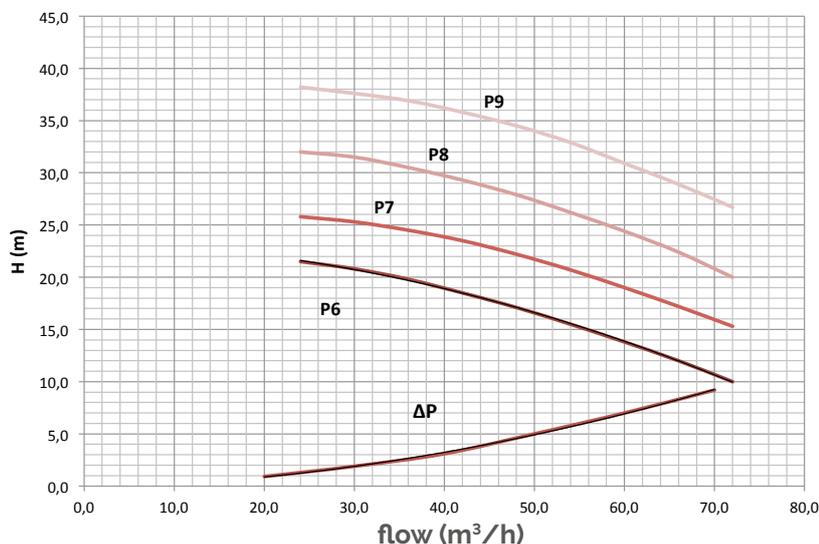


ΔP: pressure loss of the HPT unit

HPT hydronic systems

Prevalence and pressure loss curve

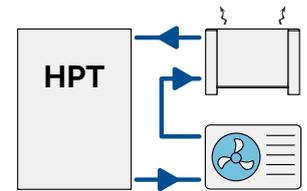
HPT 1500-2500



ΔP : pressure loss of the HPT unit

Hydronic systems

HPT Layout 1 Codes



HPT Capacity	1 pump				2 pumps (1 redundant)				F.L.I kW	F.L.A. (400/3/50) A	Ve l
	Model	Code	Price	Weight kg	Model	Code	Price	Weight kg			
100 vertical	PT2*	838011493X		171	PT2*	838011494X		176	0,72	1,3	18
	PT3*	838011495X		172	PT3*	838011496X		176	0,72	1,3	18
200 vertical	PT2*	838011497X		193	PT2*	838011498X		198	0,72	1,3	18
	PT3*	838011499X		194	PT3*	838011500X		198	0,72	1,3	18
300 vertical	P1	838010891X		231	P1	838010896X		251	1,1	2,5	25
	P2	838010892X		233	P2	838010897X		254	1,5	3,2	25
	P3	838010893X		233	P3	838010898X		255	1,5	3,4	25
	P4	838010894X		237	P4	838010899X		262	2,2	4,8	25
	P5	838010895X		239	P5	838010900X		266	3	5,6	25
300 horizontal	P1	838010349		260	P1	838010354		305	1,1	2,5	25
	P2	838010350		262	P2	838010355		308	1,5	3,2	25
	P3	838010351		262	P3	838010356		309	1,5	3,4	25
	P4	838010352		266	P4	838010357		316	2,2	4,8	25
	P5	838010353		297	P5	838010358		320	3	5,6	25
500 horizontal	P1	838010359		283	P1	838010364		318	1,1	2,5	25
	P2	838010360		285	P2	838010365		321	1,5	3,2	25
	P3	838010361		285	P3	838010366		322	1,5	3,4	25
	P4	838010362		289	P4	838010367		330	2,2	4,8	25
	P5	838010363		320	P5	838010368		334	3	5,6	25
	P6	838010879X		313	P6	838011056X		369	3	6,1	25
750 horizontal	P6	838010374		425	P6	838010379		476	3	6,1	25
	P7	838011384X		428	P7	838011385X		481	4	8,7	25
	P8	838010375		442	P8	838010380		542	5,5	10,4	25
	P9	838011392X		446	P9	838011393X		550	7,5	13,6	25
	P10	838010376		460	P10	838010381		559	5,5	10,4	25
	P11	838010377		464	P11	838010382		568	7,5	13,6	25
	P12	838011400X		477	P12	838011401X		605	9,2	17,2	25
1000 horizontal	P13	838010378		477	P13	838010383		605	11	21,3	25
	P6	838010384		445	P6	838010389		531	3	6,1	25
	P7	838011386X		447	P7	838011387X		536	4	8,7	25
	P8	838010385		461	P8	838010390		598	5,5	10,4	25
	P9	838011394X		465	P9	838011395X		606	7,5	13,6	25
	P10	838010386		479	P10	838010391		615	5,5	10,4	25
	P11	838010387		484	P11	838010392		624	7,5	13,6	25
P12	838011402X		496	P12	838011403X		661	9,2	17,2	25	
P13	838010388		496	P13	838010393		661	11	21,3	25	

Pve (bar) 1,5 Ps (bar) 3 T min (°C) -10

* PT2 and PT3 available in single-phase version on request

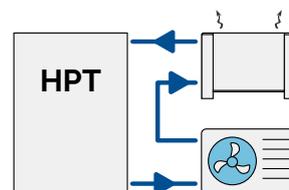
NOTE - Layout 1 is the standard execution unless otherwise stated in the order. Prices for Layout 2 and Layout 3 on request.

Legend

F.L.I. Maximum absorbed power
 F.L.A. Maximum current absorbed
 Ve Expansion vessel capacity
 Pve Expansion vessel pre-charge
 Ps Maximum operating pressure
 T min Minimum liquid temperature

Hydronic systems

HPT Layout 1 Codes



HPT Capacity	1 pump				2 pumps (1 redundant)				F.L.I. kW	F.L.A. (400/3/50) A	Ve l
	Model	Code	Price	Weight kg	Model	Code	Price	Weight kg			
1500 horizontal	P6	838010705		653	P6	838010458		716	3	6,1	2x25
	P7	838011388X		656	P7	838011389X		721	4	8,7	2x25
	P8	838010704		670	P8	838010630		783	5,5	10,4	2x25
	P9	838011396X		674	P9	838011397X		791	7,5	13,6	2x25
	P10	838010703		688	P10	838010696		803	5,5	10,4	2x25
	P11	838010702		692	P11	838010695		812	7,5	13,6	2x25
	P12	838011404X		705	P12	838011405X		846	9,2	17,2	2x25
	P13	838010701		705	P13	838010694		849	11	21,3	2x25
	P14	838010700		749	P14	838010693		939	15	27,7	2x25
	P15	838011380X		739	P15	838011381X		921	11	20,2	2x25
	P16	838010699		776	P16	838010692		995	15	26,6	2x25
	P17	838010698		786	P17	838010691		1015	18,5	33	2x25
P18	838010697		795	P18	838010690		1033	22	40,4	2x25	
2500 horizontal	P6	838010689		706	P6	838010682		763	3	6,1	3x25
	P7	838011390X		708	P7	838011391X		768	4	8,7	3x25
	P8	838010688		722	P8	838010681		830	5,5	10,4	3x25
	P9	838011398X		726	P9	838011399X		838	7,5	13,6	3x25
	P10	838010687		740	P10	838010680		843	5,5	10,4	3x25
	P11	838010686		745	P11	838010679		852	7,5	13,6	3x25
	P12	838011406X		757	P12	838011407X		889	9,2	17,2	3x25
	P13	838010685		757	P13	838010678		889	11	21,3	3x25
	P14	838010684		801	P14	838010677		980	15	27,7	3x25
	P15	838011382X		791	P15	838011383X		967	11	20,2	3x25
	P16	838010707		828	P16	838010459		1041	15	26,6	3x25
	P17	838010683		838	P17	838010676		1061	18,5	33	3x25
P18	838010706		847	P18	838010633		1079	22	40,4	3x25	

Pve (bar) 1,5 Ps (bar) 3 T min (°C) -10

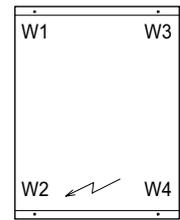
* PT2 and PT3 available in single-phase version on request

NOTE - Layout 1 is the standard execution unless otherwise stated in the order. Prices for Layout 2 and Layout 3 on request.

Legend

F.L.I. Maximum absorbed power
 F.L.A. Maximum current absorbed
 Ve Expansion vessel capacity
 Pve Expansion vessel pre-charge
 Ps Maximum operating pressure
 T min Minimum liquid temperature

HPT hydronic systems: vertical distribution of the weight



Unit top view

Pump model	Tank capacity l	1 pump				2 pumps (1 redundant)			
		W1 kg	W2 kg	W3 kg	W4 kg	W1 kg	W2 kg	W3 kg	W4 kg
PT2	100	31	70	52	120	31	71	53	123
	200	44	101	75	175	44	103	76	177
PT3	100	31	70	52	121	31	71	53	123
	200	44	101	76	175	45	102	76	177
P1	300	191	100	160	82	138	138	138	138
P2	300	194	100	160	81	140	140	138	138
P3	300	193	99	159	84	139	139	139	139
P4	300	194	101	161	83	141	141	141	141
P5	300	196	101	162	83	143	143	141	141

HPT hydronic systems

capacity of the expansion vessel

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

On the first chart, the max water content in the hydraulic device which is compatible with the capacity of the expansion vessel (supplied with every HPT model) and with the start-up value of the safety valve (3 bar for all models) is indicated. If the actual water volume in the device, the storage tank included, is more than the operative conditions on the chart, more expansion vessels need to be installed.

