

# HP 2.0

## Hydronic system



Piping insulated with anti-condensate elastomere



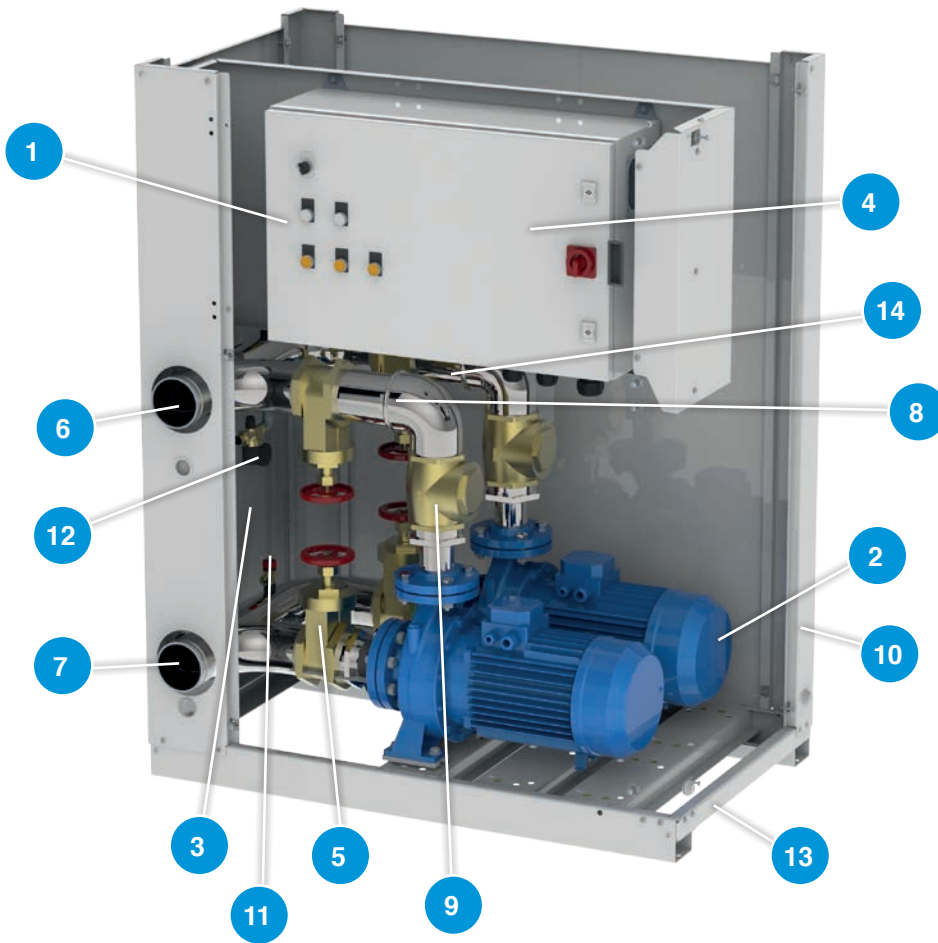
The HP 2.0 units are hydraulic stations meant to reduce the set-up time of the conditioning and cooling devices. They can be linked to any kind of water cooler.

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.
- Expansion vessel (optional)
- Safety valve
- Deaerator
- Manometer
- Fill-up/discharge valve
- Base in galvanized and coated steel sheets
- Self-supporting aluminium panels for outdoor installation
- 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.

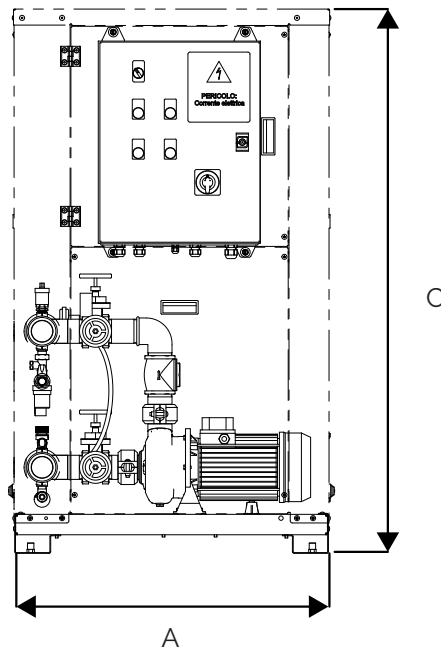
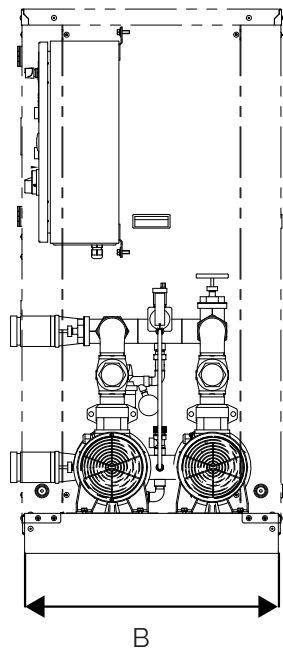
# HP 2.0 hydronic system: components



