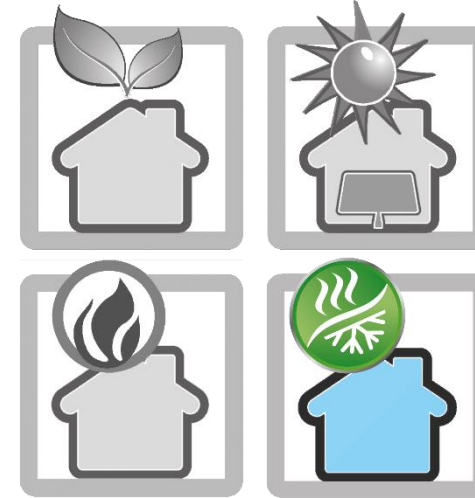




**++ NEW PRODUCTS COMBINABLE TO
MODERN SYSTEMS SOLUTIONS WITH
HEAT PUMPS ++**



F L O W C O N T R O L S Y S T E M S



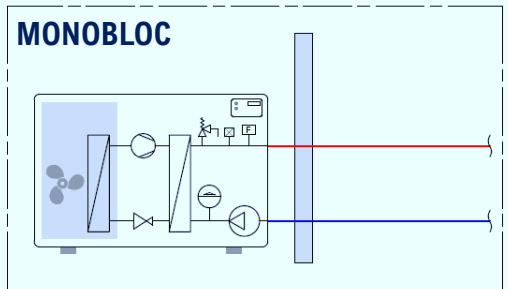
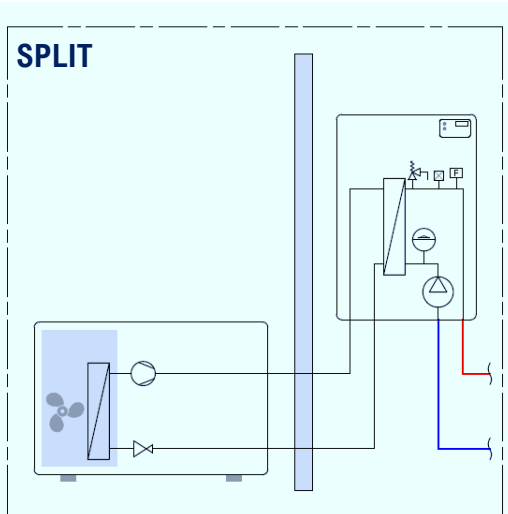
**Heat Pumps
STATIONS**

Brief summary of the numbers of «Heat Pumps» market

AIR-WATER HEAT PUMPS

HEATING
COOLING

FOCUS



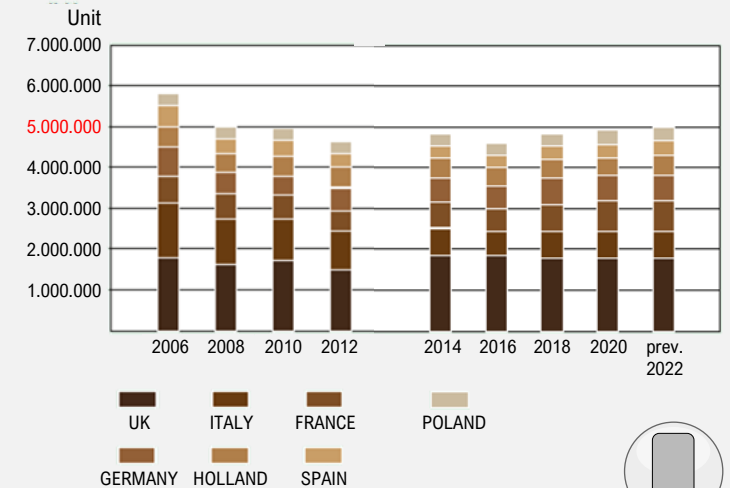
THE BOILERS MARKET

The boiler park installed in Italy is over 19 million units, including autonomous and centralized systems, mostly made up of older appliances with rather low efficiency and high consumption and emissions.

It is even estimated that more than 7 million boilers are older than the 90/396/EC directive on gas appliances, i.e. they are over 20 years old.

According to a study by BSRIA, in the seven largest countries in Europe, from 2006 until today, about 5 million boilers have been sold and installed per year. In particular, in Italy in recent years approximately 750.000 boilers have been sold and installed per year.

While condensing boilers are progressively replacing the less performing traditional boilers, on the other hand the transition trend towards heat pumps is only in an initial phase.



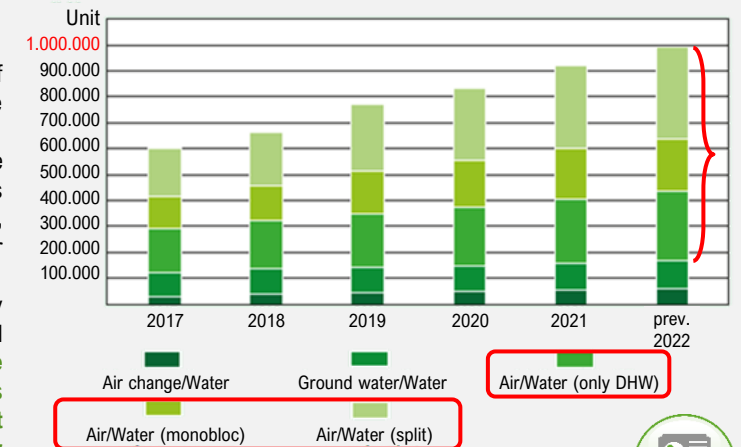
European boilers market. Source: BSRIA

THE HEAT PUMPS MARKET

The BSRIA market analysis shows that starting from 2017 the number of hydronic heat pumps installed in the European market has had a progressive annual increase of about 10%.

The trend is also confirmed for 2022, with a forecast of the future installed base of about one million pieces per year. The lion's share in new installations is entrusted to air-to-water heat pumps in both split and monobloc versions, dedicated to combined production for air conditioning and DHW or just for DHW.

Despite the important development of the heat pump market, strongly driven by national incentives and regulations, the relationship between heat pumps and boilers installed every year in Europe remains highly unbalanced. **With the current growth rate of this market and assuming that the amount of boilers sold decreases each year by a number equal to the increase in heat pumps, it will still take approximately 12-15 years for the two markets to have similar numbers.**

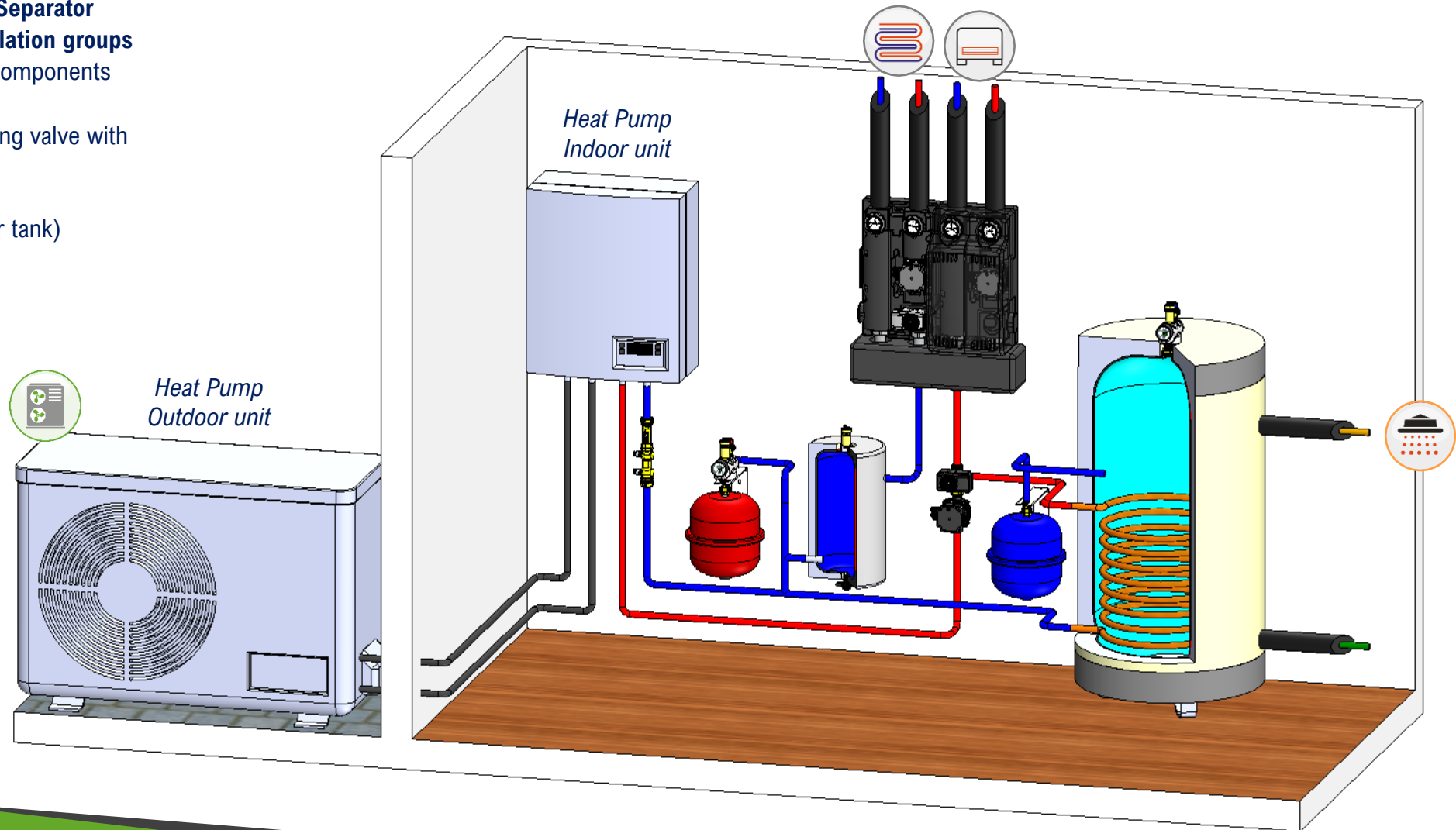


European heat pumps market. Source: BSRIA

...systems solutions with Heat Pumps → what are we talking about?

- Heat pump (monobloc / split)
- **Manifold / Hydraulic Separator**
- **Distribution and regulation groups**
- Closed circuit safety components
- Expansion vessels
- Dirt separator, balancing valve with flow meter, air vent
- Diverter valve
- Inertial storage (buffer tank)
- DHW tank
- Plant accessories
- ...

example of system solution





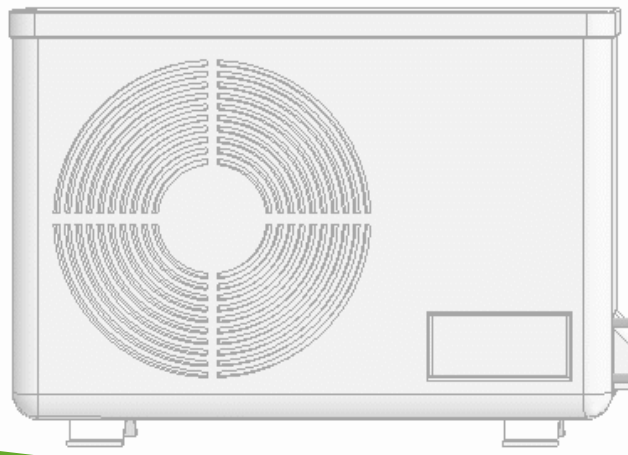
Heat Pumps STATIONS



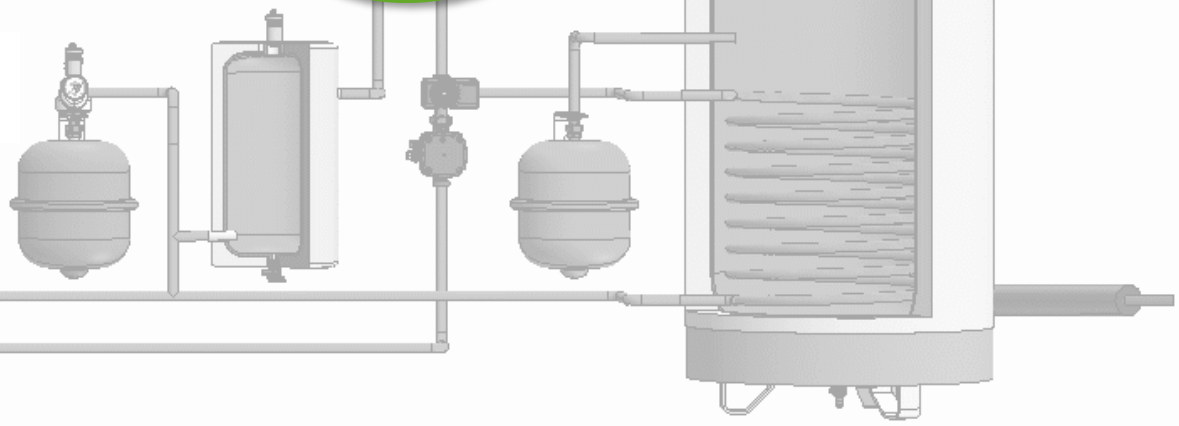
**DISTRIBUTION AND
REGULATION GROUPS →
COMBINATION WITH
HEAT PUMPS**



Outdoor unit



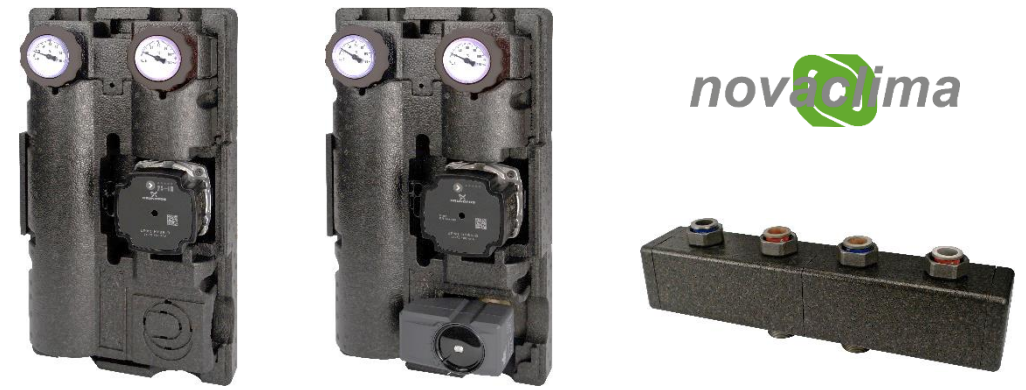
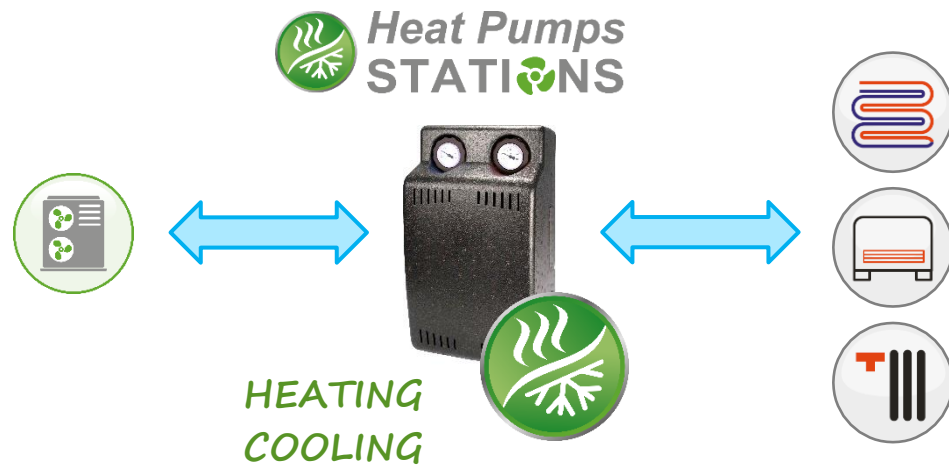
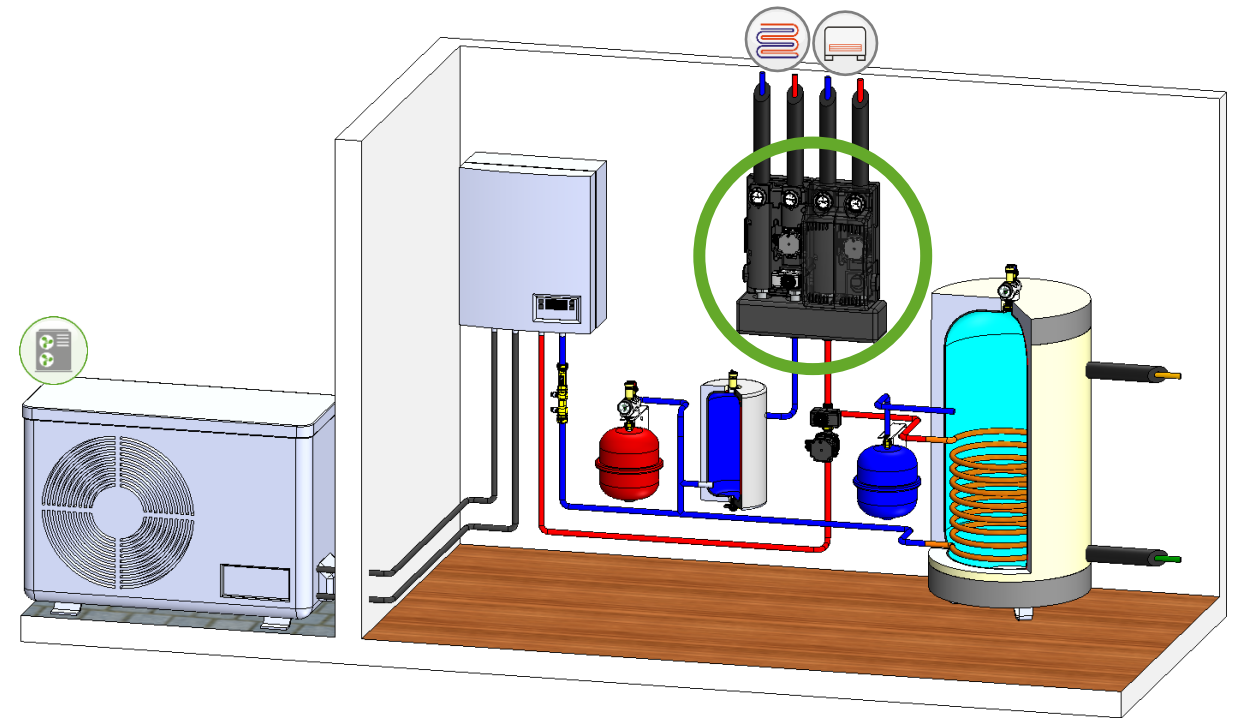
Indoor unit



What is a "group **Heat Pumps STATION**"?

It is the hydraulic solution for the management of the vector fluid in modern **heating/cooling systems**. The maximum efficiency of a heat pump generator also passes through **proper management and distribution** of technical water on the secondary circuit.

Perfect **circulation** and excellent **insulation** are the salient features of the Heat Pumps STATION group. A flexible hydraulic unit, able to adapt to the different sizes of Heat Pumps present on the market today in order to optimize their yields, but also perfect for all energy distribution systems, from underfloor heating, ceiling cooling, fan coil units and radiators.