Tav. 1

		Hydraulic height H Preload of the expansion vessel	m bar	15 1,80	10 1,50
HPT 100	Max water capacity in the circuit in litres (1)			708	885
	Max water capacity in the circuit in litres (2)			453	567
HPT 200	Max water capacity in the circuit in litres (1)			708	885
	Max water capacity in the circuit in litres (2)			453	567
HPT 300	Max water capacity in the circuit in litres (1)			984	1230
	Max water capacity in the circuit in litres (2)			630	788
HPT 500	Max water capacity in the circuit in litres (1)			984	1230
	Max water capacity in the circuit in litres (2)			630	788
HPT 750	Max water capacity in the circuit in litres (1)			984	1230
	Max water capacity in the circuit in litres (2)			630	788
HPT 1000	Max water capacity in the circuit in litres (1)			984	1230
	Max water capacity in the circuit in litres (2)			630	788
HPT 1500	Max water capacity in the circuit in litres (1)			1964	2461
	Max water capacity in the circuit in litres (2)			1261	1576
HPT 2500	Max water capacity in the circuit in litres (1)			2953	3691
	Max water capacity in the circuit in litres (2)			1891	2363

Operative conditions

- (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 temperature				
Water/glycol mix.	max.	min.	Correction factor	Reference
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)

HPT hydronic systems

Preload of the expansion vessel

The expansion vessel, of all models, is preloaded with a standard value of 1.5 bar. However, the value has to be adjusted to the height of the device H.

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

If the result of the preload value is less than the standard value, no steps should be taken. This means that for every installation with a height below 12.25 m, the preload of the expansion vessel should be 1.5 bar. In these cases the operator should only check the pressure value without carrying out any intervention.

Example:

You take a height H of 15.3 m. The preload value is:

$$P = (15,3/10,2)+0,3= 1,8 \text{ bar}$$

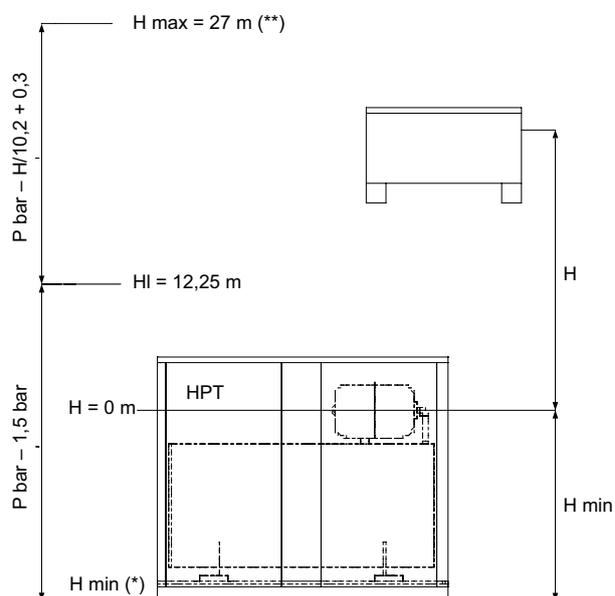
H height of the device

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 device's pressure

** verify that the highest point of the device is not higher than H max = 27 m



HPT hydronic system user's conditions

Normal user conditions

The HPT Hydronic Group is designed to be placed in air conditioning systems, usually coupled with a chiller or a heat pump.

The groups are designed to work with water or ethylene glycol and water mixtures up to a maximum of 30%. For operation with percentages of higher glycols or with different fluids, you must consult our technical support.

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 versions 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

HPT accessories

1 Programmable timer for alternating pumps

In the dual pump configuration, the timer can be used to handle alternating pump operation at specified time intervals. Without the timer, the alternating pump operation occurs at each startup of the group. Default alternation every 48 hours programmable.

*** WARNING:** If the system operates 24 hours a day, 7 days a week, the pump alternation is not guaranteed by the standard group. In this case, we recommend the use of this accessory.

Code	Description	Price
838081104X	TIMER OPTION 48H	

2 Differential pressure switch

Security device that allows you to verify that there is flow inside the system. The device generates an alarm signal but does not automatically stop the machine.

Code	Description	Price
838081000X	DIFFERENTIAL PRESSURE SWITCH	

3 Anti-vibrating feet

Set of anti-vibrating feet to be placed on the machine's support points. The feet are supplied disassembled.

Code	Description	Price
838080917X	ANTIVIBRATION FOR HPT 300/500	
838080936X	ANTIVIBRATION FOR HPT 750/1000	
838080938X	ANTIVIBRATION FOR HPT 1500/2500L	

4 Inverter (special version)

Each pump can be operated by an inverter. The units equipped with inverters have a pressure sensor, 0-10 bar, which communicates with the inverter with 4-20 mA signal. All adjustment parameters are pre-loaded during the test run at the company. The user must choose only the desired set point pressure value.

see page: 133

5 Antifreeze electric resistance kit (special version)

The kit, mounted inside the tank, consists of an electrical resistance of 1300 W for dimensions up to 1000 l and two 1300 W electric resistors for larger dimensions. The kit also includes a bi-thermostatic antifreeze adjustment (-35 / + 35 ° C) and is supplied assembled, wired and tested.

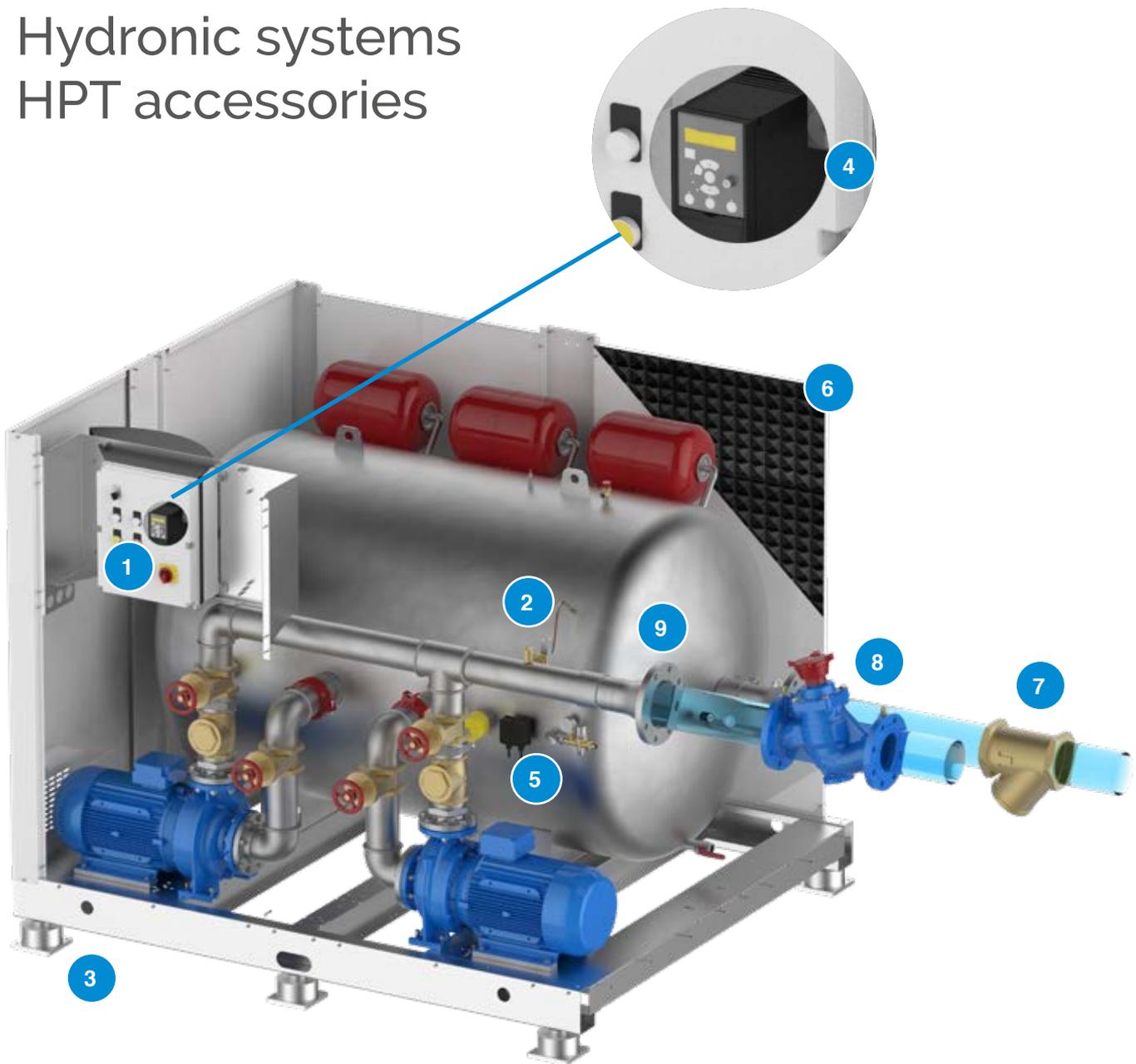
see page: 133

6 Soundproof coating (special version)

The soundproofing is available, which attenuates the sound level of the machine significantly.

see page: 133

Hydronic systems HPT accessories



7 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: 133

8 Balancing valves (special version)
Valve can be connected externally to balance the flow within the circuit.
see page: 133

Wooden box packing (special version)
Extra protective packing suitable for risky and long-distance transport.
see page: 133

9 Tailored connections
From Threaded to Flanged/Victaulic Standard **see page: 132**
Special version for larger size, flanged victaulic in various materials **see page: 133**

HP 2.0

Hydronic system



Piping insulated with anti-condensate elastomer



The HP 2.0 units are hydraulic stations meant to reduce the set-up time of the conditioning and cooling devices. They can be linked to any kind of water cooler.