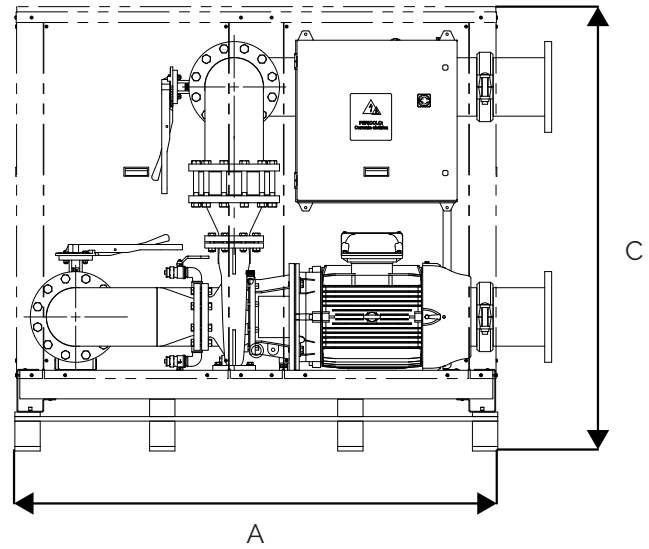
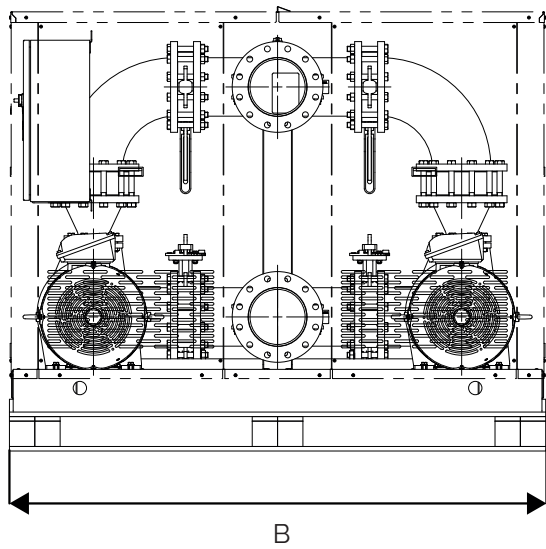
## components

- |    |   |
|----|---|
| 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 grill                                     |
| 11 | Safety valve  |
| 12 | automatic filling unit                                |
| 13 | Base  |
| 14 | automatic pressure relief                             |