Main functions



CIRCULATION and **DISTRIBUTION** of the vector fluid



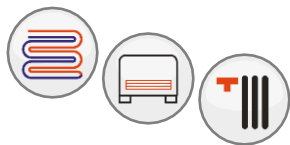
DELIVERY TEMPERATURE REGULATION (if present)



INTEGRATED THERMOMETERS and **CHECK VALVE** with temperature sensor pocket



MANIFOLD or **SEPARATOR Combi** with choice N° of secondary circuits



Management of **DIRECT** and **MIXED CIRCUITS**
HEATING & COOLING



Autonomy in control and optimal regulation

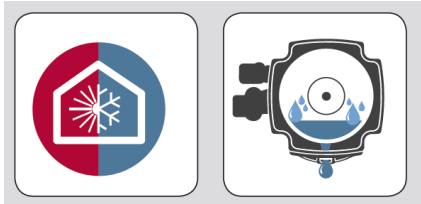
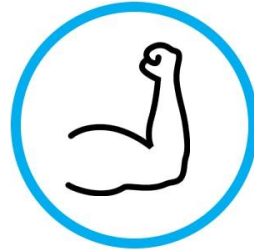




Fundamental functions → Pump Hot-Cold + Intermediate Insulation



UPM3(K)
HYBRID

 **Heat Pumps**
STATIONS
STRENGTHS

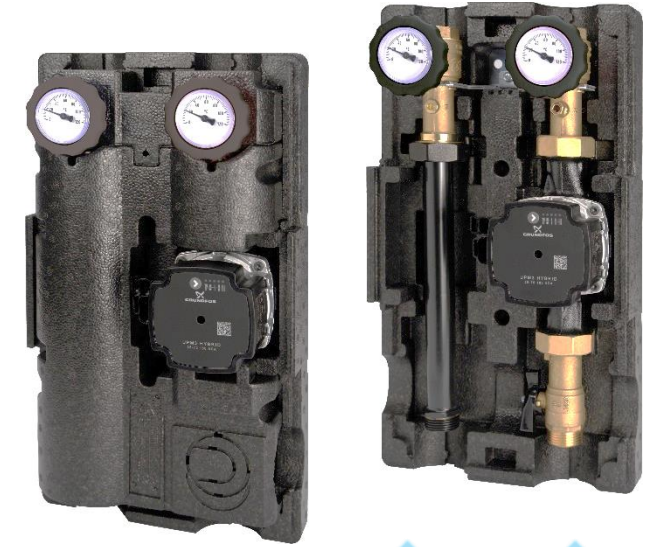
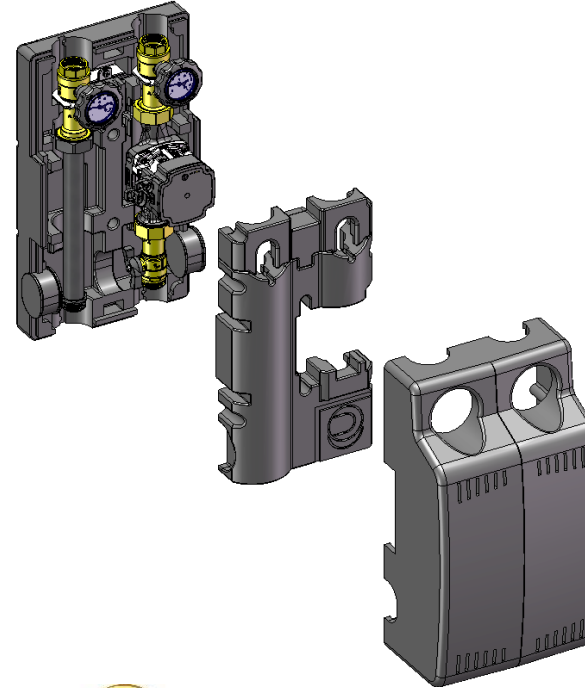


IP44	
IPX4D	

- The UPM3K pump range is designed for **condensing** applications with media below ambient temperature → the minimum admissible media temperature can be down to **-10 °C**
- The stator housing is CED electrocoated with one drain hole in two possible positions, as IPX4D

Insulation compliant to EnEV2014

HEATING
COOLING



**NO CONDENSATION
FORMATION!!!**

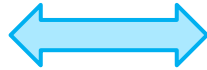
HPS = EXTERNAL COVER + **INTERMEDIATE INSULATION**
Each component inside the group HPS is protected and insulated, there is **no** danger of **condensation** forming during **cooling** operation with cold fluid

Process of choosing the correct group HPS

1

COMBINATION OF HEAT PUMP & HPS

Schemes
Size (kW)



DN20
DN25
DN32
DN32b
Manifold
Separator Combi



2

GROUPS CHOICE DEPENDING ON PLANT SYSTEM



DIRECT



MIXING
MOTORIZED



3

SYSTEM SETTING OPTIMIZATION



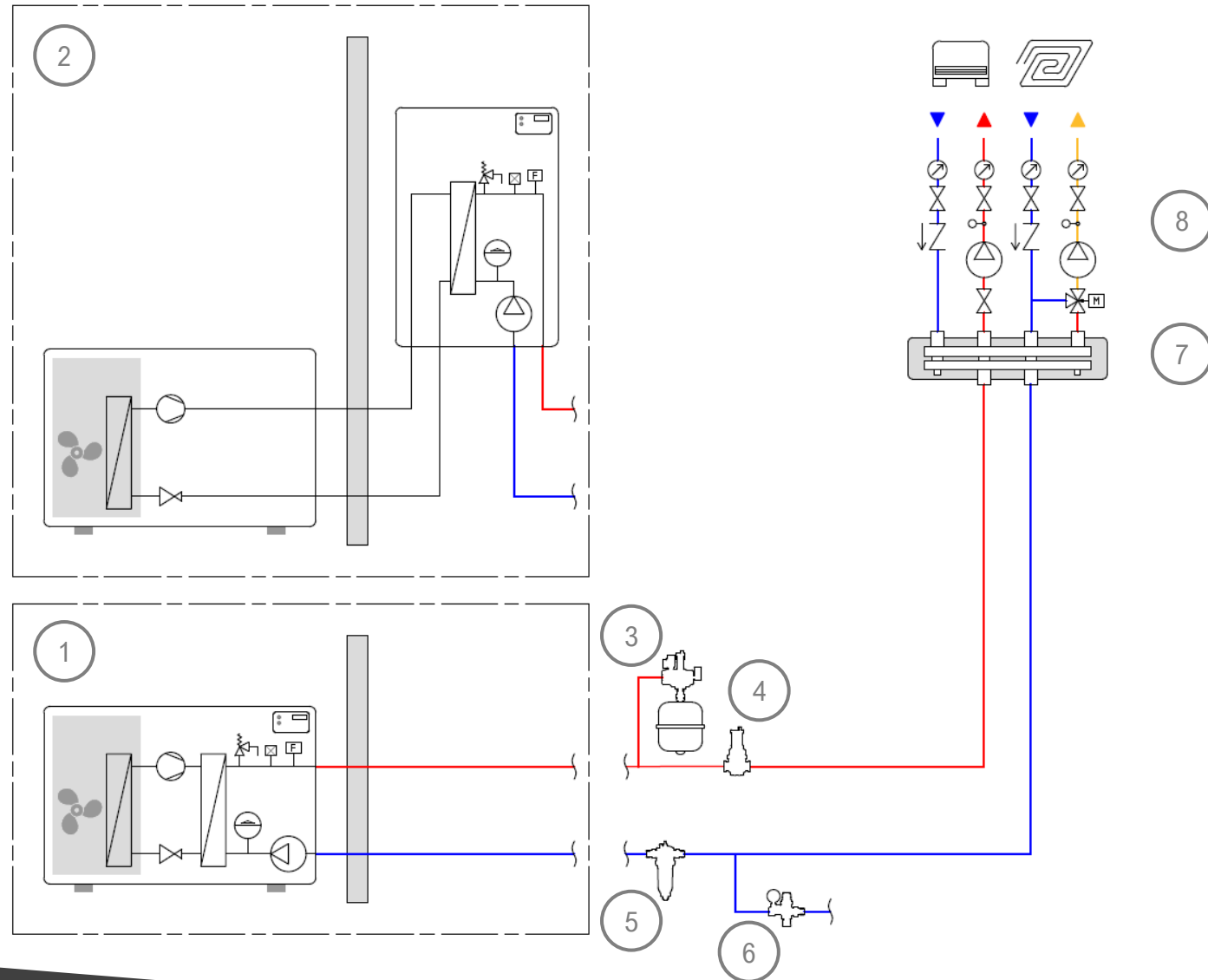
Examples of indicative installation schemes

Multi-zone heating and/or cooling system,
combined with a Heat Pump

HEATING
COOLING



1. Monobloc Heat Pump
2. Split Heat Pump
3. Instrument holder manifold
4. Air vent
5. Dirt separator
6. Automatic filling
- 7. Separator Combi with 2 circuits**
- 8. HPS distribution and regulation groups**



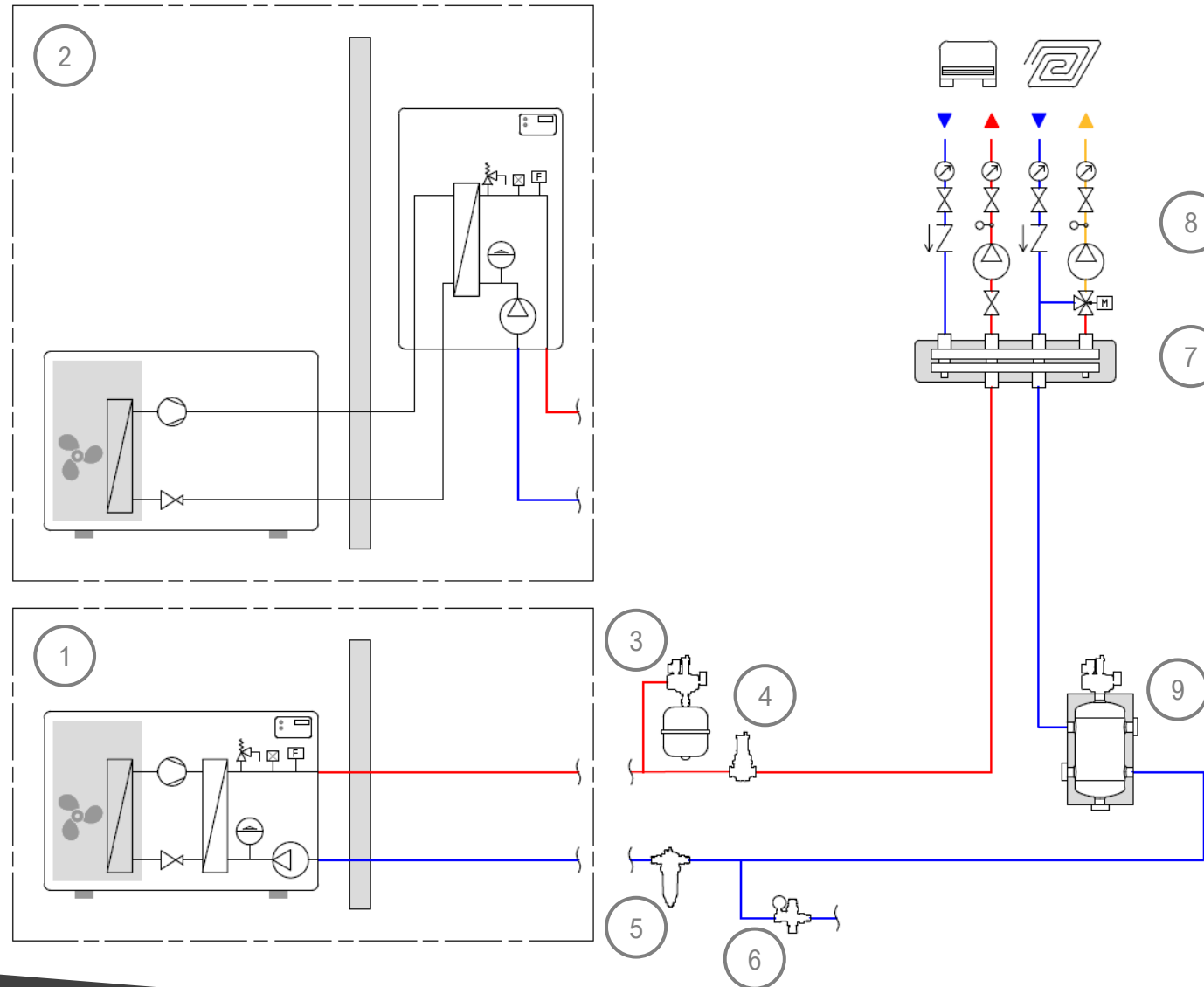
Examples of indicative installation schemes

Multi-zone heating and/or cooling system,
combined with a Heat Pump and micro inertial
storage on the return

HEATING
COOLING



1. Monobloc Heat Pump
2. Split Heat Pump
3. Instrument holder manifold
4. Air vent
5. Dirt separator
6. Automatic filling
7. **Separator Combi with 2 circuits**
8. **HPS distribution and regulation groups**
9. Micro inertial storage



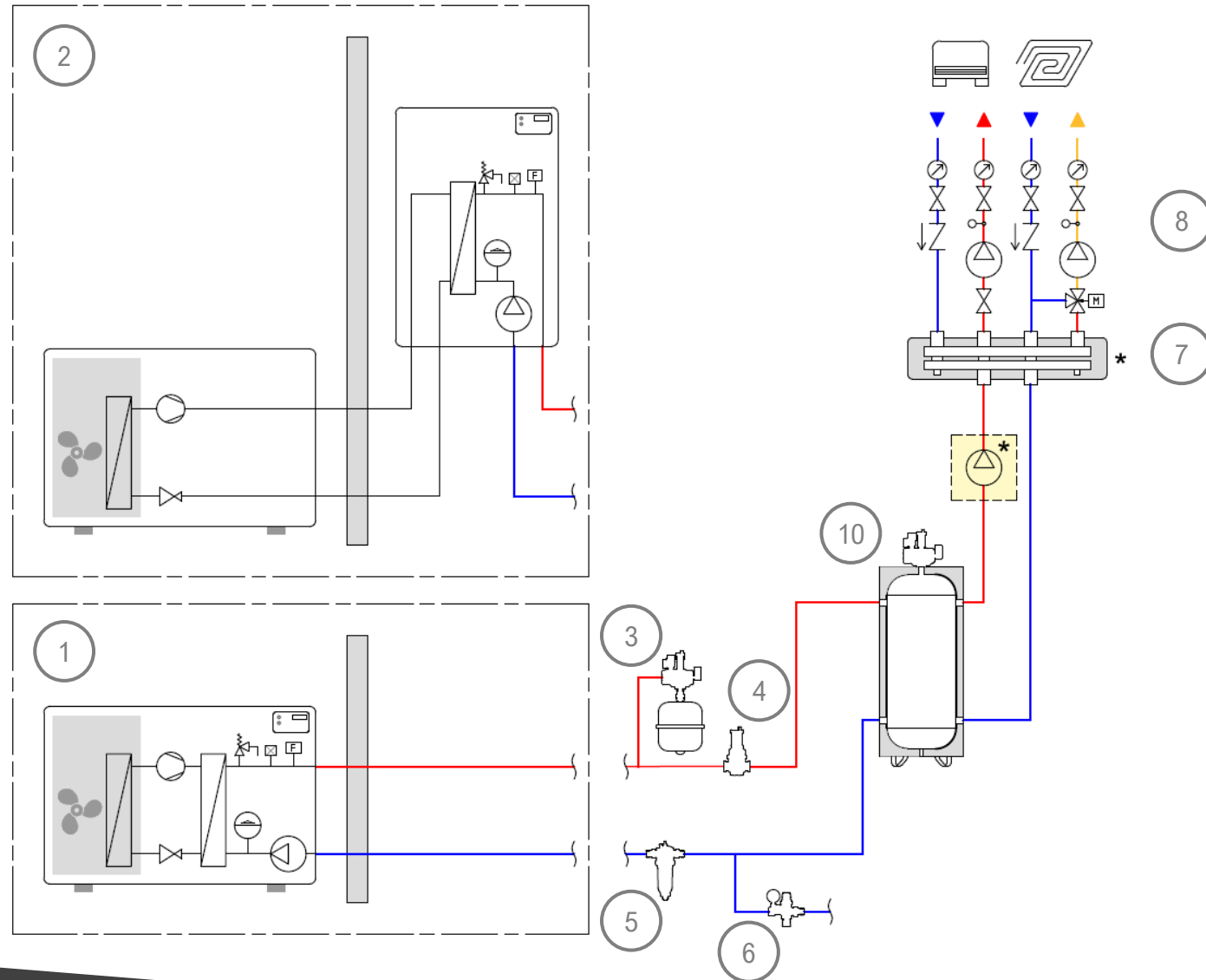
Examples of indicative installation schemes

Multi-zone heating and/or cooling system,
combined with a Heat Pump and inertial storage

HEATING
COOLING



1. Monobloc Heat Pump
2. Split Heat Pump
3. Instrument holder manifold
4. Air vent
5. Dirt separator
6. Automatic filling
7. **Separator Combi with 2 circuits if is present the pump *; otherwise Manifold with 2 circuits**
8. **HPS distribution and regulation groups**
10. Inertial storage



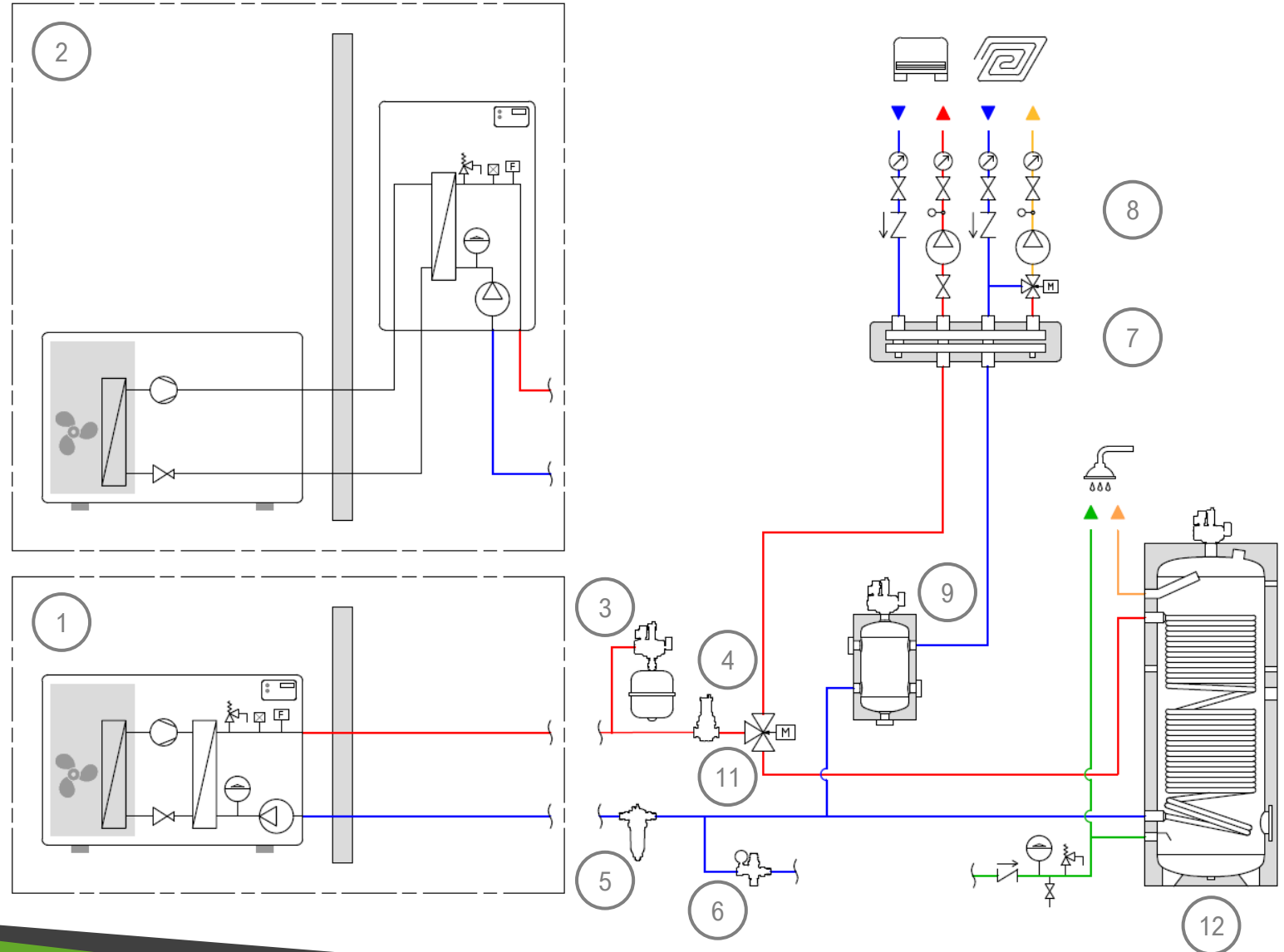
Examples of indicative installation schemes

Multi-zone heating and/or cooling system with DHW production, combined with a Heat Pump and micro inertial storage on the return

HEATING
COOLING



1. Monobloc Heat Pump
2. Split Heat Pump
3. Instrument holder manifold
4. Air vent
5. Dirt separator
6. Automatic filling
7. **Separator Combi with 2 circuits**
8. **HPS distribution and regulation groups**
9. Micro inertial storage
11. Diverter valve
12. DHW tank