The HP unit has:

- piping insulated with anti-condensate elastomere
- Single or double centrifugal pump with shut-off valve
- Power switchboard with device to alternate pumps with every start-up (version with two pumps), start-up of the back-up pump in case of breakdown (version with two pumps), magnetothermal protection, contacts to command the pumps from a distance, protection category IP55.
- Safety valve
- Deaerator
- Manometer
- Fill-up/drain valve
- Base and self-supporting panels made of galvanized and coated steel sheets, suitable for outdoor installations
- Panels that can be quickly and easily removed
- Easy and quick access to the switchboard

The broad range of combinations offers a solution for every single type of installation.

Expansion vessel available on request.

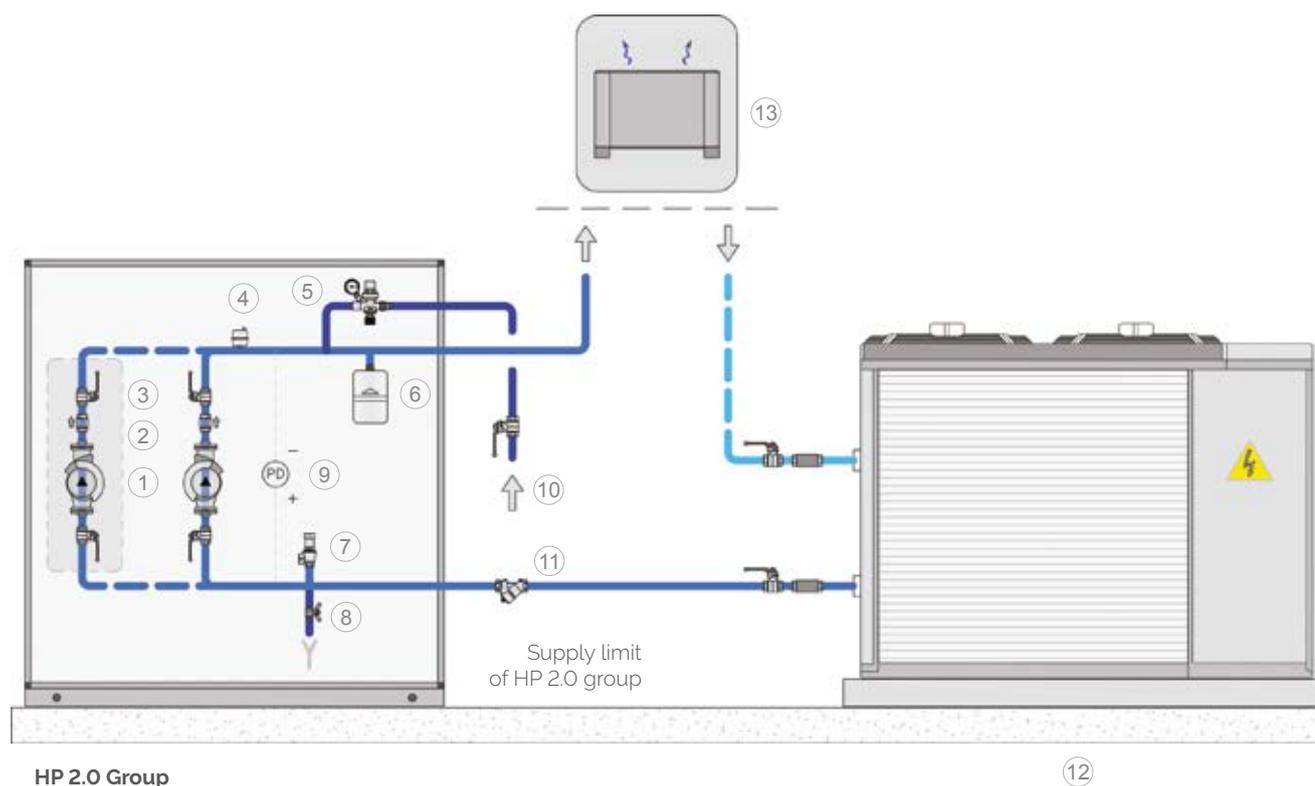
Accessories

See pag. 116 for the list of available accessories

HP 2.0 hydronic systems: hydraulic chart

Features: Hydronic kit, chiller and plant connected in series, hence the water flow is constant throughout the plant.

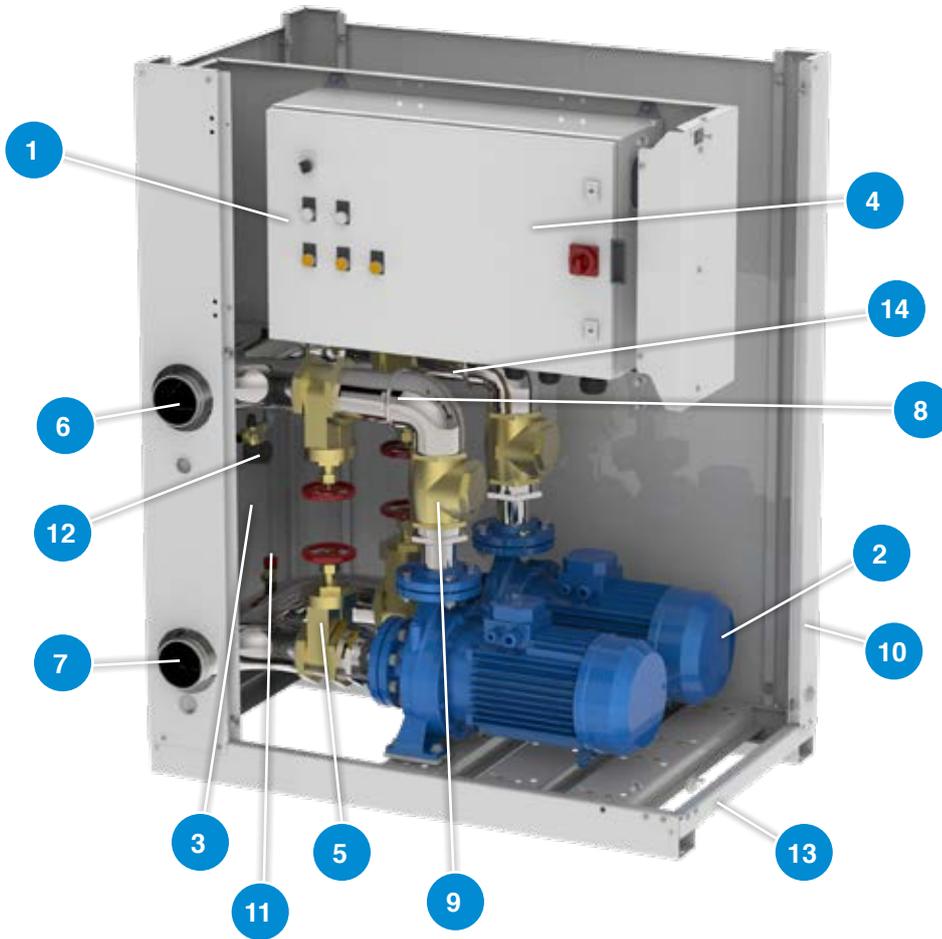
NOTE: All HPT Fiorini standard kit kits are designed according to the following chart.



Legend

1. Circulator
2. Shut-off valve (only version with 2 pumps)
3. On-off valve
4. Deaerator
5. Automatic filling unit
6. Expansion vessel (optional)
7. Safety valve
8. Drain
9. Differential pressure switch (optional)
10. Inlet returning fluid
11. Y filter. Optional, supplied non-assembled
12. Chiller
13. Device

HP 2.0 hydronic system: components

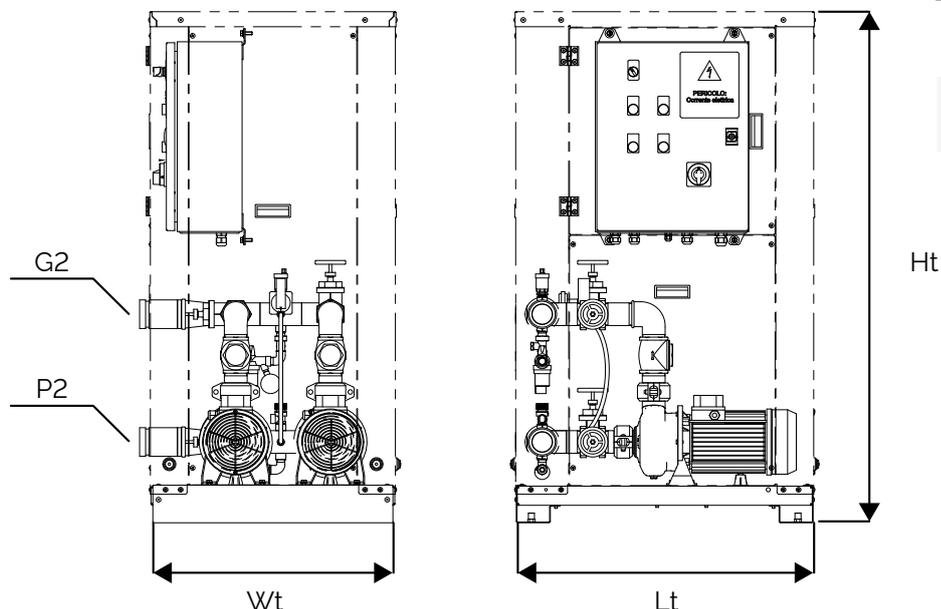


Components

- | | |
|----|-------------------------------------------------------|
| 1 | Switchboard |
| 2 | Circulation pump (version with double pump, optional) |
| 3 | Removable bolted panel |
| 4 | Hinged panel |
| 5 | Shut-off valve |
| 6 | Water outlet |
| 7 | Water inlet |
| 8 | Pressure transmitter (only version with inverter) |
| 9 | Check valve (only version with double pump) |
| 10 | Ventilation grid |
| 11 | Safety valve |
| 12 | Automatic filling unit |
| 13 | Base |
| 14 | Automatic pressure relief |