# HP 2.0 hydronic system: dimensions



TYPE A



TYPE B

## Single pump

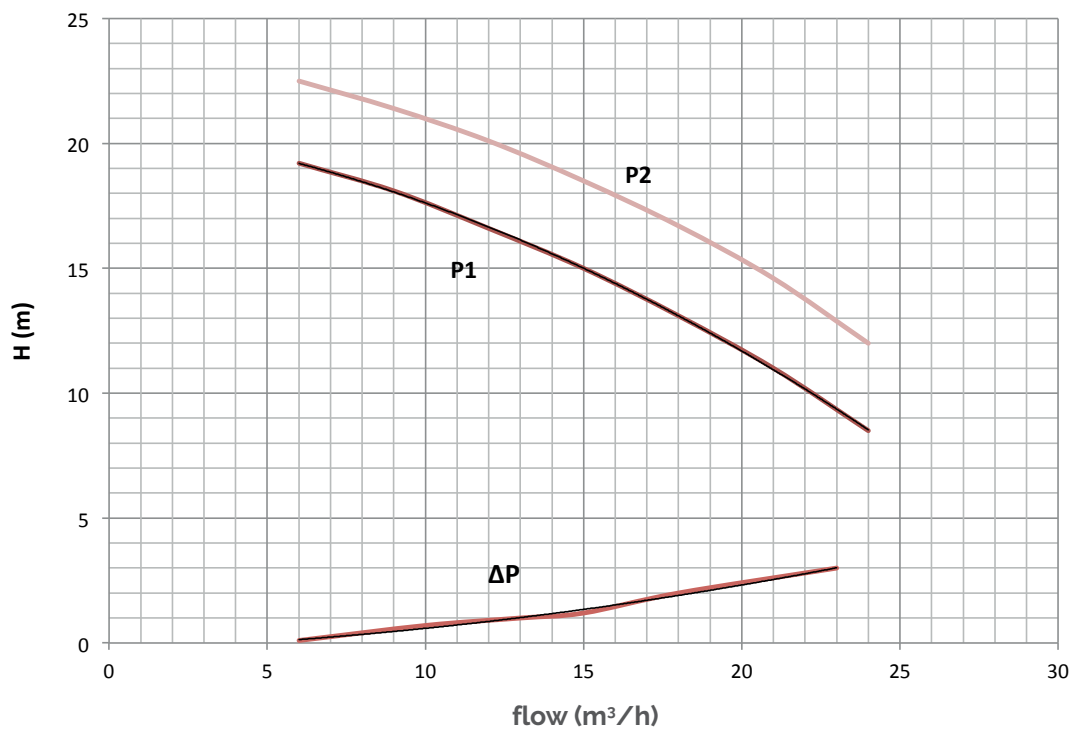
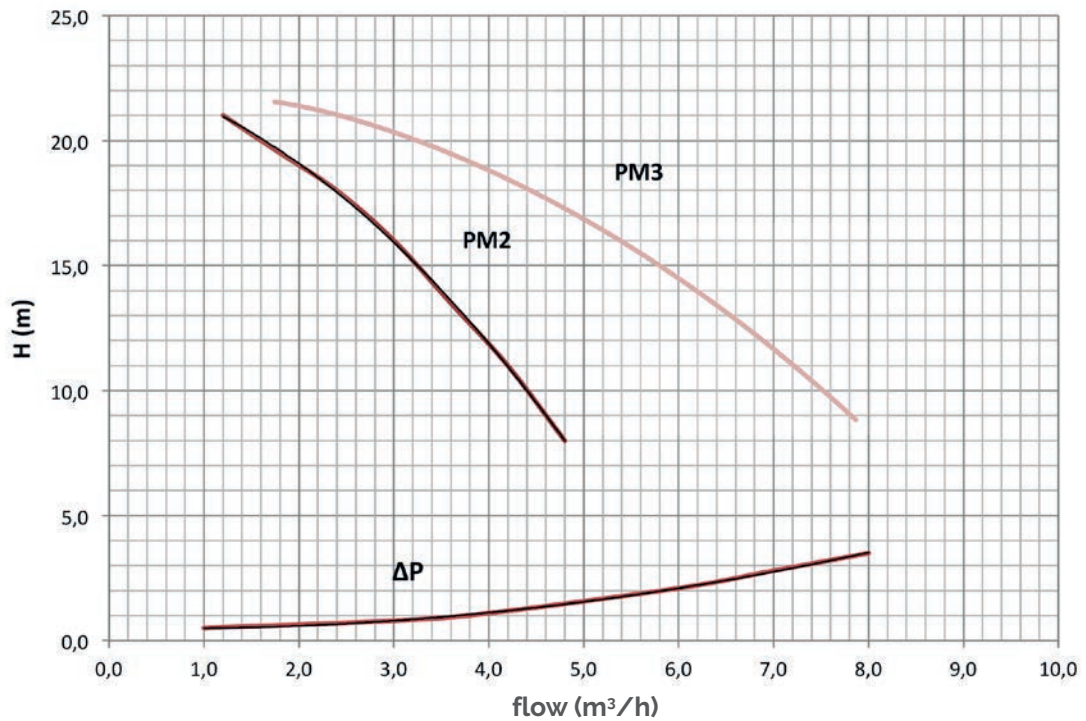
pump model	dimensions			type
	A mm	B mm	C mm	
PM2N PM3N P1N P2N P3N P4N P5N	650	790	1360	A
P6N P7N P8N P9N P10N P11N P12N P13N P14N P15N P16N P17N P18N	1116	790	1360	A
P19N P20N P21N	2000	1800	1500	B

## Double pump

pump model	dimensions			type
	A mm	B mm	C mm	
PM2R PM3R P1R P2R P3R P4R P5R	650	790	1360	A
P6R P7R P8R P9R P10R P11R	1116	790	1360	A
P12R P13R P14R P15R P16R P17R P18R	1280	760	1600	A
P19R P20R P21R	2000	1800	1500	B