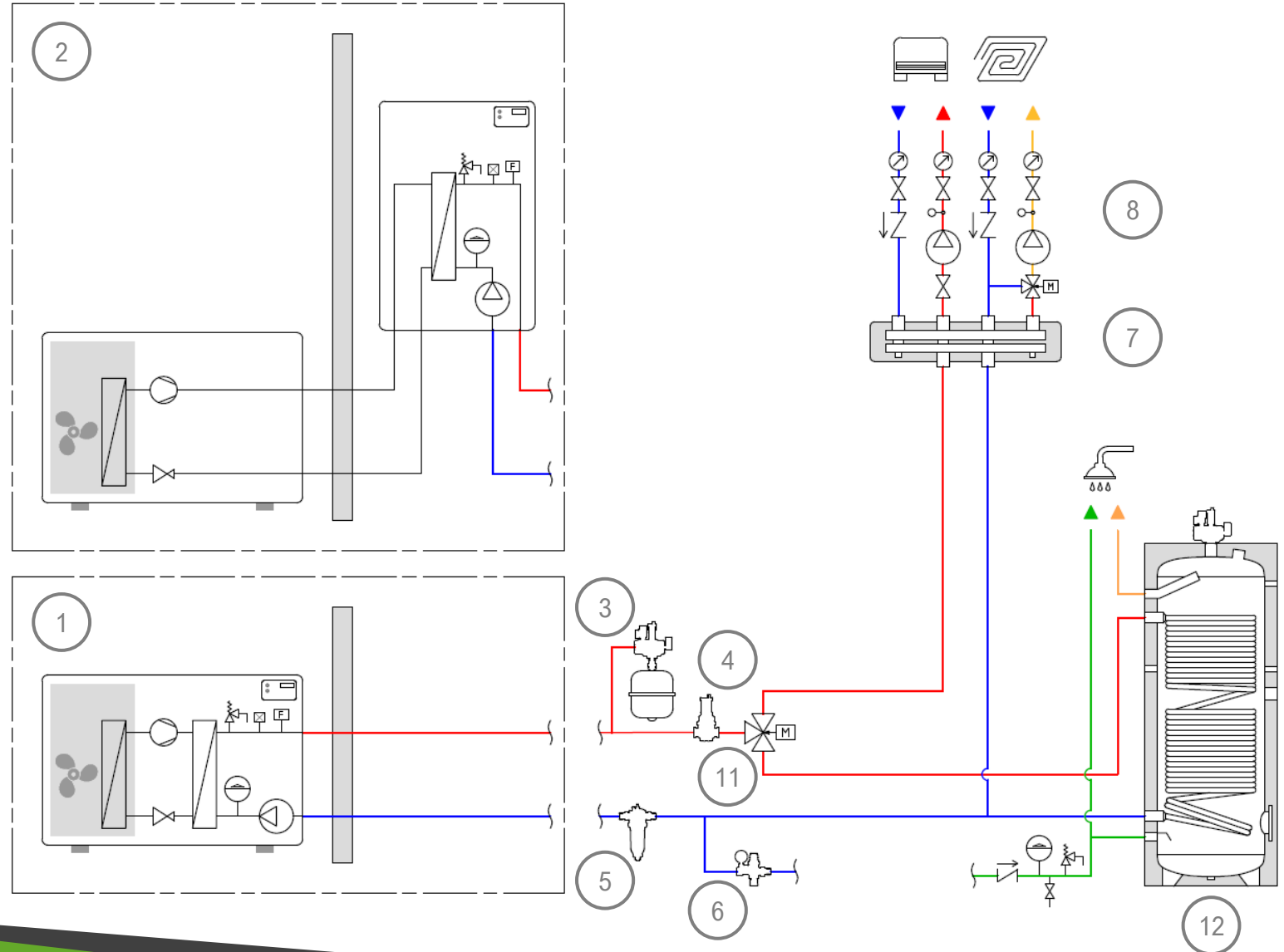
Examples of indicative installation schemes

Multi-zone heating and/or cooling system with
DHW production, combined with a Heat Pump

HEATING
COOLING



1. Monobloc Heat Pump
2. Split Heat Pump
3. Instrument holder manifold
4. Air vent
5. Dirt separator
6. Automatic filling
7. **Separator Combi with 2 circuits**
8. **HPS distribution and regulation groups**
11. Diverter valve
12. DHW tank



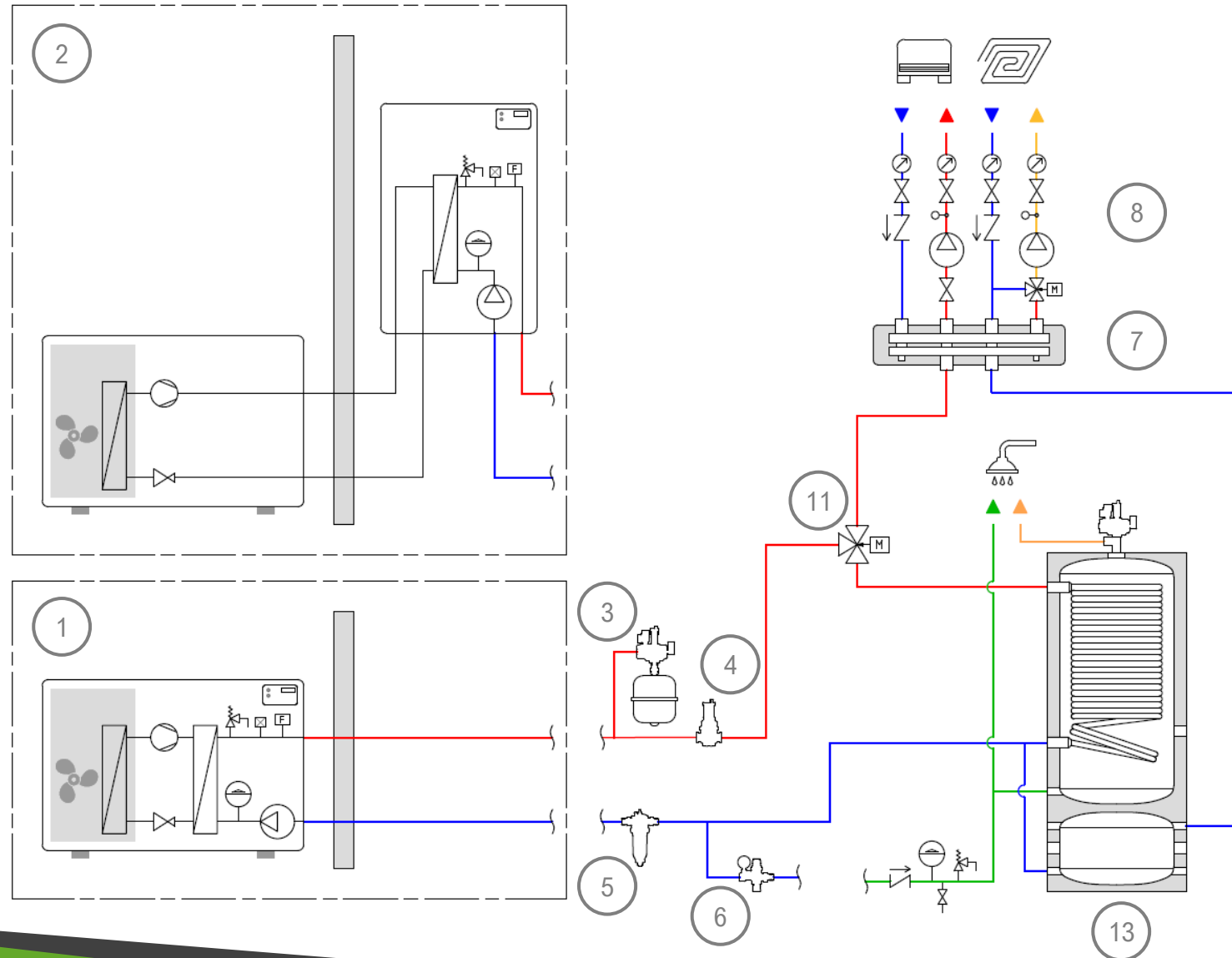
Examples of indicative installation schemes

Multi-zone heating and/or cooling system with DHW production, combined with a Heat Pump and micro inertial storage on the return integrated inside the DHW tank

HEATING
COOLING



- 1. Monobloc Heat Pump
- 2. Split Heat Pump
- 3. Instrument holder manifold
- 4. Air vent
- 5. Dirt separator
- 6. Automatic filling
- 7. Separator Combi with 2 circuits
- 8. HPS distribution and regulation groups
- 11. Diverter valve
- 13. DHW tank with integrated micro inertial storage



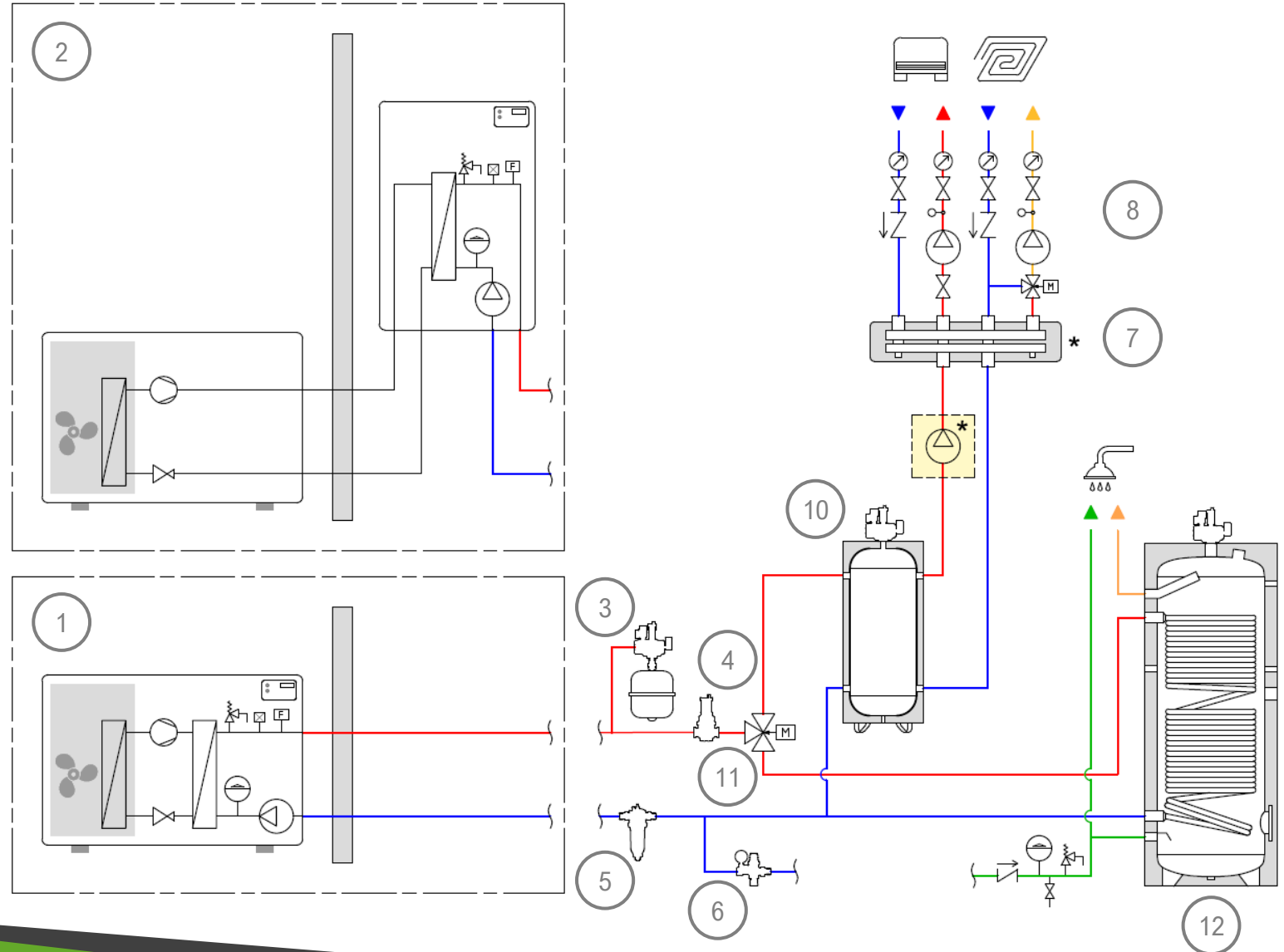
Examples of indicative installation schemes

Multi-zone heating and/or cooling system with DHW production, combined with a Heat Pump and inertial storage

HEATING
COOLING



1. Monobloc Heat Pump
2. Split Heat Pump
3. Instrument holder manifold
4. Air vent
5. Dirt separator
6. Automatic filling
7. **Separator Combi with 2 circuits if is present the pump *; otherwise Manifold with 2 circuits**
8. **HPS distribution and regulation groups**
10. Inertial storage
11. Diverter valve
12. DHW tank



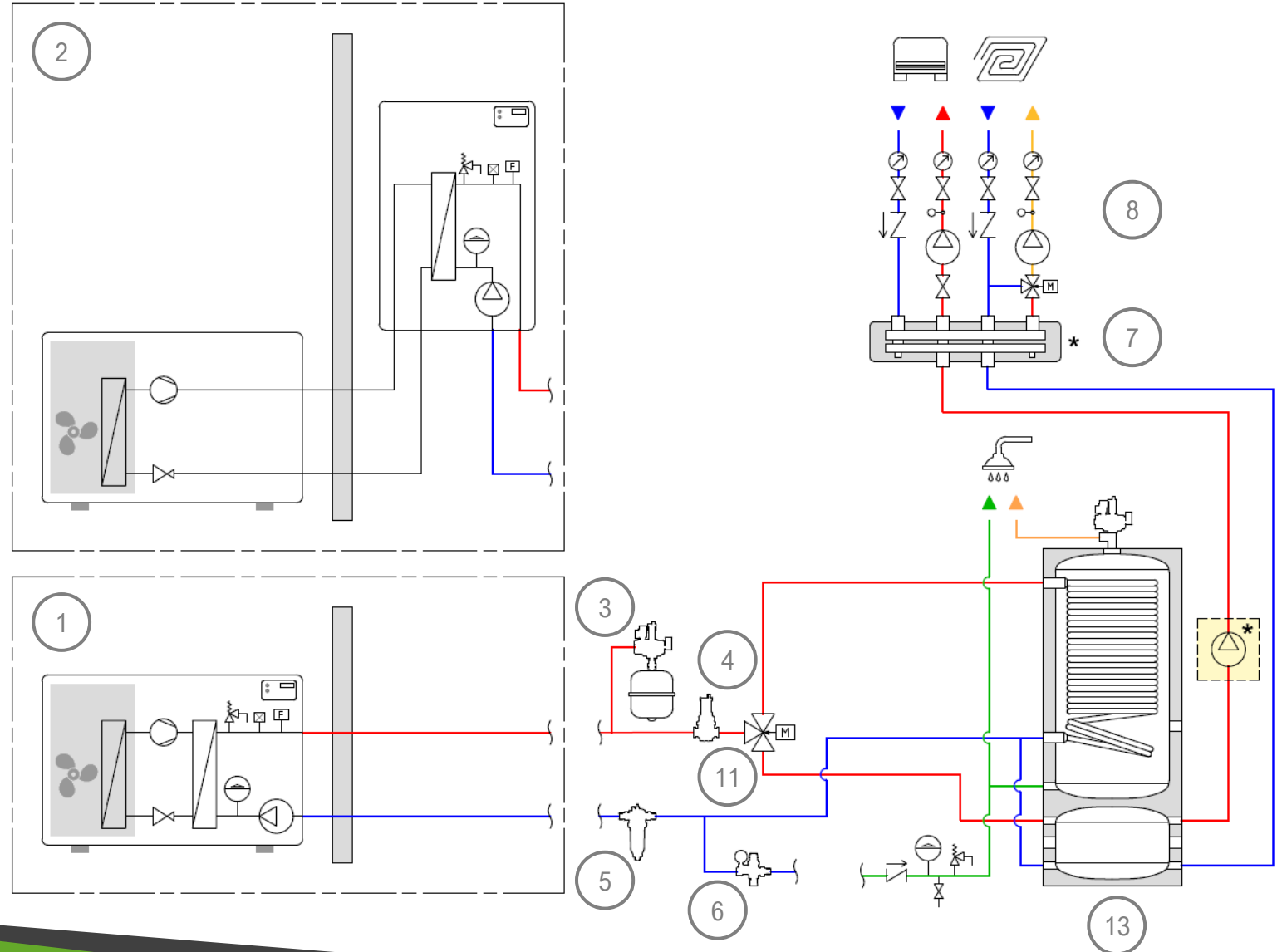
Examples of indicative installation schemes

Multi-zone heating and/or cooling system with DHW production, combined with a Heat Pump and inertial storage integrated inside the DHW tank

HEATING
COOLING

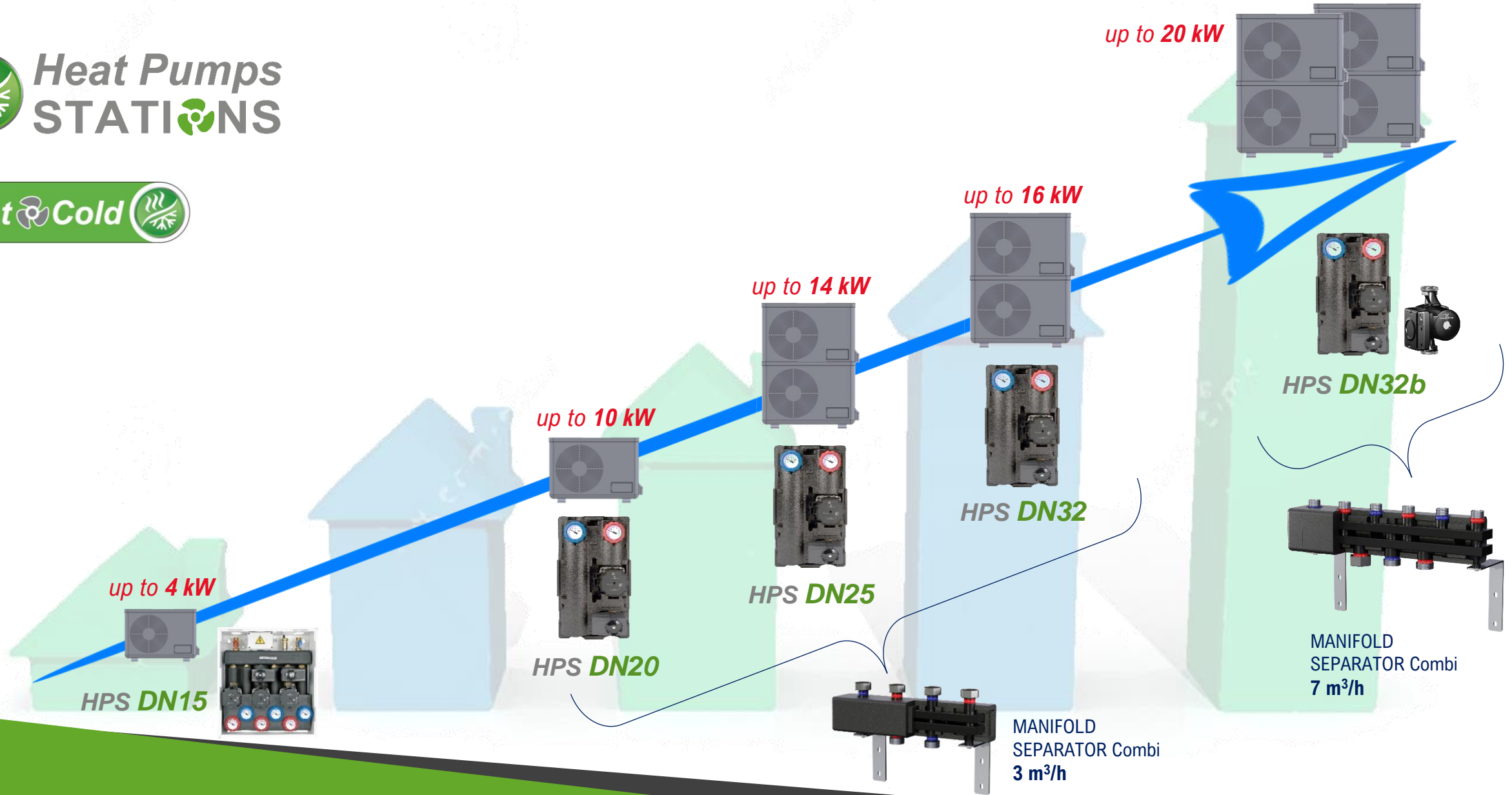


1. Monobloc Heat Pump
2. Split Heat Pump
3. Instrument holder manifold
4. Air vent
5. Dirt separator
6. Automatic filling
7. **Separator Combi with 2 circuits if is present the pump *; otherwise Manifold with 2 circuits**
8. **HPS distribution and regulation groups**
11. Diverter valve
13. DHW tank with integrated inertial storage



Combination Heat Pump & HPS

1



Heat Pumps STATIONS

DIRECT

MIXING
MOTORIZED *



- **HPS D20**
→ DN20, pump 7 m
- **HPS D25**
→ DN25, pump 7 m
- **HPS D32**
→ DN32, pump 7 m
- **HPS D32b**
→ DN32, pump big 10,5 m

- **HPS M20**
→ DN20, pump 7 m
- **HPS M25**
→ DN25, pump 7 m
- **HPS M32**
→ DN32, pump 7 m
- **HPS M32b**
→ DN32, pump big 10,5 m

* see following pages for available servomotors and control groups



- **HPS D20** → DN20, pump 7 m
- **HPS D25** → DN25, pump 7 m
- **HPS D32** → DN32, pump 7 m
- **HPS D32b** → DN32, pump 10,5 m

Directive PED - 2014/68/UE
Insulation compliant to EnEV2014



Main components

- Pump **Grundfos UPM3 Hybrid (7 meters)** ErP ready
- Pump **Grundfos UPML (10,5 meters)** ErP ready *
- Shut-off ball valves
- Thermometers (0÷120 °C)
- Check valve (excludable)
- Temperature sensor pocket (sensor Ø6 mm) on delivery heating/cooling
- PPE insulation (also intermediate)**

* for group D32b



Technical data	DN20	DN25	DN32	DN32b
Max. pressure	10 bar			
Working temperature	5÷95 °C (110 °C peak)			
Power supply	230 V - 50 Hz			
External dimensions	250 x 450 x 200 mm			
Wheelbase	125 mm			
Bottom connections	1" M	1" M	1" 1/4 M	1" 1/4 M
Top connections	1" F	1" F	1" 1/4 F	1" 1/4 F
Max. flow rate	2100 L/h	2400 L/h	2700 L/h	4000 L/h