HP 2.0 hydronic system: dimensions

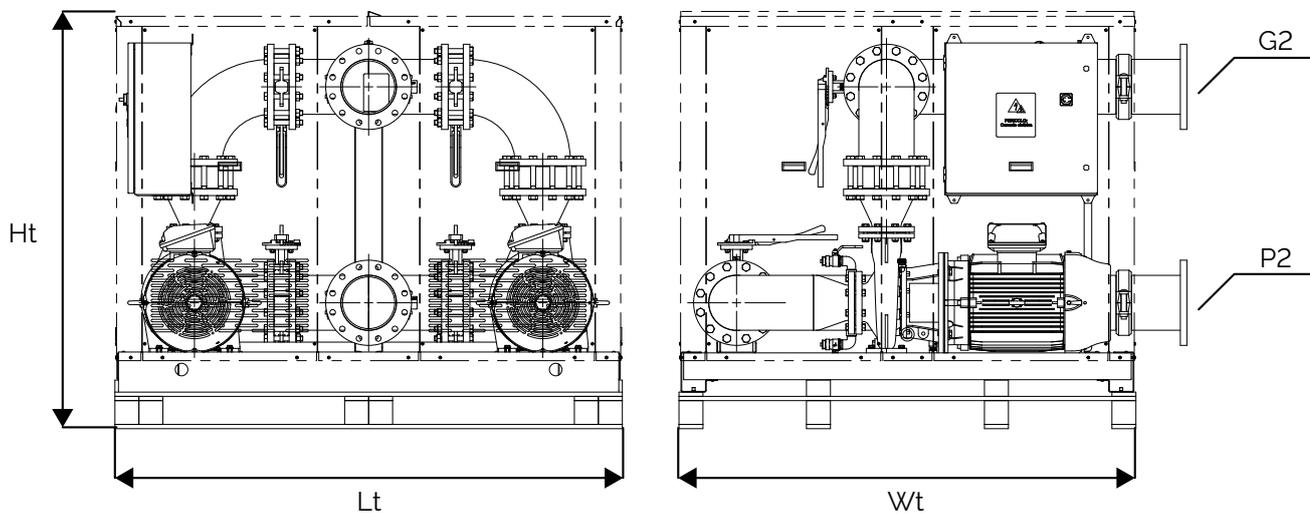
Layout of pump models PT2, PT3, from P1 to P18



Couplings legend

- G2** To plant
Victaulic connection
- P2** From energy source
Victaulic connection

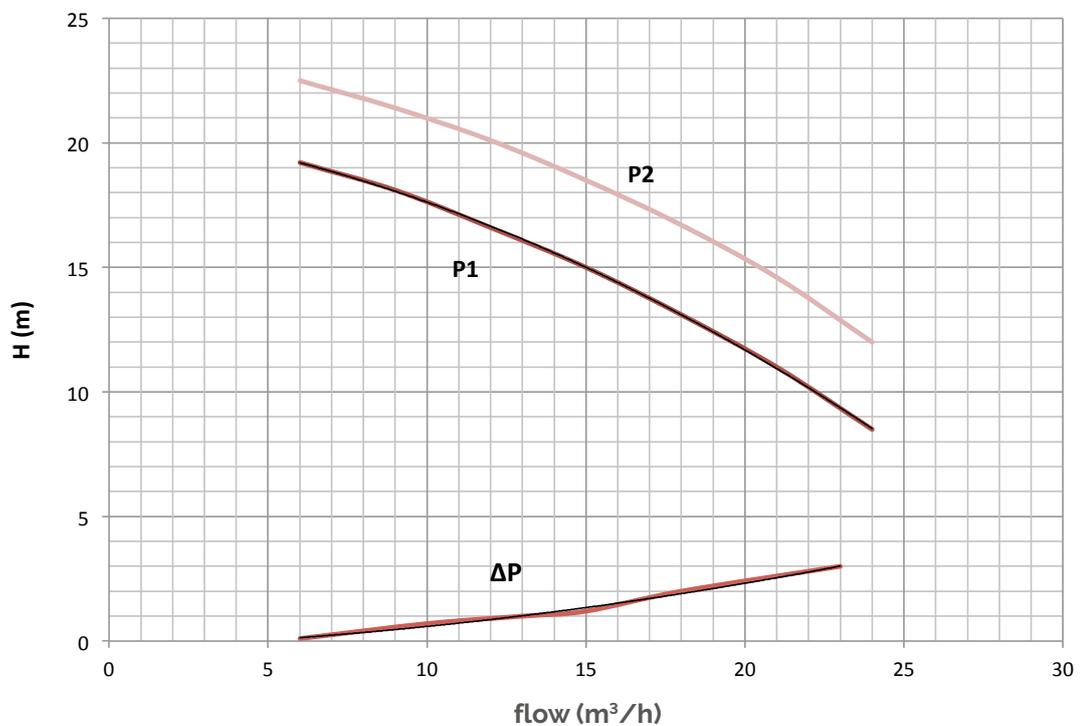
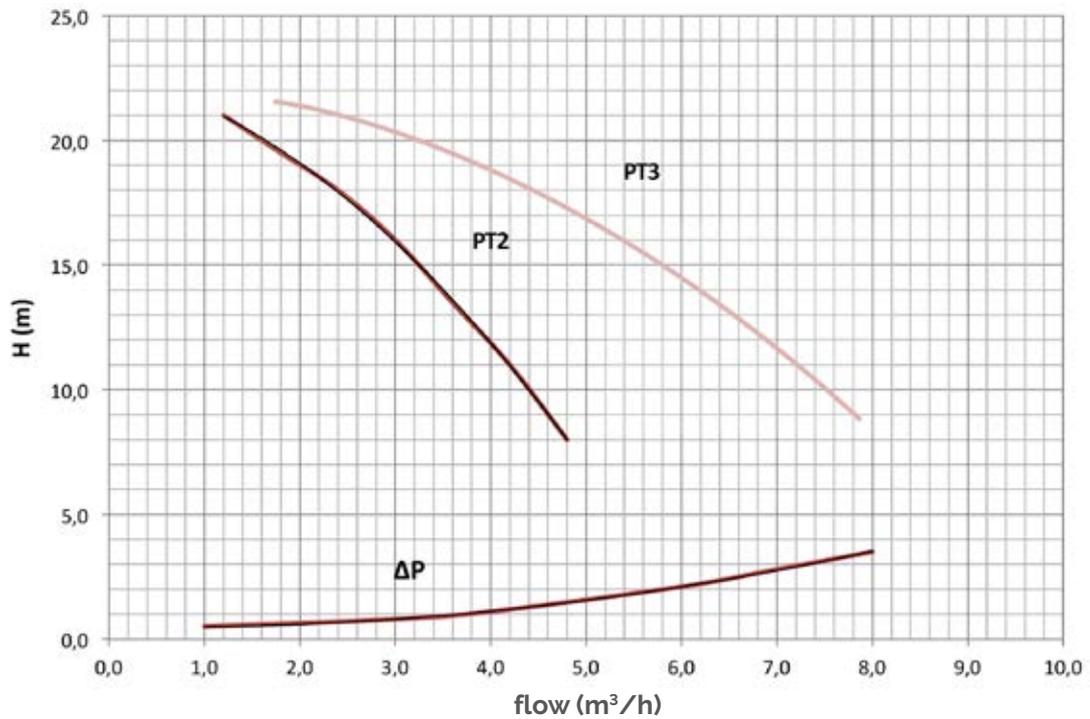
Layout of pump models from P19 to P21



Pump model	1 pump Dimensions			2 pumps (1 redundant) Dimensions			G2 inch	P2 inch
	Lt mm	Wt mm	Ht mm	Lt mm	Wt mm	Ht mm		
PT2-PT3	790	650	1360	790	650	1360	1 1/2	1 1/2
P1-P2-P3-P4-P5	790	650	1360	790	650	1360	2 1/2	2 1/2
P6-P7-P8-P9	1200	790	1360	1200	790	1360	3'	3'
P10-P11-P12-P13-P14-P15-P16-P17-P18	1200	790	1360	1280	790	1600	4'	4'
P19-P20-P21	2000	1800	1575	2000	1800	1575	DN 200 UNI PN16	DN 200 UNI PN16