# HP 2.0 Hydronic systems

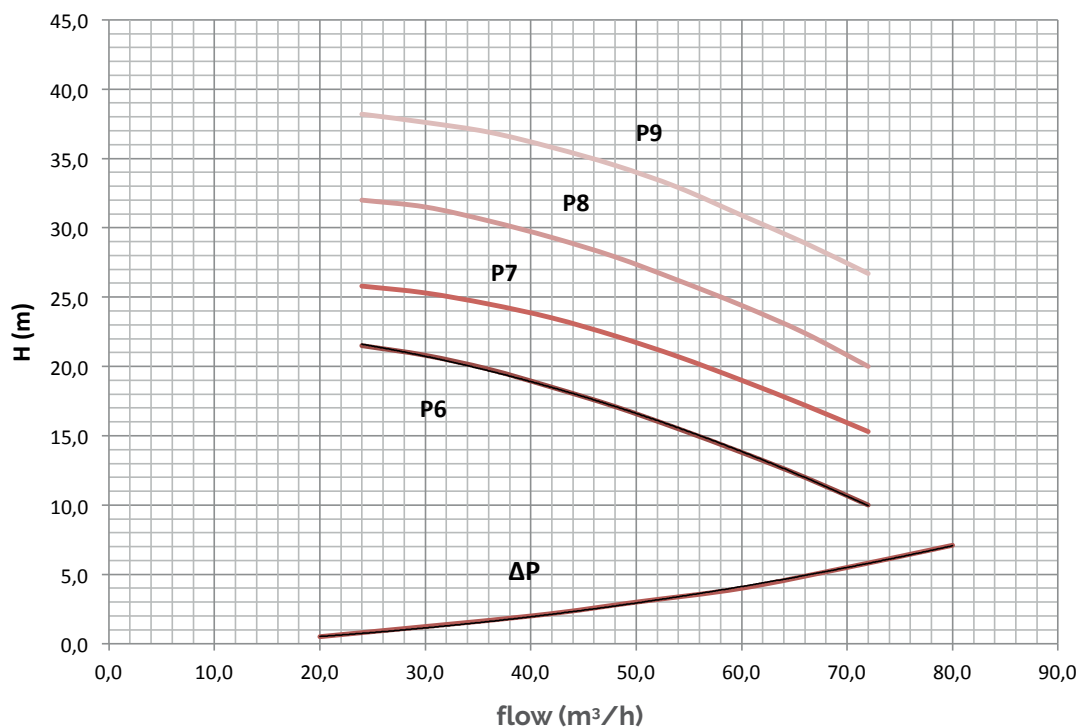
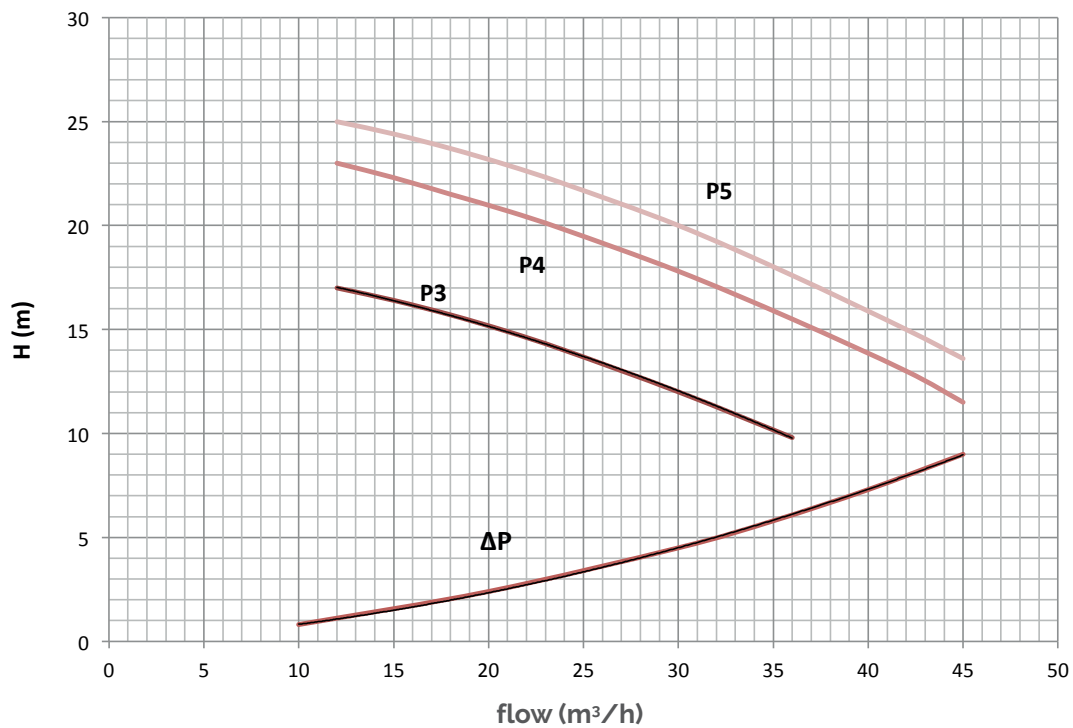
## Prevalence and pressure loss curve