MOTORIZED mixing distribution and regulation group



Photo with pump 7 m and servomotor NVM08 **

- **HPS M20** → DN20, pump 7 m
- **HPS M25** → DN25, pump 7 m
- **HPS M32** → DN32, pump 7 m
- **HPS M32b** → DN32, pump 10,5 m

Directive PED - 2014/68/UE
Insulation compliant to EnEV2014



Main components

- Pump Grundfos UPM3 Hybrid (7 meters) ErP ready
- Pump Grundfos UPML (10,5 meters) ErP ready *
- Motorized 3-port mixing valve**, 4 control options available **
- Shut-off ball valves and thermometers (0÷120 °C)
- Check valve (excludable)
- Temperature sensor pocket (sensor Ø6 mm) on delivery heating/cooling
- PPE insulation (also intermediate)**

* for group M32b

** see following pages for available servomotors and control groups

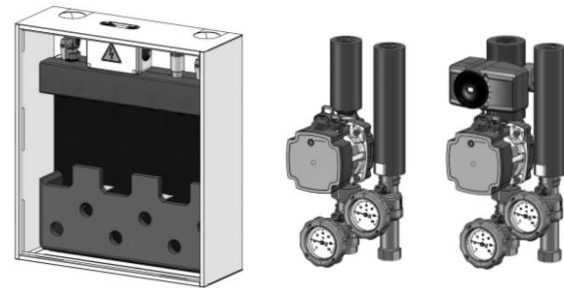
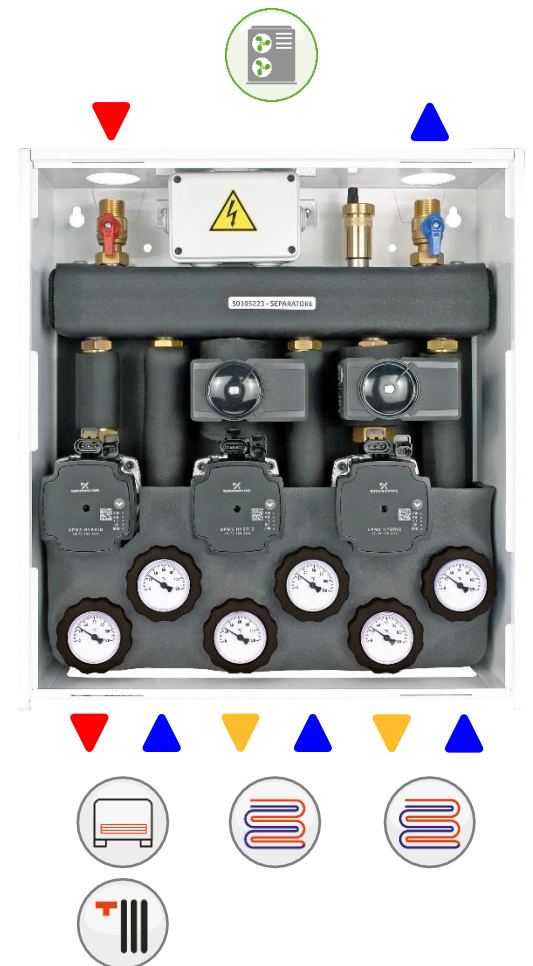


Technical data	DN20	DN25	DN32	DN32b
Max. pressure	10 bar			
Working temperature	5÷95 °C (110 °C peak)			
Power supply	230 V - 50 Hz			
External dimensions	250 x 450 x 200 mm			
Wheelbase	125 mm			
Bottom connections	1" M	1" M	1" 1/4 M	1" 1/4 M
Top connections	1" F	1" F	1" 1/4 F	1" 1/4 F
Max. flow rate	2000 L/h	2300 L/h	2700 L/h	4000 L/h

Heat Pumps STATIONS

MULTI-ZONE IN COMPACT BOX

➤ **HPS 15**
→ DN15, pumps 7 m



Compact multi-zone mixing distribution and regulation group



Photo with pumps 7 m pumps and servomotors NVM08 *

max. 3 circuits

1 CODE = 1 PRODUCT

➤ **HPS 15** → **DN15**, pumps 7 m

Directive PED - 2014/68/UE



Main components

- Pump **Grundfos UPM3 Hybrid (7 meters)** ErP ready
- Motorized 3-port mixing valve**, 4 control options available *
- Manifold or Separator**, with automatic air vent
- Temperature sensor pockets (sensor Ø6 mm)
- Check valves (excludable)
- Shut-off ball valves and thermometers (0÷120 °C)
- Electrical junction box with terminals for quick connection of components
- PPE insulation**
- Wall/recessed box, internal/external, painted white RAL 9003

* see following pages for available servomotors and control groups

Configurable circuits kit → max. modularity



Technical data	
Max. pressure	10 bar
Working temperature	5÷95 °C (110 °C peak)
Power supply	230 V - 50 Hz
External dimensions	450 x 500 x 160 mm
Wheelbase generator	320 mm
Connections generator	3/4" M
Wheelbase secondary circuits	70 mm
Connections secondary circuits	3/4" F
Chambers Manifold / Separator	DN50
Volume Manifold / Separator	1,5 L
Max. flow rate direct circuit	2100 L/h **
Max. flow rate mixing circuit	1900 L/h **

** with residual head of 2 m w.c.

«PREASSEMBLED» LOGIC + 100% tested

Combination Heat Pump & HPS

1

 **Heat Pumps
STATIONS**

Hot Cold 



NEW!

HPS 90 DN20

up to 14 kW

up to 16 kW

up to 20 kW

up to 10 kW

up to 4 kW

HPS DN15

HPS DN20

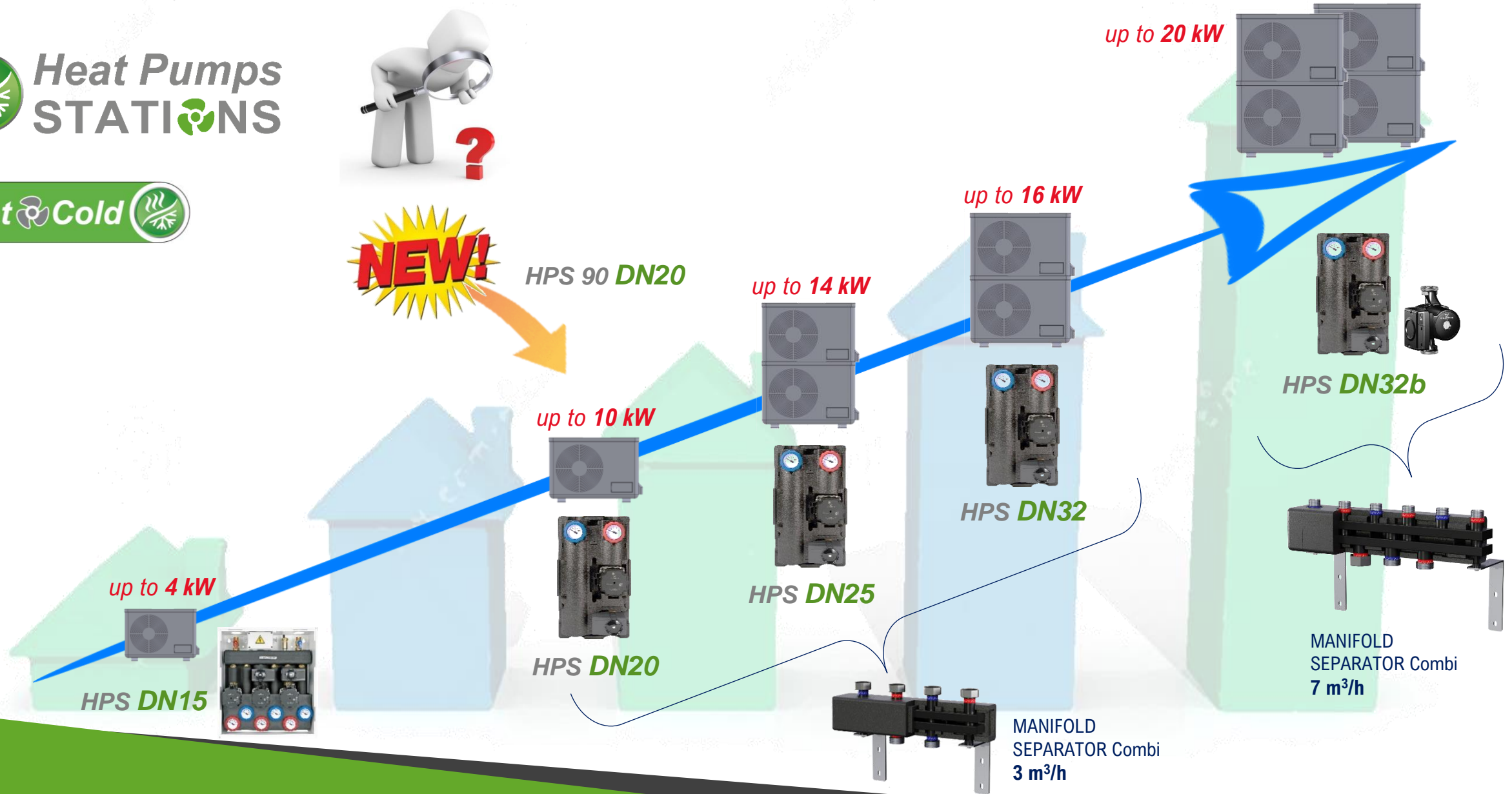
HPS DN25

HPS DN32

HPS DN32b

**MANIFOLD
SEPARATOR Combi
7 m³/h**

**MANIFOLD
SEPARATOR Combi
3 m³/h**



NEW HPS 90...preview



➤ **HPS 90 20** → DN20, pumps 7 m

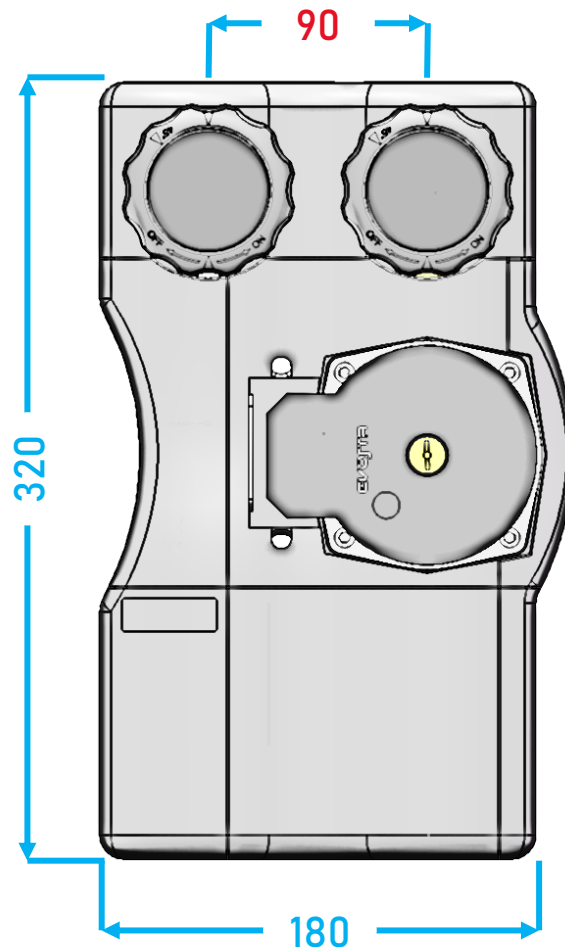


**COMING
SOON!**

NEW!

**WHEELBASE
90 mm**

COMPACT



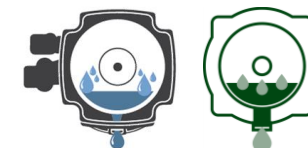
✓ DN20 

✓ **DIRECT & MOTORIZED MIXING VERSIONS** → compatible with the whole range of servomotors and control groups available for HPS

✓ **HEATING & COOLING** 

✓ Pump **GRUNDFOS UPM3K HYBRID 7 m**

✓ Pump **DAB EVOSTA2 7 m**



✓ **PPE COMPLET INSULATION** → also on the side of the pump

✓ Shut-off ball valves and **CHECK VALVE INTEGRATED**



✓ **TEMPERATURE SENSOR POCKET** (sensor Ø6 mm) on delivery heating/cooling

NEW HPS 90...preview



➤ **HPS 90 20** → DN20, pumps 7 m

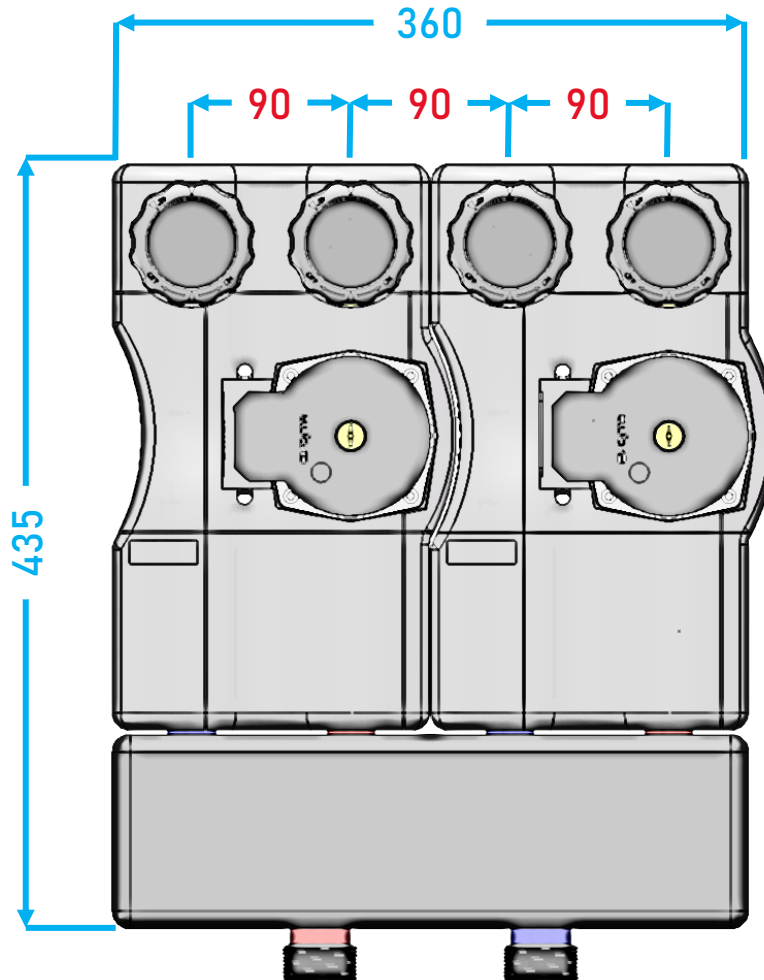
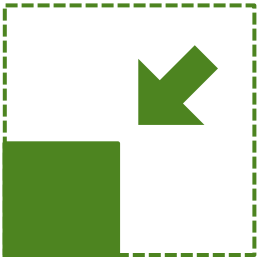


**COMING
SOON!**

NEW!

**WHEELBASE
90 mm**

COMPACT



✓ **MODULARITY AND CONFIGURABLE** groups



✓ **MANIFOLD & SEPARATORS Combi** → available
N° secondary circuits: **2, 3 circuits**

✓ **PRE-ASSEMBLED ON DEMAND** with Manifold or
Separators Combi

✓ **THERMOMETERS KIT** → 0÷120 °C



✓ Accessories on demand

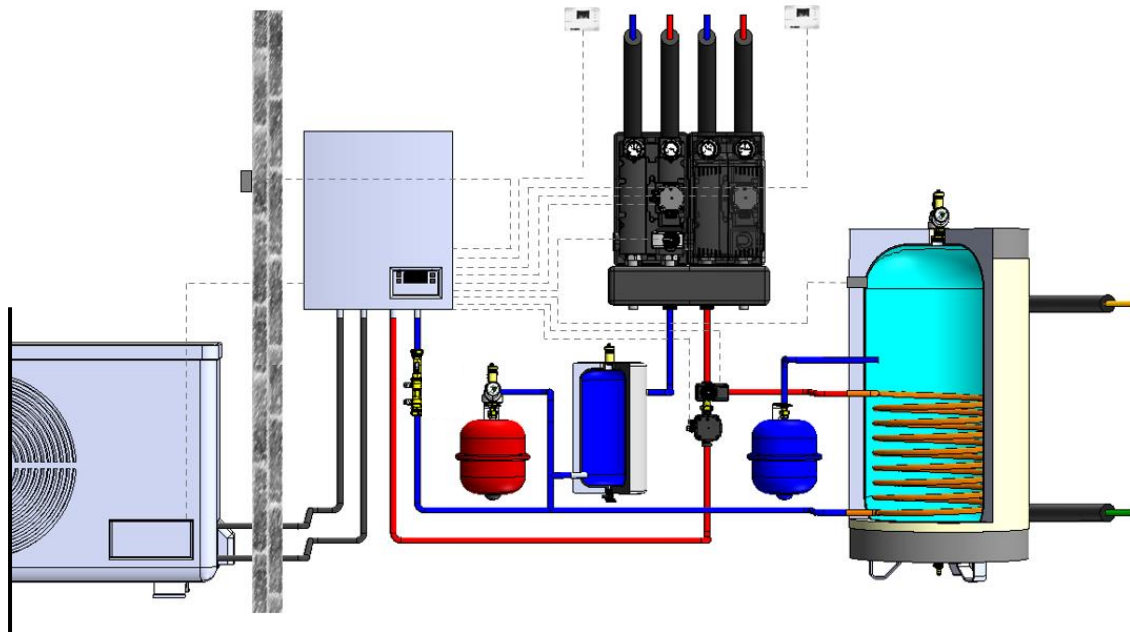
MANIFOLD
2 m³/h



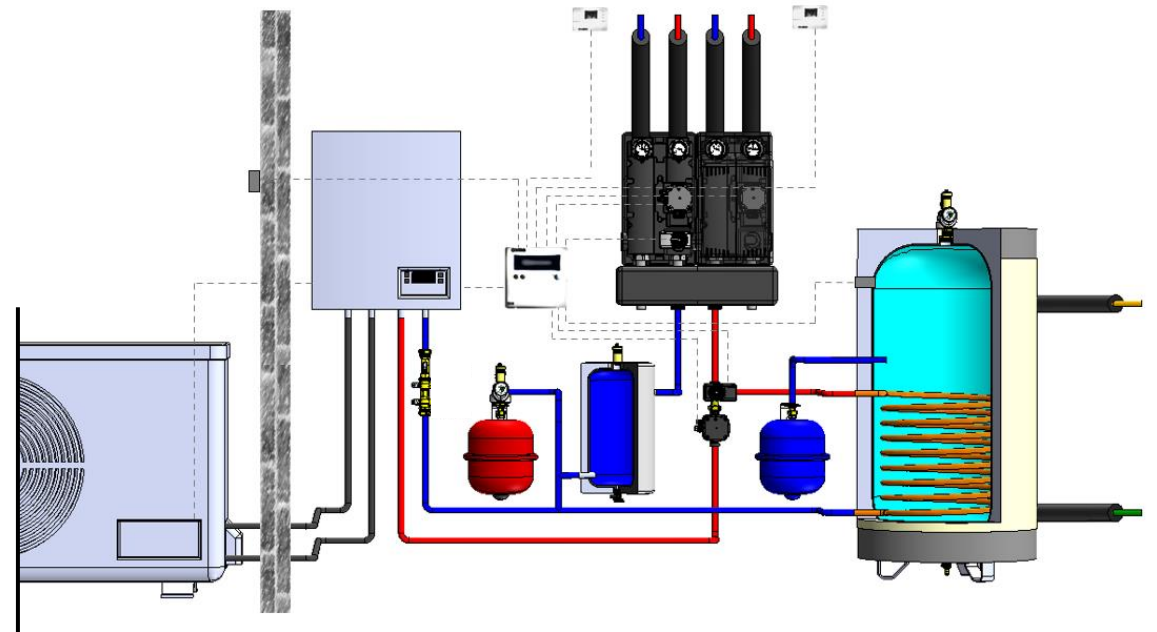
SEPARATOR Combi
2 m³/h



CL1 The heat pump manages the entire system



CL2 A control unit manages the entire system



SERVOMOTOR NVM08 3-points



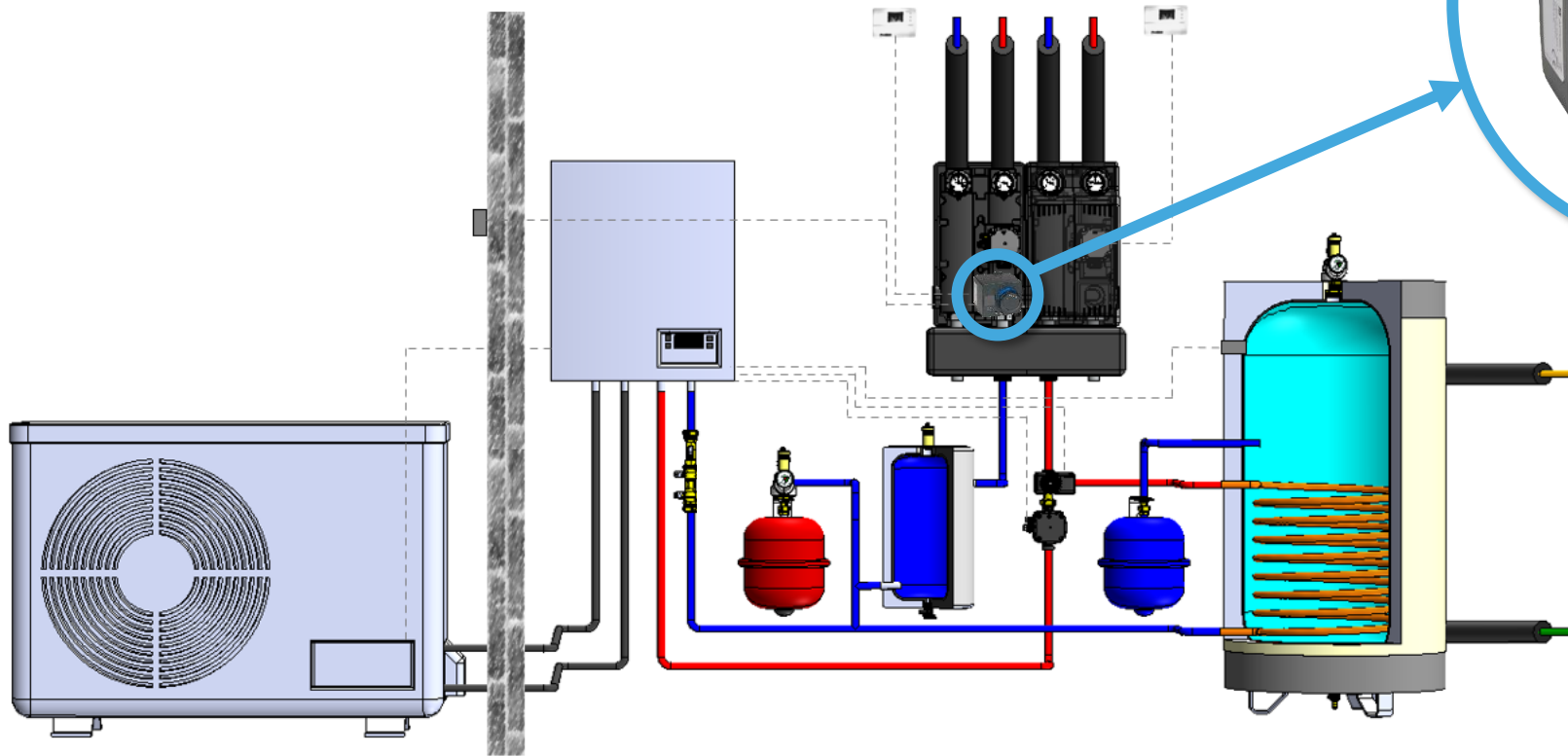
Servomotor combinable with external control logic	
Control signal	3-point
Electric supply	230 V - 50 Hz
Power consumption	4,5 VA
Rotation and operating time	90° x 30 s
Max. torque	10 Nm
Integrated cable	length 1 m