HP 2.0 Hydronic systems

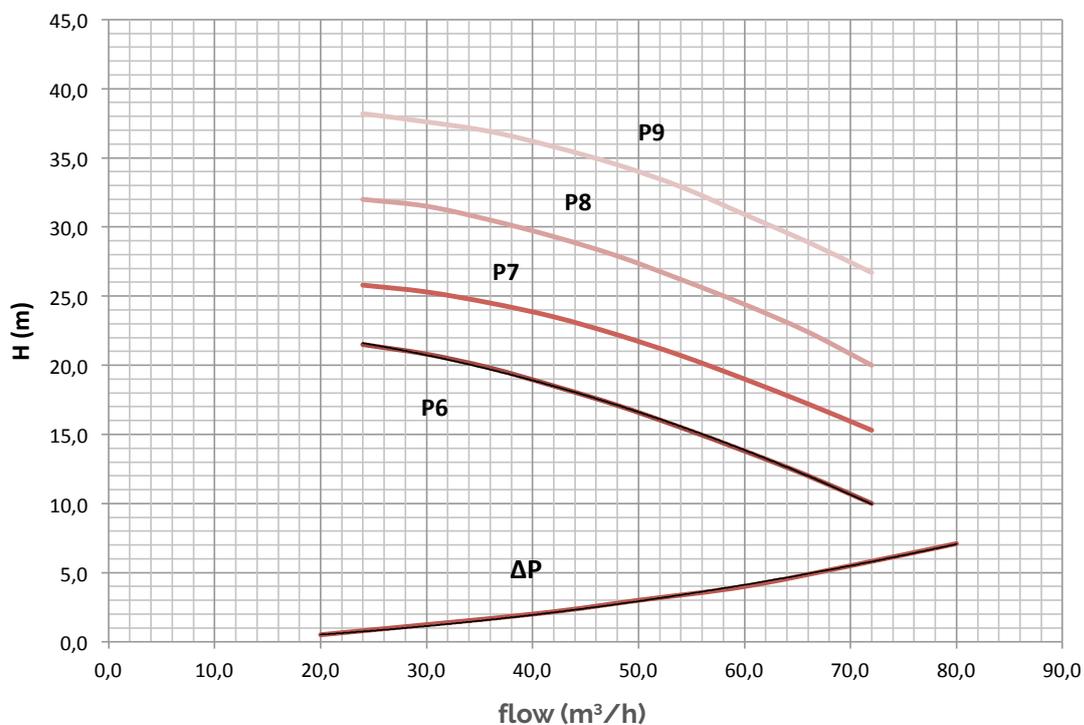
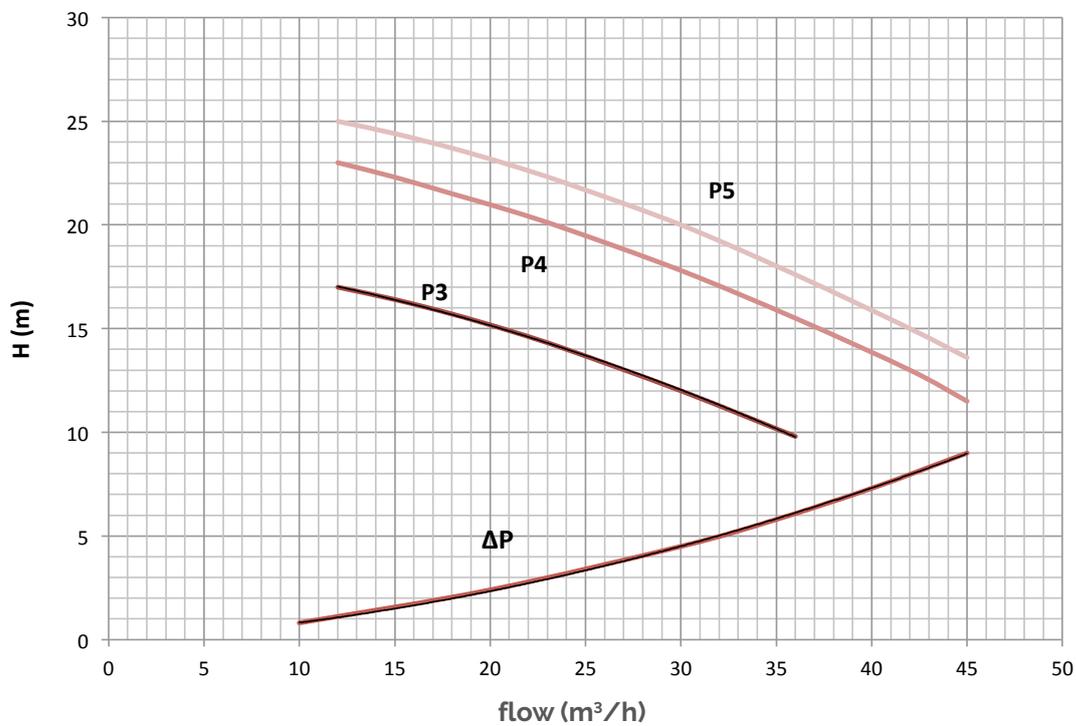
Prevalence and pressure loss curve



ΔP: Pressure drop HP unit

HP 2.0 Hydronic systems

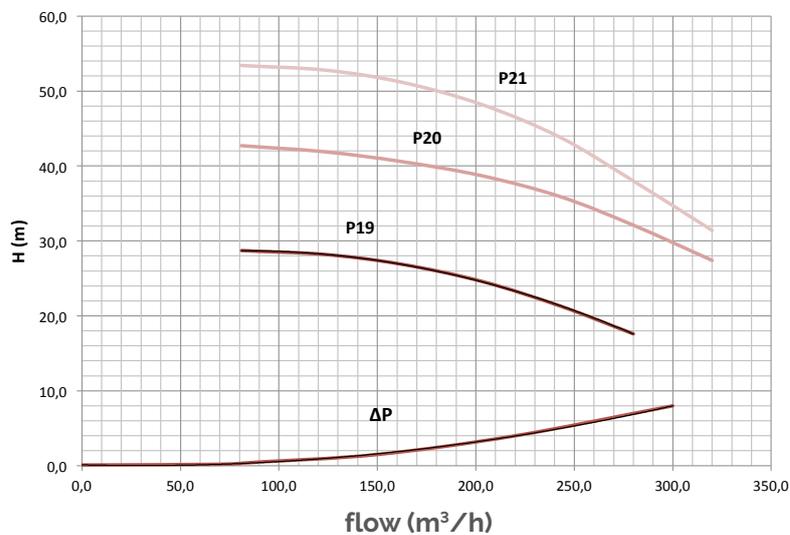
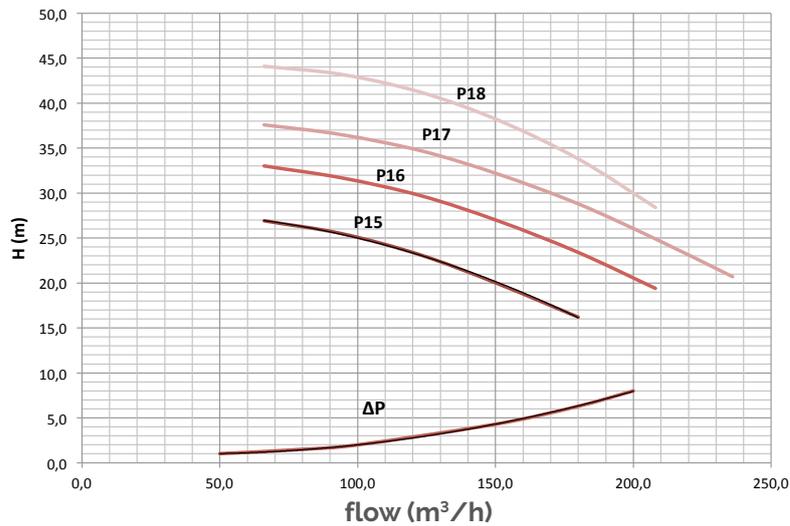
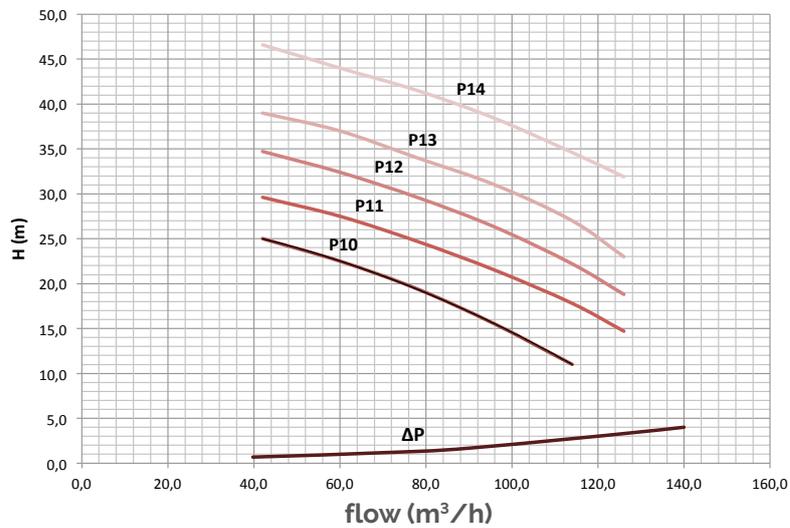
Prevalence and pressure loss curve