Pressure drop HP unit

# HP 2.0 Hydronic systems

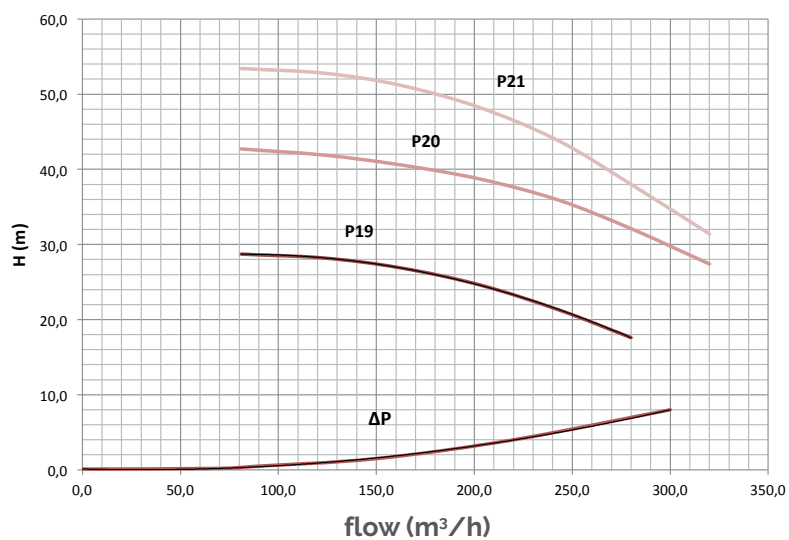
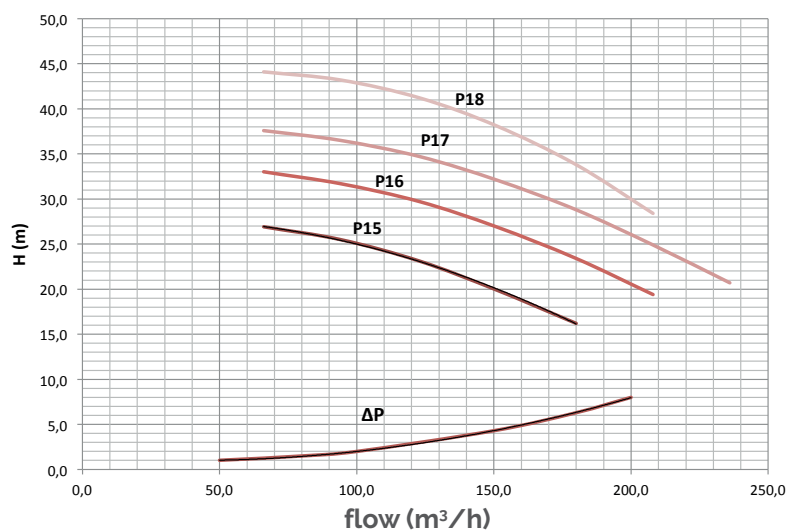
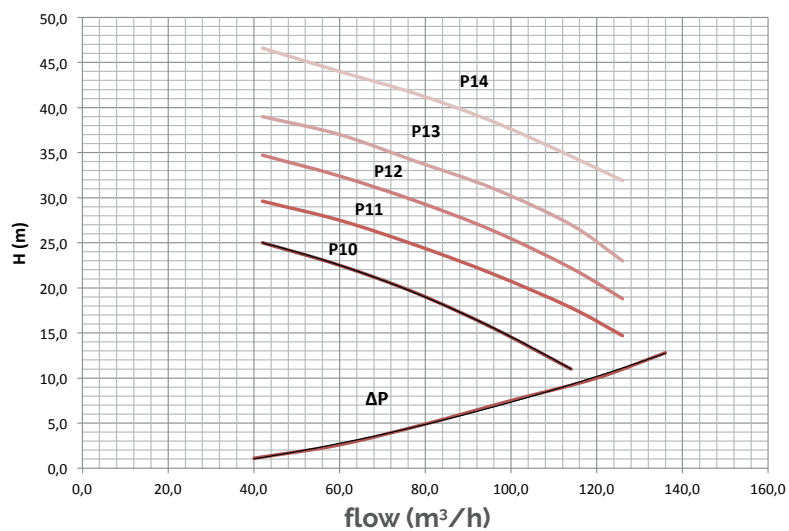
## Prevalence and pressure loss curve