SERVOMOTOR NVM07 0(2)÷10 V



Servomotor combinable with external control logic	
Control signal	0(2)÷10 V
Electric supply	24 V - 50 Hz
Power consumption	5 W
Rotation and operating time	90° x 60 s
Max. torque	10 Nm
Integrated cable	length 1 m

CL3 Primary circuit managed by heat pump
Secondary circuits managed by NVMC controller



1° option
*CONSTANT TEMPERATURE
CONTROLLER*

2° option
*WEATHER COMPENSATED
CONTROLLER*



Controllers available for motorized regulation



NEW!

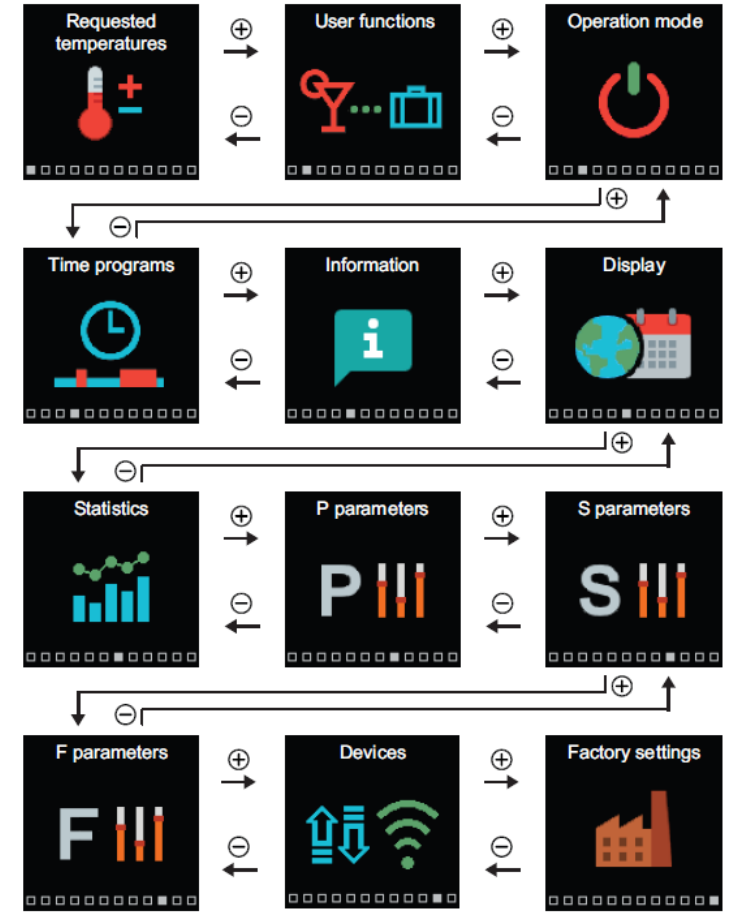


Controllers available for motorized regulation



MENU STRUCTURE AND DESCRIPTION

The menu consists of twelve main groups:

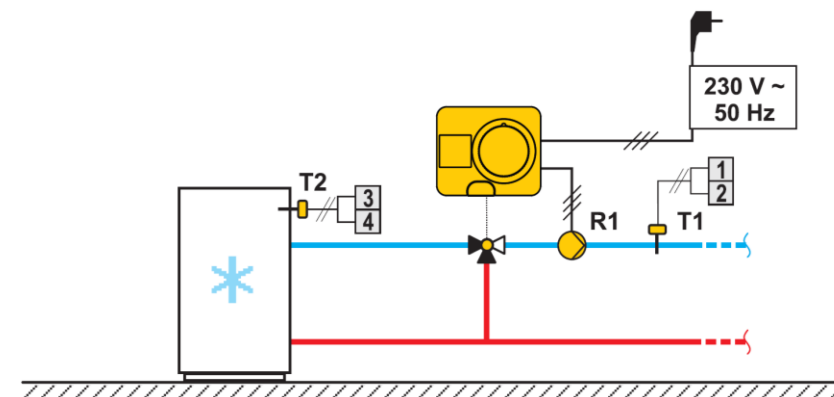
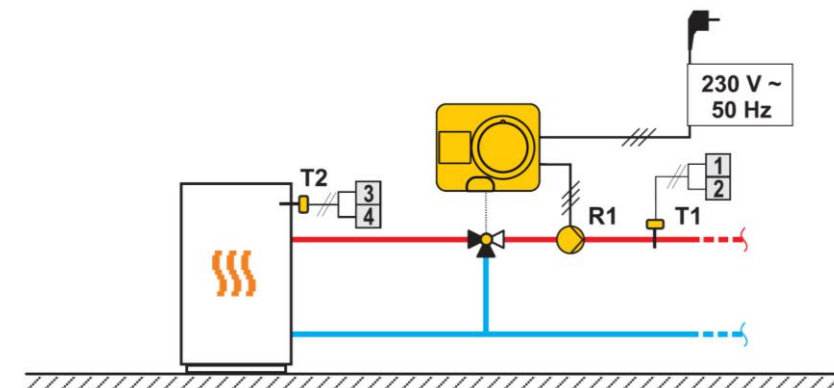


Controllers available for motorized regulation - 1° option

CONSTANT TEMPERATURE CONTROLLER



HEATING
COOLING



Controller = servomotor + integrated control logic	
Heating setting	10÷90 °C
Cooling setting	5÷40 °C
Electric supply	230 V - 50 Hz
Max. own consumption	5 W
Rotation and operating time	90° x 120 s
Max. torque	6 Nm
Temperature sensors	Pt1000

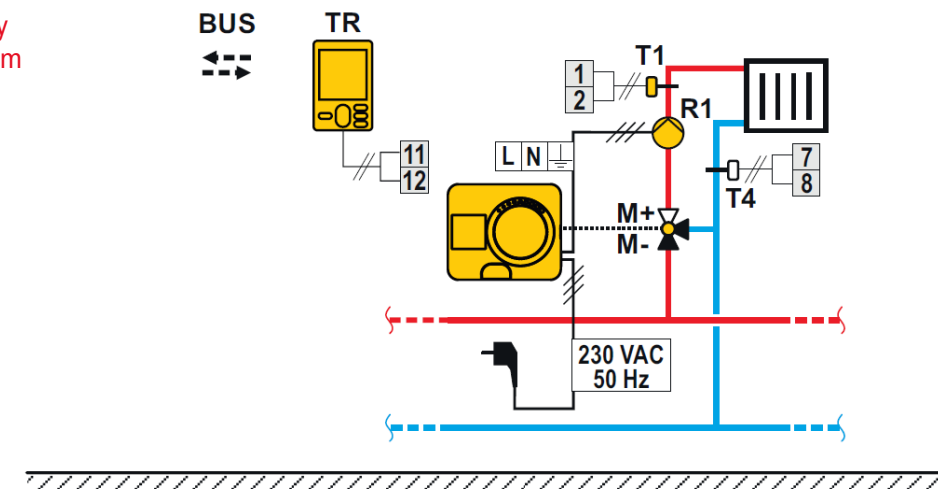
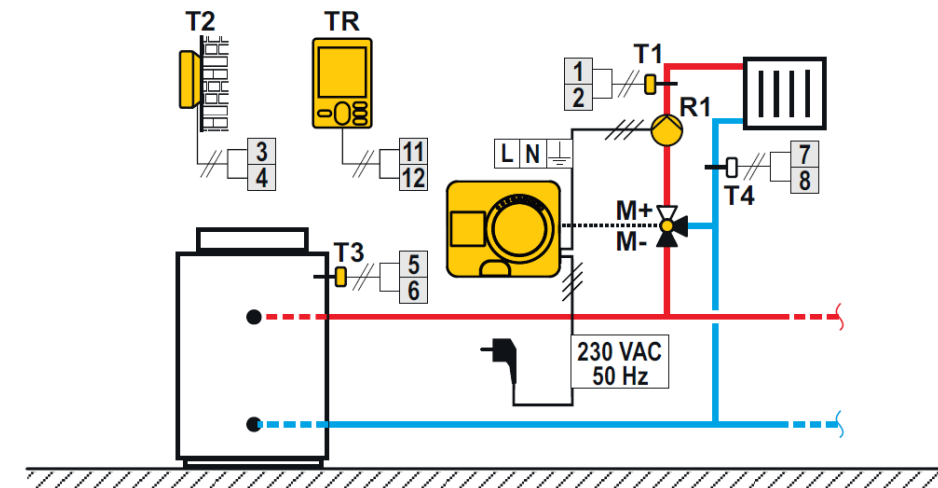
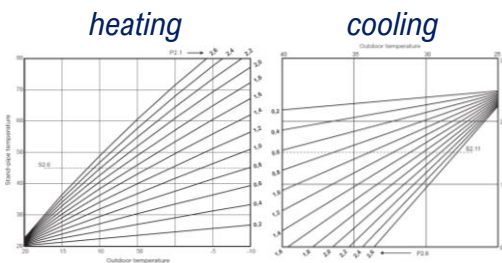
- ❖ Display of notifications and warnings
- ❖ Display of actual temperature and other operation data
- ❖ Overview of temperatures for the past week
- ❖ Indication of valve turning direction
- ❖ Control and indication of circulation pump operation
- ❖ Possibility of USB connection to a PC
- ❖ Color graphic display

Controllers available for motorized regulation - 2° option

WEATHER COMPENSATED CONTROLLER



HEATING
COOLING



Controller = servomotor + integrated control logic	
Heating curve steepness	0,1÷2,6
Cooling curve steepness	0,1÷2,6
Electric supply	230 V - 50 Hz
Max. own consumption	5 W
Rotation and operating time	90° x 120 s
Max. torque	6 Nm
Temperature sensors	Pt1000

- ❖ 2 operating modes, weather compensated (by outdoor temperature) or thermostatic (by room temperature)
- ❖ BUS connection
- ❖ Display of notifications and warnings
- ❖ Display of actual temperature and other operation data
- ❖ Overview of temperatures for the past week
- ❖ Signalling of valve rotating direction
- ❖ Control and signalling of circulation pump operation
- ❖ Possibility of USB connection to a PC
- ❖ Color graphic display



UPM3(K)
HYBRID

- The UPM3K pump range is designed for **condensing** applications with media below ambient temperature → the minimum admissible media temperature can be down to **-10 °C**
- The stator housing is CED electrocoated with one drain hole in two possible positions, as IPX4D



Pump **GRUNDFOS** model **UPM3K HYBRID** → the HYBRID version is the top of the range of UPM3 series, and allows significant operational advantages, as it makes **all possible modes and operating curves available for each system configuration**

These pumps can be controlled externally via PWM signal or can be controlled internally in the following modes:

- Proportional Pressure** (3 speeds and Autoadapt)
- Constant Pressure** (3 speeds and Autoadapt)
- Constant Curve** (3 speeds)

The pump also has a self-diagnostics system to reveal any possible operating problems → any problem detected is shown by a sequence of LEDs (alarm status)



UPML

Pump **GRUNDFOS** model **UPML** → is the «BIG» version for systems with high flow rates required

These pumps can be controlled externally via PWM signal or can be controlled internally in the following modes:

- Proportional Pressure** (3 speeds and Autoadapt)
- Constant Pressure** (3 speeds and Autoadapt)

High efficiency pumps!!!

GRUNDFOS
HYBRID

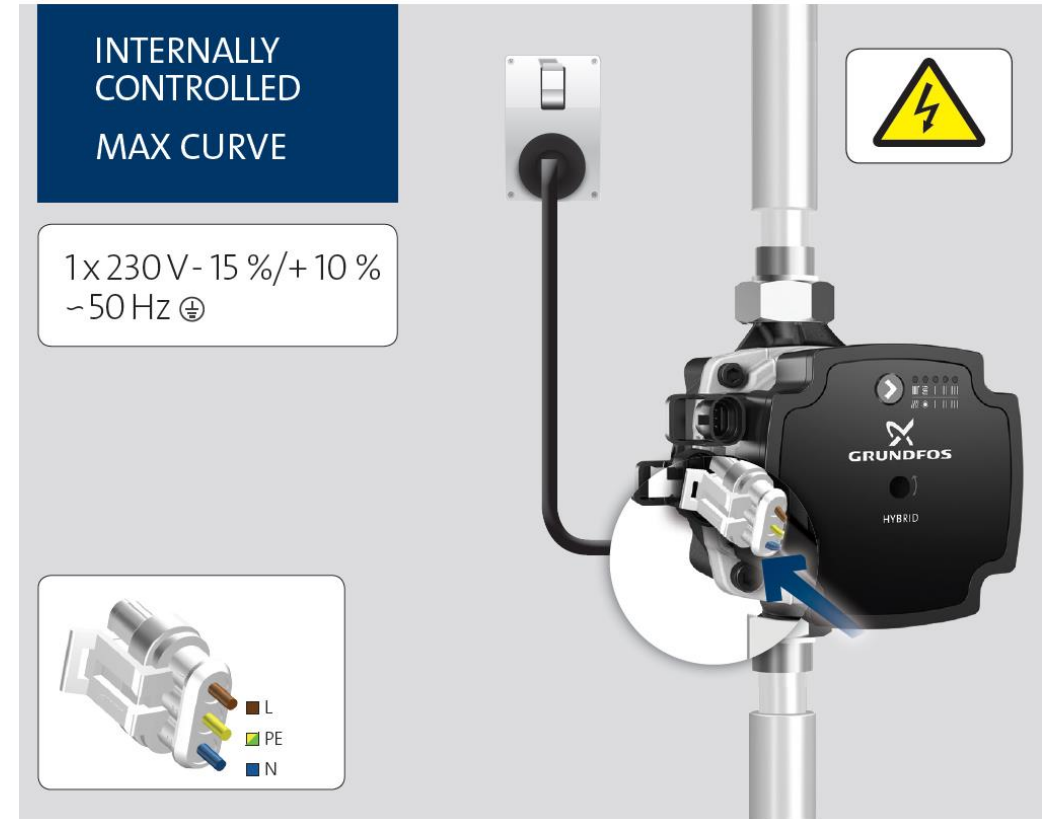
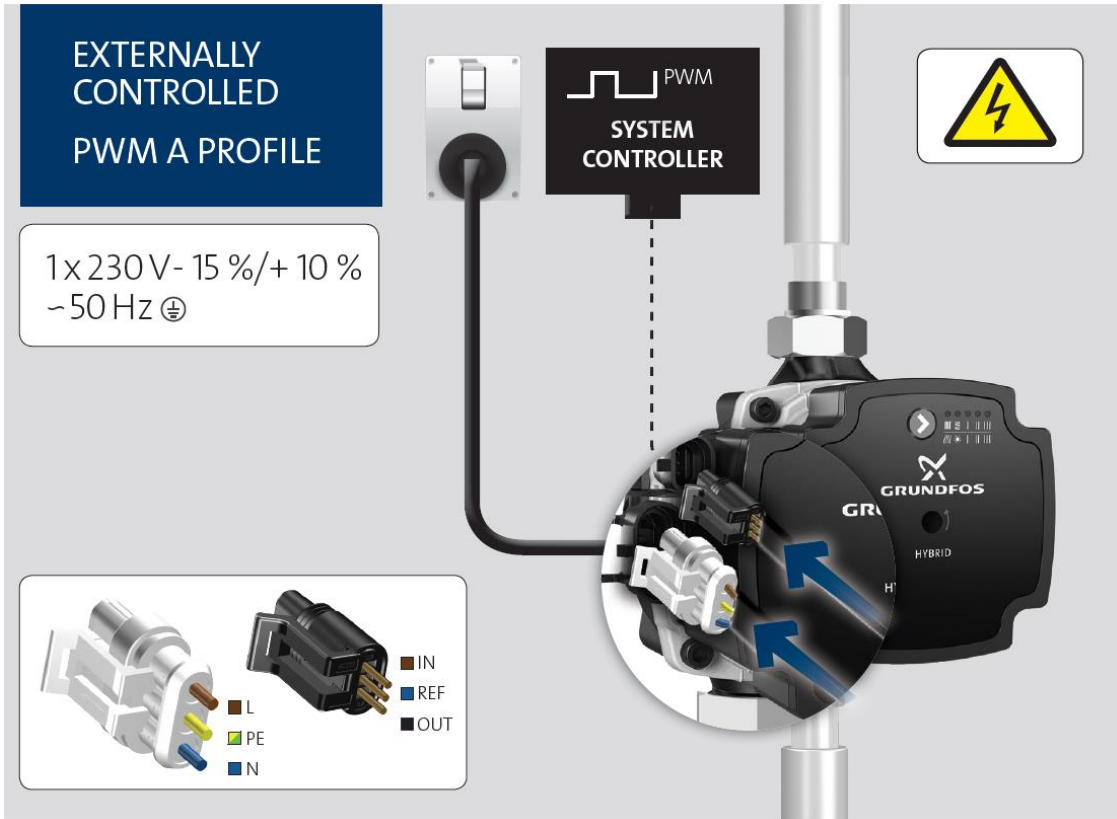
FLASH INDICATION	
	1 FLASH PER SECOND
	12 FLASHES PER SECOND

ALARM STATUS	FAULT
	BLOCKED
	LOW VOLTAGE
	ELECTRICAL ERROR

>	OPERATING PANEL	CONTROL MODE
0		PROPORTIONAL PRESSURE AUTO ADAPT
1		CONSTANT PRESSURE AUTO ADAPT
2		PROPORTIONAL PRESSURE 1
3		PROPORTIONAL PRESSURE 2
4		PROPORTIONAL PRESSURE 3 - MAX
5		CONSTANT PRESSURE 1
6		CONSTANT PRESSURE 2
7		CONSTANT PRESSURE 3 - MAX
8		CONSTANT CURVE 1
9		CONSTANT CURVE 2
10		CONSTANT CURVE 3 - MAX
11		PWM PROFILE C - SIGNAL OFF
		PWM PROFILE C - SIGNAL ON
12		PWM PROFILE A 1 - SIGNAL OFF
		PWM PROFILE A 1 - PWM SIGNAL ON
13		PWM PROFILE A 2 - SIGNAL OFF
		PWM PROFILE A 2 - PWM SIGNAL ON
14		PWM PROFILE A 3 - SIGNAL OFF
		PWM PROFILE A 3 - PWM SIGNAL ON

UPM3(K)
HYBRID




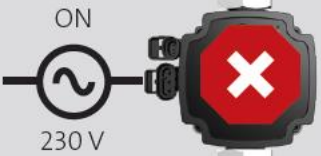








High efficiency pumps!!!