ΔP: Pressure drop HP unit

HP 2.0 Hydronic systems

Prevalence and pressure loss curve



ΔP: Pressure drop HP unit

HP 2.0 hydronic systems: technical information

Pump model	F.L.I. kW	F.L.A. (400/3/50) A	1 pump			2 pumps (1 redundant)		
			Code	Price	Weight kg	Code	Price	Weight kg
PT2*	0,72	1,3	838060261X		100	838060262X		114
PT3*	0,72	1,3	838060263X		100	838060264X		114
P1	1,1	2,5	838060129X		129	838060119X		150
P2	1,5	3,2	838060130X		130	838060120X		151
P3	1,5	3,4	838060131X		131	838060121X		153
P4	2,2	4,8	838060132X		135	838060122X		157
P5	3	5,6	838060133X		137	838060123X		163
P6	3	6,1	838060107X		183	838060193X		256
P7	4	8,7	838060108X		190	838060194X		272
P8	5,5	10,4	838060109X		208	838060195X		311
P9	7,5	13,6	838060110X		224	838060196X		343
P10	5,5	10,4	838060111X		215	838060197X		323
P11	7,5	13,6	838060112X		231	838060198X		355
P12	9,2	17,2	838060235X		284	838060236X		407
P13	11	21,3	838060183X		284	838060217X		412
P14	15	27,7	838060184X		309	838060218X		503
P15	11	20,2	838060227X		279	838060228X		460
P16	15	26,6	838060185X		316	838060219X		549
P17	18,5	33	838060186X		319	838060220X		569
P18	22	40,4	838060187X		340	838060221X		587
P19	18,5	33	838060229X		703	838060230X		1265
P20	30	53,5	838060231X		844	838060232X		1519
P21	37	65,6	838060233X		865	838060234X		1557

Pve (bar) 1,5 Ps (bar) 3 T min (°C) -10

* PT2 and PT3 available in single-phase version on request

Legend

F.L.I. Max absorbed power

F.L.A. Max absorbed current

Pve Preload of expansion vessel

Ps Max operating pressure

Tmin Min temperature of the liquid

HP 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 HP 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

Pump model	Hydraulic height	m	15	10
			bar	1,80
PT2 PT3 P1 P2 P3 P4 P5	Circuit's max water content (1)	l	492	615
	Circuit's max water content (2)	l	315	394
P6 - P18	Circuit's max water content (1)	l	984	1230
	Circuit's max water content (2)	l	630	788
P19 - P21	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.

Operative conditions

- (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		Correction factors	Reference value
	max °C	min °C		
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

HP 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:

$$P = (15,3/10,2)+0,3= 1,8 \text{ bar}$$

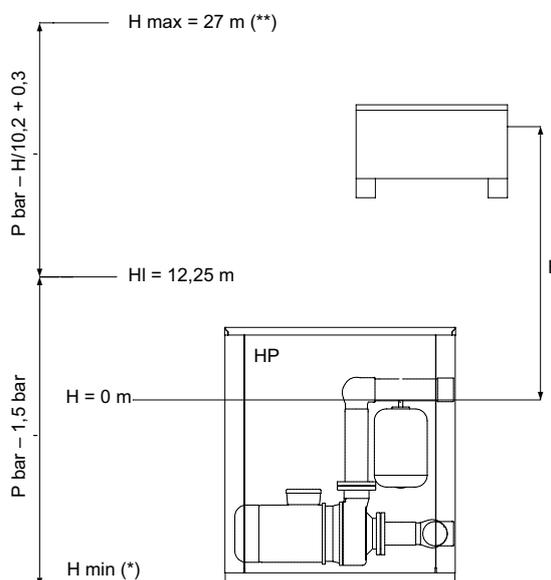
H: height of the device

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.



HP 2.0 hydronic system user's conditions

Normal user conditions

The HP 2.0 hydronic group is designed to fit into air conditioning systems, normally coupled with a chiller or a heat pump.

The groups are designed to work with water or ethylene glycol and water mixtures up to a maximum of 30%. 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

HP 2.0: accessories

1 Programmable timer for alternating pumps

In the dual pump configuration, the timer can be used to handle alternating pump operation at specified time intervals. Without the timer, the alternating pump operation occurs at each startup of the group. Default alternation every 48 hours programmable.

*** WARNING:** If the system operates 24 hours a day, 7 days a week, the pump alternation is not guaranteed by the standard group. In this case, we recommend the use of this accessory.

Code	Description	Price
838081104X	TIMER OPTION 48H	

2 Differential pressure switch

Security device that allows you to verify that there is flow inside the system. The device generates an alarm signal but does not automatically stop the machine.

Code	Description	Price
838081000X	DIFFERENTIAL PRESSURE SWITCH	

3 Anti-vibrating feet

Set of anti-vibrating feet to be placed on the machine's support points. The feet are supplied disassembled.

Code	Description	Price
838080861X	ANTI-VIBRATING FOR HP PT2/PT3 AND FOR P1 A P18	
838081286X	ANTI-VIBRATING FOR HP P19/P20/P21	

4 Expansion vessel kit

Code	Description	Compatible with	Price
838081187X	EXPANSION VESSEL 12L INNER	HP 2.0 UP TO P18	
838081195X	EXPANSION VESSEL 25L INNER	HP 2.0 UP TO P18	
838081480X	EXPANSION VESSEL 2x25L INNER	HP 2.0 UP TO P18	
838081616X	EXPANSION VESSEL 3x25L INNER	HP 2.0 UP TO P18	
838081234X	EXPANSION VESSEL 2x25L INNER	HP 2.0 FOR P19/P20/P21 VERSIONS	

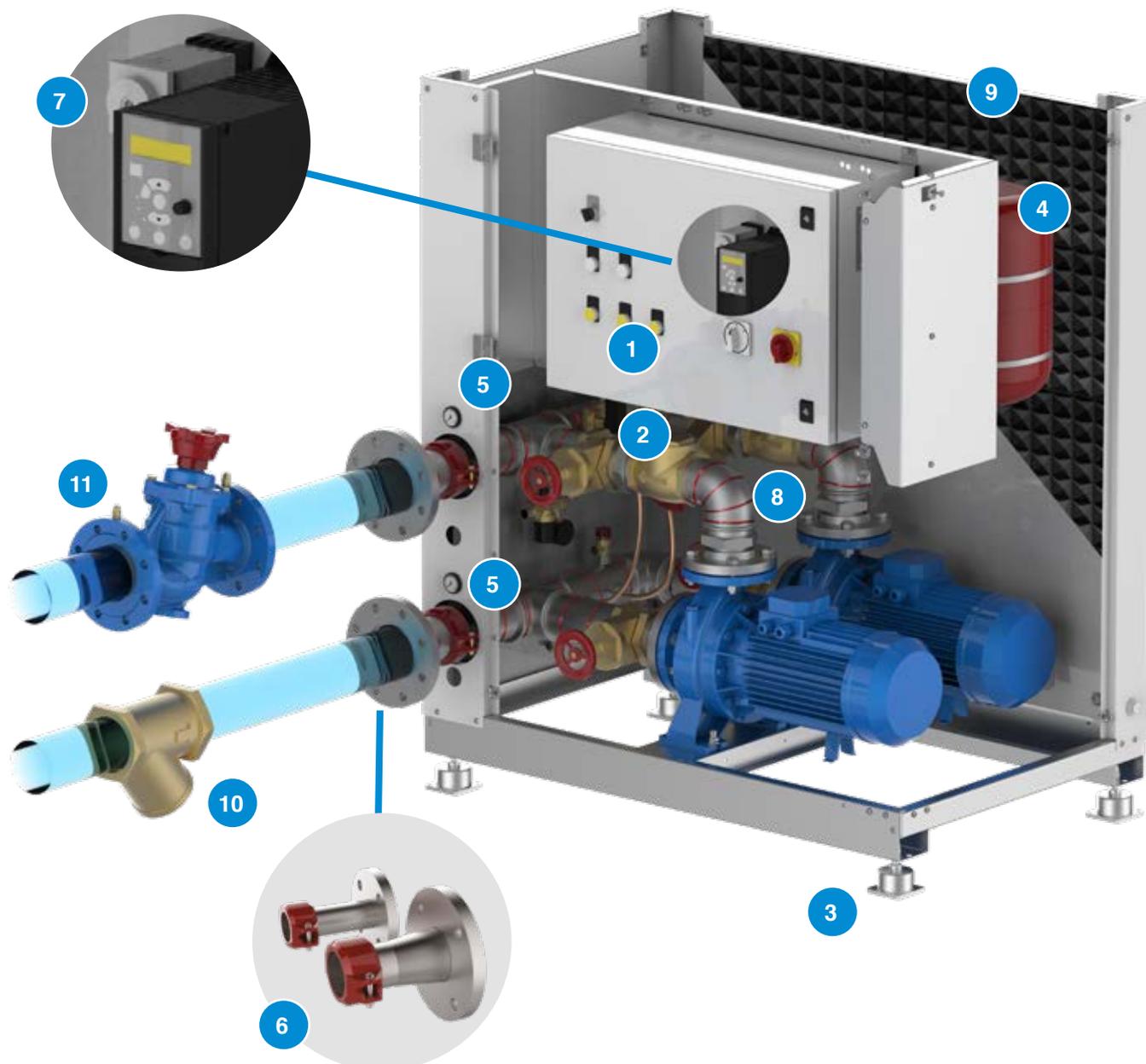
5 Manometer kit

Code	Description	Price
838081583X	MANOMETER KIT	

6 Galvanized Transformation in Victaulic connections

They transform the victaulic connections into UNI-EN PN 16 flanged connections. A version with the same diameter and one with a larger diameter is available. The codes and prices below are for single piece.