Pressure drop HP unit

# HP 2.0 Hydronic systems

## Prevalence and pressure loss curve



Pressure drop HP unit

# HP 2.0 hydronic systems: technical information

pump model	connections inch	Wsb1 kg	Wsb2 kg	F.L.I. kW	F.L.A. (400/3/50) A	F.L.A. (230/1/50) A	Ve l	single pump		double pump	
								code	price	code	price
PM2	1 1/2			0,45		3,2	12	838060054X		838060055X	
PM3	1 1/2			0,45		3,2	12	838060057X		838060058X	
P1	2 1/2	89	118	1,1	2,5		12	838060129X		838060119X	
P2	2 1/2	90	119	1,5	3,2		12	838060130X		838060120X	
P3	2 1/2	91	121	1,5	3,4		12	838060131X		838060121X	
P4	2 1/2	93	125	2,2	4,8		12	838060132X		838060122X	
P5	2 1/2	96	131	3	5,6		12	838060133X		838060123X	
P6	3'	153	220	3	6,1		25	838060107X		838060193X	
P7	3'			4	8,7		25	838060108X		838060194X	
P8	3'	178	275	5,5	10,4		25	838060109X		838060195X	
P9	3'			7,5	13,6		25	838060110X		838060196X	
P10	3'	186	296	5,5	10,4		25	838060111X		838060197X	
P11	3'	190	304	7,5	13,6		25	838060112X		838060198X	
P12	3'			9,2	17,2		25	838060235X		838060236X	
P13	4'	224	398	11	21,3		25	838060183X		838060217X	
P14	4'	248	447	15	27,7		25	838060184X		838060218X	
P15	4'			11	20,2		25	838060227X		838060228X	
P16	4'	258	483	15	26,6		25	838060185X		838060219X	
P17	4'	270	504	18,5	33		25	838060186X		838060220X	
P18	4'	284	532	22	40,4		25	838060187X		838060221X	
P19	DN 200 UNI PN 16			18,5	33		50	838060229X		838060230X	
P20	DN 200 UNI PN 16			30	53,5		50	838060231X		838060232X	
P21	DN 200 UNI PN 16			37	65,6		50	838060233X		838060234X	

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

## Legend

Wsb1 Weight HPT with 1 pump (empty)  
 Wsb2 Weight HPT with 2 pumps (empty)  
 F.L.I. Max absorbed power  
 F.L.A. Max absorbed current  
 Ve capacity of expansion vessel  
 Pve Preload of expansion vessel  
 Ps Max operating pressure  
 Tmin Min temperature of the liquid

# HP 2.0 hydronic systems: user conditions

## Normal user conditions

The unit is designed to be connected with conditioning devices and coupled to a chiller which takes the heat from the device thanks to an increase in the thermal nominal standard (7-12°C). The average operating temperature is approximately 10°C and the operating pressure varies between 0.5 and 2.5 bar. The flow depends on the overall functioning of the installation – the cooling unit, indicated by the intersection between the characteristic curve of the pump and the characteristic curve of the installation. The HP 2.0 group is designed to function as a heat pump, but it can also function in relatively high temperatures, with a maximum of 50°C and with a max pressure of 3 bar. If the HP 2.0 is operative in an environment with low winter temperatures, it is recommended to use anti-freeze gel or resistance. Alternatively, we recommend the emptying of the hydraulic circuit, in order to prevent the water from being frozen.

## Protective devices

The HP 2.0 is protected from possible functioning errors or incautious manoeuvres thanks to the installation of two devices: the differential pressure switch (optional) and the safety valve. A possible problem is a breakdown of the centrifugal pump, which causes the vector fluid to stop and eventually to freeze. The use of a differential pressure switch (supplied on demand), which blocks the compressor, prevents this inconvenient situation. The standard HP 2.0 is supplied with an expansion vessel and safety valve. In case of a wrong manoeuvre or other events which cause overpressure, the safety valve, calibrated at 3 bar, is automatically activated. The expansion vessel, appropriately preloaded, intervenes when there is an excessive dilation of the fluids in the installation.