UPM3(K)
HYBRID

High efficiency pumps!!!

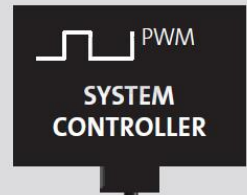
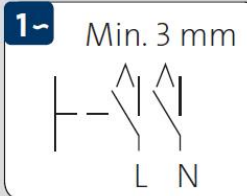
UPM3(K)
HYBRID

FAULT	OPERATING PANEL	REMEDY
 <p>OFF 0V</p>		 <p>A B C</p>
 <p>ON 230V</p>		 <p>1 2 5mm No.2</p>
 <p>ON <160V</p>		
 <p>ON 230V</p>		 <p>1 2 3 4</p>

High efficiency pumps!!!

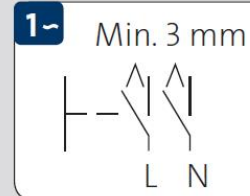
EXTERNALLY CONTROLLED

1x 230V ±10 %
~50/60 Hz Ⓧ



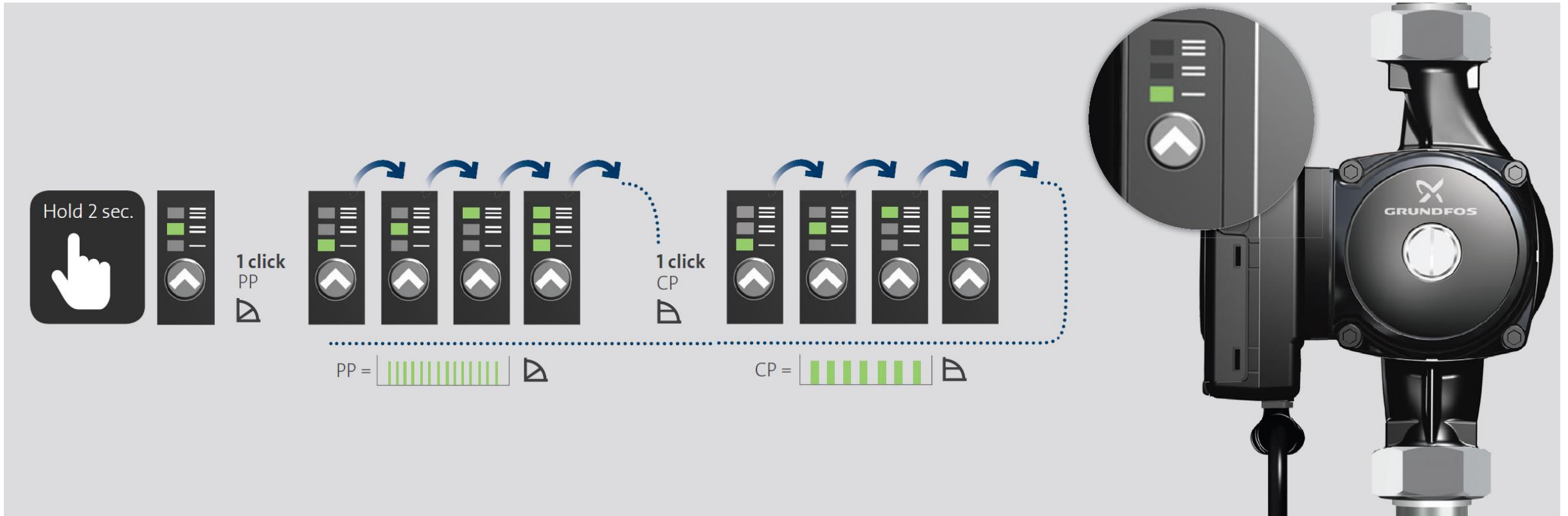
INTERNALLY CONTROLLED

1x 230V ±10 %
~50/60 Hz Ⓧ



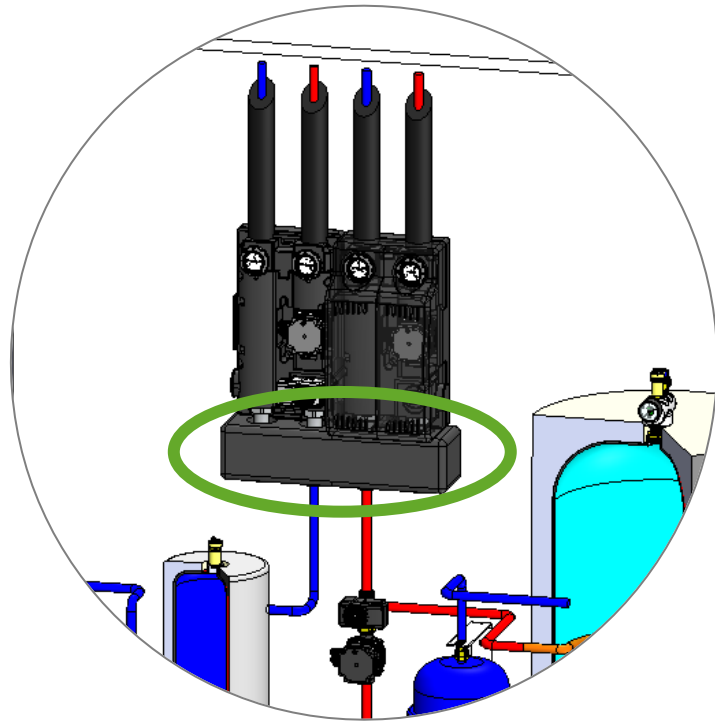
UPML

High efficiency pumps!!!



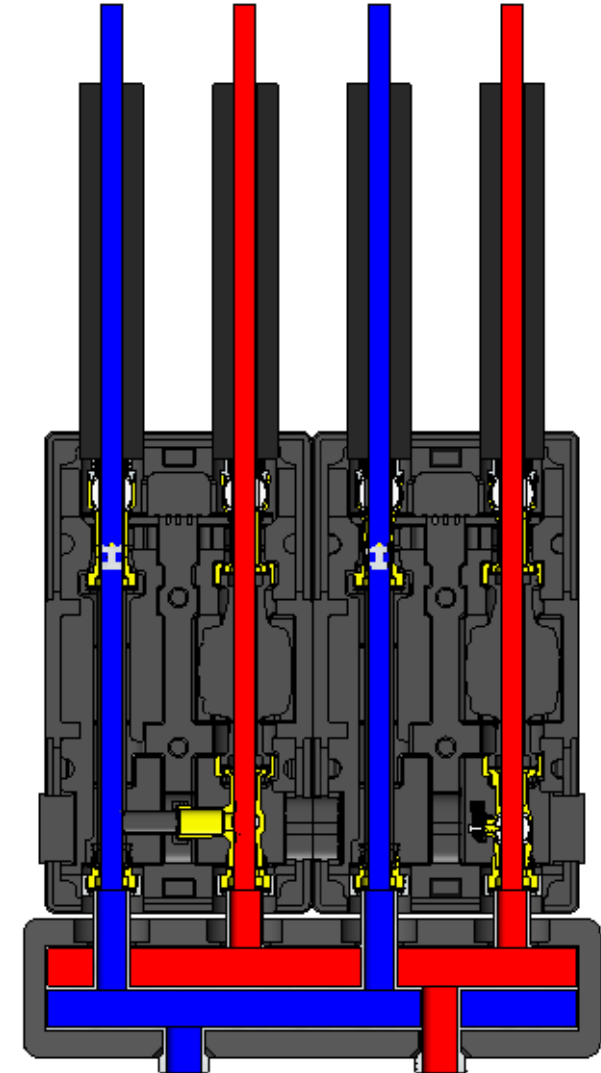
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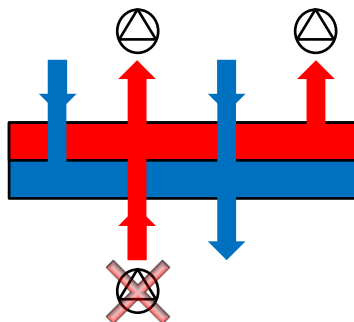
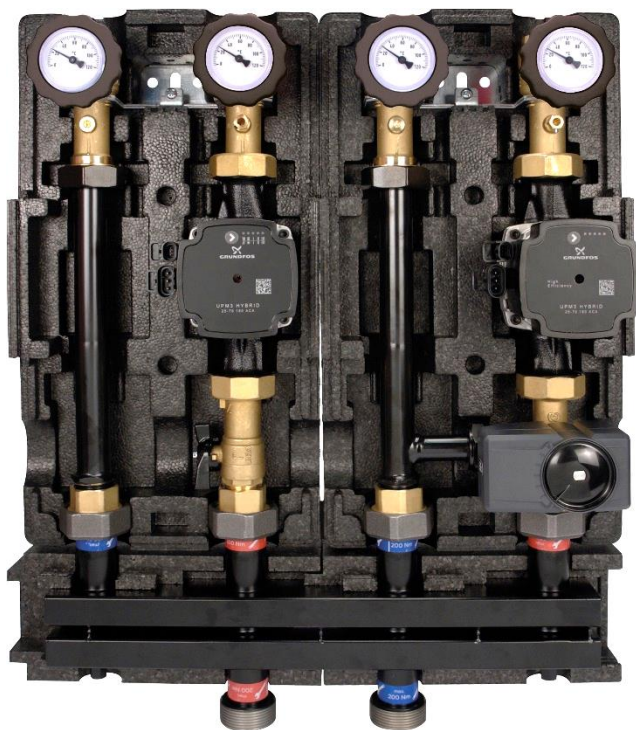
Connection of multiple secondary circuits



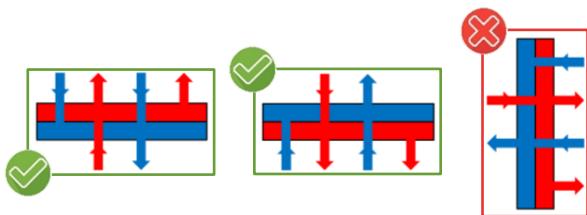
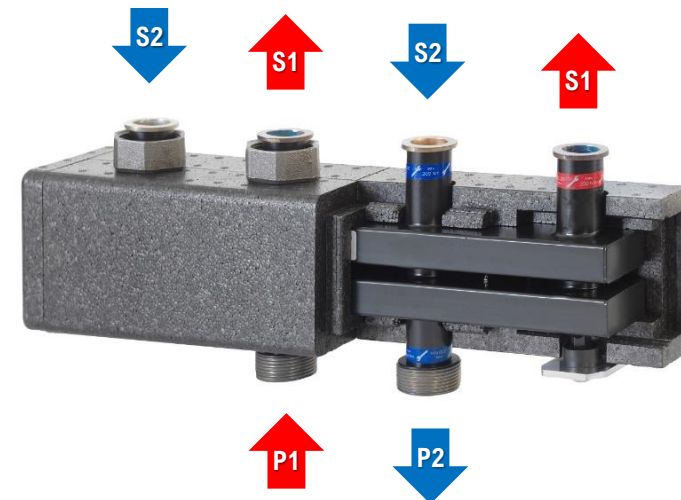
Installation based on system specifications:

- Manifold
- Separator Combi
- Hydraulic Separator





Manifold «**separate chambers**»; configuration necessary when upstream of the manifold there is no pump that serves it directly



Main components

- Complete with insulation and fixing brackets
- Available N° secondary circuits: 2, 3, 4, 5 circuits ***
- Pressure tested and painted
- With noise reducing rubber shock absorber

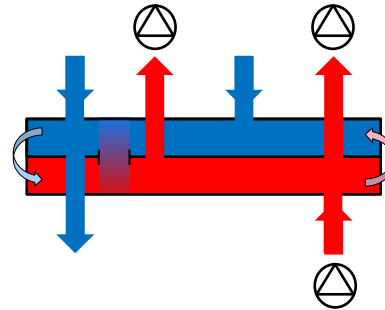
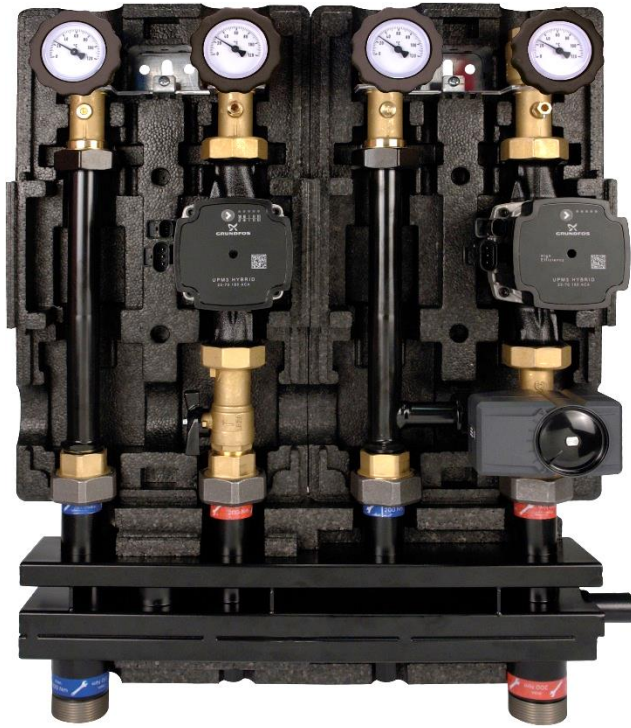
* For connection with HPS, the couplings kit is required



Technical data	
Max. flow rate	3 m ³ /h
Circuits wheelbase	125 mm
Insulation	EPP 25 mm
Max. working pressure	6 bar
Max. working temperature	110 °C
Material chambers	Steel
S1: secondary supply	1" 1/2 F coupling nut
S2: secondary return	
P1: primary supply	1" 1/2 M
P2: primary return	

Separators Combi

→ SEPARATOR COMBI = MANIFOLD WITH INTEGRATED HYDRAULIC SEPARATOR

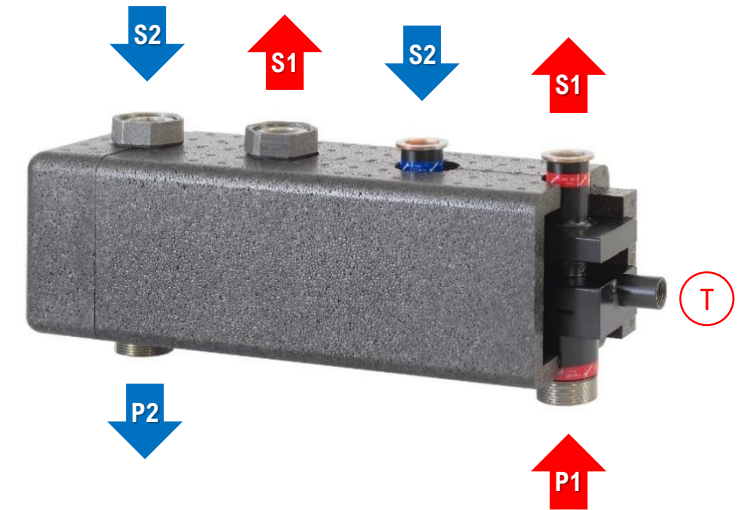
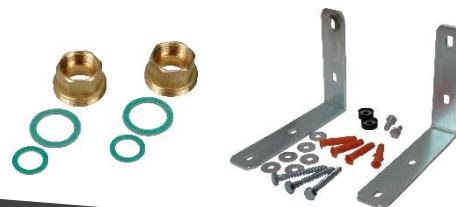


Separator Combi «communicating chambers»; the communication between the supply and return chambers allows to manage a system with several pumps that can work simultaneously upstream and downstream of the separator; the separator makes the pumps totally independent from each other

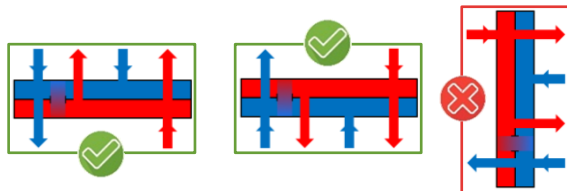
Main components

- Complete with insulation and fixing brackets
- Available N° secondary circuits: 2, 3 circuits ***
- Pressure tested and painted
- With noise reducing rubber shock absorber

* For connection with HPS, the couplings kit is required

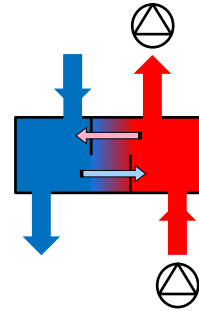
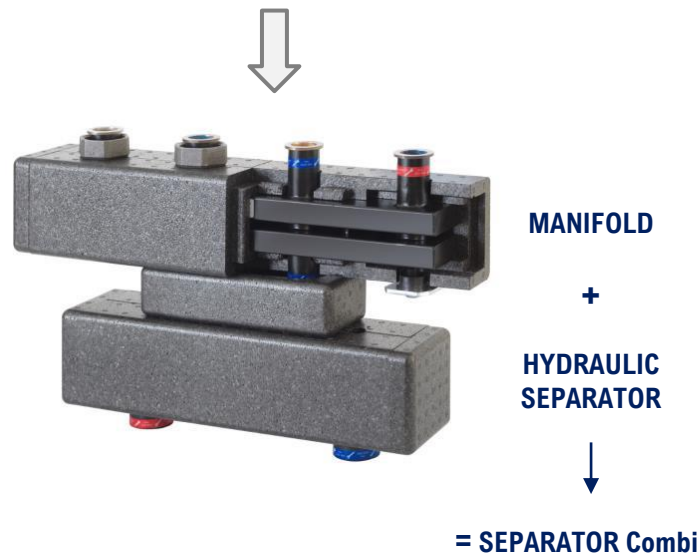


Technical data	
Max. flow rate	3 m ³ /h
Circuits wheelbase	125 mm
Insulation	EPP 35 mm
Max. working pressure	6 bar
Max. working temperature	110 °C
Material chambers	Steel
S1: secondary supply	1" 1/2 F coupling nut
S2: secondary return	
P1: primary supply	1" 1/2 M
P2: primary return	
T: additional side connection	1/2" F



Hydraulic Separators

- If we need the functions of a Separator Combi but we have only Manifolds and Hydraulic Separators in stock?
- If we need the functions of a Separator Combi but our system has 4÷5 secondary circuits?

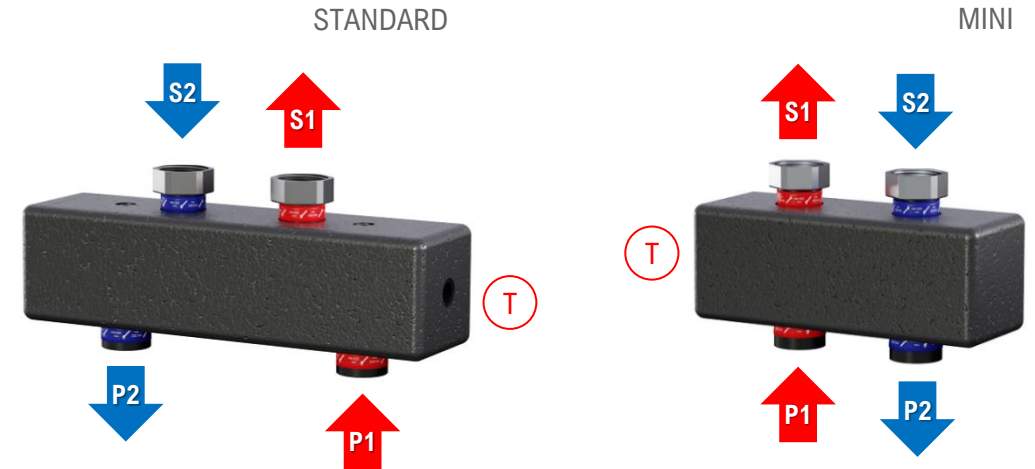


Hydraulic Separator
hydraulic separation of the primary circuit from the secondary circuit;
compact MINI version

Main components

- Complete with insulation
- Available N° secondary circuits: 1 circuit ***
- Pressure tested and painted
- With noise reducing rubber shock absorber
- Intermediate EPP insulation accessory

* For connection with HPS, the couplings kit is required



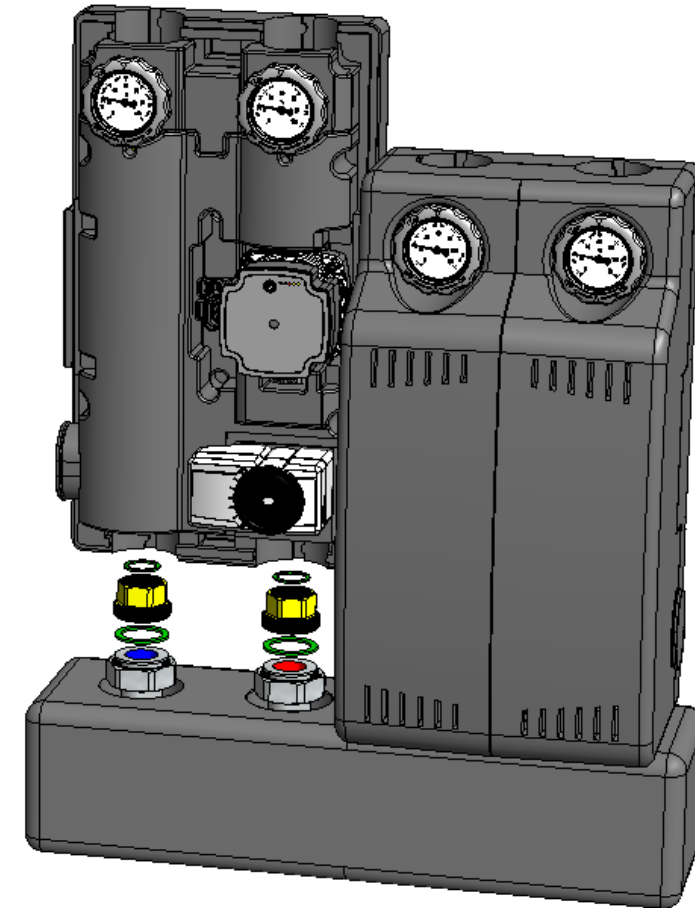
Technical data	
Max. flow rate (STANDARD)	3 m ³ /h
Max. flow rate (MINI)	2 m ³ /h
Circuits wheelbase	125 mm
Insulation	EPP 25 mm
Max. working pressure	6 bar
Max. working temperature	110 °C
Material chambers	Steel
S1: secondary supply	1" 1/2 F coupling nut
S2: secondary return	
P1: primary supply	1" 1/4 F
P2: primary return	
T: additional side connection	1/2" F

KIT COUPLINGS FOR CONNECTION TO MANIFOLD AND SEPARATOR Combi



Kit necessary for connecting Heat Pumps STATIONS (for all versions) to Manifold or Separator Combi
Complete kit with pair of couplings and gaskets

DN HPS	DN20	DN25	DN32
Connections HPS	1" M		1" 1/4 M
Code Kit Couplings	C1405503		C1405505
Connections Kit Couplings	1" F x 1" 1/2 M		1" 1/4 F x 1" 1/2 M



Technical info: choice of the correct group HPS

Normally an “**heating/cooling project**” starts from the energy needs of the house. The designer calculates the need for energy, whether it is useful for heating or cooling the rooms, based on the location of the house, the cubic meters, the transmittance and insulation of the walls, the number of windows, other parameters, etc. .