Original connection Victaulic	Transformed connection UNI-EN PN 16	Code	Price
1 1/2	DN40	838081247X	
	DN50	838081248X	
2	DN50	838081249X	
	DN65	838081250X	
2 1/2	DN65	838081251X	
	DN80	838081252X	
3	DN80	838081253X	
	DN100	838081254X	
4	DN100	838081255X	
	DN125	838081256X	



7 Inverter (special version) Each pump can be operated by an inverter. The units equipped with inverters have a pressure sensor, 0-10 bar, which communicates with the inverter with 4-20 mA signal. All adjustment parameters are pre-loaded during the test run at the company. The user must choose only the desired set point pressure value.
see page: 133

8 Antifreeze electric resistance kit (special version) The kit provides protection against freezing by means of a heating cable wound around piping. The kit also includes a bi-thermostatic antifreeze adjustment (-35 / + 35 ° C) and is supplied assembled, wired and tested.
see page: 133

9 Soundproof coating (special version) The soundproofing is available, which attenuates the sound level of the machine significantly.
see page: 133

10 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: 133

11 Balancing valves (special version) Valve can be connected externally to balance the flow within the circuit.
see page: 133

Wooden box packing (special version) Extra protective packing suitable for risky and long-distance transport.
see page: 133

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.

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

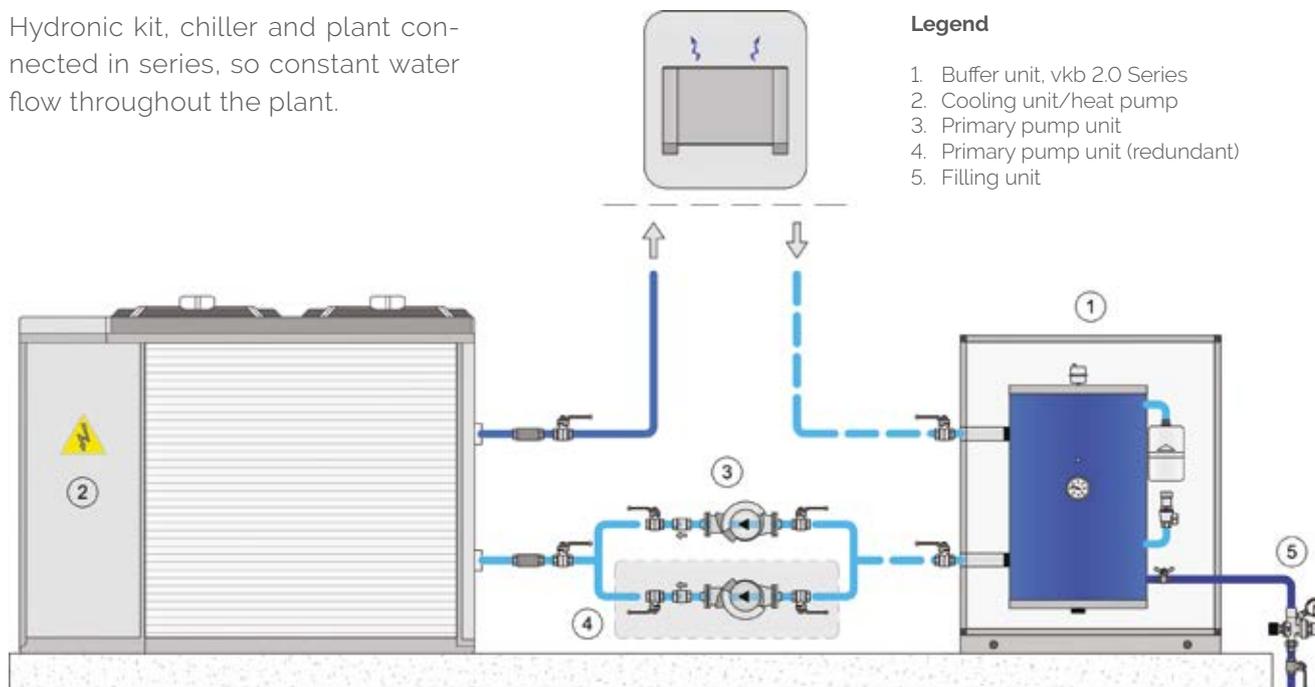


Tank insulated with anti-condensate elastomer



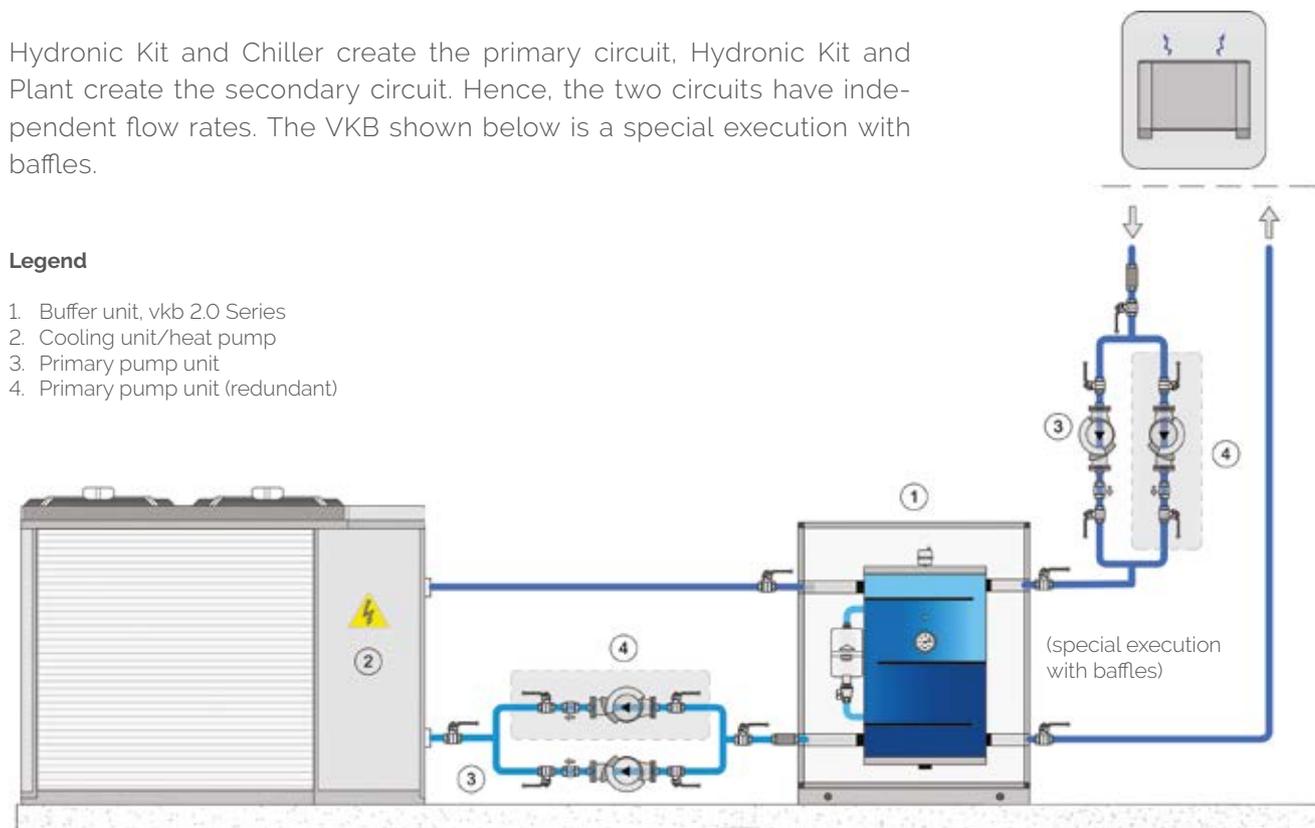
Hydronic systems VKB 2.0 Layout 1 STANDARD

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



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. The VKB shown below is a special execution with baffles.



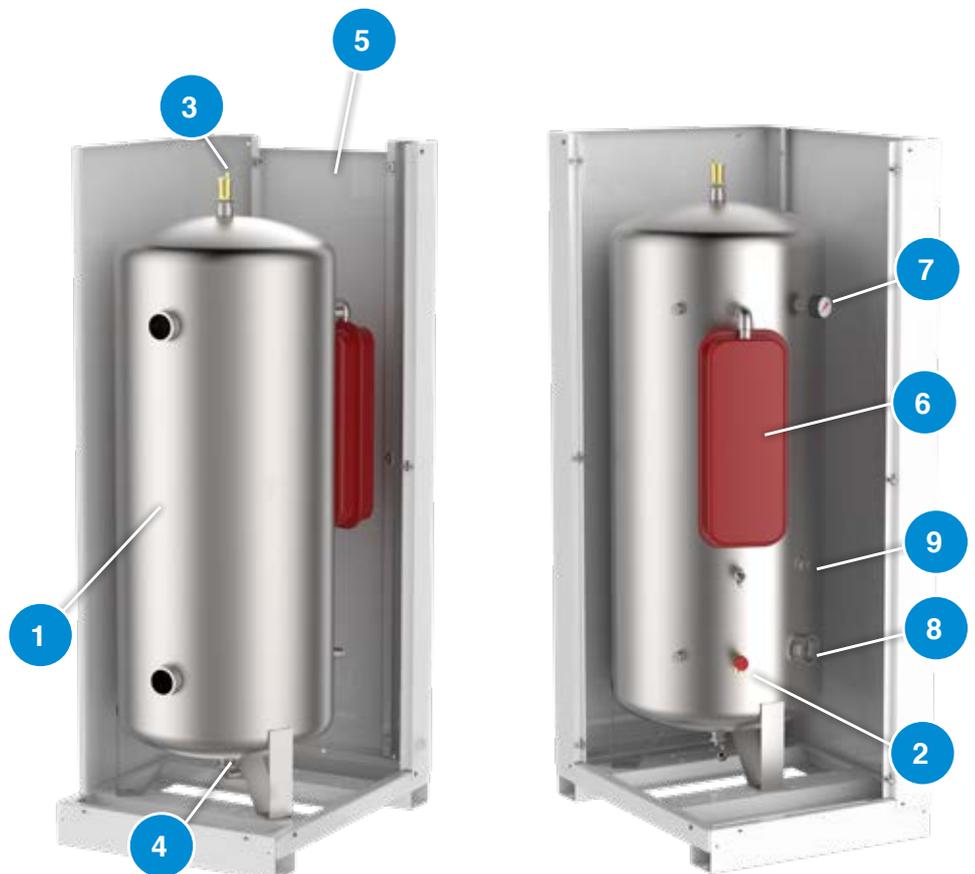
Hydronic systems

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. The basement 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