# 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
PM2 PM3 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

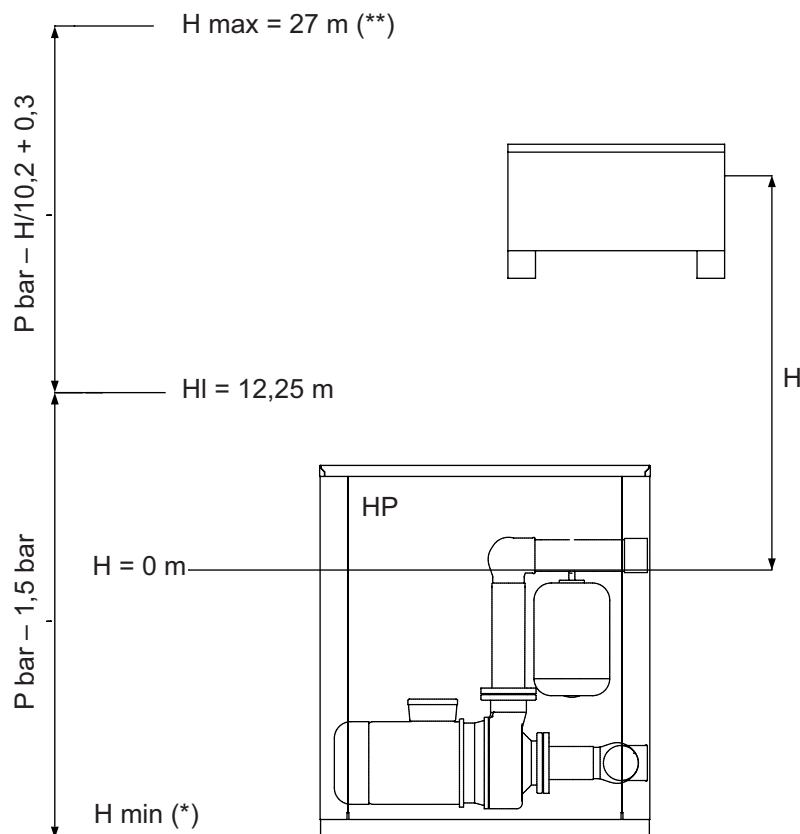
P: preload of the expansion vessel in bar