The generic formula can be summarized in:

$$\text{Heat requirement [kW]} = \text{Heated/cooled surface [m}^2\text{]} \times \text{Specific heat requirement [kW/m}^2\text{]}$$

The generic formula is to be considered reliable for heating loads. It is less so for cooling loads due to the variable external climate. The approach to the formula is still different if the generator in question is a **Heat Pump**. In fact, while with a gas generator the logic applied is to calculate the energy necessary to bring the house from cold to warm, with a heat pump generator you must calculate the energy necessary to keep the rooms warm (or cold) as a function of the external variable. It is therefore necessary to consider the thermal energy dispersed rather than the thermal energy required.

Therefore, for the correct sizing of a **Heat Pump**, the following parameters must be considered:

- **Degrees Day:** represent the sum of the differences between the internal temperature (conventionally 20 °C) and the average external temperature of the single day for all the days of the heating season;
- **Design external temperature:** minimum external temperature at which the heat generator provides sufficient thermal energy to ensure that the internal temperature remains stationary;
- **Annual thermal energy requirement for winter conditioning (ETH):** the thermal energy required, during the heating season, for winter conditioning;
- **Usable surface:** calculated as the net floor area of the temperature-controlled or conditioned rooms of the building.

Therefore, the calculation of the power required by the **Heat Pump** to maintain the design temperature becomes:

$$P_{thermal_design} = ETH \times Surface \times (T_{internal} - T_{external_design}) / Degrees_Day / Houres_day$$

For example, if we consider an apartment of 200 m², divided into two zones, with an energy requirement of 55 kWh/year/m² (class C), with T_{external} -5 ° C (Milan), we will obtain that:

$$P_{thermal_design} = 55 \times 200 \times [(20 - (-5)) / 2400 / 14] \rightarrow 8,18 \text{ kW}$$

In the case of DHW production, the power of the Heat Pump must also consider this variable.



Technical info: choice of the correct group HPS

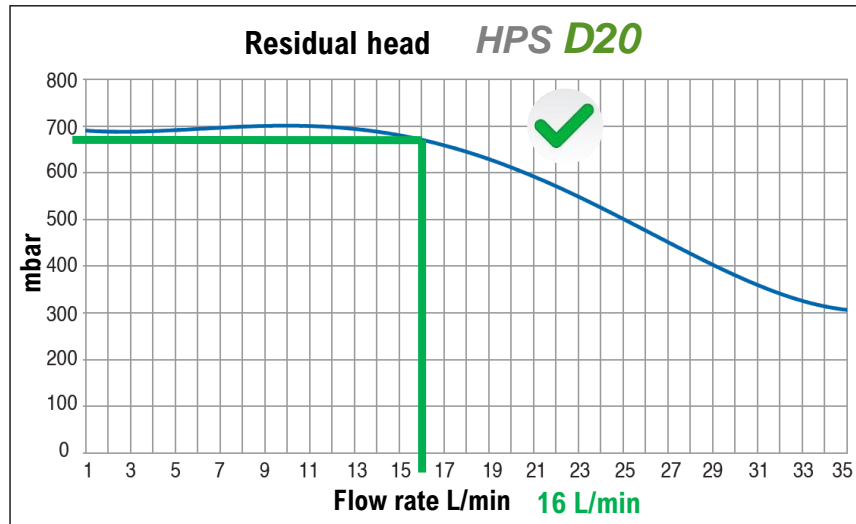
Therefore, starting from the necessary thermal power, about **9 kW**, the designer will establish the commercial size of the **Heat Pump** closest to our energy needs, then he will define the other characteristics of the system. At the end of the project we will have all the necessary information, for example:

- **Lay-out** → management of 2 heating zones, one underfloor of 100 m² and one with fan coils of 100 m²
- **Technical data of zone 1**
 - HEATING → flow rate 12 L/min - T delivery 36 °C - ΔT 10 °C - pressure drops max. valued 255 mbar
 - COOLING → flow rate 16 L/min - T delivery 15 °C - ΔT 5 °C - pressure drops max. valued 255 mbar
- **Technical data of zone 2**
 - HEATING → flow rate 14 L/min - T delivery 50 °C - ΔT 7 °C - pressure drops max. valued 200 mbar
 - COOLING → flow rate 16 L/min - T delivery 10 °C - ΔT 5 °C - pressure drops max. valued 200 mbar



With this information, the plumber will have to choose 2 HPS hydronic groups, one mixing motorized and one direct, for the management of the zones with a **residual head of 255 mbar** or more, with a flow rate of 16 L/min, and all the accessories supplied (manifold, room thermostats, safety thermostats, control unit, etc...)

Direct Group DN20



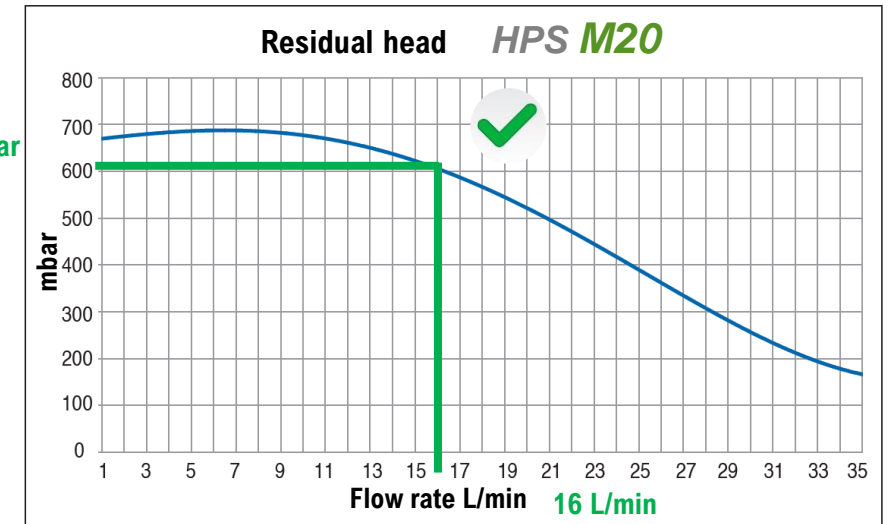
In this example:

the **HPS DIRECT DN20** group has approximately 680 mbar of residual head → **OK**

the **HPS MIXING DN20** group has approximately 610 mbar of residual head → **OK**

Can we still optimize the system to «economize»?
Such as?

Mixing Group DN20



Technical info: choice of the correct group HPS



UPM3(K)
HYBRID

Pump **GRUNDFOS** model **UPM3K HYBRID** → the HYBRID version is the top of the range of UPM3 series, and allows significant operational advantages, as it makes **all possible modes and operating curves available for each system configuration**

These pumps can be controlled externally via PWM signal or can be controlled internally in the following modes:

- Proportional Pressure** (3 speeds and Autoadapt)
- Constant Pressure** (3 speeds and Autoadapt)
- Constant Curve** (3 speeds)



In the example we are dealing with:

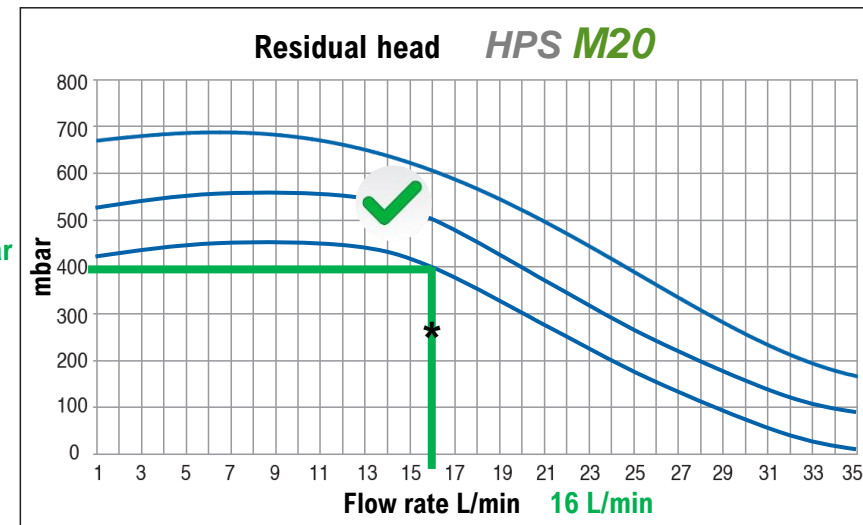
With the group **HPS M20** (mix, DN20), at 16 L/min we have about 610 mbar of residual head. By setting curve 1, we still guarantee a residual head of 400 mbar → **OK**

With this intervention and by optimizing the Constant Pressure setting, the electric consumption of the pump goes from the initial 50 W to about 16 W !!!



400 mbar
40 kPa

* working point



Technical info: choice of the correct group HPS



GRUNDFOS
HYBRID

FLASH INDICATION	
	1 FLASH PER SECOND
	12 FLASHES PER SECOND

ALARM STATUS	FAULT
	BLOCKED
	LOW VOLTAGE
	ELECTRICAL ERROR

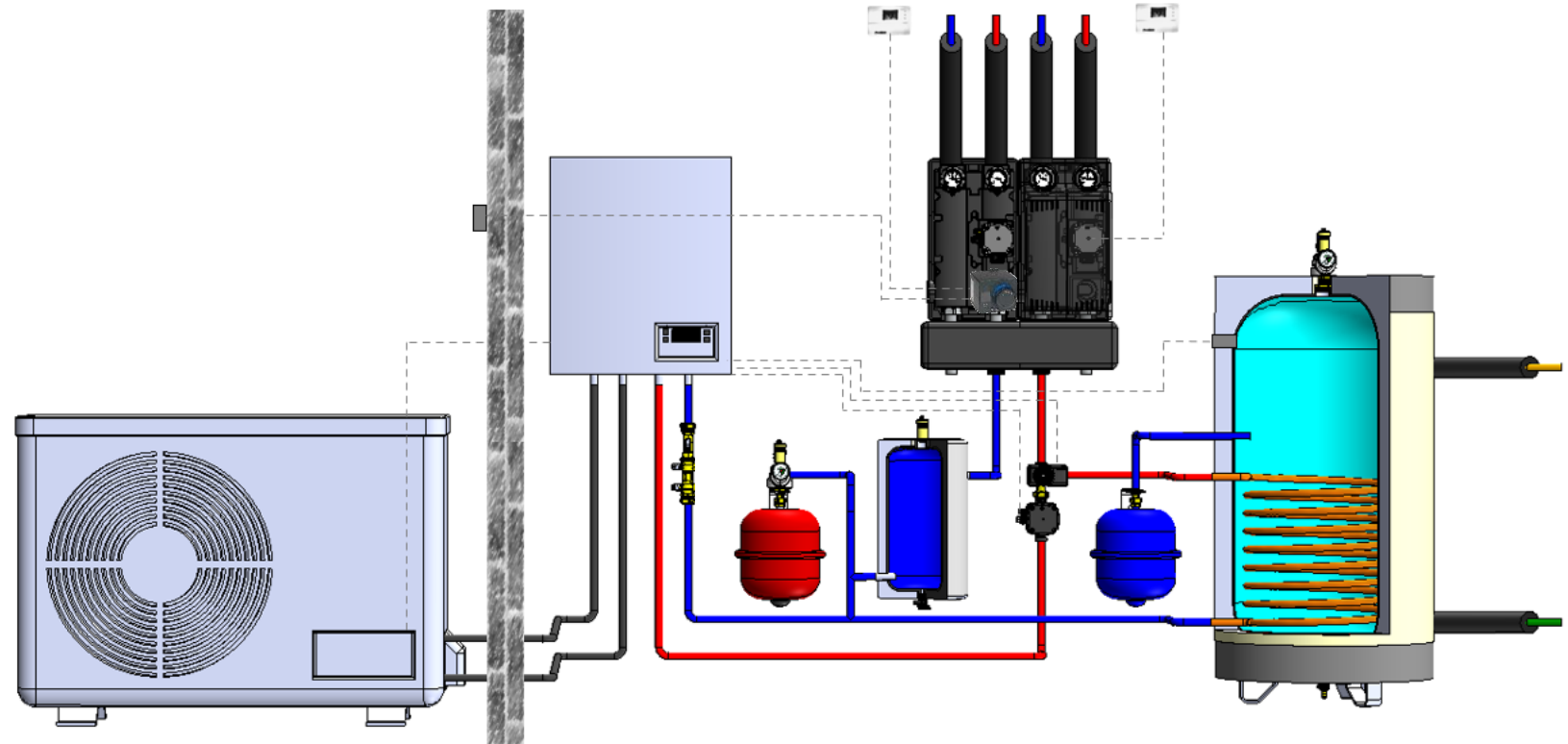
>	OPERATING PANEL	CONTROL MODE
0		PROPORTIONAL PRESSURE AUTO ADAPT
1		CONSTANT PRESSURE AUTO ADAPT
2		PROPORTIONAL PRESSURE 1
3		PROPORTIONAL PRESSURE 2
4		PROPORTIONAL PRESSURE 3 - MAX
5		CONSTANT PRESSURE 1
6		CONSTANT PRESSURE 2
7		CONSTANT PRESSURE 3 - MAX
8		CONSTANT CURVE 1
9		CONSTANT CURVE 2
10		CONSTANT CURVE 3 - MAX
11		PWM PROFILE C - SIGNAL OFF
		PWM PROFILE C - SIGNAL ON
12		PWM PROFILE A 1 - SIGNAL OFF
		PWM PROFILE A 1 - PWM SIGNAL ON
13		PWM PROFILE A 2 - SIGNAL OFF
		PWM PROFILE A 2 - PWM SIGNAL ON
14		PWM PROFILE A 3 - SIGNAL OFF
		PWM PROFILE A 3 - PWM SIGNAL ON

UPM3(K)
HYBRID

Technical info: choice of the correct group HPS

In summary, let's see the example of installing a Heat Pump Split 10 kW with the following system components:

- Separator Combi with 2 circuits
- Direct hydronic group **HPS D20**
- Mixing hydronic group **HPS M20** with hot/cold NVMC controller
- Room thermostats hot/cold
- Micro inertial storage
- Hydraulic system accessories

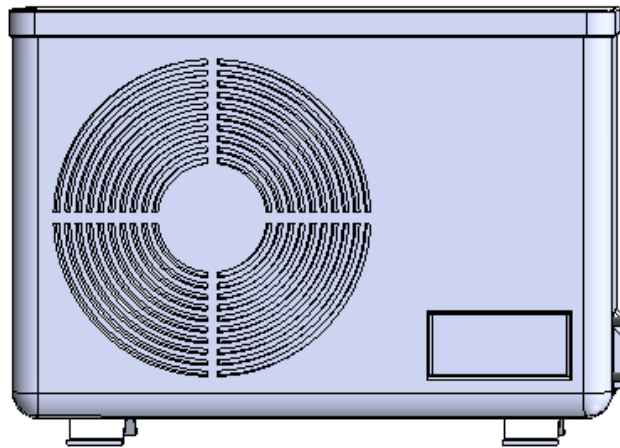


WARNING: check the technical characteristics and compatibility of the devices interfaced with the products presented. Schematic indicative of principle, not valid as a system project. This diagram does not include all the shutdown and safety devices necessary for a state of the art installation. National and international laws, regulations, standards and directives must be observed.

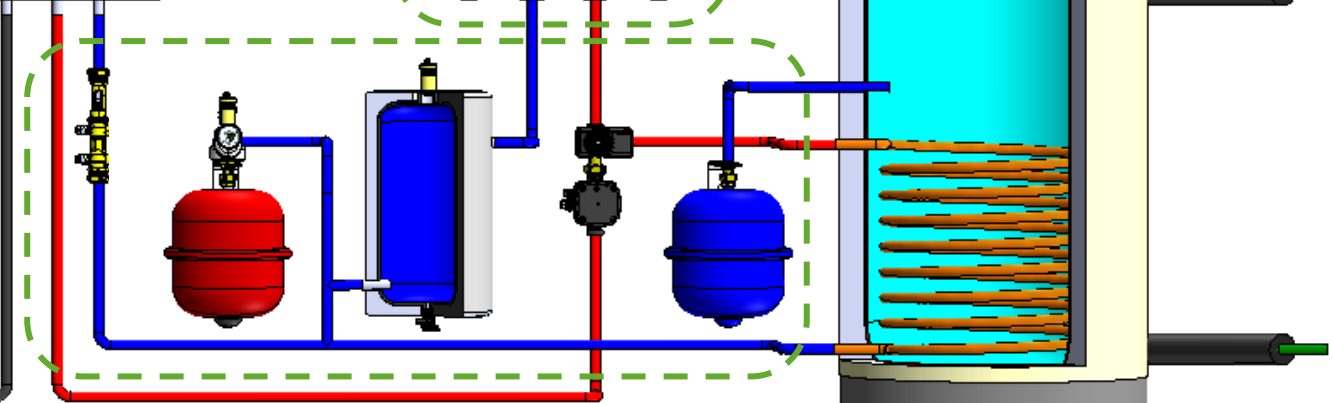
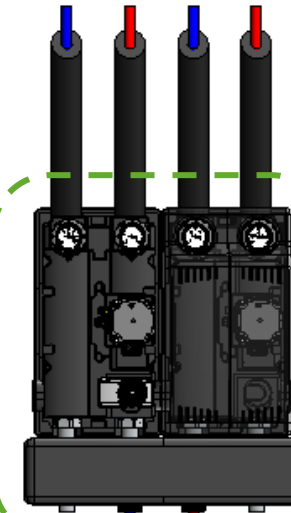
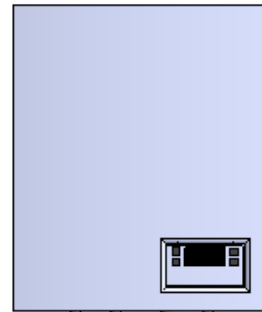
The other opportunities besides the Heat Pumps STATIONS