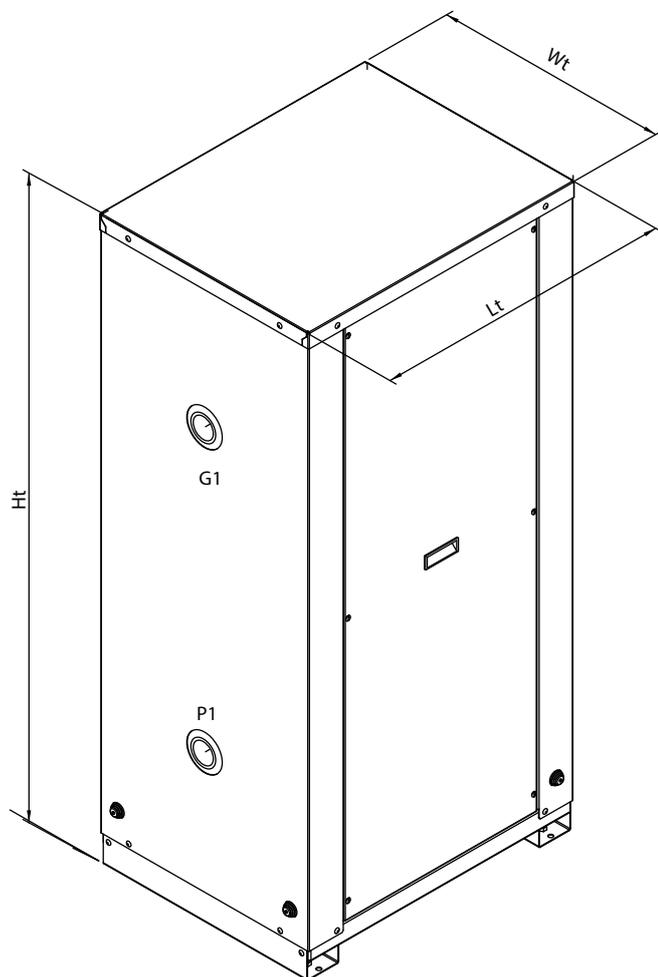


Hydronic systems

VKB 2.0

Capacity l	Vessel l	Vessel calibration bar	Safety valve bar	Couplings inch	Wt mm	Lt mm	Ht mm	P1 mm	G1 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 with packaging mm	Weight kg
250	838050090X		625x785x1670	95
500	838050091X		800x1050x1920	155
1000	838050092X		1150x1150x1920	255
1500	838050016		1250x1250x2020	313



Couplings legend

- G1** From plant
Threaded connection
- P1** To energy source
Threaded connection

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
			bar	1,8
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		Correction factors	Reference value
	max °C	min °C		
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:

$$P = (15,3/10,2)+0,3= 1,8 \text{ bar}$$

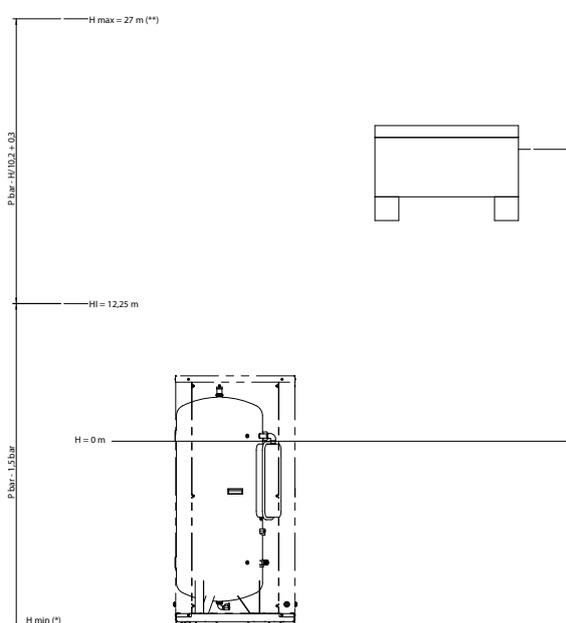
H: height of the device

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



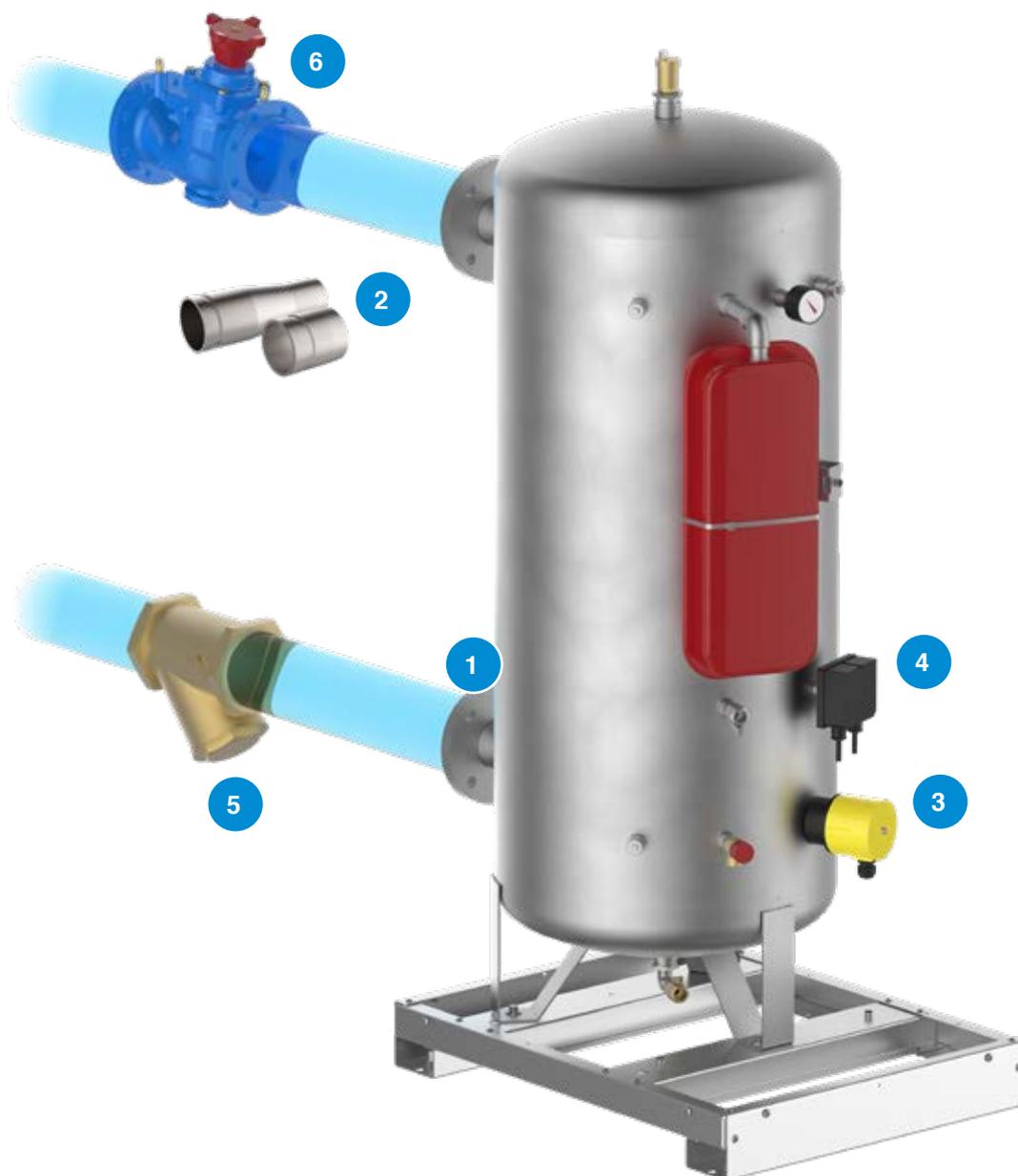
Power W	Voltage V	Element number	Connection diameter inch	Length mm	Code	Price
1300	230/380	3	2"	220	824100008	
2000	230/380	3	2"	290	824100009	
3000	230/380	3	2"	340	824100010	
4000	230/380	3	2"	390	824100012	

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: 133

6 Balancing valves (special version)

Valve can be connected externally to balance the flow within the circuit.

see page: 133

Tailored connections (special version)

Flangiata (in various materials), Victaulic (in various materials), Larger

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