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

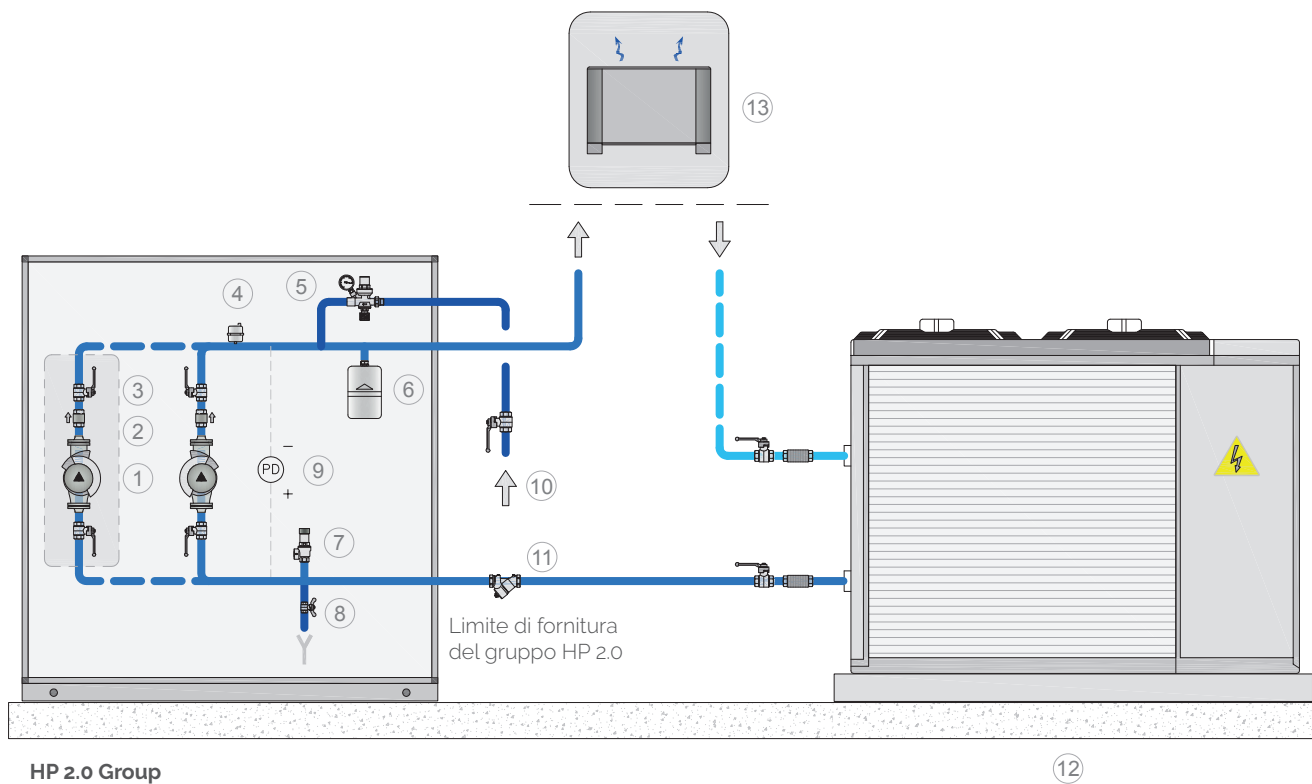
Hmax: max height of the device

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 systems: hydraulic 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. outlet
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: accessories

## Inverter

Every pump can be managed with an inverter. The units equipped with an inverter have a pressure sensor, 0-10 bar which communicates with the inverter through a 4-20 mA signal. All regulation parameters are preloaded during the testing phase in the factory. The user has only to select the set point value for the wanted pressure.

## Kit with electric anti-freeze resistor

The kit is installed in the inside of the tank and has an electric resistor of 1300 W for tanks up to 1000l and two electric resistors of 1300 W for tanks with a larger capacity. The kit also contains an anti-freeze bithermostat (-35/+35°C) and is assembled, cabled and tested before delivery.

## Timer for alternative pumps

In the version with double pump, the timer can be used to manage the shift between the pumps in intervals of a determined time. Without the timer, the shift between pumps is carried out with every start-up.

### Attention

If the system is active 24/7 the shift between pumps is not guaranteed by the standard group. In this case it is recommended to use a timer.

## Differential pressure switch

This is a safety measure which makes it possible to verify the flow in the system. The device generates an alarm signal but does not automatically stop the device.

## Soundproof covering

Soundproof covering is available and significantly decreases the sound emission by the device.

## Anti-vibration feet

A set of anti-vibration feet which can be put on the supportive points of the device. They are supplied non-assembled.

## Filter

Mesh filter, with 1000 micron holes, to be attached to the outside of the unit in order to protect the pump from any impurities of the devices.

## Balancing valve

The valve is to be attached to the outside in order to regulate the flow in the circuit. It is especially recommended in devices with a variable pressure drop.

## Packaging in a wooden case

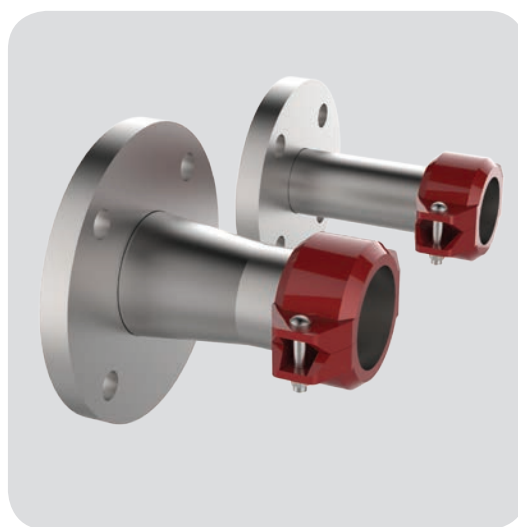
Protective packaging adapted to risky transport and long distances.

## Package for overseas transport

Extra packaging for maritime transport, with a wooden case in accordance with the international standards ISPM-15, a protective bag and hygrosopic salt.

## Kit to transform couplings

The kit contains two joints which transform the Victaulic coupling of the HP 2.0 unit in UNI-EN PN 16 flanged couplings. There is a version with the same diameter as the couplings and another version with a bigger diameter available.



Transformation to a flanged coupling

Original coupling Victaulic	Transformed coupling UNI-EN PN 16	Code	price
1 1/2"	DN40	838081247X	
	DN50	838081248X	
2"	DN50	838081249X	
	DN65	38081250X	
2 1/2"	DN65	838081251X	
	DN80	838081252X	
3"	DN80	38081253X	
	DN100	838081254X	
4"	DN100	838081255X	
	DN125	838081256X	