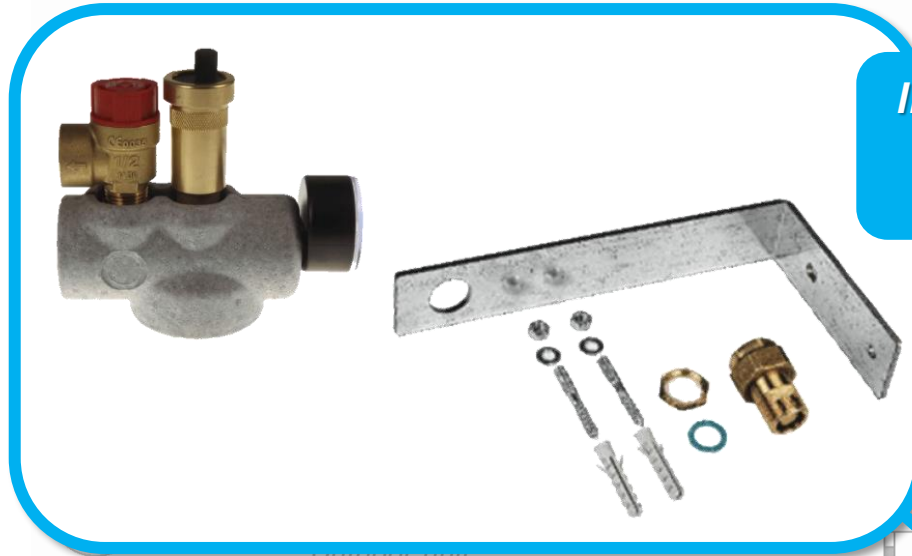


Outdoor unit

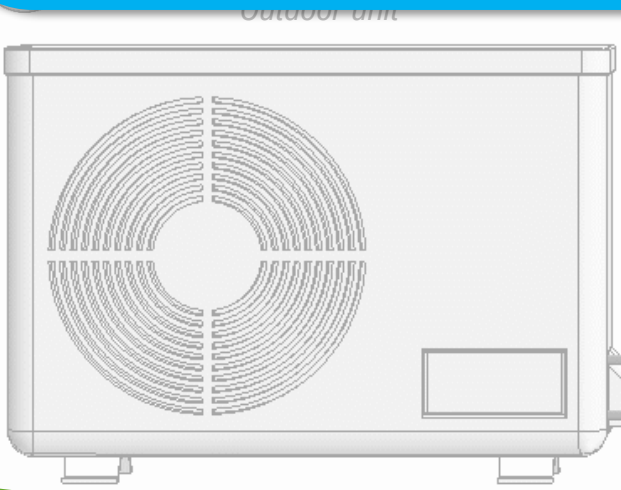
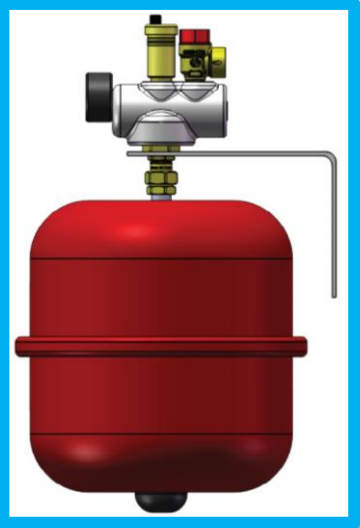
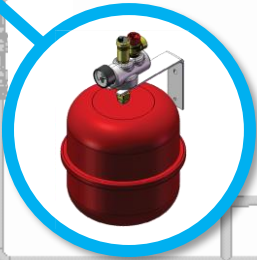
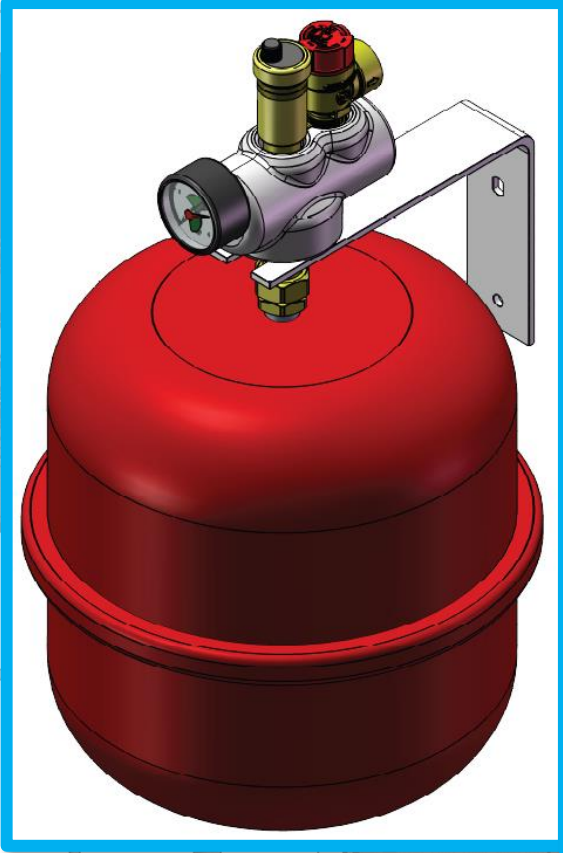


Indoor unit

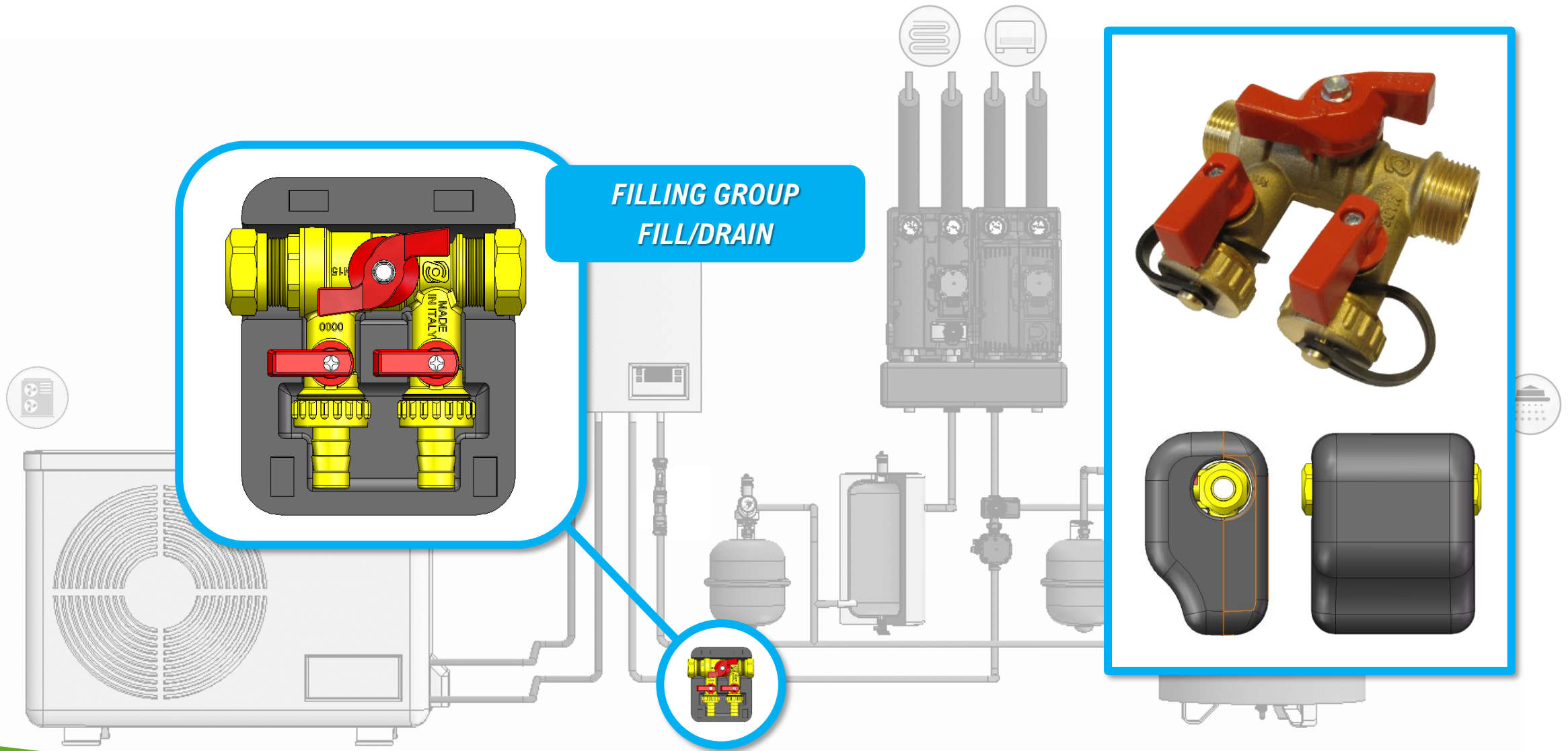


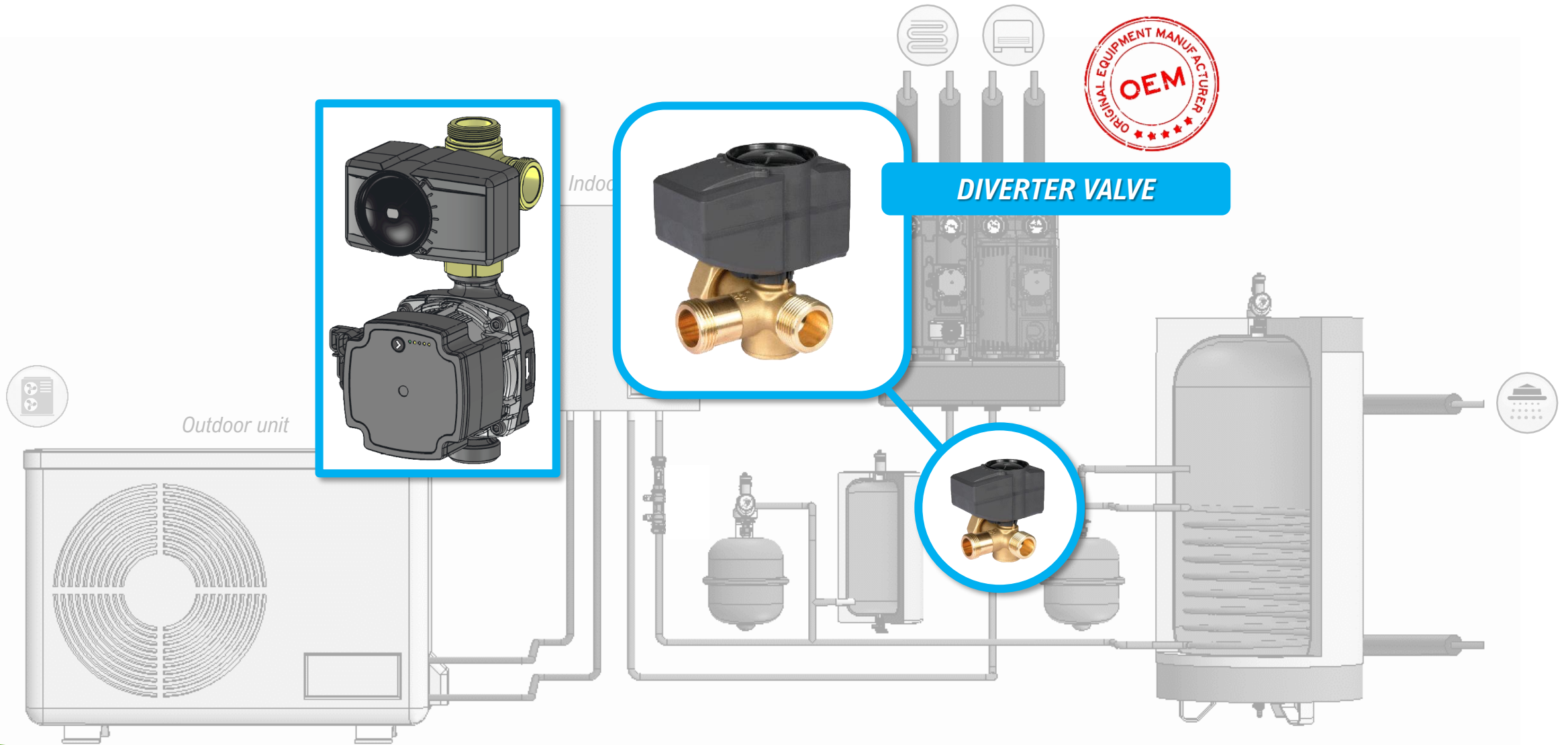


**INSTRUMENT HOLDER
MANIFOLD ***
*** OR SINGLE COMPONENTS**



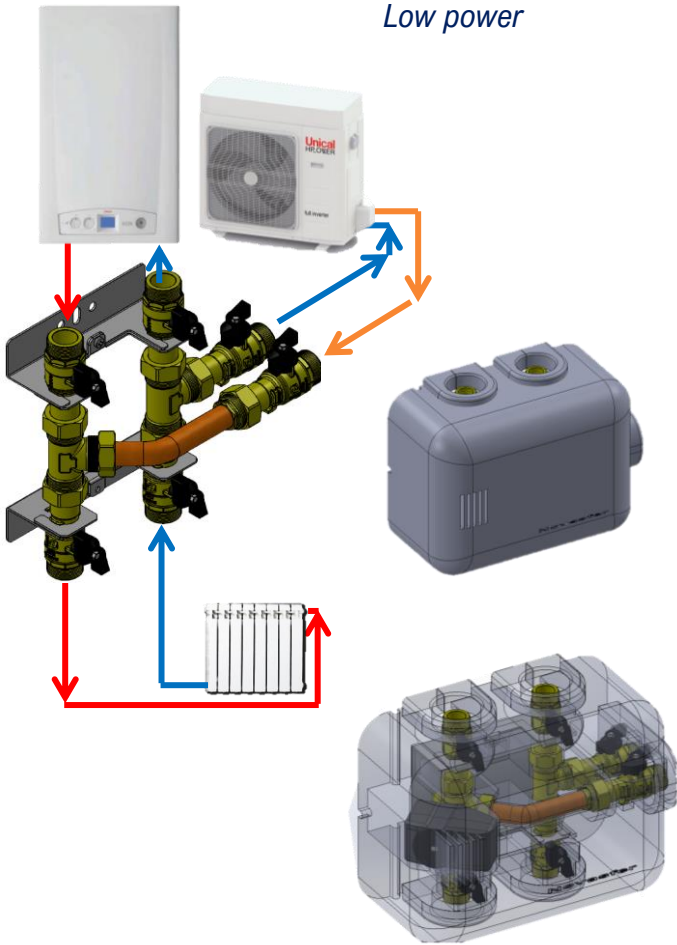
NEW!



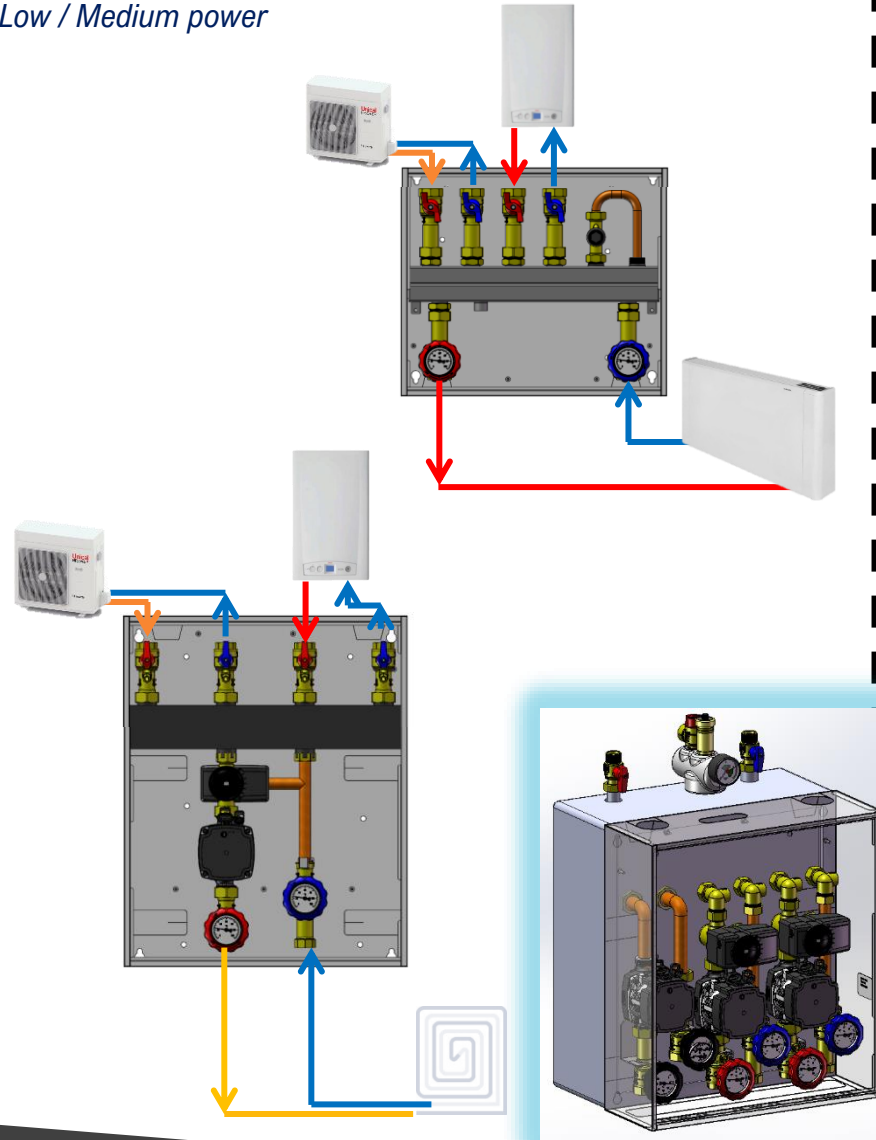


Possible developments for Hybrid systems, boiler + heat pump

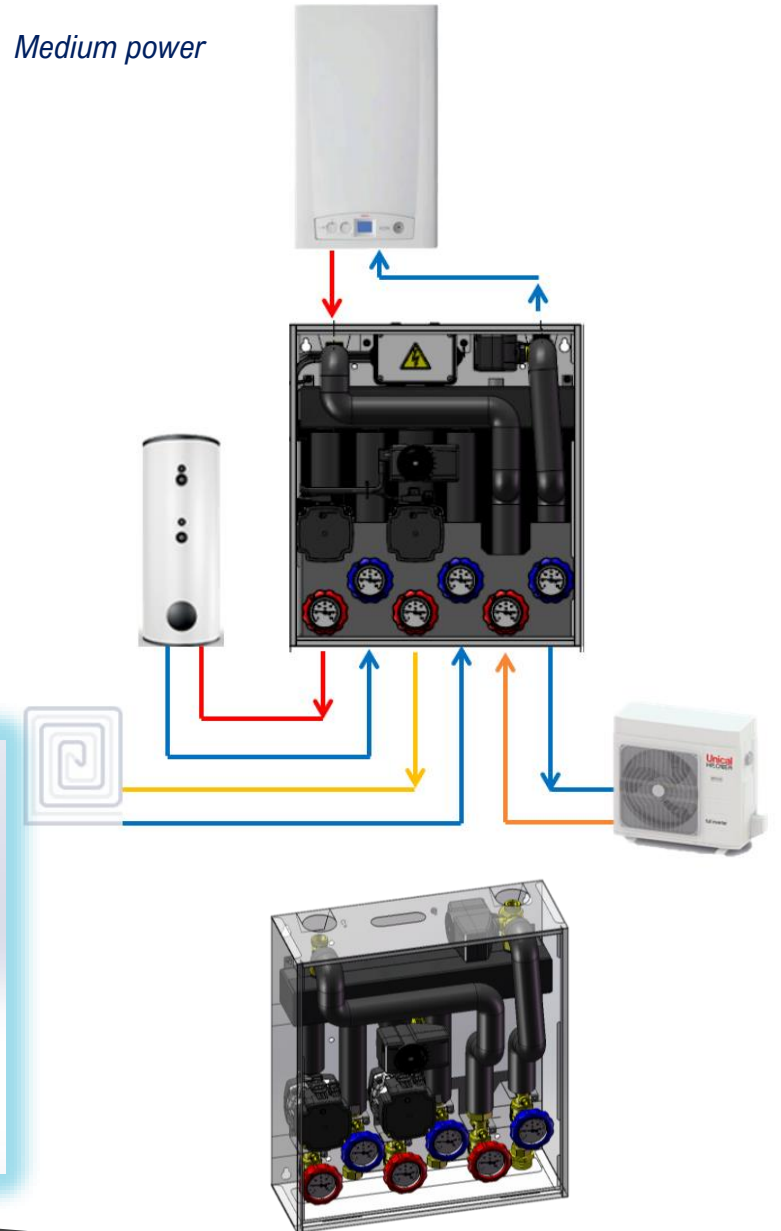
Low power

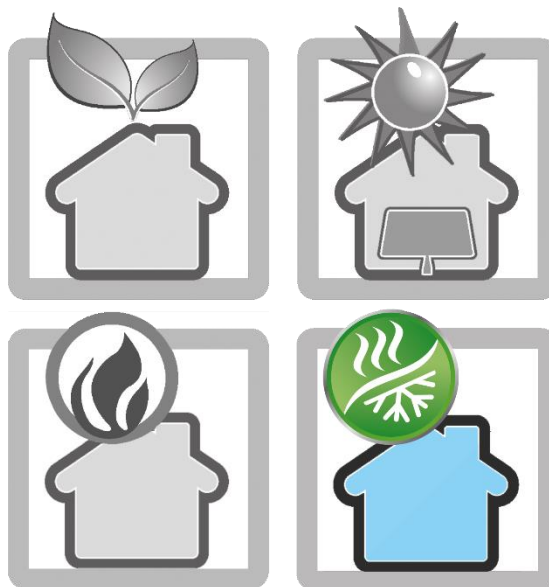


Low / Medium power



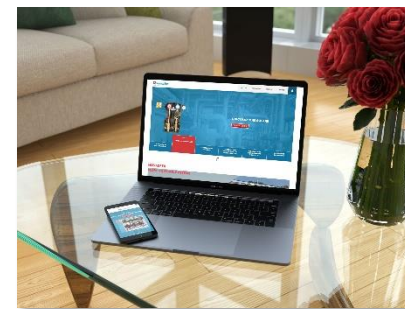
Medium power





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Thank you



Novasfer Video



Novasfer Srl